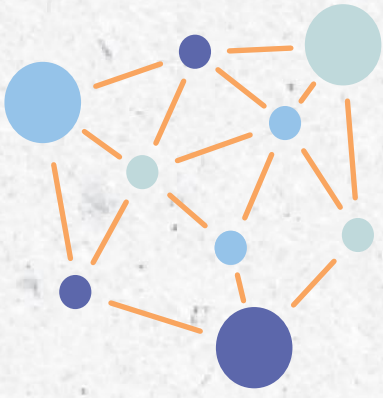
ACT PUBLIC HEALTH SYSTEM



WORKPLACE CULTURE FRAMEWORK

A summary of the research on an evidence-based approach to workplace change

November 2020

Culture Review **Implementation**

our journey of positive change

ACT Government

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Background

The ACT public health system (the system) provides a broad range of services that benefit the community every day. The community trusts the system to deliver these high-quality healthcare and services. For the workforce, that means putting in their best efforts in a workplace where they feel safe, supported and valued.

Across the ACT public health system, there has been a commitment made to drive culture change that benefits the workforce and the community. This commitment acknowledges there is a need to address certain factors that underpin organisational culture.

From review to action

There has been significant inquiry undertaken to understand the culture across the system. This includes the *Final Report: Independent Review into the Workplace Culture within ACT Public Health Services* (Culture Review Report) undertaken in 2019 and the associated 20 recommendations.

Through the independent review, it was identified that several of the recommendations were directly linked to the key workplace culture factors of organisational behaviour, workforce and leadership. To improve these factors there was recognition that a consistent strategic approach is required across the ACT public health system.

The **Workplace Culture Framework** puts this into action.

Informed by evidence, the Framework has been developed to guide approaches on the key cultural changes required to enable the system to continue to deliver the highest level of care for the community.

Based on evidence

Every day in healthcare, decisions are made using evidence. The Framework has been designed using a similar approach to an evidence-based practice model.

Changing culture takes time. The Framework is about supporting the system with a purposeful approach that's sustainable. It's focused on setting the ACT public health system up for success in the long-term with the most appropriate actions.

Why another report?

The Culture Review Report made clear recommendations relating to improving workplace culture across the system.

As an outcome from the partnership, The Workplace Culture Framework (the Framework) was developed. The Framework provides a roadmap, informed by evidence and provides a system-wide overview of the required change journey, including desired outcomes.

The Framework isn't designed to be the sole driver of culture change, rather, it works to complement and inform workplace culture-related projects across the system.

Culture matters
All workplaces have a culture. Workplace culture sets the tone for how things get done, and how people interact and engage with others. It guides appropriate and acceptable behaviours in the workplace.

Why does this matter? Because when organisations create a workplace culture that values employees and builds work relationships high in trust, the organisation does better. For the system, that means a culture that supports its workforce in delivering the best outcomes for the community.

A collaboration with the Australian National University Research School of Management

To establish the foundation for long-term culture change that sticks, the system needed to engage an external with relevant expertise and experience. The Australian National University, Research School of Management (ANU-RSM) and the Center for Evidence-Based Management (CEBMa) are leaders in evidence-based management practices. Together, they have conducted research on people leadership and management in many different organisations.

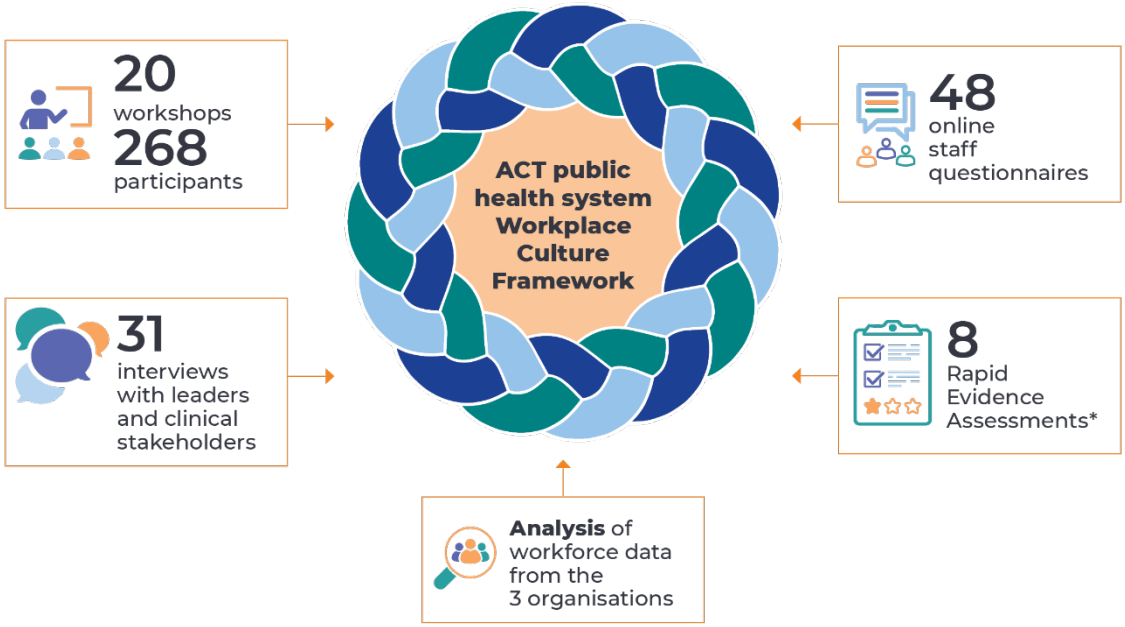
Being a local Canberra-based institution also meant ANU-RSM had knowledge and insight of factors unique to the ACT jurisdiction.

The Framework is based on research and insights conducted by ANU-RSM and CEBMa, and a process of co-design across the system.

How the Workplace Culture Framework was developed

ANU-RSM gained a greater understanding of the situation across the system by consulting with both internal and external stakeholders. This identified key workplace themes, which were then tested and consolidated with further research.

ANU-RSM outlined their findings in a report *Investing in our people: A system-wide evidence-based approach to workplace change*, which includes the Workplace Culture Framework.



Exploratory phase

To gain an understanding of the system and the organisations within it, ANU-RSM conducted interviews and workshops with key stakeholders and analysed organisational data. Insights from these identified key workplace change priorities. Taking this approach, allowed ANU-RSM to gain an understanding of the culture challenges within the system and ensures that the issues most pressing to our workforce are addressed.

Interviews

Thirty-one interviews with senior managers and external stakeholders were based around the following two questions:

1. What do you see as the underlying causes of the problems outlined in the Independent Review into Workplace Culture?
2. What are your preferred solutions to these problems?

Workshops

A total of 268 stakeholders across the three ACT public health system organisations took part in a series of co-design workshops. The solution-focused workshops were designed to gain insight from participants relating to the changes required at different levels of the organisation (co-worker, supervisor and organisational). For organisational change to be sustained, all levels of the organisation need to be involved in its planning and implementation.

Online Survey

Staff members unable to attend a workshop and workshop participants who wanted to provide additional input were given the opportunity to complete an online survey.

Organisation Data

Numerous forms of organisational data were reviewed and analysed by the ANU-RSM team including:

- Workforce data,
- Staff survey data from Canberra Health Services and the ACT Health Directorate,
- HR policies, and
- Data from incident reporting systems.

Key themes

Taking insights uncovered in the workshops, online surveys, analysis of workforce data and interviews, ANU-RSM was able to group the results into the following key workplace change priorities:

- Workplace incivility,
- Psychological safety,
- Team effectiveness,
- Leadership skills, and
    - Motivating individual performance and development,
    - Cognitive and decision-making skills, and
- Transparency and measurement of workplace behaviour and outcomes (now known as Organisational Trust).

The key themes were identified and prioritised based on:

1. The number of times the issue was raised;
2. Urgency (the issue was considered very important and needing immediate attention); and
3. Being within ANU-RSM's area of expertise: organisational behaviour, leadership and human resources management.

Further testing of key themes

To further test the themes, ANU-RSM engaged the CEBMa to undertake eight Rapid Evidence Assessments (REAs). CEBMa is world renowned as an authority on evidence-based practice in leadership, management and organisational behaviour.

The REAs are summaries of trustworthy global scientific research to define the issues in each theme.

The REA's provide evidence for solutions that have been successfully put into practice by other organisations. These initiatives are proven to have the greatest positive impact on the workforce.

The findings from the REAs were used to distil the themes into **five key workplace change priorities**. These are central to the Workplace Culture Framework.

Full summaries are available on all eight REAs conducted:

- Impact of line and/or middle managers on workplace performance,
- Individual performance,
- Employee recognition and non-financial rewards,
- The effect of feedback on workplace performance,
- Drivers of workplace incivility,
- Psychological safety,
- Drivers of team effectiveness, and
- Effectiveness of leadership training.

The ACT public health system Workplace Culture Framework

The Framework brings together the priorities identified in the exploratory research and translates the scientific evidence with a high-level representation of the desired outcomes, and how to achieve these outcomes for each of the key workplace change priorities.

ACT Public Health System: Evidence-Based Workplace Culture Framework

Our five workplace change priorities	Set Expectations System-Wide	Baseline Measures of Desired Outcomes	Build knowledge through education	Intermediate Measure	Develop People & Leadership Skills	Measure Desired Outcomes	Measure outcomes	Safer and Higher Performing Workforce
ORGANISATIONAL TRUST	▸ Workplace Change Framework mapped to existing data & priorities, and data strategy developed to support measurement.		▸ **All leaders** educated about the importance of workplace data and metrics in decision-making.		▸ Align current training against evidence-based training guidelines. ▸ **All leaders** trained in people, cognitive and decision-making skills (I). ▸ **Senior leaders** trained in cognitive and decision-making skills (II).		▸ Organisational trust. ▸ Trust in leaders. ▸ Behavioural integrity. ▸ Perceptions of fairness.	
LEADERSHIP AND PEOPLE SKILLS	▸ Baseline measurement tool in place. ▸ Evidence-based guidelines are created for motivating individual performance and growth.		▸ **Workforce** educated on evidence-based guidelines on individual performance and development. ▸ **Leaders** educated about the roles and responsibilities related to facilitating individual performance and development.		▸ **Workforce and leaders** trained in: goal setting, communication; and giving/receiving feedback. ▸ **Leaders** trained in: fair and evidence-based decision-making; goal setting (individual and team); & giving and receiving feedback.		▸ Access to resources. ▸ Supervisory support. ▸ Work engagement. ▸ Perceptions of fairness. ▸ Goal and role clarity.	
WORKPLACE CIVILITY	▸ Baseline measurement tool in place. ▸ Evidence-based guidelines are created for workplace civility.		▸ **Workforce** educated about: · Standards of workplace behaviour. · Evidence-based workplace incivility guidelines. ▸ **Leaders** educated about the roles and responsibilities in managing incivility.		▸ **Workforce and leaders** trained in: conflict management; communication; and stress management. ▸ **Leaders** to receive training in: fair & evidence-based decision-making; role clarity; & goal setting.		▸ Quality of co-worker relationships. ▸ Perceptions of fairness. ▸ Role clarity. ▸ Supervisory support. ▸ Ethical leadership.	
PSYCHOLOGICAL SAFETY	▸ Baseline measurement tool in place. ▸ Evidence-based guidelines are created for psychological safety.		▸ **Workforce and leaders** educated on evidence-based psychological safety guidelines. ▸ **Leaders** educated about roles and responsibilities related to psychological safety.		▸ **Workforce and leaders** trained in: goal setting, conflict management; & communication. ▸ **Leaders** trained in: participative and empowering leadership style; setting climates for learning; role clarity; and goal setting.		▸ Speaking up. ▸ Quality of leader/employee relationship. ▸ Climate for inclusion. ▸ Climate for learning and innovation.	
TEAM EFFECTIVENESS	▸ Baseline measurement tool in place. ▸ Evidence-based guidelines are created for drivers of team performance.		▸ **Workforce and leaders** educated on evidence-based team effectiveness guidelines. ▸ **Leaders** educated about roles and responsibilities related to team effectiveness.		▸ **Workforce and leaders** trained in conflict management. ▸ **Leaders** trained in: psychological safety; providing positive feedback; team goal-setting; inclusive leadership; team building; & facilitation for team learning.		▸ Team cohesion. ▸ Intra-team trust. ▸ Team psychological safety. ▸ Team goal clarity. ▸ Information sharing and integration.	

Prerequisite

1. Director-General ACTHD, the CEO CHS and the Regional CEO Calvary Hospital support a system-wide approach measuring progress.
2. Workplace culture priorities align with policies and procedures.
3. Leaders role model expected behaviours and skills.
4. Knowledge and skills development follows evidence-based principles of training design and delivery.

Organisational Trust 	We need to improve the trust in our organisations, and decisions must be fairly and transparently made and applied.
Leadership and People Skills 	We need to build our people skills at work, as well as investing in specific people management and leadership training to support us all.
Workplace Civility 	We need more inclusive workplaces with respectful interactions between each other.
Psychological Safety 	We need to be able to raise concerns and suggest new ideas in open, supportive, safe and accepting work environments.
Team Effectiveness 	We need more clarity in our roles and to develop our skills to do our jobs effectively. We need to ensure that workloads are more balanced within teams.

The priorities provide focus and set the expectation for people in the ACT public health system (across clinical, non-clinical and policy settings) to think about their work and behaviour towards others.

Organisational Trust

Transparency and measurement of system-wide workplace behaviour and outcomes are essential in creating a shared understanding of what skills and behaviours are valued and expected in the workplace. A commitment to effective evidenced-base decision making using available information, data, evaluation and analysis will result in increased organisational trust.

Leadership and people skills

Effective communication, active listening, interacting respectfully, performance and development goals, giving and receiving feedback, providing recognition and managing conflicts collaboratively are all critical people skills that are needed to be effective individually, working in a team and as a leader.

Additionally, the roles and behaviours of leaders have a substantial impact on individual, team and organisational outcomes.

Workplace civility

Civility refers to behaviours such as being polite, respectful and considerate. Incivility generally starts with some form of interpersonal conflict and highlights the importance of people skills in the workplace for all levels of the workforce. Leaders with a supportive and participatory leadership style are also better able to moderate incivility.

Psychological safety

Psychological safety refers to the extent to which employees believe they can openly speak up, ask for help, ask questions and make suggestions without judgment or repercussions

Active listening, conversational turn-taking, giving and receiving feedback, and cooperative conflict management are people skills supporting a psychologically safe environment. Leaders need to exhibit an empowering leadership style, establish development opportunities, encourage teams and individuals to speak up and ask questions and foster inclusion and diversity.

Team effectiveness

Teams are not automatically effective. Effective teams are defined as groups of workers who exhibit certain behaviours and processes that lead to high performance. Examples of behaviours or norms that lead to team effectiveness and high performance include active feedback loops, group reflection, sharing information freely, and well-developed intra-team processes (such as how to communicate and overcome conflict).

The process to change

The Workplace Culture Framework highlights a four-step process to address the five culture change priorities:

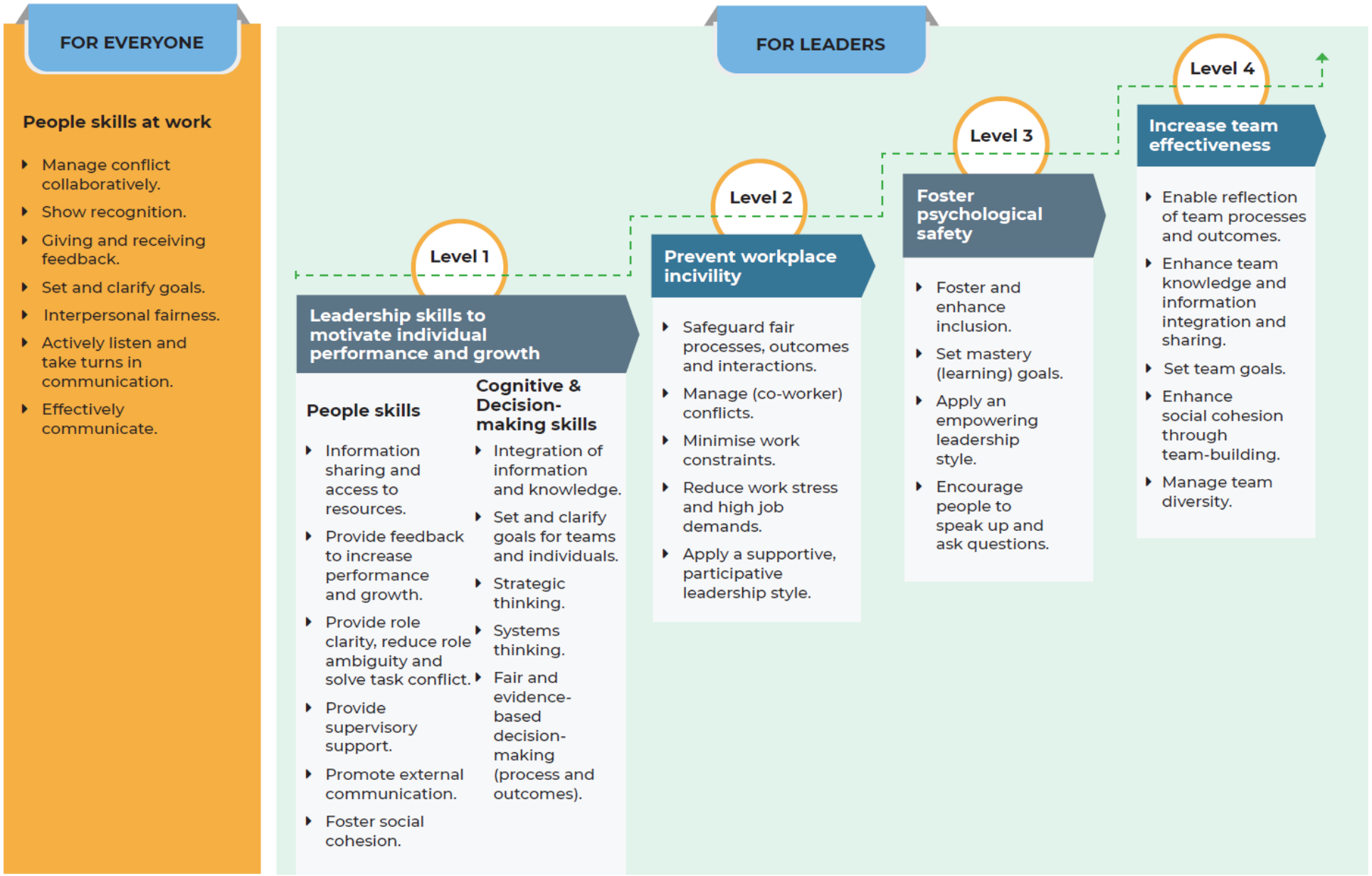
1. Set expectations system-wide,
2. Build knowledge through education,
3. Develop people and leadership skills, and
4. Measure outcomes.

Supporting the Framework

The process of change in the Framework places importance on building knowledge (knowing what) followed by skills (knowing how).

To help work through the four-steps in the Framework, an evidence-based **Workplace Skills Development Model** was developed. This works with the Framework to support the workforce to adopt the behaviours and skills needed to deliver on the priority areas.

ACT public health system: Evidence-Based Workplace Skills Development Model



Measurement

Repeated measurement of desired outcomes is a key feature of the Framework.

Tracking progress provides an indication of the effectiveness of approaches. It helps guide future decisions about where's best to invest in implementations and interventions.

Committed to change

Achieving the outcomes outlined in the Framework requires a system-wide effort and commitment at all levels and across clinical and non-clinical roles. Everyone has a part to play in building knowledge, developing skills and applying these skills.

Balancing act

The Framework balances the needs of each organisation in the system through a strategic and system-wide approach. The Framework allows for a consistency in approach across the System (where the exploratory research highlighted the same key issues across the system), while providing flexibility for nuances within and across organisations.

The implementation will equip leaders and the workforce with skills to adapt and thrive in the face of future challenges.

ACKNOWLEDGMENT OF COUNTRY

ACT Health acknowledges the Traditional Custodians of the land, the Ngunnawal people. ACT Health respects their continuing culture and connections to the land and the unique contributions they make to the life of this area. ACT Health also acknowledges and welcomes Aboriginal and Torres Strait Islander peoples who are part of the community we serve.

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ACT Public Health System: Evidence-Based Workplace Culture Framework

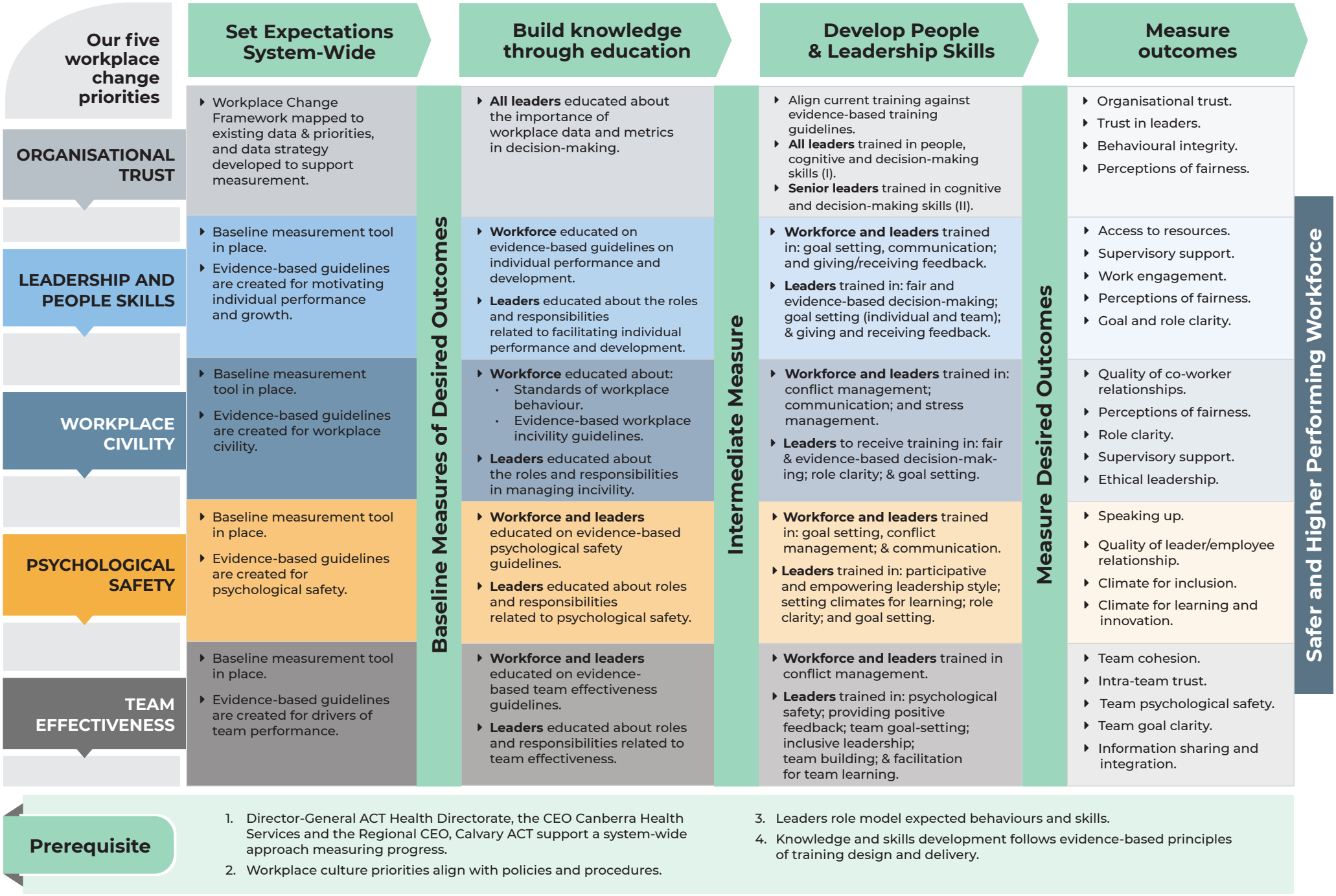


Figure 11. Workplace Culture Framework

ACT public health system: **Evidence-Based Workplace Skills Development Model**

FOR EVERYONE

People skills at work

- Manage conflict collaboratively.
- Show recognition.
- Giving and receiving feedback.
- Set and clarify goals.
- Interpersonal fairness.
- Actively listen and take turns in communication.
- Effectively communicate.

FOR LEADERS

Level 1

Leadership skills to motivate individual performance and growth

People skills

- Information sharing and access to resources.
- Provide feedback to increase performance and growth.
- Provide role clarity, reduce role ambiguity and solve task conflict.
- Provide supervisory support.
- Promote external communication.
- Foster social cohesion.

Decision-making skills

- Integration of information and knowledge.
- Strategic thinking.
- Systems thinking.
- Fair and evidence-based decision-making (process and outcomes).
- Set and clarify goals for teams and individuals.

Level 2

Prevent workplace incivility

- Safeguard fair processes, outcomes and interactions.
- Manage (co-worker) conflicts.
- Minimise work constraints.
- Reduce work stress and high job demands.
- Apply a supportive, participative leadership style.

Level 3

Foster psychological safety

- Foster and enhance inclusion.
- Set mastery (learning) goals.
- Apply an empowering leadership style.
- Encourage people to speak up and ask questions.

Level 4

Increase team effectiveness

- Enable reflection of team processes and outcomes.
- Enhance team knowledge and information integration and sharing.
- Set team goals.
- Enhance social cohesion through team-building.
- Manage team diversity.

Rapid Evidence Assessment (REA)



ATTRIBUTES OF EFFECTIVE TEAMS AND INTERVENTIONS INCREASING TEAM EFFECTIVENESS

a summary of scientific literature

December 2019

Culture Review **Implementation**

our journey of positive change

ACT Government

This REA was produced by the Center for Evidence Based Management (CEBMa). The ACT Government acknowledges and thanks the CEBMa for allowing ACT Health to reproduce and redesign the content of their REA.

Any enquiries in relation to the content of this REA should be directed to CEBMa through their website: www.cebma.org

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Background

Novartis, one of the largest pharmaceutical companies, with more than 125,000 employees, is involved in several projects to enhance organisational effectiveness and performance. The effectiveness of teams and workgroups is assumed to be one of the most significant factors affecting a company's performance. For this reason, Novartis approached the Center for Evidence Based Management (CEBMa) to undertake a Rapid Evidence Assessment (REA) to understand what is known in the scientific literature about the attributes of effective teams and workgroups and the effectiveness of interventions aimed at increasing team effectiveness. This review presents an overview of the findings.

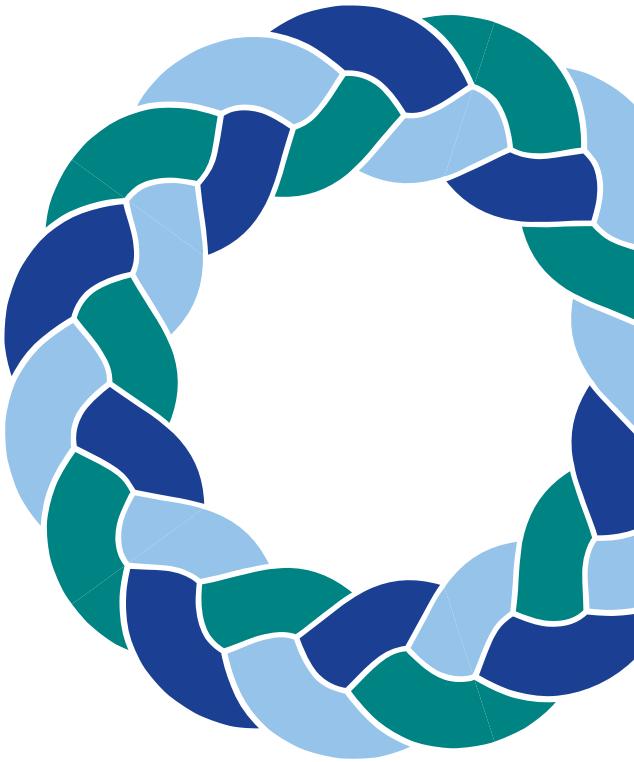


What is a Rapid Evidence Assessment (REA)?

Evidence reviews come in many forms. One of the best-known types is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: Clear criteria for inclusion is often lacking and studies are selected based on the researcher's personal preferences.

As a result, conventional literature reviews are prone to severe bias. This is why 'rapid evidence assessments' (REAs) are used. REAs use a specific research methodology to identify the most relevant studies on a given topic as comprehensively as possible, and to select appropriate studies based on explicit criteria. In addition, the methodological quality of the studies included is assessed by two independent reviewers on the basis of explicit criteria. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and, as a result, the likelihood of bias is considerably smaller.





Main question: What does the REA answer?

What is known in the scientific literature about the attributes of effective teams?

Other issues raised, which will form the basis of our conclusion regarding the main question above, are:

1. **What constitutes a team?**
2. **What is team effectiveness?**
3. **How can the effectiveness of teams be measured?**
4. **What are the attributes (e.g. characteristics, conditions, composition) of effective teams?**
5. **What interventions influence team effectiveness?**
6. **What is known about the reliability and validity of team effectiveness models?**

Search strategy: How was the research evidence sought?

Three databases were used to identify studies: ABI/INFORM Global, Business Source Premier and PsycINFO. The following generic search filters were applied during the search:

1. **Scholarly journals, peer-reviewed.**
2. **Published in the period 2000 to 2019.**
3. **Articles in English.**

A search was conducted using combinations of various search terms, including 'performance', 'effectiveness', 'team', and 'group'. We conducted 10 different search queries and screened the titles and abstracts of 992 studies. An overview of all search terms and queries is provided in Appendix I.

Selection process: How were the studies selected?

Study selection took place in two phases. First, titles and abstracts of the 993 studies identified were screened for relevance. In case of doubt or lack of information, the study was included. Duplicate publications were removed. This first phase yielded 141 studies. Second, studies were selected based on the full text of the article using these inclusion criteria:

1. **Type of studies:** Focusing on quantitative, empirical studies.
2. **Measurement:** Only studies in which relationships among team attributes, interventions and outcomes were quantitatively measured.
3. **Context:** Only studies related to workplace settings
4. **Level of trustworthiness:** Only studies that were graded level C or above (see below).

In addition, the following exclusion criteria were applied:

- Studies of ad hoc teams formed for immediate task performance, such as emergency teams.
- Studies of dyadic teams.
- Studies measuring the effect of leader attributes on team effectiveness.

This second phase yielded a total number of 70 studies.
An overview of the selection process is provided in Appendix II.



Critical appraisal: How were the quality of the included studies judged?

The overall quality of the included studies were moderate to high. Of the 70 studies included, 31 studies concerned controlled studies and were therefore graded level B or higher. The remaining studies concerned uncontrolled, longitudinal studies, and were therefore classified as level C or lower. An overview of all studies included and their year of publication, research design, sample size, population, main findings, effect sizes and limitations is provided in Appendix III.

Main findings

1. What constitutes a team?

In daily life, a team is simply a group of people working together to achieve a goal. In the domain of social sciences, however, teams have specific characteristics that differentiate them from groups generally. For example, a widely used definition states: "A team is a collection of individuals who are interdependent in their tasks, share responsibility for outcomes, see themselves (and who are seen by others) as a social entity embedded in one or more larger social system (for example, business unit or the corporation), and, who manage their relationships across organisational boundaries." (Cohen, 1997). Most researchers, however, summarise the minimal defining characteristics of a team as: A group of employees who are 1) formally established; 2) assigned (some) autonomy; and 3) interdependent.

2. What is team effectiveness?

Teams are not automatically more effective than individual employees. Working in teams may impede performance because of the potential conflict between individual and group interests. In addition, a team's performance may decline due to a phenomenon known as social loafing: The tendency of team members to get by with less effort than what they would have put when working alone (also referred to as the free-rider effect). Although the term 'team effectiveness' is widely used in the research literature, it is rarely specified. In fact, even some of the meta-analyses and high quality studies included in this review fail to provide a clear definition of team effectiveness. Most studies included in this review consider team effectiveness synonymous to team performance. As such, team effectiveness is broadly defined as task performance, contextual performance, and/or adaptive performance (e.g. learning, creativity, decision making). Some scholars differentiate between performance behaviours and performance outcomes (Beal, 2003). Behaviours are actions that are relevant to achieving goals, whereas outcomes are the consequences or results of performance behaviours (Mathieu, 2008). Examples of performance behaviours include feedback seeking, reflectivity, information sharing, and learning behaviours.

Finally, several authors point out that an effective team is not necessarily an efficient team (Beal, 2003). Whereas team effectiveness concerns merely an evaluation of a team's results, team efficiency also takes into account the 'costs' of achieving those results. For this reason, intra-team processes such as communication, information sharing, conflicts, etc. are often considered an essential element of team effectiveness (Mathieu, 2008).

3. How can team effectiveness be measured?

Whether or not a team is effective depends on the applied criteria. In most of the studies included, the criterium is team (task) performance, that is, the degree to which a team accomplishes its goals, as reflected by performance-indicators such as number of units produced, number of items sold, number of clients served, number of innovations, number of errors, number of complaints, etc. In addition, some studies also measure intra-team processes such as team-member exchange, internal communication, level of information sharing, etc., as these are considered relevant indicators for team effectiveness.

As a result, there is no generally accepted instrument that measures team effectiveness - organisations, researchers, and consulting firms often create their own. Instruments developed by consulting firms typically ask members to assess their teams on those dimensions that the consulting firm assumes to be most consequential for team effectiveness (Wageman, 2005). By contrast, scholar-developed instruments that measure team effectiveness tend to focus on variables that are of (research) interest to the scholars who devised them.

4. What are the attributes of effective teams?

This review has yielded a large number of studies examining myriad attributes. To facilitate a better understanding, we have grouped the findings into three main categories: team composition, emergent socio-affective states, and emergent cognitive states. Team composition refers to team member characteristics such as age, gender, level of education and functional background. Team composition variables and their impact on team outcomes have been incorporated into studies of team effectiveness for nearly 60 years (e.g., Mann, 1959).

Emergent states are team attitudes that arise from individual team members' experiences. As such, they are different from team processes such as membership changes, internal communication or conflicts. Whereas team process describes the nature of team member interaction, emergent states describe conditions that dynamically enable and underlie effective teamwork (DeChurch, 2010). Research on teams has identified a range of emergent states assumed to affect a team's performance such as confidence, efficacy, cohesion, trust, and shared mental models. In the scientific literature, two main categories of emergent states are distinguished: socio-affective states and cognitive states. While conceptually distinct, socio-affective and cognitive states are correlated and are assumed to in tandem.

It should be noted, however, that team performance is, to a large extent, a compositional construct - it is a direct result of its members' individual performance. As such, drivers of individual performance - such as goal clarity, supervisory support, employee recognition - should first be taken into account before considering attributes and interventions at the team level (see CEBMa's *REA - Factors Associated with Knowledge Worker Performance, a summary of research literature, July 2019*).

Team composition

Finding 1: The link between team effectiveness and team diversity dimensions such as age, gender, ethnicity, religion, functional background, educational background, organisational tenure, and experience is small and sometimes negative (Level AA)

It is often assumed that differences between individual members of a team on dimensions such as age, functional background, organisational tenure, gender, race, ethnicity, and experience enhance team effectiveness. As such, team diversity is one of the most researched attributes of effective teams. This review identified eight meta-analyses representing a combined sample size of more than 2,000 teams that measured the correlations between these attributes and team effectiveness or team efficiency (Bell, 2011; Bui, 2019; Guillaume, 2012; Haas, 2010; Horwitz, 2007; Wang, 2019; Webber, 2001; Zhou, 2015). Surprisingly, all meta-analyses demonstrated only small (< .1), zero, or even negative associations, regardless of team size, team type, or task type. As such, it is important to also consider – and compensate for – potential negative consequences of team diversity on communication, cohesiveness, and consequently performance (see also Finding 9).

Finding 2: Of the Big Five personality traits, only agreeableness and conscientiousness are (somewhat) positively related to team performance (Level B)

Several meta-analyses with a combined sample size of more than 100 studies found that the higher the level of agreeableness and conscientiousness within teams, the better their performance (Bell, 2007; Hopp, 2012; Peeters, 2006; Prewett, 2009). The effect sizes found, however, were small. Other personality traits such as emotional stability, extraversion, and openness to experience were not related with team performance.

Socio-affective states describe team members' collective reactions to interpersonal aspects of team functioning. Examples of emergent socio-affective states that have received considerable attention during the past decades include team confidence, social cohesion, collective efficacy, shared feelings, psychological safety, and intra-team trust (Mathieu, 2008). Below an overview is provided of the socio-affective states that were found to have the highest impact on team effectiveness.



Socio-affective states

Finding 3: Intrateam trust is positively related to performance (Level A)

Finding 4: Team trust is most critical when team virtually, task interdependency, authority differentiation, and/or team temporality is high (Level A).

Several meta-analyses and high quality studies have demonstrated that a high level of intra-team trust is an important attribute of effective teams (Breuer, 2016; De Jong, 2016; Webber, 2008). Scholars often distinguish two types of trust: cognition-based trust (a member's cognitive evaluation of the reliability, integrity, and competence of other members) and affect-based trust (a member's emotional feelings/evaluation of the reliability, integrity, and competence of other members), which are regarded as functionally distinct, in that they affect a team performance through different causal mechanisms (De Jong, 2016). It was also found that team trust is even more important under conditions that create challenges for teamwork. These include: a high level of task interdependence (i.e. the degree to which team members must rely on each other's input and resources to perform their tasks effectively); a high level of virtuality (i.e. the degree to which team members do not work in either the same place and/or at the same time, and therefore cannot collaborate face-to-face all of the time); low temporal stability (i.e. the degree to which team members have a history of working together in the past and an expectation of working together in the future); high authority differentiation (decision-making responsibility is distributed across the team); and a high level of skill differentiation (the degree to which teams consist of members with specialised knowledge or skills that make them uniquely qualified and therefore difficult to substitute).



In addition, it was found that in virtual teams, team familiarity has a positive effect on the development of team trust (Webber, 2008), whereas negative performance feedback has a substantial negative impact on team trust (Jaakson, 2019). Finally, a meta-analysis of controlled studies indicate that team-building has a moderate to large positive effect on a team's affect-based trust (Klein, 2009).

Finding 5: Group-level psychological safety has a moderate to large positive impact on team performance (Level B)

Psychological safety at the group-level refers to the shared belief held by members of a group that the group is safe for 'interpersonal risk taking' - a sense of confidence that others will not embarrass, reject or punish someone for speaking up (Edmondson, 1999). Psychological safety is related to 'intra-team trust', but the primary difference is that psychological safety concerns a belief about a group norm, whereas trust concerns a belief that one person has about another (Edmondson, 2003). A large, recent meta-analyses including 136 studies with a combined sample size of 5,000 teams indicates that psychological safety has a moderate to large impact on team performance (Frazier, 2017).

Finding 6: Team cohesion has a moderate to large impact on team performance (Level B)

Finding 7: The cohesion – performance relationship is moderated by team size, type of team, and task interdependence (Level B)

Several meta-analyses have demonstrated that cohesion, in particular social cohesion, has a moderate to large impact on a team's (behavioural) performance (Chiocchio, 2009; Evans, 2012; Mathieu, 2015). Social cohesion refers to a shared liking or attraction to the group, emotional bonds of friendship, caring and closeness among group members, and enjoyment of each other's company (Chiocchio, 2009). Other constructs that are related to social cohesion, such as relationship building, team familiarity, friendship, social network density, have shown a similar impact on team performance (Chung, 2018; De Jong, 2017). For example, a meta-analysis involving more than 3000 teams found that for newly acquainted team members, informal (social) ties are critical to performance (Balkundi, 2006).

In addition, it was found that the positive effect of social cohesion is stronger within large teams, virtual teams, project teams, and teams with high task interdependency (Lin, 2008; Gully, 2012; Chiocchio, 2009). Finally, social cohesion is not a stable trait; it can (and most likely does) change over time. More specifically, several studies suggest that it takes time for team cohesion to develop and solidify before it positively affects performance. As such, it may be beneficial to try and accelerate the process by engaging in team building and other activities aimed at enhance team familiarity, morale and cohesion (Mathieu, 2015).



Finding 8: The emergence of intra-team trust and social cohesion are critical for virtual teams (Level A)

As mentioned above, the positive effect of intra-team trust and social cohesion is stronger within virtual teams. In fact, a meta-analysis of high quality studies shows that these two attributes are critical for the performance of teams with a high level of virtuality (Lin, 2008). This finding was confirmed by several randomised controlled studies that demonstrate that virtual teams with a high level of social cohesion and intra-team trust outperform teams in which trust and social cohesion is low (Capiola, 2019; Fang, 2014; Kennedy, 2010). As pointed out by Kennedy (2010), this finding suggests that managers, when setting up a computer-supported team, may want to require an initial face-to-face session (i.e., more than just a "meet and greet") to prepare members to work together in the future.

Finding 9: Team cohesion is strongly associated with team inclusion (Level B)

According to the social inclusion model developed by Shore et al (2011), inclusive teams are expected to be more effective than non-inclusive ones, because inclusion stimulates social cohesion, improves intra-team trust, and reduces chances of conflict in the team. Findings from a recent longitudinal study confirmed the central tenet of the social inclusion model and demonstrated that, indeed, at the team level, perceptions of inclusiveness strongly correlate with team cohesion. In addition, the study's findings suggest that when a team contains members who all feel included (i.e. accepted and feel that their unique characteristics are valued), the team becomes vastly more cohesive, which in turn has a positive effect on a team's effectiveness (De Cooman, 2016).



Finding 10: Team identification has a positive effect on social cohesion and consequently team performance (Level B)

Finding 11: Turnover has a negative effect on social cohesion and consequently team performance (Level C)

Team identification refers to the extent to which people acknowledge and value being part of a team, share norms and behaviours, and experience a sense of social cohesion and interdependency (Solansky, 2011). Randomised experimental interventions have demonstrated, that team identification leads to increased emotional convergence (the process in which people are affectively influenced by others and become more similar with regard to their socio-affective states), social cohesion, and consequently team performance (Tanghe, 2010). Conversely, turnover of members in a team negatively affects social integration and cohesion and thus negatively impacts team performance (Van der Vegt, 2010).

Team cognition is an emergent state that refers to the way in which knowledge important to team functioning is cognitively organised, represented, and distributed within the team (Kozlowski, 2006). Team cognition is a bottom-up emergent construct, originating from the cognition of individual team members (DeChurch, 2010).

Cognitive states

Finding 12: Team cognition – in particular information sharing, transactive memory systems, and cognitive consensus – has a large, positive impact on team performance (Level AA).

In the past decade, a large number of high quality studies have consistently demonstrated that team cognition is one of the most important drivers of team effectiveness (DeChurch, 2010; Mesmer-Magnus, 2009; Turner, 2014). The research literature distinguishes several constructs of team cognition, such as shared mental models, team mental models, information sharing, transactive memory systems, cognitive consensus and group learning. Of these constructs, information sharing, transactive memory systems, and cognitive consensus have the largest impact on team performance.

Information sharing (IS) refers to the extent to which a team utilises its individual members' knowledge or expertise for the team's benefit. Especially if complex problems have to be addressed, IS is indispensable in that it allows team members to share their knowledge and past experiences and exchange and discuss ideas, which is particularly important for the generation of new ideas (Hülsheger et al., 2009). In addition, sharing information with teammates promotes team trust and social cohesion, which in turn increases team performance. Finally, it was found that IS strongly predicts team performance across all kinds of moderators (team size, team type, etc.).

An important concept related to IS is that of the Transactive Memory System (TMS). TMS within a team refers to a form of knowledge that is embedded in a team's collective memory. This collective memory works like an indexing system that tells members who knows what. Results from meta-analyses consistently show that TMS has a large, positive effect on team performance (Bachrach, 2019; Mesmer Magnus, 2017, Turner, 2014). Surprisingly, a cross-sectional study suggests that trust in team mates is a strong predictor for the emergence of a TMS, whereas trust in management is not (Robertson, 2013).

Cognitive consensus (CC) refers to refers to similarity among group members regarding how key issues are defined and conceptualised (Mohammed, 2001). CC is not so much about consensus regarding final decisions or solutions, but rather about consensus regarding the interpretation of issues. Put differently, CC is about whether team members attend to, interpret, and communicate about issues in a similar way (Mumford, 2008).



Finding 13: Team learning does not automatically lead to team performance improvement (Level AA)

Finding 14: Team reflexivity moderates the effect of team cognition on team performance (Level C)

Team learning involves behaviours such as asking questions, challenging assumptions, and discussing errors or unexpected outcomes. Surprisingly, team learning seems to have a rather small impact on team performance (Turner, 2014; Santos, 2015). However, this does not seem to be the case for team reflexivity, which is often considered an important element of (team) learning.

In fact, team reflexivity – the extent to which team members overtly reflect upon the team's goals, collaboration, decision making processes, internal communication, etc. – seems to moderate the effect of team cognition (Schippers, 2013; Konradt, 2015; Wildman, 2018). Put differently, if teams don't periodically reflect on how the team is doing, the positive effects of information sharing, a shared memory system, and cognitive consensus on team performance will decrease (see also Finding 16).

5. What interventions influence team effectiveness?

In the past decades, numerous studies on the effectiveness of team interventions have been published. Below an overview is provided of interventions that have shown to have moderate to large effects.

Finding 15: Team building has a moderate positive effect on team performance (Level A)

Originally designed as a group process intervention (e.g., Schein, 1969, 1999) for improving interpersonal relations and social interactions, team-building interventions are common and popular (Klein, 2009). Although team building interventions encompass a wide range of activities, the term refers to a class of formal and informal team-level interventions that focus on improving social relations and clarifying roles. As such, team building typically does not target skill-based competencies and is often done in settings outside the actual workplace.

A meta-analyses of longitudinal studies shows that, in general, team-building interventions have a moderate, positive indirect effect on team performance, and a moderate to large positive direct effect on trust, social cohesion, and internal communication (Klein, 2009). This meta-analysis confirmed the findings of a previous meta-analyses that included controlled studies and examined the effect of moderating factors (Svyantec, 1999). Results indicate that the effect of team building is larger when:

- the initiator is external (rather than internal to the team).
- the rationale is corrective (rather than preventive).
- when team members are not involved in the planning.
- when the focus is on both the team's goals and interpersonal relations.
- when the team building is planned together with other interventions.
- when the team building is led by both an internal staff member and external consultant.
- when the focus is on the group (rather than the individuals).
- when the team building is supported by (higher) management.



Finding 16: Teamwork training has a large positive effect on team performance (Level A)

In the scientific literature a distinction is made between 'taskwork' and 'teamwork'. In short, taskwork represents what teams are doing, whereas teamwork describes how they are doing it. Teamwork training involves education of team members about the importance of providing social support within the team or promoting ways to manage interpersonal conflict among teammates.

In some types of training team members take part in a group activity in which they discuss the team's purposes, goals, and performance, or a simulation wherein they experientially enact various teamwork skills, such as interpersonal communication and coordination. A recent meta-analysis that included 51 controlled studies shows that teamwork training, in general, tend to have a large, positive effect on team performance (McEwan, 2017). This study confirmed the findings of previous meta-analyses, that demonstrated that teamwork training not only has a large, positive effect on team performance, but also on a team's affective, social, and cognitive state (Delise, 2010; Salas, 2008).

Finding 17: Debriefing sessions and guided team reflexivity have a moderate to large positive effect on team performance (Level A)

Debriefing sessions lead teams through a series of questions that allow its members to reflect on a recent experience, construct their own meaning from their actions, and uncover lessons learned in a non-punitive environment (Tannenbaum, 2013). Debriefing sessions are also referred to as 'guided team reflexivity' (see also inding 13). Meta-analyses and randomised controlled studies have found that, when appropriately conducted, debriefing sessions can lead to substantial improvement of a team's performance (Tannenbaum, 2013; Konradt, 2015). In addition, it was found that debriefs are most effective when the following requirements are met:

- The focus of the debrief should be on learning and improvement, rather than evaluation or judgment. A developmental, non-punitive focus not only yields more honest and accurate feedback, but also enhances experiential learning.
- The debrief should focus on specific activities, episodes or events, rather than performance or results in general.
- The debrief should be informed by a variety of perspectives and evidence sources. For example, the review should include input from multiple participants and at least one additional source of evidence (e.g. organisational data).

Finally, it was found that facilitated and highly structured debriefs have a greater effect on team performance than non-facilitated or loosely structured debriefs.



Finding 18: Setting group goals has a moderate to large positive effect on team performance (Level AA)

Over the past decades, high-quality meta-analyses in a wide range of disciplines (management, medicine, sports, rehabilitation, prevention, etc.) and populations (patients, athletes, managers, senior adults, children, etc.) have demonstrated the positive effects of goal-setting interventions on performance outcomes.

Overall, challenging and specific goals (rather than non-specific 'do your best' goals) have a positive effect on performance. Several studies, however, demonstrate that setting goals at the group level may yield even higher performance than individual goals (Kleingeld, 2011). In addition, it is assumed that group goals enhance both social and cognitive group processes such as planning, cooperation, morale-building, communication, and collective efficacy. Finally, a recent cross-sectional study indicates that the effect of group goals is mediated by team reflexivity (Acikgoz, 2018; see also Findings 14 and 17).

6. What is known about the reliability and validity of team effectiveness models?

In an attempt to understand how effective teams work, a number of authors have developed models for determining a team's performance. Typically, these models contain several variables believed to influence team effectiveness. Some of these models have been proposed decades ago, whereas some have been developed in recent years. By 2008, it was found that there were over 130 different models of team effectiveness available (Salas, 2008). As such, a full review of the evidence supporting these models is beyond the scope of this REA. However, based on the studies included in this review, the following general finding emerged:



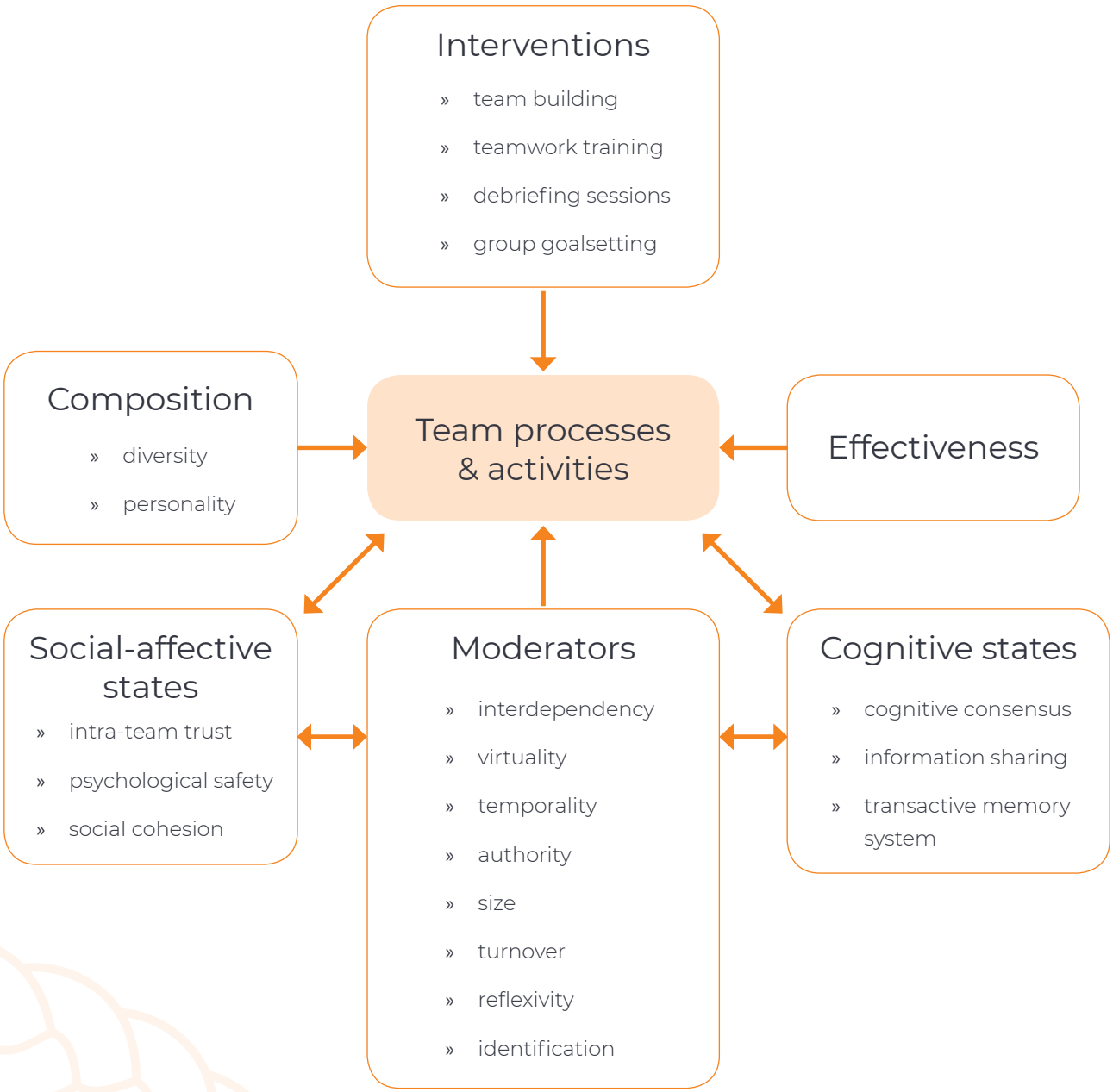
Finding 19: For most models of team effectiveness the underlying research is inadequate to establish reliability and validity.

In the popular management literature, there are many team effectiveness models available that claim to help teams work together more efficiently. Examples of popular models are Lombardo and Eichinger's T7 Model, Hackman & Wageman's 6 Conditions model, the Lencioni Model, the Katzenbach & Smith model, and the Drexler/Sibbet Team Performance Model. Some of these models focus on team composition and structure, while others emphasise intra-team processes such as communication and interaction.

Although some models contain factors that have been shown to be strong predictors of team performance (e.g. social cohesion, goal clarity, trust), the underlying psychometric research is often inadequate to establish the reliability and validity of the model as a whole (Eisele, 2015).

Conclusion

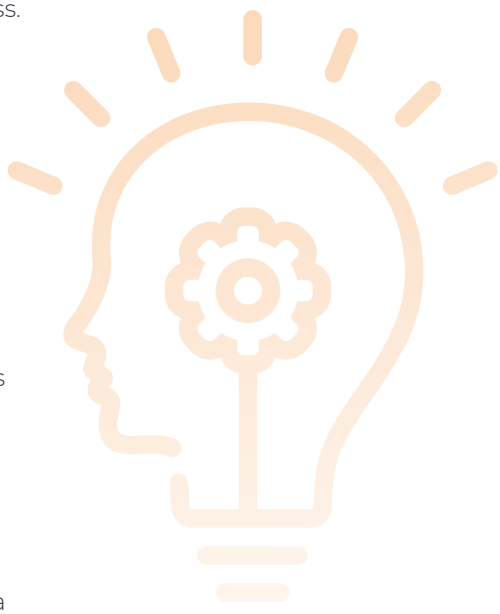
Attributes of effective teams are one of the most widely researched topics in industrial/organisational (I/O) psychology. This review identified a large number of high quality studies that indicate that effective teams are not so much determined by their composition, but rather through the emergence of socio-affective (in particular trust, psychological safety and social cohesion) and cognitive states (in particular cognitive consensus, information sharing and TMS). An overview of the minimal and maximal effect sizes is provided below.



Average minimal and maximal effect sizes

Team diversity	ρ = -.05 /.10	Soc. cohesion	ρ = .20/.60	Team building	ρ = .25/.45
Personality	ρ = -.20/.25	Cognitive consensus	ρ = .40	Teamwork training	ρ = .35/.55
Team trust	ρ = .30/.40	Information sharing	ρ = .30/.50	Debriefing/reflection	d = .30/.70
Psychological safety	ρ = .40/.50	Transactive Memory system	ρ = .30/.50	Group goalsetting	d = .55/1.2

In addition, findings suggest that level of interdependency, virtuality, team size, team reflexivity, identification, authority, turnover, and temporality are important moderators. Finally, team interventions such as team building, team training, debriefing and goal setting have shown to positively affect both the emergence of socio-affective and cognitive states and consequently team performance. This suggests that team leaders not only have an important role in promoting and stimulating the emergence of socio-affective and cognitive states - they can also (proactively) initiate interventions to enhance team effectiveness.



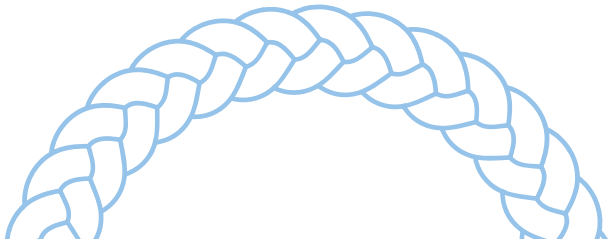
Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about the attributes of effective teams and interventions increasing team effectiveness by using the systematic review method to search and critically appraise empirical studies. However, in order to be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases and a focus on empirical research published in the period 2000 to 2019. As a consequence, some relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included, which did not incorporate a comprehensive review of the psychometric properties of their tests, scales and questionnaires.

Finally, this REA focused only on high-quality studies, i.e. studies with a control group and/or longitudinal studies. For this reason, cross-sectional studies were excluded. As a consequence, new, promising findings that are relevant for practice may have been missed.

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.



References

Açıkgöz, A., & Latham, G. P. (2018). The mediating effect of team reflection on the relationship between a challenging learning goal and new product success. *Canadian Journal of Behavioural Science/ Revue canadienne des sciences du comportement, 50*(3), 136.

Bachrach, D. G., Lewis, K., Kim, Y., Patel, P. C., Campion, M. C., & Thatcher, S. M. B. (2019). Transactive memory systems in context: A meta-analytic examination of contextual factors in transactive memory systems development and team performance. *Journal of Applied Psychology, 104*(3), 464-493.

Balkundi, P., & Harrison, D. A. (2006). Ties, leaders, and time in teams: Strong inference about network structure's effects on team viability and performance. *Academy of Management Journal, 49*(1), 49-68.

Beal, D. J., Cohen, R. R., Burke, M. J., & McLendon, C. L. (2003). Cohesion and Performance in Groups: A Meta-Analytic Clarification of Construct Relations. *Journal of Applied Psychology, 88*(6), 989-1004.

Bell, S. T. (2007). Deep-level composition variables as predictors of team performance: A meta-analysis. *Journal of Applied Psychology, 92*(3), 595.

Bell, S. T., Villado, A. J., Lukasik, M. A., Briggs, A. L., & Belau, L. (2011). Getting Specific about Demographic Diversity Variable and Team Performance Relationships: A Meta-Analysis. *Journal of Management, 37*(3), 709-743.

Breuer, C., Hüffmeier, J., & Hertel, G. (2016). Does trust matter more in virtual teams? A meta-analysis of trust and team effectiveness considering virtuality and documentation as moderators. *Journal of Applied Psychology, 101*(8), 1151.

Bui, H., Chau, V. S., Degl'Innocenti, M., Leone, L., & Vicentini, F. (2019). The Resilient Organisation: A Meta-Analysis of the Effect of Communication on Team Diversity and Team Performance: International Review of Applied Psychology. *Applied Psychology, 68*(4), 621-657.

Capiola, A., Alarcon, G. M., Lyons, J. B., Ryan, T. J., & Schneider, T. R. (2019). Collective Efficacy as a Mediator of the Trustworthiness - Performance Relationship in Computer-Mediated Team-based Contexts. *The Journal of Psychology, 153*(7), 732-757.

Chiocchio, F., & Hélène, E. (2009). Cohesion and Performance: A Meta-Analytic Review of Disparities Between Project Teams, Production Teams, and Service Teams. *Small Group Research, 40*(4), 382-420.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Cohen, S. G., & Bailey, D. E. 1997. What makes teams work: Group effectiveness research from the shop floor to the executive suite. *Journal of Management, 23*: 239-290.

DeChurch, L. A., & Mesmer-Magnus, J. R. (2010). The cognitive underpinnings of effective teamwork: A meta-analysis. *Journal of Applied Psychology, 95*(1), 32.

De Jong, B. A., Dirks, K. T., & Gillespie, N. (2016). Trust and team performance: A meta-analysis of main effects, moderators, and covariates. *Journal of Applied Psychology, 101*(8), 1134.

De Jong, J. P., & Fodor, O. C. (2017). Attuning to individual work routines and team performance. *Team Performance Management, 23*(7/8), 385-406.

Delise, L. A., Gorman, C. A. P., Brooks, A. M. P., Rentsch, J. R. P., & Steele-Johnson, D. P. (2010). The effects of team training on team outcomes: A meta-analysis. *Performance Improvement Quarterly, 22*(4), 53.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*(2), 350_383.

Edmondson, A.C. (2003). *Managing the Risk of Learning: Psychological Safety in Work Teams.* In West, Michael A.; Tjosvold, Dean; Smith, Ken G. (eds.). International Handbook of Organisational Teamwork and Cooperative Working. New York: Wiley. pp. 255–275.

Eisele, P. (2013). Validation of the Team Diagnostic Survey and a Field Experiment to Examine the Effects of an Intervention to Increase Team Effectiveness. *Group Facilitation*(12), 53-70.

Eisele, P. (2015). The predictive validity of the team diagnostic survey: Testing a model with performance and satisfaction as output variables. *Team Performance Management, 21*(5/6), 293-306.

Evans, C. R., & Dion, K. L. (1991). Group cohesion and performance: A meta-analysis. *Small Group Research, 22*(2), 175.

Evans, C. R., & Dion, K. L. (2012). Group Cohesion and Performance: A Meta-Analysis. *Small Group Research, 43*(6), 690-701.

Fang, H. M., & Wen-Ching, C. (2014). The Effects of member familiarity, task results visibility and perceived co-worker loafing on technology-supported team performance: social loafing effect perspective. *Asia Pacific Management Review, 19*(4), 361.

Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., & Vracheva, V. (2017). Psychological safety: A meta-analytic review and extension. *Personnel Psychology, 70*(1), 113-165.

Greer, L. L., de Jong, B. A., Schouten, M. E., & Dannals, J. E. (2018). Why and when hierarchy impacts team effectiveness: A meta-analytic integration. *Journal of Applied Psychology, 103*(6), 591.

Guillaume, Y. R. F., Brodbeck, F. C., & Riketta, M. (2012). Surface- and deep-level dissimilarity effects on social integration and individual effectiveness related outcomes in work groups: A meta-analytic integration. *Journal of Occupational and Organisational Psychology, 85*(1), 80.

Gully, S. M., Joshi, A., Incalcaterra, K. A., & Beaubien, J. M. (2002). A meta-analysis of team-efficacy, potency, and performance: Interdependence and level of analysis as moderators of observed relationships. *Journal of Applied Psychology, 87*(5), 819-832.

Gully, S. M., Devine, D. J., & Whitney, D. J. (MA - 2012). A meta-analysis of cohesion and performance: Effects of level of analysis and task interdependence. *Small Group Research, 43*(6), 702-725.

Haas, H. (2010). How can we explain mixed effects of diversity on team performance? A review with emphasis on context. *Equality, Diversity and Inclusion: An International Journal, 29*(5), 458-490.

Hackman, J.R. (2002), *Leading Teams: Setting the Stage for Great Performance,* Harvard Business School Press, Boston.

Hackman, J.R. and Wageman, R. (2005), "A theory of team coaching", *Academy of Management Review, Vol. 30*, pp. 269-87.

Hopp, C., & Zenk, L. (2012). Collaborative team networks and implications for strategic HRM. *The International Journal of Human Resource Management, 23*(14), 2975.

Horwitz, S. K., & Horwitz, I. B. (2007). The effects of team diversity on team outcomes: A meta-analytic review of team demography. *Journal of Management, 33*(6), 987-1015.

Hülsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. *Journal of Applied Psychology, 94*(5), 1128.

Jaakson, K., Reino, A., & McClenaghan, P. B. (2019). The space between – linking trust with individual and team performance in virtual teams. *Team Performance Management, 25*(1/2), 30-46.

Kennedy, D. M., Vozdolska, R. R., & McComb, S. A. (2010). Team Decision Making in Computer-Supported Cooperative Work: How Initial Computer-Mediated or Face-to-Face Meetings Set the Stage for Later Outcomes. *Decision Sciences, 41*(4), 933.

Klein, C., DiazGranados, D., Salas, E., Huy, L., Burke, C. S., Lyons, R., & Goodwin, G. F. (2009). Does Team Building Work? *Small Group Research, 40*(2), 181-222.

Kleingeld, A., van Mierlo, H., & Arends, L. (2011). The effect of goal setting on group performance: A meta-analysis. *Journal of Applied Psychology, 96*(6), 1289.

Konradt, U., Schippers, M. C., Garbers, Y., & Steenfatt, C. (2015). Effects of guided reflexivity and team feedback on team performance improvement: The role of team regulatory processes and cognitive emergent states. *European Journal of Work and Organisational Psychology, 24*(5), 777.

Kozlowski, S. W. J., & Ilgen, D. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest, 7*, 77_124.

Lin, C., Standing, C., & Liu, Y.-C. (2008). A model to develop effective virtual teams. *Decision Support Systems, 45*(4), 1031.

Mann, R. D. (1959). A review of the relationships between personality and performance in small groups. *Psychological Bulletin, 56*: 242-270.

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. *Journal of Management, 34*(3), 410-476.

McEwan, D., Ruissen, G. R., Eys, M. A., Zumbo, B. D., & Beauchamp, M. R. (2017). The effectiveness of teamwork training on teamwork behaviors and team performance: A systematic review and meta-analysis of controlled interventions. *PLoS ONE, 12*(1).

Mesmer-Magnus, J. R., & DeChurch, L. A. (2009). Information sharing and team performance: A meta-analysis. J*ournal of Applied Psychology, 94*(2), 535.

Mesmer-Magnus, J., Niler, A. A., Plummer, G., Larson, L. E., & DeChurch, L. A. (2017). The cognitive underpinnings of effective teamwork: a continuation. *Career Development International, 22*(5), 507-519.

Mohammed, S., & Dumville, B. C. (2001). Team mental models in a team knowledge framework: Expanding theory and measurement across disciplinary boundaries. *Journal of Organisational Behavior, 22*, 89–106.

Mumford, M. D., Hunter, S. T., & Bedell-Avers, K. E. (Eds.). (2008). *Multi-level issues in creativity and innovation.* Emerald Group Publishing Limited.

Peeters, M. A. G., Van Tuijl, H. F. J. M., Rutte, C. G., & Reymen, I. M. M. J. (2006). Personality and Team Performance: A Meta-Analysis. *European Journal of Personality, 20*(5), 377-396.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: an introduction to assessing study quality. *Systematic reviews in the social sciences: A practical guide,* 125-163.

Prewett, M., Walvoord, A. G., Stilson, F. B., Rossi, M., & Brannick, M. (2009). The Team Personality-Team Performance Relationship Revisited: The Impact of Criterion Choice, Pattern of Workflow, and Method of Aggregation. *Human Performance, 22*(4), 273-296.

Robertson, R., Gockel, C., & Brauner, E. (2012). Trust your teammates or bosses? Differential effects of trust on transactive memory, job satisfaction, and performance. *Employee Relations, 35*(2), 222-242.

Salas, E., DiazGranados, D., Klein, C., Burke, C. S., Stagl, K. C., Goodwin, G. F., & Halpin, S. M. (2008). Does team training improve team performance? A meta-analysis. *Human Factors, 50*(6), 903-933.

Salas, E., Cooke, N.J. and Rosen, M.A. (2008), "On teams, teamwork, and team performance: discoveries and developments", Human Factors: *The Journal of the Human Factors and Ergonomics Society, Vol. 50* No. 3, pp. 540-547.

Santos, C. M., Uitdewilligen, S., & Passos, A. M. (2015). A temporal common ground for learning: The moderating effect of shared mental models on the relation between team learning behaviours and performance improvement. *European Journal of Work and Organisational Psychology, 24*(5), 710.

Santos, J. P., Caetano, A., & Tavares, S. M. (2015). Is training leaders in functional leadership a useful tool for improving the performance of leadership functions and team effectiveness? *Leadership Quarterly, 26*(3), 470.

Schein, E. H. (1969). *Process consultation: Its role in organisation development.* Reading, MA: Addison-Wesley.

Schein, E. H. (1999). *Process consultation revisited: Building the helping relationship.* Reading, MA: Addison-Wesley.

Schippers, M. C., Homan, A. C., & van Knippenberg, D. (2013). To reflect or not to reflect: Prior team performance as a boundary condition of the effects of reflexivity on learning and final team performance. *Journal of Organisational Behavior, 34*(1), 6.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Shore, L. M., Randel, A. E., Chung, B. G., Dean, M. A., Ehrhart, K. H., & Singh, G. (2011). Inclusion and diversity in work groups: A review and model for future research. *Journal of Management, 37*, 1262-1289.

Solansky, S. T. (2011). Team identification: a determining factor of performance. *Journal of Managerial Psychology, 26*(3), 247-258.

Solansky, S. T. P., & Stringer, D. P. (2019). Collective Mind: A Study of Development and Team Performance. *Organisation Development Journal, 37*(3), 59-69.

Svyantek, D. J., Goodman, S. A., Benz, L. L., & Gard, J. A. (1999). The Relationship Between Organisational Characteristics and Team Building Success. *Journal of Business and Psychology, 14*(2), 265.

Tanghe, J., Wisse, B., & van der Flier, H. (2010). The Role of Group Member Affect in the Relationship between Trust and Cooperation. *British Journal of Management, 21*(2), 359.

Tanghe, J., Wisse, B., & van der Flier, H. (2010). The Formation of Group Affect and Team Effectiveness: The Moderating Role of Identification. *British Journal of Management, 21*(2), 340.

Tannenbaum, S. I., & Cerasoli, C. P. (MA - 2013). Do team and individual debriefs enhance performance? A meta-analysis. *Human Factors, 55*(1), 231-245.

Turner, J. R., Chen, Q. P., & Danks, S. (2014). Team Shared Cognitive Constructs: A Meta-Analysis Exploring the Effects of Shared Cognitive Constructs on Team Performance. *Performance Improvement Quarterly, 27*(1), 83.

Van Der Vegt, G. S., Bunderson, S., & Kuipers, B. (2010). Why turnover matters in self-managing work teams: Learning, social integration, and task flexibility. *Journal of Management, 36*(5), 1168-1191.

Wageman, R. (1995). Interdependence and group effectiveness. *Administrative Science Quarterly, 40*: 145-180.

Wageman, R., J. R. Hackman, and E. Lehman. (2005). "Team Diagnostic Survey." *Journal of Applied Behavioral Science, 41*(4): 373–98.

Wang, J., Grand H-, L. C., Chen, T., & Leung, K. (2019). Team creativity/innovation in culturally diverse teams: A meta-analysis. *Journal of Organisational Behavior, 40*(6).

Webber, S. S., & Donahue, L. M. (2001). Impact of highly and less job-related diversity on work group cohesion and performance: a meta-analysis. *Journal of Management, 27*: 141-162.

Webber, S. S. (2008). Development of cognitive and affective trust in teams: A longitudinal study. *Small Group Research, 39*(6), 746-769.

Widmann, A., & Mulder, R. H. (2018). Team learning behaviours and innovative work behaviour in work teams. *European Journal of Innovation Management, 21*(3), 501-520.

Zhou, W., & Rosini, E. (2015). Entrepreneurial Team Diversity and Performance: Toward an Integrated Model. *Entrepreneurship Research Journal, 5*(1), 31-60.

Appendix I

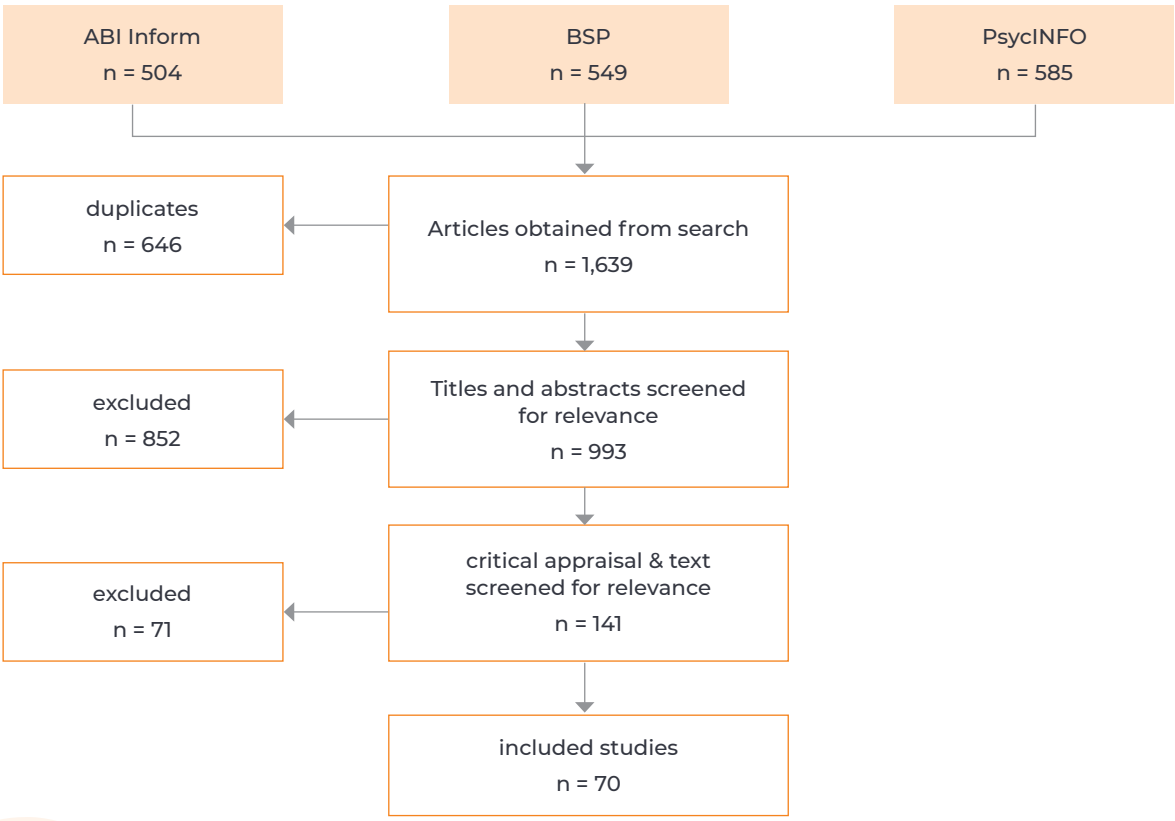
Search terms & hits

ABI/Inform Global, Business Source Elite, PsycINFO peer reviewed, scholarly journals, November 2019

Search terms	ABI	BSP	PSY
S1: ti(team* OR workgroup* OR group*)	27,086	32,959	69,490
S2: ti(effectiv* OR effic* OR perform* OR innovati* OR learn* OR success* OR collaborati* OR cooperati*	191,527	237,841	252,785
S3: S1 AND S2	4,960	5,031	8,659
S4: filter meta-analyses	62	69	140
S5: ti(antecedents OR attributes OR characteristics OR predictor*)	37,217	30,080	77,497
S6: S3 AND S5 limit > 2010	138	77	71
S7: S3 AND filter high quality studies, limit > 2010	371	384	284
S8: S6 OR S7	431	465	344
S9: ti(team*) AND ti(build* OR interven* OR train* OR develop*)	1,288	1,156	1,147
S10: S9 AND (filter meta-analyses* OR high quality studies**)	11*	15*	101**

Appendix II

Selection of studies



Appendix III

Critical Appraisal Studies Team Effectiveness

Author & year	Design & sample size	Sector / Population	Main findings	Effect sizes	Limitations	Level
Acikgoz, 2018	cross-sectional study n = 194 (78 teams)	product development teams of 43 high tech firms in the Istanbul region	The results showed that setting a specific, challenging learning goal is associated with team performance (new product success), but that this relationship is mediated by collective team reflection.	R2 = .64	no serious limitations	D
Bachrach, 2019	Meta-analysis k = 76 N = 6,869	various	Research on moderators of TMS to performance relationship. It was found that environmental volatility (market turbulence, technology turbulence, or environmental dynamism), leadership effectiveness, and team human capital (team level knowledge, skills, abilities) are positively associated with TMS, and informational diversity (heterogeneity of work experience - e.g., organisational tenure, job experience- education level, education major, functional background) and gender diversity are negatively associated with TMS development.	All-over team performance ρ = .45 Task performance ρ = .44 Affective performance ρ = .58 Creative performance ρ = .42 Effect moderators: env volatility ρ = .12 leader eff ρ = .60 team h cap ρ = .12 inf div ρ = -.08 gender div ρ = -.13	Design of included studies not specified	C

Balkundi, 2006	Meta-analysis of 37 cross-sectional studies; N = 3,098 teams	Teams from the following contexts: military, top management, project, production and service	1. Teams with denser social networks tend to perform better (H1) and have greater team viability (H2) in both, team's instrumental* (H1a, H2a) and expressive* (H1b, H2b) social networks. Moreover, team's expressive tie density might a larger impact than instrumental tie density on team viability (H3b). However, the task performance implications of instrumental ties are no different from those of expressive ties (H3a). 2. Teams whose leaders are central in the team's instrumental social network (H4), as well as teams that are central in an intergroup network (H5), tend to perform better. 3. A more integrative network structure (ease of sharing resources) is likely to benefit future team task performance but is not as likely to reflect past performance (H6). 4. For newly acquainted or inexperienced team members, informal ties seem to be more critical to performance. As team members gained experience with one another and their work, effects of those ties declined (H7). * Two types of ties in social networks can be distinguished: instrumental and expressive. Instrumental ties are pathways of work related advice. They might emerge from a formal relationship (e.g., leader-subordinate), and the primary content exchanged through them is information resources or knowledge that is relevant to completing one's job within a unit. In contrast, expressive ties reflect friendships. They are more affect-laden. These ties are important conduits of social support and values.	H1a: ρ = .15 H1b: ρ = .22 H2a: ρ = .14 H2b: ρ = .55 H3a: ρ = -0.08 ns H3b: ρ = 0.63 H4: ρ = .29 H5: ρ = .13 H6: ρ = 0.41 H7: ρ = -0.40	No serious limitations	C
Bayley, 2007	longitudinal study (assessment at 3 points in time: immediately after, 3 months after, 6 months after) 47 people from 11 teams	Health professionals in the UK	Finding: Teambuilding does not have an effect on perceived conditions for successful teamwork (as measured by a team development questionnaire – see below). Team development measure: instrument measuring eight factors relating to successful teamworking: appropriate workload, team capability, association with colleagues, sharing of activities, role security, personal empowerment, self-direction, and focus of approach.	not reported	no serious limitations	B

Bell, 2007	Meta-analysis of 37 cross-sectional studies; k = 243 correlations	Teams (context is not clear)	Team mean conscientiousness (H1), team minimum agreeableness (H2), extraversion (H3), team average emotional stability (H4), openness to experience (H5), collectivism (H6), and preference for teamwork (H7) were found to be related to team performance in field studies. Only negligible effects were observed in lab settings for the relationship between these factors and team performance. However, in lab settings, team minimum and maximum general mental ability (H8) and team mean emotional intelligence (H9) were related to team performance. Also in the field setting GMA was related to team performance (H8). The relationships between the personality factors and team performance was not related to the team tenure (H12 not supported).	H1: ρ = .30 H2: ρ = .31 H3: ρ = .15 H4: ρ = .21 H5: ρ = .20 H6: ρ = .40 H7: ρ = .22 H8: ρ = .33; ρ = .26 (lab) H9: ρ = .20 (lab)	No serious limitations	B
Bell, 2011	meta-analysis, k = 92 (274 independent correlations)		1. There is a small positive relationship between functional background diversity in terms of variety and team performance. 2. There is NO relationship between educational background diversity in terms of variety and team performance. 3. The positive relationship between functional background diversity in terms of variety and team performance is (somewhat) stronger when the team performance criterion is creativity or innovation rather than efficiency. 4. The positive relationship between functional background diversity in terms of variety and team performance is (somewhat) stronger when the team is a design team or top management teams (TMT) as compared to another team type. 5. The positive relationship between educational background diversity in terms of variety and team performance is stronger when the team performance criterion is creativity or innovation rather than efficiency. 6. The positive relationship between educational background diversity in terms of variety and team performance is (somewhat) stronger when the team is a design team or TMT as compared to another team type. 7. There is NO relationship between team mean educational level and team performance, regardless of team type. 8. There is a small positive relationship between team mean organisational tenure and team performance when efficiency is the criterion. 9. There is NO relationship between organisational tenure diversity and team performance when innovation is the criterion. 10. Team mean tenure is NOT related to team performance when efficiency is the criterion. 11. There is NO relationship between sex or age diversity in terms of separation and team performance.	Most ES are very small 1. ρ = .11 2. ρ = .01 3. innovation ρ = .18 efficiency ρ = .03 4. design ρ = .16 TMT ρ = .07 5. other ρ = -.01 6. crea/inno ρ = .23 efficiency ρ = -.02 7. design ρ = .07 TMT ρ = .13 other ρ = -.05 8. ρ = .01 9. ρ = .14 10. ρ = .04 11. ρ = .11 ns and -.04 12. ρ = .04 ns	Design of studies included not specified, but the text suggests that RCTs were included.	AA

Breuer, 2016	meta-analysis of cross-sectional and longitudinal studies k = 54 N = 12,615 (1,850 teams)	various	Team trust facilitates coordination and cooperation in teams, and is therefore positively related with team effectiveness (attitudes, information processing and team performance). The relationship between team trust and team task performance was stronger in virtual teams than in face-to-face teams.	Team effectiveness overall ρ = .33 Team attitudes ρ = .64 Team inf. proc ρ = .54 Team perf ρ = .27 (task ρ = .27, contx ρ = .27) Team performance: virt teams ρ = .33 ftf teams ρ = .22	no serious limitations	B
Bui, 2019	meta-analysis, k = 35	various	1. Team diversity measured with SC attributes have a positive impact on a) openness and b) frequency of communication. 2. Team diversity measured with KSA attributes have a negative impact on a) openness and b) frequency of communication. 3. Frequency (a) and high openness (b) of communication have a positive relationship with team performance. Note 1: social-category (SC) differences = race, ethnicity, gender, age, religion, sexual orientation, and physical abilities; differences in knowledge, skills, and abilities (KSA) = education, functional knowledge, information or expertise, training, experience, and abilities). Note 2: Openness of communication is defined in several studies as 'knowledge sharing'.	1a: ρ = .13 1b: ρ = .00 ns 2a: ρ = .14 ns 2b: ρ = .11 ns 3a: ρ = .20 3b: ρ = .35	design of included studies not specified	C
Capiola, 2019	RCT n = 320 (64 teams)	undergraduate students and general public in the US	1. Individual-level trustworthiness perceptions is positively related to team performance in a computer-mediated task. 2. Individual-level trustworthiness perceptions has indirect effects on team performance in a computer-mediated task through group-level collective efficacy across time.	only unstandardized coefficients are reported	artificial setting and tasks (airport simulation)	A

Chiocchio, 2009	meta-analysis k = 29 (9,416 participants distributed in 1,598 teams)	various	The cohesion–performance relationship is moderated by type of team and setting. Project teams in organisational settings show large effect sizes than other types of teams and teams in different settings. In addition, the cohesion-performance relationship is strongest for social cohesion – behavioural performance. Note: Outcome performance relates to the end results of tasks and includes measures such as profits, sales, ranks, grades as well as schedule and cost variance. Behavioural performance includes two types of performances: task and contextual.	proj teams: ρ = .49 prod teams: ρ = .14 service teams ρ = .33 soc coh–behavioural perf: ρ = .65 task coh–outcome perf: ρ = .38 task coh–behavioural perf: ρ = .36 social coh–outcome perf: ρ = .19	design of included studies not specified (includes some longitudinal studies)	B
Chung, 2018	meta-analysis k = 26 (1,016 groups)	various	Results show that friendship has a significant positive effect on group task performance. Furthermore, this relationship was moderated by group size (i.e., the positive effect of friendship on performance increased with group size) and task focus (i.e., friendship groups performed better than acquaintance groups on tasks requiring a high quantity of output, whereas there was no performance benefit on tasks requiring a single or high-quality output). Task interdependence did not moderate the effect.	friendship vs acquaintance groups: d = .31	Design of the included studies not specified	C
Cordery, 2010	Interrupted time series N = 17 teams	wastewater treatment teams	1. Redesigning work to provide teams with increased autonomy results in improved team performance. 2. Increasing levels of task uncertainty is associated with declining levels of team performance. 3. Task uncertainty and team autonomy interact, such that the higher the level of task uncertainty, the stronger the positive impact of team autonomy on team performance.	Not reported	No major weaknesses	B
De Cooman, 2016	longitudinal study n = 121 (30 teams)	college students participating in a course on strategic management in a large Dutch university	1. Individual-level supplementary fit positively correlated with team cohesion. 2. At the team level, the aggregate of supplementary fit positively correlated with the team average of team cohesion. 3. The aggregate of complementary fit positively correlated with the team average of team cohesion (r = .41).	1. r =.47 2. r = .87 3. r = .41	no serious limitations	C

Delise, 2010	meta-analysis of cross-sectional studies (30 studies measured outcomes immediately after training, 11 had a time-lag) K = 41 (1413 teams)	various	Intervention: Team training is defined as a planned effort designed to improve team performance by assisting individuals in the acquisition of new information, skills, and attitudes essential to effective performance in a team environment. It is administered to an entire team, aimed at enhancing the performance of the team as a unit. It is a planned effort to develop a team's task-specific competencies, thereby improving its ability to perform its tasks effectively. 1. Team training is positively associated with affective, cognitive, subjective task-based skill, objective task-based skill, and teamwork skill. 2. There are no differences in effects of team training in military vs. civilian samples, laboratory vs. field setting, ad-hoc vs. intact (existing) teams, team-oriented vs. task-oriented training, short vs. long training. Team training is associated more strongly with improved cognitive outcomes after a period of time passed from the training than immediately after the training.	1. Affective outcomes: d=.80; cognitive: d=1.37; subjective task-based skill: d=.88; objective task-based skill: d=.76; teamwork skill: d=.64. 2. Military: d=1.05, civilian: d=.80; Lab: d=.87, field: d=.76; Ad-hoc: d=.92, intact: d=.62; no effect size estimates given for team-oriented vs, task-oriented training and short vs. long training.Immediately after the training: d=1.21; time lag after training: d=2.40	Publication bias is incorrectly analysed (funnel plot only maps positive effect sizes)	C
Evans, 2012	meta-analysis k = 16 (372 groups)	various	The results indicated a positive relationship with the average cohesive group performing 18 percentile points above the average non-cohesive group.	r = .42 note: large 95% CI	limited search, relevant studies may have been missed design of included studies not specified	C
Fang, 2014	RCT n = 285 (95 teams)	students from Taiwan	1. Compared to teams in which members are familiar with each other, teams in which members are strangers have lower performance. 2. Compared to teams in which task results are visible, teams in which these result are invisible do NOT have lower performance. 3. Compared to teams in which team members are not perceived as engaging in co-worker loafing, teams in which members are perceived as engaging in co-worker loafing do NOT have lower team performance.	no effect sizes reported	artificial setting and tasks (brain storming)	A

Frazier, 2017	Meta-analysis k = 136 N = > 22,000, (5,000 groups)	Various	Psychological safety impacts important organisational outcomes. It is positively related to information sharing, citizenship behaviours and task performance. There are personality traits that are positively related to psychological safety. The results indicate that psychological safety is impacted by positive leader relations (e.g. transformational leadership), workplace support (e.g. peer support), and work design (e.g. interdependence).	Task performance ρ = .43 Information sharing ρ = .52 OCB ρ = .32	Search terms not specified	B
Garrett, 2019	Quasi-experiment N = 79 teams (24 intervention, 55 control)	Insurance, US	The study examines the performance and behavioural impact of team design on sales performance. The findings demonstrate improved overall performance for the team and the individual members of the team - the gains were particularly pronounced when members have moderate levels of difference in ability, rather than small or large differences in ability. 1. A. Individuals in team tasks perform better than those in individual tasks. B. Weaker individuals in team tasks perform better than those in individual tasks. c. Stronger individuals in team tasks perform better than those in individual tasks. 2. A. Performance gains across individuals in team tasks, relative to those in individual tasks, exhibit an inverted U-shaped relationship with the difference in ability of the team members. B. Performance gains for weaker individuals in group tasks, relative to weaker individuals working alone, exhibit an inverted U-shaped relationship with the difference in ability of the group members. C. Performance gains for stronger individuals in group tasks, relative to stronger individuals working alone, exhibit an inverted U-shaped relationship with the difference in ability of the group members. 3. Instrumentality to the team relates positively to the performance gain exhibited by the sales team member. 4. Self-efficacy for the task does not relate positively to the performance gain of the sales team member. 5. Impression management does not relate positively to the performance gain of the sales team member, but negatively. 6. The perception of receiving coaching from a team member negatively moderates the relationship of self-efficacy to the performance gain of the sales team member.	Not reported	Inconsistent reporting on hypotheses	B

Gino, 2010	Study # 2: RCT n = 36 teams N = 238 participants	College students	Direct task experience leads to more highly developed transactive memory systems than indirect experience (H4). Transactive memory positively influences the level of creativity of products within teams (H5). Transactive memory mediates the relationship between experience and the level of creativity of products within teams (H6).	H5: $\eta^2 = .05$ H6: ß = 0.33	No serious limitations	A
Greer, 2018	Meta-analysis of 54 cross-sectional studies N = 13,914 teams	Teams, organisational setting	In general, hierarchy is likely to have a negative impact on team effectiveness (performance and viability); this effect is mediated by increased conflict-enabling states (H2a, H2b). The negative relationship between hierarchy and team performance is exacerbated by aspects of the team structure: membership instability (H4a) and skill differentiation (H4b), and the hierarchy itself: mutability (H5a). The predictions regarding the positive effect of hierarchy on team viability as mediated by coordination-enabling processes (H1b), and of hierarchy on team performance as mediated by coordination-enabling processes (H1a), as well as the moderating roles of several aspects of team tasks: interdependence (H3a) and complexity (H3c), and the hierarchy: form (5b), were not supported, with the exception that task ambiguity enhanced the positive effects of hierarchy (H3b).	Note: all ES low or ns r = -.08 (hierarchy & performance) r = -.11 (hierarchy & viability) H1a: not supported H1b: not supported H2a: unclear H2b: unclear H3a: not supported H3b: not supported H3c: not supported H4a: unclearH4b: unclear H5a: unclearH5b: not supported	No serious limitations	C

Guillaume, 2012	Meta-analysis of cross-sectional studies	Work groups from divers industries	1. Both, surface-level* (H1a) and deep-level** (H1b) dissimilarity are negatively related to social integration. 2. The negative relationship between surface-level dissimilarity and social integration is weaker under high team interdependence than under low team interdependence (H2a). On the other hand, the negative relationship between deep-level dissimilarity and social integration is stronger under high team interdependence than under low team interdependence (H2b). 3. There is a positive relationship between social integration and task performance (H3) and between social integration and contextual performance (H4). Moreover, social integration and turnover are negatively related (H5). 4. Under low team interdependence, social integration mediates the negative relationship between surface-level dissimilarity and task performance (H6a), and between surface-level dissimilarity and contextual performance (H7a). 5. Under high team interdependence, social integration mediates the negative relationship between deep-level dissimilarity and task performance (H6b), and between deep-level dissimilarity and contextual performance (H7b). 6. Under low team interdependence, social integration mediates the positive relationship between surface-level dissimilarity and turnover (H8a). Under high team interdependence, social integration mediates the positive relationship between deep-level dissimilarity and turnover (H8b). * surface-level dissimilarities: i.e., age, race/ethnicity, gender, tenure, ** deep-level dissimilarity: i.e., personality, attitudes, and values.	Unclear, only gamma's are reported	No serious limitations	C
Gully, 2002	Meta-analysis of 67 cross-sectional studies	Context is not clear	The positive relationships between team efficacy and performance, and potency* and performance is stronger at the team level of analysis than at the individual level (H3). At the team level, both team-efficacy (H1) and potency (H2) had positive relationships with performance. The relationship between team-efficacy and performance seems to be stronger when interdependence was high than when it was low). Such moderating effect of interdependence was not found for the relationship between potency and performance. * Potency refers to generalized beliefs about the capabilities of the team across tasks and contexts (i.e., our team will be successful no matter what the task).	H1: ρ = .41 H2: ρ = .37 H3: ρ = .39 (team level) ρ = .20 (individual level) H4 (team-efficacy): ρ = .45 (high interdependence) ρ = .34 (low interdependence)	No serious limitations	C

Gully, 2012	meta-analysis k = 46 (51 effect sizes)	various	Results suggest that level of analysis and task interdependence moderate the cohesion-performance relationship.	low task interd: r = .21 high task interd: r = .46	limited search, relevant studies may have been missed design of included studies not specified	C
Haas, 2010	meta-analysis k = 30	various (includes non-work settings)	1. Twelve out of the 15 relationships of age diversity to team performance that were tested in regression models did not show any significance. The remaining three were negative. 2. For gender diversity, performance links (18) show weak (positive, negative, and non-significant) correlations. 3. For educational level diversity, regressions (4) are negative or not significant. There is no pattern of context factors that might explain the differences. 4. For ethnic diversity (note: combined with national diversity!), four studies showed a negative and three a (weak) positive regression result, leaving 11 non-significant. When considering national diversity alone, there are no significant relationships. An additional finding is that negative effects of ethnic diversity in terms of correlation coefficients occur in teams with more than 12 members. 5. For functional background diversity and organisational tenure diversity, correlations are mixed (size, neg/pos), but mostly non-significant 6. None of the observed relationships between team tenure diversity and team performance is significantly positive or negative.	close to zero or ns	Very limited search, mainly studies cited in other reviews. Design of studies included not specified, but the text suggests that exp lab studies were included. Uses vote counting!	B
Hopp, 2012	Non-randomised longitudinal study 18 teams (97 students)	Computer science students	Teams that exhibit a higher variation with respect to conscientiousness (with more people having higher or lower values than other team members) reduces team performance. Having people in the team that deviate on crucial personal characteristics is negative for performance. This effect is supported by the negative coefficient associated with the deviation of aspired points among team members. A wide dispersion is negative for team performance. Having team members who vary in their goals from the rest of the team is detrimental for team performance.	Unclear	no serious limitations	C

Horwitz, 2007	meta-analysis k = 35 (78 correlations)		1. A. There is a positive relationship between task-related diversity and the quality of team performance. B. : There no relationship between bio-demographic diversity and the quality of team performance. 2. The relationship between team diversity and team performance is stronger for task-related diversity than bio-demographic diversity. 3. A. There is a positive relationship between task-related diversity and the quantity of team performance. B. There is a positive relationship between bio-demographic diversity and the quantity of team performance. 4. There is a (very small) negative relationship between team diversity (bio-demographic diversity and task-related diversity) and social integration among team members. 5. Task complexity, team type, and teams size do NOT moderate the relationship between team diversity and team performance. Note: team performance = decision making, creativity & innovation, problem solving.	All ES are very small 1a: ρ = .13 1b: ρ = .00 3a: ρ = .07 3b: ρ = -.02 4: bio ρ = -.04 task ρ = -.02	Design of studies included not specified, but the text suggests that RCTs were included.	A

Hu, 2015	1) Longitudinal field study, N = 67 teams, 310 team members 2) Randomised 2x2 experiment N = 124 4-person teams	1) Work teams, diverse industries, US and China 2) undergraduate business students, US	Study proposed a theoretical model that links team prosocial motivation to team effectiveness as mediated by team processes. 1. Team prosocial motivation is indirectly and positively related to (a) team performance and (b) team OCB, but not negatively related to (c) team voluntary turnover via team cooperation. 2. Team prosocial motivation is indirectly and positively related to (a) team performance, and negatively related to (c) team voluntary turnover via team viability, but not positively related to (b) team OCB via team viability. 3. Task interdependence moderates the indirect effects of team prosocial motivation on (a) team performance, (b) team OCB, but not (c) team voluntary turnover via team cooperation, such that these relationships are stronger when task interdependence is high than when task interdependence is low. 4. Task interdependence did not moderate the indirect effects of team prosocial motivation on (a) team performance, and (b) team OCB, but did moderate (c) team voluntary turnover via team viability, such that these relationships are stronger when task interdependence is high than when task interdependence is low.	Study 1 1a) ß1 = .56 ß2 = .49 1b) ß1 = .56 ß2 = .24 1c) ß1 = .56 ß2 ns 2a) ß1 = .59 ß2 = .24 2b) ß1 = .59 ß2 ns 2c) ß1 = .59 ß2 = -.59 3a) high ß = .26 low ß = .02 (ns) 3b) high ß = .21 low ß = .02 (ns) 3c) CI incl 0 4a) CI incl 0 4b) CI incl 0 4c) High ß = -.47 low ß = -.20 Study 2 1a) ß1 = .26 ß2 = .59 1b) ß1 = .26 ß2 = .25 1c) ß1 = .26 ß2 ns 2a) ß1 = .58 ß2 = .51 2b) ß1 = .58 ß2 ns 2c) ß1 = .58 ß2 = -.56 3a) ßdiff = .08 3b) ßdiff = .07 3c) ßdiff = ns 4a) CI incl 0 4b) CI incl 0 4c) ßdiff = -.17	no serious weaknesses	1) C 2) A

Hulsheger, 2009	Meta-analysis of 104 cross-sectional studies.	Teams, work context	Results revealed that team process variables of support for innovation (H7), vision (H5), task orientation (H8), and external communication (H10b) displayed the strongest relationships with creativity and innovation. Slightly weaker associations were found for cohesion (H9) and internal communication (H10a). In contrast, participative safety displayed only a weak, non-generalizable positive correlation with innovation (H6 not supported). Moreover, the results did not confirmed an association between task and relationship conflict and innovation (H11 not supported). Input variables (i.e., team composition and structure): job-relevant diversity (H1a), task (H2a) and goal (H2b) interdependence, team size (H3) and team longevity (H4) showed weaker positive association with creativity and innovation. Background diversity (H1b) appeared to be negatively related to innovation. Moderator analyses confirmed that relationships differ substantially depending on measurement method (self-ratings vs. independent ratings of innovation) and measurement level (individual vs. team innovation). Team variables displayed considerably stronger relationships with self-report measures of innovation compared with independent ratings and objective criteria. Team process variables were more strongly related to creativity and innovation measured at the team than the individual level.	H1a: ρ = .16 H1b: ρ = -.13 H2a: ρ = .04 H2b: ρ = .28 H3: ρ = .17 H4: ρ = .02 (ns) H5: ρ = .49 H6 (not supported): ρ = .15 H7: ρ = .47 H8: ρ = .42 H9: ρ = .31 H10a: ρ = .36 H10b: ρ = .48 H11a (not supported): ρ = .07 H11b (not supported): ρ = -.09	No serious limitations	C
Jaakson, 2019	Longitudinal study n = 71 teams	international virtual student teams working in four universities in Finland, Estonia, Latvia and Russia	Results showed that, in virtual teams, relatively high levels of initial trust did not change over the period of the teams' projects in general, but in teams where feedback on performance was negative, both trust and trustworthiness declined substantially.	not reported (but text suggests large)	no serious limitations	C

Jin, 2017	Meta-analysis of 52 cross-sectional studies N = 55 independent samples (8,892 observations)	Organisational setting, teams in the context of new ventures (high-and low-tech industry)	Aggregated entrepreneurial team composition characteristics are positively related to new venture performance, such that the greater the aggregated characteristics, the greater the new venture performance (H1). Moreover, contrary to the expectations, the relationship between aggregated entrepreneurial team characteristics and new venture performance is stronger in low-tech industries than in high-tech industries (H4a). The heterogeneity of entrepreneurial team composition characteristics is positively related to new venture performance, such that the greater the heterogeneity, the greater the new venture performance (H2). This relationship is similar in the low-tech and high-tech industries (H4b). Entrepreneurial team size is positively related to new venture performance, such that the greater the team size, the greater the new venture performance (H3).	H1: r = .14 H2: r = .05 H3: r = .08 H4a (not supported): r = .25 (low-tech industries) r = .11 (high-tech industries)	No serious limitations	C
De Jong, (2016)	Meta-analysis k = 112 N = 7.763	various	Intrateam trust is positively related to team performance. To maximize team performance, trust building initiatives should focus on developing both cognitive and affective bases of trust within the team, and enhance team members' trust both in each other and in the team leader. Team trust will be most critical when team members work in a highly interdependent manner, with other members who possess unique skills and have different levels of authority in the team (see moderators). Note I: Cognition-based trust: individuals' cognitive evaluations of the reliability, integrity, and competence of others. Affect based trust: individuals' feelings of emotional involvement and others' genuine care and concern for their welfare. Besides being conceptually distinct, cognition- and affect-based trust are regarded as functionally distinct, in that they affect outcomes through distinct causal mechanisms and thus uniquely contribute to predicting performance. Note II: - Task interdependence: the degree to which team members must rely on each other's input and resources to perform their tasks effectively; - Team virtuality: the degree to which team members do not work in either the same place and/or at the same time, and therefore cannot collaborate face-to-face all of the time; - Temporal stability: the degree to which team members have a history of working together in the past and an expectation of working together in the future; - Authority differentiation: how decision-making responsibility is distributed across the team; - Skill differentiation: the degree to which teams consist of members with specialised knowledge or skills that make them uniquely qualified and therefore difficult to substitute.	Team performance overall ρ = .30 Cognitive-based trust ß = .24 Affect-based trust ß = .15 Moderators (low vs high): virtuality ρ = .26 vs .35 task interdependence ρ = .21 vs .33 temporal stability ρ = .23vs .32 authority differentiation ρ = .25 vs .41 skill differentiation ρ = .23 vs .36	Search terms not specified Design included studies not specified (ref's suggest some are longitudinal or controlled)	A

De Jong, 2017	1) Quasi experiment N = 35 teams 2) Field study N = 66 teams (255 team members)	1) Mainly female students, Romania 2) Work teams, 3 countries, various sectors	1) Above and beyond team familiarity, transactive memory and friendship network density, cross-attuning (CA) have a positive impact on team performance. 2a The group level elevation of social sensitivity (team social sensitivity) is positively related to CA. 2b CA mediates the relationship between the group level elevation of social sensitivity (team social sensitivity) and team performance. 2c Team social sensitivity is more positively related to CA in small teams with low longevity and in large teams with high longevity in comparison to large teams with low longevity but not with small teams with high longevity. Note: Cross-attuning = having an accurate understanding of and anticipate on one another's work routines.	1) R2 = .58 vs .35 2a) ß = .14 2b) Indirect effect .16	No major weaknesses	B
Kennedy, 2010	RCT n = 294 (98 teams)	undergraduate business students from a large public university in the Northeastern United States	Results indicate computer-mediated teams reported lower participative decision making than face-to-face teams after the first session and the disparity continued at the second session. Results suggest that practitioners may want to require an initial face-to-face session (i.e., more than just a meet and greet) to prepare members to work together in the future. In addition, When setting up a computer-supported team, practitioners need to consider how the duration of the team's existence may impact the team's process development and outputs. Teams that are assembled to complete a specific task in a very short period may not have time to successfully develop processes as would a team working on a project over a much longer duration. In such cases, assigning team members that are well acquainted with each other may be most appropriate.	no effect sizes reported	artificial setting and tasks	A

Klein, 2009	meta-analysis of before-and-after studies (some studies are also controlled) 20 studies, 1,562 teams	Adults in non-clinical settings	Intervention: team building (a class of formal and informal team-level interventions that focus on improving social relations and clarifying roles, as well as solving task and interpersonal problems that affect team functioning). Team building does not target skill-based competencies, is not systematic in nature, and is typically done in settings that do not approximate the actual performance environment. 1. Teambuilding interventions have a moderate positive effect on team outcomes. 2. Teambuilding have a small positive effect on cognitive team outcomes (e.g. declarative knowledge of teamwork competencies). 3. Teambuilding have a medium-large positive effect on affective team outcomes (e.g. trust, team potency). 4. Teambuilding have a medium-large positive effect on process team outcomes (e.g. coordination, communication). 5. Teambuilding have a small-to-medium positive effect on team performance. 6. Components of teambuilding (goal setting, interpersonal relations, problem solving, and role clarification): each of them individually has a medium effect on team outcomes. Note: Team size moderates the effects of teambuilding on team outcomes: the effect is medium for small and medium-sized teams, and large for large teams.	ρ=.31 ρ=.13 ρ=.44 ρ=.44 ρ=.26 goal setting: ρ=.37; interpersonal relations: ρ=26; problem solving: ρ=.24; role clarification: ρ=.35 small teams (<5 members): ρ=.28; medium (5-10 members): ρ=.27; large (>10 members): ρ=.66	no serious limitations	A
Kleingeld, 2011	3/4 lab studies, 1/4 field studies; only studies with pre-test and control group k = 49, N(groups) = 739; N (individuals) = 2954	various	Specific difficult goals yield considerably higher group performance compared with nonspecific goals. Moderately difficult and easy goals were also associated with performance benefits relative to nonspecific goals, but these effects were smaller. Unexpectedly, task interdependence, task complexity, and participation did NOT moderate the effect of group goals. Our inventory of multilevel goals in interdependent groups indicated that the effect of individual goals in groups on group performance was contingent upon the focus of the goal: “Egocentric” individual goals, aimed at maximizing individual performance, yielded a particularly negative group-performance effect, whereas “group centric” goals, aimed at maximizing the individual contribution to the group’s performance, showed a positive effect. These findings demonstrate that group goals have a robust effect on group performance. Individual goals can also promote group performance but should be used with caution in interdependent groups.	overall d = .56 specific & difficult d = 0.80 group centric d = 1.2	No serious limitations	AA

Knight, 2015	Meta-analysis of 39 studies N = 2,799 groups	Context is not clear	Group positive affect has consistent positive effects on social integration and task performance regardless of contextual characteristics (H1). The effects of group negative affect depend on the context. Shared negative feelings promote social integration and task performance when stemming from an exogenous source (H2) or experienced in a 1-shot group (H3), but undermine social integration and task performance when stemming from an endogenous source (H2) or experienced in an ongoing group (H3).	Unclear, only B's instead of ß's are reported.	Design of the included studies not reported	C
Konradt, 2015	RCT n = 294 (98 teams)	university students (Dutch and German?)	1. Reflection is higher in teams (irrespective of virtual or face-to-face) that receive guided reflexivity combined with feedback, as compared to teams who receive either (a) guided reflexivity without feedback or (b) neither guided reflexivity nor feedback. 2. Virtual teams do NOT show lower team reflection than face-to-face teams. Note: Guided team reflexivity (sometimes referred to as briefing/debriefing) refers to an intervention to induce reflection in groups.	1. ß = .34 vs ß = .24 2. ß = -.13 ns	artificial setting and tasks	A
Lee, 2014	Longitudinal study, n = 528 (132 four member teams)	undergraduate business students at a university in the US	Frequent, dyadic information exchanges among team members both help and hinder members learn about the expertise of other members and thus help and hinder the development of a TMS.	small beta's	simulation, student population, small teams	C
Lin, 2008	Meta-analysis (k = 50) and RCT (n = 200)	MA: various RCT: Australian students	Results show that both social (e.g. relationship building and cohesion) and task (e.g. coordination) factors are crucial for improving the performance and satisfaction of virtual teams. SEM suggest the following paths: 1. communication > relationship building > coordination > performance. 2. communication > cohesion > coordination > performance.	Coord – Perf: r = .53 Comm – Perf: r = .32 Coh – Perf: r = .36 Rel Bui – Pef: r = .21 Trust – Perf: r = .29	no serious limitations	AA

Marlow, 2018	Meta-analysis of 150 cross-sectional studies; N = 9,702 teams	Teams of students or employees (fields such as management, sales, research and development, surgical teams, search and rescue teams, and simulated war games.	Communication is positively and significantly related to team performance (H1). The relationship between communication and team performance is stronger in familiar teams than in unfamiliar teams (H2), and in face-to-face teams comparing to virtual teams (H3, the difference between hybrid teams and face-to-face teams was not significant). Moreover, the relationship between communication quality and performance seems to be stronger than the relationship between communication frequency and performance (H7). The relationship between communication and team performance does not depend on leadership style (shared vs hierarchical leadership, H4), task interdependence (H5), task type (cognitive-based vs action-based, H6), content of communication (task-oriented vs personal communication, H8).	H1: ρ = .31 H2: ß = 0.3 H3:ρ = .10 (virtual teams) ρ = .29 (hybrid teams) ρ = .32 (face-to-face teams) H4 (not supported): ρ = .27 (shared leadership) ρ = .33 (hierarchical leadership) H5 (not supported): ρ = .27 (highly independent tasks) ρ = .39 (low independent tasks) H6 (not supported): ρ= .30 (cognitive-based tasks) ρ = .26 (action-based tasks) H7: ρ = .36 (quality) ρ = .19 (frequency) H8 (not supported): ρ= .22 (personal communication) ρ= 0.35 (task-related communication)	No serious limitations	C
Mathieu 2015	meta-analysis of longitudinal studies (and two additional single longitudinal studies) k=15 (N = 737 teams)	various	Cohesion and performance were related positively and reciprocally over time (while controlling for previous performance). However, on average, the cohesion > performance relationship exceeded the performance > cohesion relationship. Moreover, the cohesion > performance relationship grew stronger over time whereas the performance > cohesion relationship did not. Results suggest that it takes time for team cohesion, as an emergent state, to develop and solidify before it begins to relate significantly to later performance. Following this logic, one might conclude that it would be beneficial to try and accelerate the process by engaging in team building, chartering exercises, and other activities that are designed to enhance team morale and cohesion.	ρ= .27 (T1) to .35 (T2)	no serious limitations	B

McEwan, 2017	meta-analysis of controlled before-and-after studies Sample size: 72 studies, 8439 participants	Teams in different settings (laboratory, academia, different sectors: healthcare, aviation, industry)	1. Teamwork training has a medium-to-large positive effect on teamwork behaviours. 2. Teamwork training has a large positive effect on team performance. Moderators for effect on teamwork behaviours: 3. Team context: strongest effect in aviation teams, followed by military teams, followed by healthcare and lab experiments, then industry, and finally academia. 4. Team tenure: teamwork training has a larger positive effect on teamwork behaviours in newly-formed teams than in existing (intact) teams. 5. Training method: simulation-based trainings has a large positive effect, team reviews a medium-to-large effect, workshop a medium effect, and didactic education a small effect. 6. The number of dimensions of teambuilding targeted by the training: targeting 3 dimensions has the strongest effect, followed by two, four, and one. 7. The dimensions targeted by the teambuilding: preparation had the strongest effect, followed by interpersonal dynamics, reflection, and execution. Moderators for effect on team performance: 8. Team context: strongest effect in teams in industry, followed by healthcare, military, aviation, lab experiment, and academia. 9. Team tenure: teamwork training has a larger positive effect on team performance for existing (intact) teams than for newly-formed teams. 10. Training method: team reviews have a medium-to-large effect, simulation-based trainings and workshops have a medium effect, and didactic education a small-to-medium effect. 11. The number of dimensions of teambuilding targeted by the training: targeting 4 dimensions has the strongest effect, followed by two, one and three. The dimensions targeted by the teambuilding: preparation had the strongest effect, followed by interpersonal dynamics, reflection, and execution.	1. d=.68 (outliers removed: d=.55) 2. d=.92 (outliers removed: d=.58) 3. ? 4. existing teams: d=.33; new teams: d=.67 5. simulation-based training: d=.78; team reviews: d=.64; workshops: d=.50; didactic education: d=.19 6. three dimensions: d=.98; two dimensions: d=.65; four dimensions: d=.57; one dimension: d=.005 7. Preparation: d=.75; interpersonal dynamics: d=.69; reflection: d=.65; execution: d=.64 8. ? 9. existing teams: d=.99; new teams: d=.54 10. team reviews: d=.69; simulation-based training: d=.57; workshops: d=.55; didactic education: d=.41 11. d between .46 and .67 d between .52 and .60	no serious limitations	A

McLarnon, 2019	RCT n = 13,224 (1,839 teams)	individuals who were participating in the X-Culture consulting competition	Results supported a stronger indirect effect between communication frequency and performance, via process coordination, when global virtual team members gave and received weekly (peer) feedback.	unclear	artificial setting and tasks	A
Mesmer-Magnus, 2009	Meta-analysis, includes RCTs k = 72 (4,795 groups, n = 17,279)	various	Information sharing positively predicted team performance across all levels of moderators. However, IS uniqueness predicts team performance more strongly than IS openness. In addition, it was found that teams share more information wherein (a) task demonstrability is high (solve vs judge), b) discussion structure is high (freeform vs highly focused), and (c) members are more cooperative during discussions.	IS > perf: ρ = .42 IS un > perf: ρ = .50 IS op > perf: ρ = .32 task dem > IS: ρ = .45 disc struct > IS: ρ = .41 coop disc > IS: ρ = .57	no serious limitations	AA
Mesmer Magnus, 2017	meta-analysis k = 28 (results from 4,943 teams / 19,575 individuals).	various	Results show consistent effects for team cognition in team process and performance. However, whereas originally compilational cognition (TMS) was more strongly related to both team process and team performance than was compositional cognition (SMM), in the updated database, compilational cognition (TMS) is more strongly related to team process and compositional cognition (SMM) is more strongly related to team performance. In essence, this updated finding suggests that knowing who knows what (TMS) is more important to predicting effective and efficient team process, while having a shared understanding of the problem, task, or team (e.g. SMMs) is more influential in predicting the extent to which a team will be successful.	overall ρ = .36 compositional (SMM) ρ = .39 compilational (TMS) ρ = .29	design of the included studies not specified	C

Peetes, 2006	Meta-analysis k = 10	Professional and student teams	Meta-analysis on the relationship between team composition in terms of the Big-Five personality traits (trait elevation and variability) and team performance. The higher the average level of agreeableness and conscientiousness within teams, and the more similar team members are with respect to agreeableness and conscientious- ness, the better their team performs. H1a Elevation of extraversion is NOT related to team performance. H1b Variability in extraversion is NOT positively related to team performance. H2a Elevation of agreeableness is positively related to team performance. H2b Variability in agreeableness is negatively related to team performance. H3a Elevation of conscientiousness is positively related to team performance. H3b Variability in conscientiousness is negatively related to team performance. H4a Elevation of emotional stability is NOT related to team performance. H4b Variability in emotional stability is NOT related to team performance. H5a Elevation of openness to experience is NOT related to team performance. H5b Variability in openness to experience is not related to team performance. Moderation by type of team was tested for professional teams versus student teams. Moderation results for agreeableness and conscientiousness were in line with the total sample results. However, student and professional teams differed in effects for emotional stability and openness to experience.	1a ρ = 0.04 1b ρ = 0.05 (ns) 2a ρ = 0.24 2b ρ = = -0.12 3a ρ = 0.20 3b ρ = -0.24 4a ρ = 0.04 4b ρ = 0.02 5a ρ = 0.03 5b ρ = -0.01	Design of included studies not reported Small number of correlations	C

Prewett, 2009	Meta-analysis k = 70	Not reported	Study examined relations between team personality and team performance considering a.o. the choice of criterion (behavioural vs. outcome) and method of aggregation (mean, minimum, maximum and variance). 1. Conscientiousness acts as a supplementary trait, such that (A) mean and (B) minimum methods of aggregating Conscientiousness positively relates to performance. (C) Variance in Conscientiousness is not negatively related to performance. 2. Extroversion acts as a complementary trait (A) minimum scores did not negatively relate to performance (B) variance in Extroversion positively predicts team performance. 3. Agreeableness acts as a supplementary trait, such that (A) mean and (B) minimum methods of aggregation positively relate to performance, and (C) variance in Agreeableness negatively relates to performance. 4. Emotional Stability did not demonstrate supplementary characteristics, such that (A) mean and (B) minimum methods of aggregation will positively relate to performance, and (C) variance methods will negatively relate to performance. 5. Team Extroversion relates more strongly to (A) team behavior than to (B) team outcome measures. 6. Team Agreeableness relates more strongly to (A) team behavior than to (B) team outcome measures. 7. Team Emotional Stability relates more strongly to (A) team behavior than to (B) team outcome measures.	1a r = .13 1b r = .13 1c r = -.06 (ns) 2a r = .03 (ns) 2b r = .06 3a r = .10 3b r = .10 3c r = -.07 4a r = .08 4b r = .06 (ns) 4c r = -.03 (ns) 5a r = .20 5b r = .06 (ns) 6a r = .20 6b r = .08 7a r = .17 7b r = .05 (ns)	Design of included studies not reported Large number of hypotheses	C
Rapp, 2014	longitudinal study, n = 153 teams	sales teams in a in a medium-sized high technology firm	Team goal monitoring moderates the relationship between team efficacy and team performance, such that: (a) there is an inverted U-shaped relationship between these variables among teams that engage in low levels of monitoring and (b) a positive relationship in teams that engage in high levels of monitoring.	ß = .37	no serious limitations	C

Robertson, 2013	cross-sectional study n = 383	various	Trust in teammates predicted transactive memory. Trust in management did NOT predict transactive memory.	trust teammates > TMS: ß = .46 trust management > TMS: ß = .08	no serious limitations	D
Salas, 2008	meta-analysis of cross-sectional studies k = 45 (2,650 teams)	Most subjects either in military domain or students in lab settings	Intervention: team training: a set of tools and methods that, in combination with required [team-based] competencies and training objectives, form an instructional strategy. Task focused team training enables team members to become aware of, learn about, and practice requisite team competencies (i.e., KSAs) and performance processes while receiving feedback on their performance. 1. Team training has a moderate positive effect on team outcomes. 2. Team training has a medium-to-large positive effect on cognitive and process outcomes, and a medium positive effect on affective outcomes. 3. Team training has a moderate-to-high positive effect on team performance. Moderators of the effect of team training on team performance: 4. The content of the training (taskwork, teamwork, both) results in little differences in the effect size estimates. 5. The stability of the team: the effect in intact (existing) teams is higher than in ad-hoc teams. The size of the team: the effect is greatest in large teams, followed by small teams and then by medium teams.	1. ρ=.34 2. cognitive outcomes: ρ=.42; process outcomes: ρ=.44; affective outcomes: ρ=.35 3. ρ=.39 4. taskwork: ρ=.35; teamwork: ρ=.38; both: ρ=.40. 5. existing teams: ρ=.54; ad-hoc teams: ρ=.38 large teams: ρ=.50; small teams: ρ=.39; medium teams: ρ=.34	no serious limitations	C

Santos, 2015	Longitudinal study N = 67 teams, 314 individuals	Company managers, university students	Team learning processes do not automatically lead to performance improvement. In order to achieve an increase in team performance over time, teams need to complement their team learning behaviours with shared task and temporal mental models. 1) The extent to which the team members engage in team learning processes is not positively related to team performance improvement. 2a) The relationship between team learning processes and team performance improvement is moderated by task mental model similarity in such a way that when team members have a similar task mental model, the relationship will be more positive than when they do not have a similar mental model. 2b) The relationship between team learning processes and team performance improvement is not moderated by team mental model similarity in such a way that when team members have a similar mental model the relationship will be more positive than when they do not have a similar mental model. 2c) The relationship between team learning processes and team performance improvement is moderated by temporal mental model similarity in such a way that when team members have a similar temporal mental model the relationship will be more positive than when they do not have a similar temporal mental model.	no effect sizes provided	Concerns a simulation, partly with students	C
Schippers, 2013	Longitudinal study N = 73 teams (groups of 3 students)	Business students	1) Prior team performance moderates the relationship between team reflexivity and final team performance such that team reflexivity will be positively related to final team performance for a) teams with relatively low prior performance and unrelated to final team performance for b) teams with relatively high prior performance. 2) Prior team performance moderates the relationship between team reflexivity and team learning such that a) team reflexivity will be positively related to team learning for teams with relatively low prior performance and b) unrelated to final team performance for teams with relatively high prior performance. 3) Team learning mediates the interaction between team reflexivity and prior team performance on final team performance.	1a ß = .25 1b ß = -.16 (ns) 2a ß = .49 2b ß = .09 (ns)	No major weaknesses	C

Sivasubram-aniam, 2012	Meta-analysis of 38 studies	Organisational setting, teams from different industries (e.g., high-tech, manufacturing, software, electronics, healthcare)	Team inputs: team leadership (H4), team ability (H3) and team tenure (H1) are positively related to NPD* team performance. Functional diversity (H2) is unrelated to NPD outcomes. Team process variables: Internal (H5) and external (H6) communication, group cohesiveness (H7) goal clarity (H8) were found to be positively associated with NPD outcomes. Additionally, NPD effectiveness seems to be predicted by team leadership, internal and external communication, and group cohesiveness (H9, H10). NPD efficiency was predicted by all but team size and team tenure (H9). * NPD = new product development. * team leadership = the extent to which the team leader is charismatic and transformational, and utilises a style characterised as being participative, empowering, facilitative, and communicative.	H1: r = .28 H2: r = .02 H3: r = .29 H4: r = .44 H5: r = .31 H6: r = .18 H7: r = .20 H8: r = .50 H9, H10: R2 = .45 R2 = .34	Design of the included studies not reported	C
Solansky, 2011	Study 1 Longitudinal study N1 = 20 teams (86 students) Study 2 N2a = 126 (10 teams) N2b = 58 (12 teams)	1) Student teams, US 2) Working teams, US, construction, education	1. Team identification is positively related to performance.	Study 1 r = .63 Study 2 r = .58	no serious weaknesses	1) C 2) D
Solansky, 2019	Study 1 Quasi exp study N = 86 (20 teams) Study 2 Cross-sect N = 126 (10 teams)	1) Students, US 2) Working teams, US, construction	1. Collective mind scores increase over time. 2. Collective mind scores are positively associated with team performance. Note: collective mind collective mind refers to a team or an organisation that acts intelligently as a collection of individuals.	Study 1 1) Not reported 2) ß = .68 Study 2 2) ß = 0.80	Unclear reporting of results	1) C 2) D

Stewart, 2006	Meta-analysis of 93 studies	Teams performing real-life tasks in a natural setting (management, production and project teams)	The study examines the relationships between team design features (group composition, task design and leadership) and team performance and reports the following results: 1. Aggregated measures of individual ability and disposition correlate positively with team performance. 2. Team member heterogeneity and performance correlate near zero, but the effect varies somewhat by type of team (project, production and management). 3. Project and management teams have slightly higher performance when they include more members. 4. Team-level task meaningfulness exhibits a modest but inconsistent relationship with performance. 5. Increased autonomy and intra-team coordination correspond with higher performance, but the effect varies depending on task type (teams engaged in physical vs knowledge work). 6. Leadership, particularly transformational and empowering leadership, improves team performance.	1. ρ= .22 2. ρ = -.04 (general) ρ = .04 (project teams) ρ = -.07 (production teams) ρ = -.03 (management teams) 3. ρ = .04 4. ρ = .16 5. Autonomy: ρ = .25 (general) ρ = .36 (physical work) ρ = .26 (knowledge work) intra-team coordination: ρ = .25 (general) ρ = .12 (physical work) ρ = .29 (knowledge work) 6. ρ = .26 (transformational leadership) ρ = .33 (empowering leadership)	Design of the included studies not reported	C

Svyantec, 1999	meta analysis of before-after studies and controlled before-after studies n = 11 studies	Employees in business or government settings	Moderators of team building effect on team productivity: **Factors before team building** 1. The initiator of the teambuilding: when the initiator is external (vs. internal to the team), the positive effect is stronger. 2. The rationale for the teambuilding: when the action is corrective (vs. preventive), the effect is stronger. 3. The expectations from team building benefits: when the expectation is to change both, the effect is strongest, followed by expectations to improve performance, and lastly by expectations to improve attitudes 4. The involvement of the group in planning the team building: when the group is involved, the effect is weaker than when it isn't involved. **Factors during team building** 5. Focus of team building: a mixed focus on goal setting and interpersonal relations has the highest effect, followed by only goal setting, followed by only interpersonal relationships.The presence of other interventions together with team building: in the presence of other interventions, the effect of team building is stronger than when it is alone. 6. Who managed the intervention(s): for team buildings with an external and an internal consultant the effect is strongest, followed by only external consultant, followed lastly by only internal consultant. 7. The focus of the teambuilding: an intragroup focus has a stronger effect than an individual focus. **Organisational support factors** 8. Supervisory support for the team building: when support is present, the effect is stronger. 9. Support for change efforts: when support from higher levels is present, the effect is strongest, followed by organisations with no evidence for support, and followed lastly by support from different levels. 10. Organisational characteristics. 11. Size of organisation: small organisations have the strongest effect, followed by large organisations, followed by medium ones. 12. Type of organisation: in industrial/manufacturing organisations, the effect is stronger than in government organisations. 13. Team's responsibility for own performance: when the team is solely responsible for own performance, the effect is stronger than when the team depends on other elements in the organisation. Management style: in teams with a participative management style, the effect was stronger than in teams with an autocratic management style.	1. Internal initiator: d=.43; external initiator: d=.78 2. Preventive action: d=.69; corrective action: d=.86) 3. Expect to change attitudes & performance: d=.86; expect to change performance: d=.79; expect to change attitudes: d=.23 4. Group involved: d=.50; group not involved: d=1.07 5. Interpersonal focus: d=.58; goal setting focus: d=.62; mixed focus: d=.79 6. Only teambuilding: d=.53; other interventions: d=.82 7. Only internal consultant: d=.35; only external consultant: d=.74; both internal and external: d=1.75 8. Individual focus: d=.48; intragroup focus: d=.79 9. Support present: d=1.02; support missing: d=.49 10. Support from higher levels: d=.90; no evidence of support: d=.64; support from different levels: d=.50 11. (Small organisations: d=.80; medium org: d=.43; large org: d=.56) 12. (Industrial/man. d=.89; government: d=.21) 13. Responsible for performance: d=.92; interdependent: d=.76 Participative style: d=2.62; autocratic: d=.18	large number of relationships tested	A

Tanghe, 2010	Study 1 Cross-sectional N = 71 teams Study 2 Scenario experiment 2x2 design N = 121	1. Employees, mainly service organisations 2. Students	Team identification leads group members to affectively converge to their fellow group members and that this affective convergence, in turn, explains subsequent team-oriented attitudes: 1. The higher the group identification is, the stronger the affective convergence among team members. 2. Positive group affective (PA) tone is positively associated with team effectiveness and this effect will be stronger for higher levels of group identification. 3. Negative group affective (NA) tone is not negatively associated with team effectiveness and this effect will be stronger for higher levels of group identification.	See article	Measure group affect study 2 somewhat unclear	1) D 2) B
Tannenbaum, 2013	meta-analysis of before-and-after studies n = 31 studies, 2,136 participants	various	Intervention: debriefs. Debriefs lead individuals or teams through a series of questions that allow participants to reflect on a recent experience, construct their own meaning from their actions, and uncover lessons learned in a non-punitive environment. A debrief has four elements: (1) participants reflect on specific events; (2) participants are actively involved in self-discovery; (3) the environment is nonjudgmental and focused on learning; (4) both the participants and at least one other external source give input regarding the events under review. 1. Debriefs have a medium-to-large positive effect on team performance. 2. Debriefs focused on team-level improvement have a larger effect on team performance than on individual performance. Moderators of the effect of debriefs on team performance: 3. Facilitation in debriefs: facilitated debriefs have a greater effect on team performance than non-facilitated debriefs. 4. The degree of structure of debriefs: highly structured debriefs have a stronger effect than moderately structured debriefs.	d=.67 team performance: d=1.2; individual performance: d=.41 facilitated debriefs: d=.75; non-facilitated debriefs: d=.25 highly structured debriefs: d=.69; moderately-structured debriefs: d=.54	no serious weaknesses	B

Tekleab, 2016	longitudinal study n = 227 (45 teams)	employees pursuing a graduate degree at a large Midwestern university.	1. There is NO curve linear relationship between functional diversity and team cohesion. 2. Behavioural integration positively influences team cohesion. 3. A high level of behavioural integration attenuates the negative impact of functional diversity on team cohesion such that the relationship will be negative only under a low level of behavioural integration. 4. The relationship between team cohesion and objective team performance is mediated by team learning. Note: Behavioural integration is a meta-construct, which includes the team's information exchange, collaborative behavior, and joint decision making.	1. ß = −.12 ns 2. ß = .73 3. ß = −.48 4. coh > learning ß = .45 learning > performance ß = .66	Concerns a capstone simulation	C
Turner, 2014	Meta-analysis, includes RCTs k = 18 (768 teams, n = 13,491)	various	The primary focus of this meta-analysis is to identify which measure of the six team cognition constructs (shared mental models, SMM; team mental models, TMM; information sharing, IS; transactive memory systems, TMS; cognitive consensus, CC; group learning, GL) produced the best performance outcome results. The one team cognition construct that stood out was that of IS, with statistical findings greater than the constructs of TMM, GL, and TMS. The two shared cognitive constructs that were not statistically different from IS were SMM and CC; neither of these constructs was found to be significantly different from TMM, GL, or TMS. Note: see discussion & conclusion.	SMM r = .39 TMM r = .19 ns IS r = .51 TMS r = .30 CC = .42 GL = .15 ns	no serious limitations	AA
Van der Vegt, 2010	Longitudinal study N = 47 teams (average team size = 10)	Truck manufacturing	1. Turnover is negatively associated with social integration within self-managing work teams. 2. Turnover is negatively associated with team learning behavior within self-managing work teams but is not inverse U-shaped. 3. Team turnover is negatively associated with task flexibility in self-managing work teams. 4. Social integration does not partially mediate a generally negative relationship between team turnover and effectiveness in self-managing work teams. 5. Team learning behavior partially mediates a generally negative relationship between team turnover and effectiveness in self-managing work teams. 6. Task flexibility partially mediates a generally negative relationship between team turnover and effectiveness in self-managing work teams. 7. Team turnover is negatively relate to team effectiveness.	1. ß = -.32 2. ß = -.41 3. ß = -.37 4. ß = -.36	No full use of validated scales	C

Wagner, 2012	Randomised experiment N = 206 (82 teams)	Students, US	1. For work consisting of a combination of individualized and interdependent tasks, team member performance is higher for individuals possessing a mix of individualism and collectivism than for individuals who lack similar heterogeneity. 2. The relationship between intrapersonal heterogeneity in individualism–collectivism and performance predicted in H1 is moderated by structural interdependence such that the effect is stronger under conditions of loose structural interdependence than under conditions of tight structural interdependence.	See article	no serious weaknesses	A
Wang, 2019	meta-analysis k = 47 (2,832 teams)	various	1a) Surface-level diversity in culturally diverse teams is not related to team creativity/innovation, (2a) irrespective whether the team is collocated or non-collocated, level of task independency (3a), task complexity (4a), or task intellectiveness (judgmental vs intellective tasks) (5a). 1b)... whereas deep-level diversity in culturally diverse teams is somewhat positively related to team creativity/innovation. 2) This relationship is stronger for collocated teams than for non-collocated teams, 3) stronger for interdependent tasks than for independent tasks, 5)stronger for intellective tasks than for judgmental tasks. Tasks complexity and intellectiveness did not moderate the effect.	All ES very small 1. a) ns and mostly close to zero b) ρ = .16? 2. col: ρ = .18 non col: ρ = .02 ns 3. inter: ρ = .19 indep: ρ = -.10 ns	Design of included studies not reported Effect sizes reported in text do not correspond with the ES in table 2	C
Webber, 2001	meta-analysis k = 24 (45 correlations)		Results showed that job-related diversity has NO relationship with cohesion or performance.	close to zero and ns	Design of included studies not reported	C

Webber, 2008	Longitudinal study n = 69 (9 teams)	Undergraduate students, Canadian University	Note: direct effect sizes incorporated in De Jong 2016. 1. Early trust emerges as a one-dimensional factor early in the life span of a team. 2. Cognitive and affective trust emerge as separate components over time. 3. Familiarity with team members is positively related to early trust. 4. Interaction frequency is NOT related to (affective or cognitive) trust. 5. Monitoring behaviours by team members (eg tracking the work of others, creating backup plans, or working around team members to get tasks done) somewhat negatively affects the development of cognitive and affective trust in teams (even after controlling for familiarity and early trust).	3) R2 = .06, ß = .24 4) Aff: R2= .01, ß = .09 Cogn: R2= .00, ß = .03, 5) small	artificial setting	C
Weer, 2016	longitudinal study with 3 measurement points over 4,5 years n = 714 teams	Employees of a large, multinational technology-driven firm.	Intervention: coaching by team leader: facilitative coaching (providing guidance by aligning team member aspirations with organisational goals and facilitate the achievement of both individual and team objectives) and pressure-based coaching (providing direction by applying extensive pressure to get results. These managers communicate expectations by becoming visibly upset and complaining vigorously if goals are not met, and may challenge employees to improve by reprimanding poor performance and/or publicly criticizing mistakes.). Team leader's facilitative coaching predicts team effectiveness (as rated by the team leader). Team leader's pressure-based coaching negatively predicts team effectiveness.	Low effect sizes r=.14 at time 1; r=.0 at time 2; r=.02 and ß=.02 at time 3. r =-.05 at time 1; r =-.11 at time 2; r =-.06 and ß=-.24 at time 3	no serious weaknesses	B
Wildman, 2016	Systematic review of 31 cross-sectional (28) and longitudinal (3) studies.	Work teams, different industries	Concerning specific team learning behaviours, sharing, team reflection, and team activity tend to have the strongest impact on teams' engagement in innovation development. Learning and innovation development are mutually dependent aspects of teamwork and that fostering one aspect will also be beneficial for the other.	Unclear	It seems that the authors pretend to estimate causal inference basing on correlational studies.	B

Wildman, 2018	Cross-sectional study N = 117 teams (593 respondents)	Vocational educators in vocational colleges	Team learning behaviours (TLBs), especially team reflexivity and boundary spanning, relate positively to innovative work behaviour (IWB). Furthermore, team structure, task interdependence and group potency relate positively to TLBs. TLBs can be fostered by establishing these team learning conditions. 1. a) Knowledge sharing is not related to IWB. b) Team reflexivity relates positively to IWB. c) Boundary spanning relates positively to IWB. d) Storage and retrieval is not related to IWB. 2. Team structure relates positively to (a) knowledge sharing, (b) team reflexivity, (c) boundary spanning, (d) storage and retrieval. 3. Task interdependence relates positively to (a) knowledge sharing, (b) team reflexivity, (c) boundary spanning. It does not positively relate to (d) storage and retrieval. 4. Group potency relates positively to (b) team reflexivity, but not to (a) knowledge sharing, (c) boundary spanning, (d) storage and retrieval.	1a ns 1b ß = 0.54 1c ß = 0.61 1d ns 2a ß = 0.73 2b ß = 0.44 2c ß = 0.49 2d ß = 0.29 3a ß = 0.24 3b ß = 0.25 3c ß = 0.26 3d ns 4a ns 4b ß = .28 4c ns 4d ns	no serious limitations	D
Zhou, 2015	meta-analysis k = 31	entrepreneurial teams	1. No conclusion could be drawn regarding the relationship between age diversity and entrepreneurial team performance due to inconsistent research results. 2. No conclusion could be drawn regarding the relationship between race diversity and entrepreneurial team performance due to inconsistent research results. 3. The association between educational-level diversity and entrepreneurial team performance remains inconclusive. 4. Overall, the usually hypothesized positive relationship between educational-background diversity and entrepreneurial team performance was not supported by empirical studies. 5. Empirical findings regarding relationships between functional diversity and entrepreneurial team performance may be described as divergent and inconsistent. 6. Although informational diversity has often been assumed to be beneficial for firm-level as well as team-level entrepreneurial team performance, here again empirical evidence is inconsistent and therefore inconclusive.	ns	Design of included studies not reported	C

Excluded studies

Author & year	Reason for exclusion
Barczak, 2010	Cross-sectional study, partly focusses on EI, confirms findings from recent MAs.
Beal, 2003	Included in Chioccio 2009.
Budworth, 2011	Concerns the assessment of a specific training (employee selection methods).
Buljac, 2010	Literature review, narrative summary of findings (including of individual studies included).
Buvik, 2016	Cross-sectional study, small sample, Norwegian construction teams, confirms findings from recent MAs.
Carboni, 2013	Cross-sectional study, sales teams. Results indicated that individuals close to the core of a team outperformed more peripheral individuals, but only to the extent that teams were high-performing or had been together longer as a team.
Chen, 2018	Limited generalizability (undergraduate students in Singapore). Experiment comparing different methods of team formation: (1) random assignment; (2) self-selection; and (3) algorithm assignment designed to maximize skill complementarity. The study found that self-selection creates high-performing teams.
Cheng, 2016	Study with several weaknesses, artificial setting and artificial tasks, findings are inconclusive.
Chi, 2012	Paper cannot be retrieved.
Curseau, 2014	Concerns the effect of individual goals rather than group goals.
DeChurch, 2010	Incorporated in Mesmer-Magnus, 2017.
de Pillis, 2015	Concerns student teams in an educational setting.
Devine, 2001	Focusses only on differences between field and lab studies.
Ehrhardt, 2014	Cross-sectional study, mainly confirms findings from meta-analyses.
Eisele, 2013	Assessment of feedback sessions based on the Team Diagnostic Survey, lacks detailed information regarding the effect.
Eisele, 2015	The study doesn't examine an intervention. It is focused only on the predictive validity of the Team Diagnostic Survey.
Espinosa, 2015	Concerns dyadic teams.
Farh, 2017	Concerns TMX, findings rather hard to apply: strong TMX produces obligations to utilize resources provided by one's teammates, and these obligations enhance performance when (a) teammates provide resources of high quality or (b) the quality of resources available from individuals outside of the TMX relationship (i.e., the leader) are low, purportedly because TMX-based obligations protect individuals from over-utilizing low-quality resources from the leader.
Gaggioli, 2015	Longitudinal study, concerns social network indices and experience of flow.

Gilley, 2010	The study doesn't examine an intervention. It is focused only on the managerial skills that predict the manager's ability to facilitate and build teams.
Hasa, 2019	Limited generalizability (startups in India). The findings highlight how prior social connections, which are often a source of knowledge and influence, can limit new interactions and thus the ability of organisations to leverage peer effects to improve the performance of their members.
Harty, 2016	No estimate of effect sizes is given, only significance levels. Furthermore, data is analysed at individual level, and the groups might not be teams.
Huang, 2013	Cross-sectional study, mainly confirms findings from meta-analyses (Bachrach 2019, Mesmer-Magnus 2017).
Jarrett, 2016	The study is included in the McEwan (2017) meta-analysis, with another reference (Jarrett et al. 2012) – this is a dissertation that the article from 2016 was based on (the same sample & data).
Kaymak, 2011	The effect of positive past experiences working on group cohesion and group performance was only indirectly measured (SEM).
Kuipers, 2009	The study doesn't examine an intervention. It examines whether three team processes predict.
Lee, 2013	Limited generalizability (operational service teams in Hong Kong en Macao. In this study, operational service teams' attribute patterns and their associated performance levels were examined using a configuration approach.
Liu, 2011	Cross-sectional study, Taiwanese companies, confirms findings from recent MA's.
Marques-Quinteiro, 2019	Cross-setional study, confitms findings from recent MA's.
Matta, 2018	The meta-analysis doesn't focus on an intervention, but on leader-member exchange (team leader's behaviour).
McHaney, 2018	Off topic, study about whether groups with prior history of interaction outperform individuals in deception detection. Results indicated that groups which exhibited higher levels of relational links, that is, established groups, were more accurate in deception detection than ad hoc groups.
McNeese, 2017	Not relevant, laboratory-based study of collocated student teams undertaking information retrieval tasks.
Mell, 2014	Effect sizes are incorporated in Bachrach 2019. In addition, the central hypothesis ('Teams with a centralized TMS structure perform better than teams with a decentralized TMS structure when there is a disconnected distribution of interdependent task information, but not when there is a connected distribution of interdependent task information') is too detailed and too academic for this REA.
Meneghel, 2016	Cross-sectional study.
Mertins, 2015	Simulation game, no hypotheses, methods section rather unclear.
Moser, 2019	Cross-sectional study, confirms findings from recent MAs.
Muhlberger, 2015	The study doesn't measure team effectiveness, but the effectiveness of several types of coaching (including group coaching) interventions for individual goal attainment.
Mullen, 1994	Included in Chioccio 2009.
Naidoo, 2011	(included in Matta, 2018) The study doesn't focus on an intervention, but on leader-member exchange (team leader's behaviour).
Nielsen, 2010	Concerns training of managers rather than teams.

Nielsen, 2012	The study doesn't measure team effectiveness, but individual-level variables such as autonomy, social support, job satisfaction, and affective well-being.
Nielsen, 2017	Only marginally relevant, most of the findings are incorporated in recent MAs (eg McEwan, 2017).
Nisula, 2016	Cross-sectional study, focusses on individual creative self-efficacy and several other constructs measured at the individual level.
Nouri, 2013	Nice study, but unfortunately concerns dyads.
Oertel, 2015	Partly incorporated in Bachrach 2019. In addition, hypotheses tested mostly descriptive and fairly self-evident (eg "During the formation phase of teams, knowledge-based team learning behaviours (storing and retrieving task- and teamwork-relevant knowledge) are positively related to the emergence of transactive memory).
O' Leary, 1994	Included in Kleingeld, 2011.
Pierro, 2015	Cross-sectional study on the relationship between need for cognitive closure and employee performance.
Rapp, 2007	Included in Delise 2010, McEwan 2017, and Salas 2008.
Revilla, 2012	Cross-sectional study, very small sample, confirms findings from recent MAs.
Rico, 2011	Examined the effects of person-focused organisational citizenship behaviours on the performance of teams characterized by different levels of virtuality and task interdependence.
Rodriguez-Sanchez, 2016	Longitudinal study, outcomes are incorporated in recent MAs.
Rousseau, 2013	Cross-sectional study on team coaching by team leaders, uses a self-constructed 5-item questionnaire that takes a very broad approach to coaching (eg: Our team leader points out the areas we need to improve; Our team leader suggests means to improve our performance).
Salanova, 2015	Off topic, study about collective efficacy and collective flow. No performance measure.
Salas, 1999	Rather old MA of cross-sectional studies, outcome is partly refuted by more recent, high quality MAs (eg Klein, 2009).
Shazi, 2015	Cross-sectional study, small sample, confirms findings from recent MAs.
Staats, 2012	Off topic. Study about 'team scaling fallacy'. As team size increases, people increasingly underestimate the number of labor hours required to complete projects.
Sonnentag, 2010	Focusses on individual performance (findings suggest that team members can improve their individual performance when engaging in teamwork processes that are relevant for the team as a whole).
Stevens, 2003	Participants were all female and from sports teams.
Tanghe, 2010	Experimental lab study with students, very artificial. Concerns the effect of team members' affective state on propensity to trust. People who are less trusting will show more cooperative behaviours when confronted with group members displaying high activation affective states than when confronted with group members displaying low activation affective states.
Tindale, 2012	Unclear framework, hypotheses and methods, limited generalizability.
Troster, 2014	Concerns only self-managed teams and the effect of nationality. Outcomes are potency" (the team's confidence in its ability to perform)and its performance as rated by expert judges.

Unger-Aviram, 2015	Lab setting and artificial task (bridge planning task), focusses mainly on the effect of goal orientation on adaption to change.
van der Haar, 2015	Concerns on-scene-command teams that coordinate the interdisciplinary aid efforts of fire departments, the police, and disaster medicine in case of natural or man-made emergencies, such as floods, fire breakouts, or car accidents.
Van Mierlo, 2010	Lab setting and artificial task (tower building task), very academic, implications for practice somewhat unclear.
Vora, 2012	Longitudinal study, simulation with undergraduate students, effects unclear.
Woehr, 2013	Concerns an RCT with students in an artificial setting and an artificial task (building a replica of a real bridge, using 33 plastic pipes of three different sizes and 20 rubber bands). Note: Results indicated that value diversity among team members had NO significant impact on task performance.
Wu, 2016	Cross-sectional study, student population (undergraduates), confirms findings from recent MAs.
Xu, 2019	Longitudinal study, only marginally relevant to the REA question.
Yee-Young, 2015	Concerns whether social category (gender and age) and informational diversity (education and work experience) in work teams may affect a team's perceived fit, which in turn may influence leader-rated group performance.
Zhang, 2015	Cross-sectional study of Chinese teams. The statistical technique (support vector machine) that is used to build the model is rather unclear.
Zhang, 2016	Population concerns Chinese employees and students. However, in China group members may differ from their American and European counterparts in terms of group diversity effects. In addition, most beta's found were practically irrelevant.
Zhu, 2018	Longitudinal survey, confirms findings from recent MAs (Bachrach 2019, Mesmer-Magnus 2017).

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EXECUTIVE SUMMARY

Rapid Evidence Assessment (REA)



ATTRIBUTES OF EFFECTIVE TEAMS AND INTERVENTIONS INCREASING TEAM EFFECTIVENESS

a summary of scientific literature

December 2019

Culture Review **Implementation**

our journey of positive change

ACT Government

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What is a Rapid Evidence Assessment (REA)?



Rapid Evidence Assessments (REAs) use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and as a result, the likelihood of bias is considerably smaller.

Background

This REA was conducted by the Center for Evidence Based Management (CEBMa) for Novartis, a large global pharmaceutical company. Novartis, who are involved in projects to enhance organisational effectiveness and performance, approached CEBMa to undertake a REA to discover what is known in scientific literature about the attributes of effective teams and workgroups and the effectiveness of interventions aimed at increasing team effectiveness.

This REA attempts to confirm the key attributes of effective teams. It also considers the following considerations:

1. **What makes a team?**
2. **What is team effectiveness?**
3. **What are the attributes of effective teams?**
4. **What interventions influence team effectiveness?**
5. **How reliable and valid are team effectiveness models?**

Main findings

1. What makes a team?

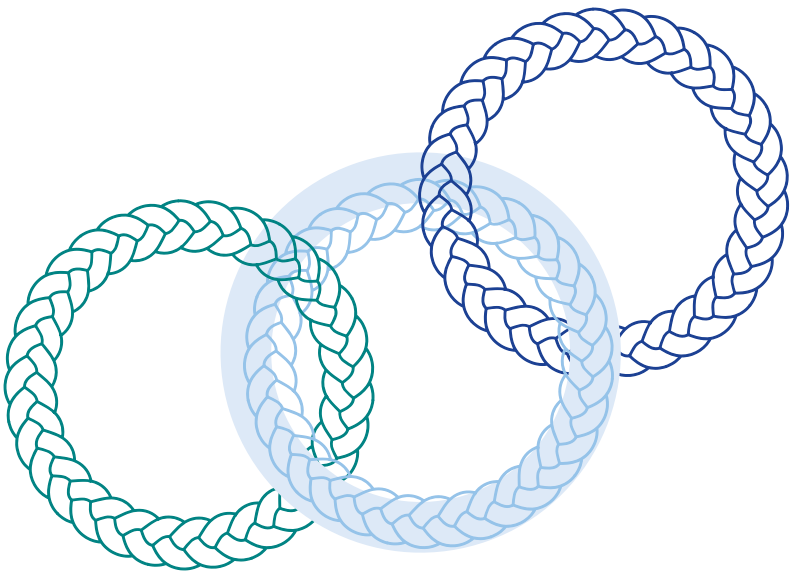
The term 'team' is simply described as 'a group of people working together to achieve a goal.' However, 'teams' in the domain of social sciences has a range of specific characteristics that differentiate them from groups. A widely used definition is 'a team is a collection of individuals who are interdependent in their tasks, share responsibility for outcomes, see themselves (and who are seen by others) as a social entity embedded in one or more larger social system (business unit or corporation), and, who manage their relationships across organisational boundaries.' (Cohen, 1997). Most researchers, however, prefer to summarise the characteristics of a typical team as 'a group of employees who are formally established, assigned some autonomy, and are interdependent'.

2. What is team effectiveness?

The research failed to provide a clear definition of what constitutes team effectiveness. This is because the research assessed showed that teams are not automatically more effective than a group of individual employees. In fact, group performance can decline due to several factors, including conflicts between individual group members or between individuals and group interests, or individuals may do less work in the group than they would if they had to complete work individually.

To provide a more meaningful definition this REA considered team effectiveness in relation to team performance. This enabled the following definition of team effectiveness to be confirmed: 'task performance, contextual performance, and/or adaptive performance (learning, creativity and decision making) . . . some scholars also differentiate between performance behaviours and performance outcomes' (Beal, 2003).

Several authors also state that an effective team is not necessarily an efficient team. Team effectiveness, it was argued, concerns an evaluation of a team's results while team efficiency considers the 'costs' of achieving those results. Finally, the research stresses that intra-team processes such as communication, information sharing, and conflicts are often considered and essential elements of team effectiveness (Mathieu, 2008).



3. What are the attributes of effective teams?

The REA grouped effective team attributes into the following categories:

- **Team composition** – characteristics of the team, including age, gender, level of education and career background.
- **Team members' collective interpersonal perceptions and attitudes in teams** – these perceptions and attitudes can enable and support effective teamwork.
- **Team cognition/knowledge** – the ways in which knowledge that is important to team functioning is organised, represented and distributed within teams.

4. Team composition

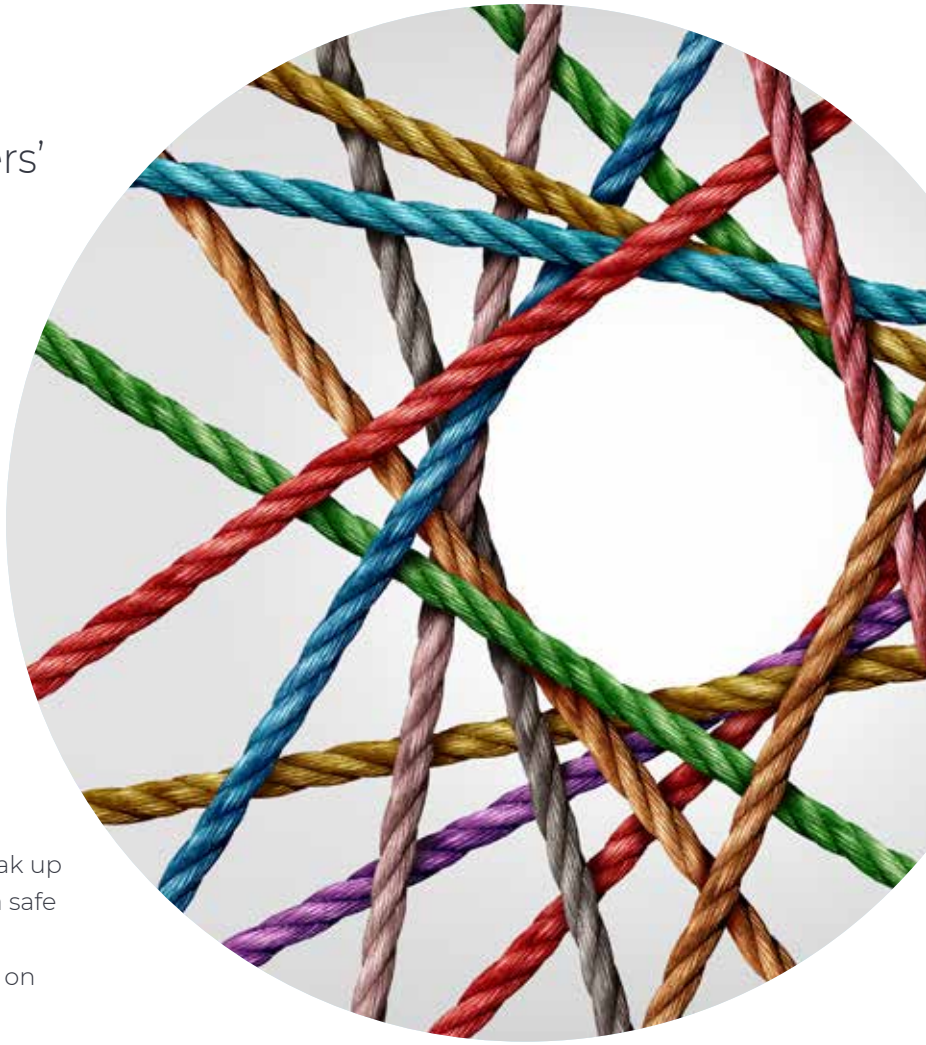
The REA findings revealed that while team composition or diversity is one of the most researched attributes of effective teams, the link between team effectiveness and team composition/diversity is small and sometimes negative. Further, research suggests it is important to consider and compensate for potential negative consequences of team composition on communication, cohesiveness and consequently performance.

The researchers also noted that of the 'Big Five Personality Traits' (emotional stability, extraversion, openness to experience, agreeableness and conscientiousness) within teams, only high levels of agreeableness and conscientiousness were related to better team performance.

5. Team attitudes due to individual team members' experiences

The following findings had the strongest impact on team effectiveness:

- Intra-team trust is positively related to team performance.
- Intra- team trust or trust within teams is most critical when teams physically work together and at the same times, they rely on each other's input and resources to complete a task, decision making is shared equally, and they have a shared work history and an expectation to work together in the future.
- Group-level psychological safety (the ability of people to feel confident to speak up and suggest new ideas or processes in a safe environment free of ridicule or derision) has a moderate to large positive impact on team performance.
- Team cohesion has a moderate to large impact on team performance.



» Social cohesion has a moderate to large impact on a team's behavioural performance.

» Teams that don't physically work together or at the same time (virtual) must have a high level of intra-team trust and social cohesion in order to effectively work together. This can be achieved by managers ensuring that they include an initial or several 'face to face' team meetings to prepare people to work together in virtual settings.

» Social cohesion is strongly associated with team inclusion.

» Team identification has a positive effect on social cohesion and consequently team performance.

» Staff turnover has a negative effect on social cohesion and consequently team performance.

6. Team cognition/knowledge

» Information sharing, the faith in and usage of the team's collective memory of processes, procedures and information (Transactive Memory System) and the degree to which a team interprets and communicates issues in a similar way (Cognitive consensus) all have a large, positive impact on team performance

» Team learning does not automatically lead to performance improvement.

» Teams need to regularly reflect on how the team is performing and what works and doesn't, otherwise the positive impacts of information sharing, TMS and cognitive consensus on team performance will decrease.

7. What interventions influence team effectiveness?

» Team building has a moderate positive effect on team performance. Research reveals that the impact on team building is greater when:

- The initiator is external, rather than internal to the team.
- The rationale is corrective, rather than preventive.
- Team members are not involved in the planning of the team building initiative.
- Focus is on both the team's goals and interpersonal relations.
- Team building is planned together with other interventions.
- Team building is led by both an internal and external consultant.
- Focus is on the group, not the individuals.
- Team building initiative is supported by higher management.

» Teamwork training has a large, positive effect on team performance.



» Debriefing sessions have a moderate to large positive effect on team performance. Debriefs are most effective when the following are met:
  - The focus should be about learning and improvement, rather than evaluation or judgement. This approach yields more honest and accurate feedback and enhances experiential learning.
  - Focus on specific activities, episodes or events, rather than performance or results in general.
  - Informed by a variety of perspectives and evidence sources (i.e. include data from multiple participants and at least one additional source of evidence).
  - Facilitated and highly structured debriefs have a greater effect on team performance than non-facilitated or loosely structured debriefs.
» Setting group goals has a moderate to large, positive effect on team performance.

8. How reliable and valid are team effectiveness models?

Whilst some models contain factors that have been shown to be strong predictors of team performance (i.e. social cohesion, goal clarity and trust) underlying psychometric research of popular models is inadequate to establish their reliability and validity.

Conclusion

The attributes of effective teams are one of the most widely researched topics in Industrial-Organisational psychology. Most of the research assessed showed that effective teams are not so much determined by their composition, but through the presence of the following factors: trust, psychological safety, social cohesion, the level of information sharing, cognitive consensus and TMS.

More information

You can access more information in the *Rapid Evidence Assessment (REA) Attributes of Effective Teams and Interventions Increasing Team Effectiveness, a summary of scientific literature, December 2019.*

References

Açıkgöz, A., & Latham, G. P. (2018). The mediating effect of team reflection on the relationship between a challenging learning goal and new product success. *Canadian Journal of Behavioural Science/ Revue canadienne des sciences du comportement, 50*(3), 136.

Bachrach, D. G., Lewis, K., Kim, Y., Patel, P. C., Campion, M. C., & Thatcher, S. M. B. (2019). Transactive memory systems in context: A meta-analytic examination of contextual factors in transactive memory systems development and team performance. *Journal of Applied Psychology, 104*(3), 464-493.

Balkundi, P., & Harrison, D. A. (2006). Ties, leaders, and time in teams: Strong inference about network structure's effects on team viability and performance. *Academy of Management Journal, 49*(1), 49-68.

Beal, D. J., Cohen, R. R., Burke, M. J., & McLendon, C. L. (2003). Cohesion and Performance in Groups: A Meta-Analytic Clarification of Construct Relations. *Journal of Applied Psychology, 88*(6), 989-1004.

Bell, S. T. (2007). Deep-level composition variables as predictors of team performance: A meta-analysis. *Journal of Applied Psychology, 92*(3), 595.

Bell, S. T., Villado, A. J., Lukasik, M. A., Briggs, A. L., & Belau, L. (2011). Getting Specific about Demographic Diversity Variable and Team Performance Relationships: A Meta-Analysis. *Journal of Management, 37*(3), 709-743.

Breuer, C., Hüffmeier, J., & Hertel, G. (2016). Does trust matter more in virtual teams? A meta-analysis of trust and team effectiveness considering virtuality and documentation as moderators. *Journal of Applied Psychology, 101*(8), 1151.

Bui, H., Chau, V. S., Degl'Innocenti, M., Leone, L., & Vicentini, F. (2019). The Resilient Organisation: A Meta-Analysis of the Effect of Communication on Team Diversity and Team Performance: International Review of Applied Psychology. *Applied Psychology, 68*(4), 621-657.

Capiola, A., Alarcon, G. M., Lyons, J. B., Ryan, T. J., & Schneider, T. R. (2019). Collective Efficacy as a Mediator of the Trustworthiness - Performance Relationship in Computer-Mediated Team-based Contexts. *The Journal of Psychology, 153*(7), 732-757.

Chiocchio, F., & Hélène, E. (2009). Cohesion and Performance: A Meta-Analytic Review of Disparities Between Project Teams, Production Teams, and Service Teams. *Small Group Research, 40*(4), 382-420.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Cohen, S. G., & Bailey, D. E. 1997. What makes teams work: Group effectiveness research from the shop floor to the executive suite. *Journal of Management, 23*: 239-290.

DeChurch, L. A., & Mesmer-Magnus, J. R. (2010). The cognitive underpinnings of effective teamwork: A meta-analysis. *Journal of Applied Psychology, 95*(1), 32.

De Jong, B. A., Dirks, K. T., & Gillespie, N. (2016). Trust and team performance: A meta-analysis of main effects, moderators, and covariates. *Journal of Applied Psychology, 101*(8), 1134.

De Jong, J. P., & Fodor, O. C. (2017). Attuning to individual work routines and team performance. *Team Performance Management, 23*(7/8), 385-406.

Delise, L. A., Gorman, C. A. P., Brooks, A. M. P., Rentsch, J. R. P., & Steele-Johnson, D. P. (2010). The effects of team training on team outcomes: A meta-analysis. *Performance Improvement Quarterly, 22*(4), 53.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*(2), 350_383.

Edmondson, A.C. (2003). *Managing the Risk of Learning: Psychological Safety in Work Teams.* In West, Michael A.; Tjosvold, Dean; Smith, Ken G. (eds.). International Handbook of Organisational Teamwork and Cooperative Working. New York: Wiley. pp. 255–275.

Eisele, P. (2013). Validation of the Team Diagnostic Survey and a Field Experiment to Examine the Effects of an Intervention to Increase Team Effectiveness. *Group Facilitation*(12), 53-70.

Eisele, P. (2015). The predictive validity of the team diagnostic survey: Testing a model with performance and satisfaction as output variables. *Team Performance Management, 21*(5/6), 293-306.

Evans, C. R., & Dion, K. L. (1991). Group cohesion and performance: A meta-analysis. *Small Group Research, 22*(2), 175.

Evans, C. R., & Dion, K. L. (2012). Group Cohesion and Performance: A Meta-Analysis. *Small Group Research, 43*(6), 690-701.

Fang, H. M., & Wen-Ching, C. (2014). The Effects of member familiarity, task results visibility and perceived co-worker loafing on technology-supported team performance: social loafing effect perspective. *Asia Pacific Management Review, 19*(4), 361.

Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., & Vracheva, V. (2017). Psychological safety: A meta-analytic review and extension. *Personnel Psychology, 70*(1), 113-165.

Greer, L. L., de Jong, B. A., Schouten, M. E., & Dannals, J. E. (2018). Why and when hierarchy impacts team effectiveness: A meta-analytic integration. *Journal of Applied Psychology, 103*(6), 591.

Guillaume, Y. R. F., Brodbeck, F. C., & Riketta, M. (2012). Surface- and deep-level dissimilarity effects on social integration and individual effectiveness related outcomes in work groups: A meta-analytic integration. *Journal of Occupational and Organisational Psychology, 85*(1), 80.

Gully, S. M., Joshi, A., Incalcaterra, K. A., & Beaubien, J. M. (2002). A meta-analysis of team-efficacy, potency, and performance: Interdependence and level of analysis as moderators of observed relationships. *Journal of Applied Psychology, 87*(5), 819-832.

Gully, S. M., Devine, D. J., & Whitney, D. J. (MA - 2012). A meta-analysis of cohesion and performance: Effects of level of analysis and task interdependence. *Small Group Research, 43*(6), 702-725.

Haas, H. (2010). How can we explain mixed effects of diversity on team performance? A review with emphasis on context. *Equality, Diversity and Inclusion: An International Journal, 29*(5), 458-490.

Hackman, J.R. (2002), *Leading Teams: Setting the Stage for Great Performance,* Harvard Business School Press, Boston.

Hackman, J.R. and Wageman, R. (2005), "A theory of team coaching", *Academy of Management Review, Vol. 30*, pp. 269-87.

Hopp, C., & Zenk, L. (2012). Collaborative team networks and implications for strategic HRM. *The International Journal of Human Resource Management, 23*(14), 2975.

Horwitz, S. K., & Horwitz, I. B. (2007). The effects of team diversity on team outcomes: A meta-analytic review of team demography. *Journal of Management, 33*(6), 987-1015.

Hülsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. *Journal of Applied Psychology, 94*(5), 1128.

Jaakson, K., Reino, A., & McClenaghan, P. B. (2019). The space between – linking trust with individual and team performance in virtual teams. *Team Performance Management, 25*(1/2), 30-46.

Kennedy, D. M., Vozdolska, R. R., & McComb, S. A. (2010). Team Decision Making in Computer-Supported Cooperative Work: How Initial Computer-Mediated or Face-to-Face Meetings Set the Stage for Later Outcomes. *Decision Sciences, 41*(4), 933.

Klein, C., DiazGranados, D., Salas, E., Huy, L., Burke, C. S., Lyons, R., & Goodwin, G. F. (2009). Does Team Building Work? *Small Group Research, 40*(2), 181-222.

Kleingeld, A., van Mierlo, H., & Arends, L. (2011). The effect of goal setting on group performance: A meta-analysis. *Journal of Applied Psychology, 96*(6), 1289.

Konradt, U., Schippers, M. C., Garbers, Y., & Steenfatt, C. (2015). Effects of guided reflexivity and team feedback on team performance improvement: The role of team regulatory processes and cognitive emergent states. *European Journal of Work and Organisational Psychology, 24*(5), 777.

Kozlowski, S. W. J., & Ilgen, D. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest, 7*, 77_124.

Lin, C., Standing, C., & Liu, Y.-C. (2008). A model to develop effective virtual teams. *Decision Support Systems, 45*(4), 1031.

Mann, R. D. (1959). A review of the relationships between personality and performance in small groups. *Psychological Bulletin, 56*: 242-270.

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. *Journal of Management, 34*(3), 410-476.

McEwan, D., Ruissen, G. R., Eys, M. A., Zumbo, B. D., & Beauchamp, M. R. (2017). The effectiveness of teamwork training on teamwork behaviors and team performance: A systematic review and meta-analysis of controlled interventions. *PLoS ONE, 12*(1).

Mesmer-Magnus, J. R., & DeChurch, L. A. (2009). Information sharing and team performance: A meta-analysis. J*ournal of Applied Psychology, 94*(2), 535.

Mesmer-Magnus, J., Niler, A. A., Plummer, G., Larson, L. E., & DeChurch, L. A. (2017). The cognitive underpinnings of effective teamwork: a continuation. *Career Development International, 22*(5), 507-519.

Mohammed, S., & Dumville, B. C. (2001). Team mental models in a team knowledge framework: Expanding theory and measurement across disciplinary boundaries. *Journal of Organisational Behavior, 22*, 89–106.

Mumford, M. D., Hunter, S. T., & Bedell-Avers, K. E. (Eds.). (2008). *Multi-level issues in creativity and innovation.* Emerald Group Publishing Limited.

Peeters, M. A. G., Van Tuijl, H. F. J. M., Rutte, C. G., & Reymen, I. M. M. J. (2006). Personality and Team Performance: A Meta-Analysis. *European Journal of Personality, 20*(5), 377-396.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: an introduction to assessing study quality. *Systematic reviews in the social sciences: A practical guide,* 125-163.

Prewett, M., Walvoord, A. G., Stilson, F. B., Rossi, M., & Brannick, M. (2009). The Team Personality-Team Performance Relationship Revisited: The Impact of Criterion Choice, Pattern of Workflow, and Method of Aggregation. *Human Performance, 22*(4), 273-296.

Robertson, R., Gockel, C., & Brauner, E. (2012). Trust your teammates or bosses? Differential effects of trust on transactive memory, job satisfaction, and performance. *Employee Relations, 35*(2), 222-242.

Salas, E., DiazGranados, D., Klein, C., Burke, C. S., Stagl, K. C., Goodwin, G. F., & Halpin, S. M. (2008). Does team training improve team performance? A meta-analysis. *Human Factors, 50*(6), 903-933.

Salas, E., Cooke, N.J. and Rosen, M.A. (2008), "On teams, teamwork, and team performance: discoveries and developments", Human Factors: *The Journal of the Human Factors and Ergonomics Society, Vol. 50* No. 3, pp. 540-547.

Santos, C. M., Uitdewilligen, S., & Passos, A. M. (2015). A temporal common ground for learning: The moderating effect of shared mental models on the relation between team learning behaviours and performance improvement. *European Journal of Work and Organisational Psychology, 24*(5), 710.

Santos, J. P., Caetano, A., & Tavares, S. M. (2015). Is training leaders in functional leadership a useful tool for improving the performance of leadership functions and team effectiveness? *Leadership Quarterly, 26*(3), 470.

Schein, E. H. (1969). *Process consultation: Its role in organisation development.* Reading, MA: Addison-Wesley.

Schein, E. H. (1999). *Process consultation revisited: Building the helping relationship.* Reading, MA: Addison-Wesley.

Schippers, M. C., Homan, A. C., & van Knippenberg, D. (2013). To reflect or not to reflect: Prior team performance as a boundary condition of the effects of reflexivity on learning and final team performance. *Journal of Organisational Behavior, 34*(1), 6.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Shore, L. M., Randel, A. E., Chung, B. G., Dean, M. A., Ehrhart, K. H., & Singh, G. (2011). Inclusion and diversity in work groups: A review and model for future research. *Journal of Management, 37*, 1262-1289.

Solansky, S. T. (2011). Team identification: a determining factor of performance. *Journal of Managerial Psychology, 26*(3), 247-258.

Solansky, S. T. P., & Stringer, D. P. (2019). Collective Mind: A Study of Development and Team Performance. *Organisation Development Journal, 37*(3), 59-69.

Svyantek, D. J., Goodman, S. A., Benz, L. L., & Gard, J. A. (1999). The Relationship Between Organisational Characteristics and Team Building Success. *Journal of Business and Psychology, 14*(2), 265.

Tanghe, J., Wisse, B., & van der Flier, H. (2010). The Role of Group Member Affect in the Relationship between Trust and Cooperation. *British Journal of Management, 21*(2), 359.

Tanghe, J., Wisse, B., & van der Flier, H. (2010). The Formation of Group Affect and Team Effectiveness: The Moderating Role of Identification. *British Journal of Management, 21*(2), 340.

Tannenbaum, S. I., & Cerasoli, C. P. (MA - 2013). Do team and individual debriefs enhance performance? A meta-analysis. *Human Factors, 55*(1), 231-245.

Turner, J. R., Chen, Q. P., & Danks, S. (2014). Team Shared Cognitive Constructs: A Meta-Analysis Exploring the Effects of Shared Cognitive Constructs on Team Performance. *Performance Improvement Quarterly, 27*(1), 83.

Van Der Vegt, G. S., Bunderson, S., & Kuipers, B. (2010). Why turnover matters in self-managing work teams: Learning, social integration, and task flexibility. *Journal of Management, 36*(5), 1168-1191.

Wageman, R. (1995). Interdependence and group effectiveness. *Administrative Science Quarterly, 40*: 145-180.

Wageman, R., J. R. Hackman, and E. Lehman. (2005). "Team Diagnostic Survey." *Journal of Applied Behavioral Science, 41*(4): 373–98.

Wang, J., Grand H-, L. C., Chen, T., & Leung, K. (2019). Team creativity/innovation in culturally diverse teams: A meta-analysis. *Journal of Organisational Behavior, 40*(6)

Webber, S. S., & Donahue, L. M. (2001). Impact of highly and less job-related diversity on work group cohesion and performance: a meta-analysis. *Journal of Management, 27*: 141-162.

Webber, S. S. (2008). Development of cognitive and affective trust in teams: A longitudinal study. *Small Group Research, 39*(6), 746-769.

Widmann, A., & Mulder, R. H. (2018). Team learning behaviours and innovative work behaviour in work teams. *European Journal of Innovation Management, 21*(3), 501-520.

Zhou, W., & Rosini, E. (2015). Entrepreneurial Team Diversity and Performance: Toward an Integrated Model. *Entrepreneurship Research Journal, 5*(1), 31-60.

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Rapid Evidence Assessment (REA)



EFFECT OF FEEDBACK ON WORKPLACE PERFORMANCE

a summary of research literature

July 2019

Culture Review **Implementation**

our journey of positive change

ACT Government

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Background

Novartis, a global pharmaceutical company with 98,000 employees, is involved in several projects to enhance organisational effectiveness and performance. Part of this effort is to replace current performance appraisal practices with a performance management system that is based on three hypotheses:

1. When associates know that their contribution matters, performance will increase.
2. When associates receive frequent and quality feedback, performance will increase.
3. When associates are recognised & rewarded for their contributions, performance will increase.

Although these three hypotheses appear to make sense from a managerial perspective, it is yet unclear whether they are supported (or contradicted) by scientific evidence. For this reason, Novartis approached the Center for Evidence Based Management (CEBMa) to undertake a Rapid Evidence Assessment (REA) to understand what is known in the scientific literature about the link between culture and performance. This review presents an overview of the scientific evidence on performance feedback.

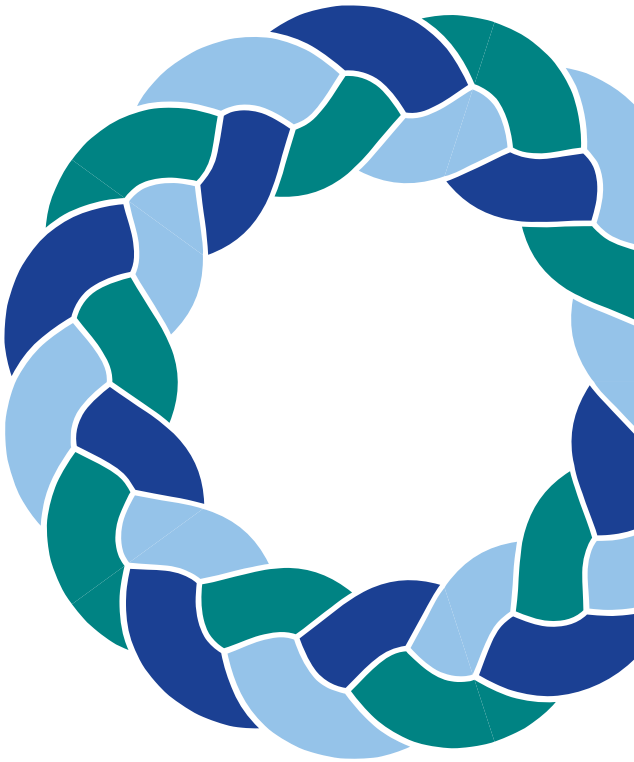


What is a Rapid Evidence Assessment (REA)?

Evidence reviews come in many forms. One of the best-known types is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: clear criteria for inclusion is often lacking and studies are selected based on the researcher's individual preferences. As a result, conventional literature reviews are prone to severe bias. This is why 'rapid evidence assessments' (REAs) are used.

This type of review uses a specific research methodology to identify the most relevant studies on a specific topic as comprehensively as possible, and to select appropriate studies based on explicit criteria. In addition, the methodological quality of the studies included is assessed by two independent reviewers on the basis of explicit criteria. In contrast to a conventional literature review, a REA is transparent, verifiable, and reproducible, and, as a result, the likelihood of bias is considerably smaller.



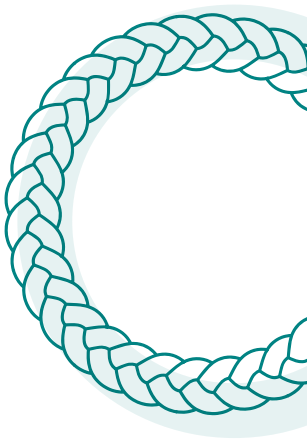


Main question: What does this REA answer?

What is known in the research literature about the link between an employee's or team's performance and receiving feedback?

Other issues raised, which will form the basis of our conclusion to the three questions above, are:

1. **What is meant by feedback (what is it)?**
2. **What is the assumed logic model (how is it supposed to enhance performance)?**
3. **What is the overall effect on performance?**
4. **What is known about the (positive or negative) effect of possible moderators and/or mediators?**



Search strategy: How was the research evidence sought?

The following three databases were used to identify studies: ABI/INFORM Global, Business Source Premier and PsycINFO. The following generic search filters were applied to all databases during the search:

1. **Scholarly journals, peer-reviewed.**
2. **Published in the period 2010 to 2019.**
3. **Articles in English.**

A search was conducted using combinations of different search terms, such as 'performance', feedback', 'feedback intervention' and 'feedback seeking behaviour'. In addition, the references listed in the studies retrieved were screened in order to identify additional articles for possible inclusion in the REA. Finally, relevant studies from a REA on Performance Appraisal conducted by CEBMa in 2017 were included. Most of these studies were published in the period 1980 to 2016 (meta-analyses) and the period 2000 to 2016 (primary studies).

We conducted six different search queries and screened the titles and abstracts of more than 250 studies. An overview of all search terms and queries is provided in Appendix I.

Selection process: How were the studies selected?

Two reviewers worked independently to identify which studies should be included. Where the reviewers disagreed on selection, a third reviewer assessed whether the study was appropriate for inclusion with no prior knowledge of the initial reviewers' assessments. The decision of the third reviewer was final.

Study selection took place in two phases. First, the titles and abstracts of the studies identified were screened for their relevance to this review. In case of doubt or lack of information, the study was included. Duplicate publications were removed. This first phase yielded 12 secondary studies (meta-analyses) and 18 primary studies.

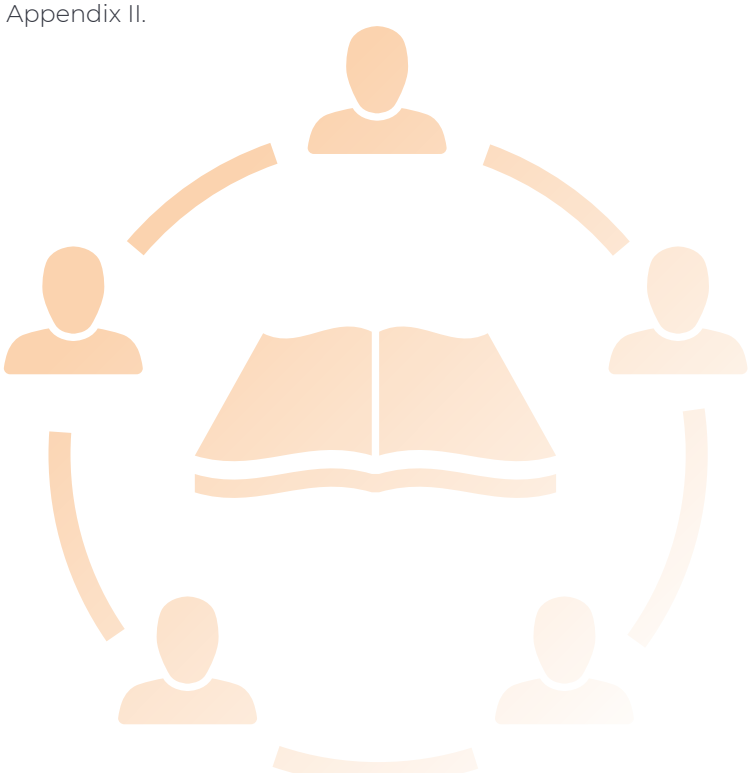
Secondly, studies were selected based on the full text of the article according to the following inclusion criteria:

1. **Type of studies:** Only quantitative, empirical studies.
2. **Measurement:** Only studies in which the link between feedback and organisational outcomes was tested
3. **Context:** Only studies on feedback related to workplace settings
4. **Level of trustworthiness:** Only studies that were graded level C or above (see below).

In addition, the following exclusion criteria were applied:

- Task-generated feedback obtained without an intervention.
- Feedback from co-workers or clients.
- Personal feedback that does not relate to task performance.

This second phase yielded three secondary studies and 17 primary studies. In addition, three secondary studies and three primary studies that were included in previous REAs were added. An overview of the selection process is provided in Appendix II.



Critical appraisal: How were the quality of the included studies judged?

In almost any situation it is possible to find a scientific study to support or refute a theory or a claim. Thus it is important to determine which studies are trustworthy (i.e. valid and reliable) and which are not. The trustworthiness of a scientific study is first determined by its methodological appropriateness. For cause-and-effect claims (i.e. if we do A, will it result in B?), a study has a high methodological appropriateness when it fulfils the three conditions required for causal inference: co-variation, time-order relationship, and elimination of plausible alternative causes (Shaughnessy & Zechmeister, 2006).

A study that uses a control group, random assignment and a before-and-after measurement is therefore regarded as the 'gold standard'. Non-randomised studies and before-after studies come next in terms of appropriateness. Cross-sectional studies (surveys) and case studies are regarded as having the greatest chance of showing bias in the outcome and therefore fall lower in the ranking in terms of appropriateness. Meta-analyses in which statistical analysis techniques are used to pool the results of controlled studies are therefore regarded as the most appropriate design.

To determine the methodological appropriateness of the included studies' research design, the classification system of Shadish, Cook and Campbell (2002), and Petticrew and Roberts (2006) was used. The following four levels of appropriateness were used for the classification:

Design	Level
Systematic review or meta-analysis of randomised controlled studies	AA
Systematic review or meta-analysis of controlled before-after studies	A
Randomised controlled study	
Systematic review or meta-analysis of non-controlled and/or before-after studies	B
Non randomised controlled before-after study	
Interrupted time series	
Systematic review or meta-analysis of cross-sectional studies	C
Controlled study without a pretest or uncontrolled study with a pretest	
Cross-sectional study	D

It should be noted, however, that the level of methodological appropriateness as explained above is only relevant in assessing the validity of a cause-and-effect relationship that might exist between a predictor/driver (organisational culture) and its outcomes (performance), which is the purpose of this review.

In addition, a study's trustworthiness is determined by its methodological quality (its strengths and weaknesses). For instance, was the sample size large enough and were reliable measurement methods used? To determine methodological quality, all the studies included were systematically assessed on explicit quality criteria. Based on a tally of the number of weaknesses, the trustworthiness was downgraded and the final level determined as follows: a downgrade of one level if two weaknesses were identified; a downgrade of two levels if four weaknesses were identified, etc.

Finally, the effect sizes were identified. An effect (e.g. a correlation, Cohen's d or omega) can be statistically significant but may not necessarily be of practical relevance: even a trivial effect can be statistically significant if the sample size is big enough. For this reason, the effect size – a standard measure of the magnitude of the effect – of the studies included was assessed. To determine the magnitude of an effect, Cohen's rules of thumb (Cohen, 1988) were applied. According to Cohen a 'small' effect is an effect that is only visible through careful examination. A 'medium' effect, however, is one that is 'visible to the naked eye of the careful observer'. Finally, a 'large' effect is one that anybody can easily see because it is substantial.

Outcome of the critical appraisal

The overall quality of the studies included was high. Most of the secondary studies were based on controlled studies and were therefore graded level A or higher. Of the 20 primary studies, 13 qualified as randomised controlled studies and were therefore graded level A. The remaining 7 studies concerned quasi-experimental or longitudinal designs and were graded level B or lower. An overview of all the studies included and information regarding year of publication, research design, sample size, population, main findings, effect sizes and limitations is provided in Appendix III (secondary studies) and Appendix IV (primary studies).

Main findings

1. What is meant by feedback?

Feedback is generally defined as information about a person's performance which is used as a basis for improvement. In the domain of management, feedback is referred to 'feedback intervention' or 'performance' feedback', and is often defined as 'actions taken by (an) external agent (s) to provide information regarding some aspect(s) of one's task performance.' (Kluger and Denisi, 1996).

2. What is the assumed logic model? (How is it supposed to work?)

The assumed logic model performance feedback is based on two theories: social comparison theory (Festinger, 1954) and feedback intervention theory (Kluger & DeNisi, 1996). Social comparison theory suggests that individuals tend to compare themselves with others in order to make judgments regarding their performance. They are concerned not only about their performance in an absolute sense, but also about how they measure up in relation to relevant peers. In addition, this theory suggests that individuals have a strong desire to improve their performance when faced with unfavorable comparative information.

Feedback intervention theory suggests that when confronted with a discrepancy between what they wish to achieve and the feedback received, individuals are strongly motivated to attain a higher level of performance. The practice of performance feedback therefore assumes that informing an employee about the discrepancies between the organisation's standard and his/her current performance – implying that he/she is achieving less than most other colleagues – will motivate the employee to attain a higher level of performance.

3. What is the effect of feedback on workplace performance?

Finding 1: There is strong evidence that feedback can have a large effect on people's learning and performance (level A)

There is wide consensus among both scholars and practitioners that feedback, in general, can have a large, positive impact on a wide range of performance outcomes. As stated above, both social comparison theory and feedback theory posit that providing feedback to people regarding their relative performance can enhance performance. There is indeed strong evidence from controlled studies that feedback is among the most powerful influences on performance.

For example, the seminal work of John Hattie that is based on a review of 23 meta-analyses demonstrates large effect sizes (d = .73). In the realm of management, this finding is confirmed by the meta-analysis by Kluger and Denisi (1996). This meta-analysis included 131 controlled studies and was based on 12,652 participants found an average effect size of d = .41

Finding 2: The effect sizes reported show considerable variability, indicating that the effect of feedback is contingent upon various moderating factors (level A)

The scientific literature on feedback interventions, however, suggests a caveat. Several researchers have pointed out that feedback may not always be effective. In fact, several meta-analyses have demonstrated that feedback interventions have highly variable effects on performance – in some situations feedback improves performance, but in other situations it has no apparent effect or even harms it (Kluger & DeNisi, 1996; Smither et al., 2005).

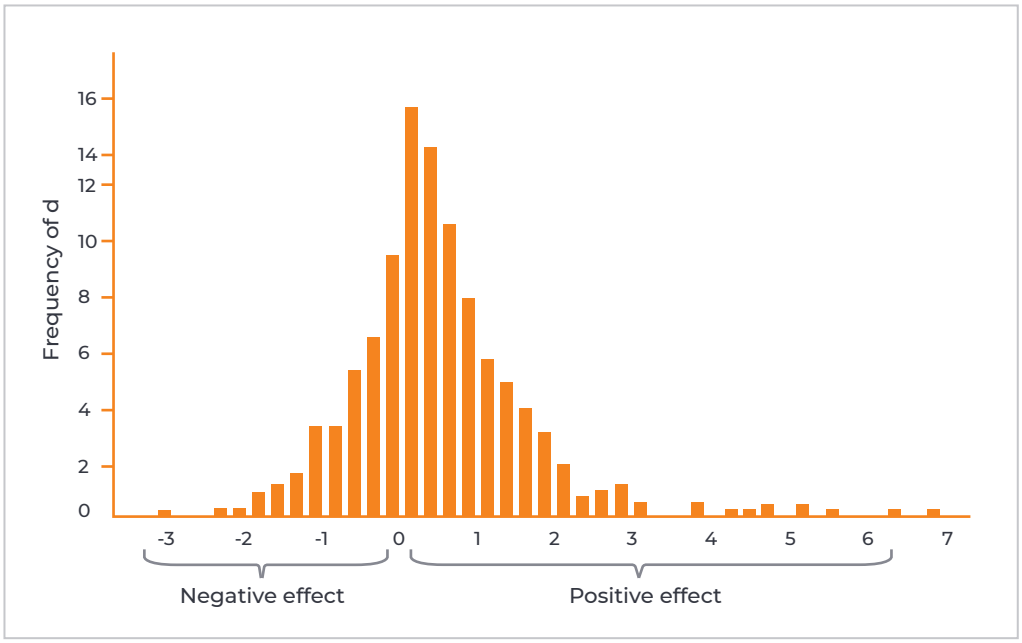


Figure 1. Distribution of 607 effect sizes (ds) of feedback intervention of performance (Kluger & DeNisi, 1996)

Similar results have been reported in meta-analyses of multi-source feedback: some of the studies included reported performance improvements, while some did not, and others reported inconclusive results (e.g. Smither et al., 2005). These findings suggest that the effect of performance appraisal is moderated and/or mediated by several factors[1]. As a consequence, the key question is not 'What is the effect of feedback on workplace performance?', but 'Given the target group, the objectives and the context involved, what are the factors moderating or mediating the effect of performance feedback that need to be taken into account?'

4. What is known about the positive or negative effect of possible moderators and/or mediators?

Finding 3: Reactions to feedback, rather than the feedback itself, influence performance (Level A)

As previously stated, research has found that although feedback generally improves performance, in more than one third of the studies, feedback lowered performance. Several theoretical models propose that people's reactions to feedback likely determine the extent to which they will use it to improve performance (e.g., Ilgen et al., 1979; Murphy & Cleveland, 1995, Illies, 2010). People have several behavioural options when confronted with a discrepancy between what they wish to achieve and the performance feedback received.

For example, they can accept the feedback and put in more effort to improve their performance, but they can also reject the feedback, feel angry and/or disappointed, and shift their attention away from their tasks. In the meta-analysis by Kluger and DeNisi it was found that the last option is likely when the feedback threatens an employee's self-esteem. A similar finding is found in the meta-analysis by Smither at al.: employees who express positive emotions immediately after receiving feedback show higher performance ratings, but those who express negative emotions show lower performance ratings.



[1]A moderator is a variable that affects the direction and/or strength of the relation between an independent or predictor variable (in this case performance feedback) and an outcome variable (work performance). Put differently, moderators indicate when or under what conditions a particular effect can be expected. A mediator is a variable that specifies the mechanism that needs to be triggered for an effect to occur. Thus, if you remove the effect of the mediator, the relationship between the independent or predictor variable (in this case performance feedback) and the outcome variable (work performance) will disapear. In short, moderators specify when a certain effect will hold, whereas mediators determine how or why the effect occurs.

Finding 4: Personality variables moderate reaction to the feedback (Level n/a)[2]

Personality variables can moderate the reaction to (negative) feedback, but they fall outside the focus of this REA. Among the personality variables that are known to be involved in the reaction to feedback are self-esteem and locus of control (e.g., Ilgen et al., 1979), tendency for cognitive interference (Kuhl, 1992; Mikulincer, 1989a), competitiveness (Raver, 2012), altruism (Korsgaard, Meglino & Lester, 1994) and openness to feedback (Smither et al., 2005).

Finding 5: The effect of feedback is moderated by task type (Level A)

Findings from a randomised controlled study demonstrate that the effect of feedback on motivation and performance is moderated by task type. Some tasks (e.g., tasks requiring creativity) are perceived as promotion tasks, whereas others (e.g., those requiring vigilance and attention to detail) are perceived as prevention tasks. It was found that positive feedback increased (self-reported) motivation and actual performance among people working on promotion tasks, relative to negative feedback. Positive feedback, however, decreased motivation and performance among individuals working on prevention tasks, relative to negative feedback (Van Dijk, 2011).

Finding 6: The effect of feedback is moderated by the type of goal (Level AA)

Several meta-analyses demonstrate that, goals-setting has stronger positive effects on performance when combined with performance feedback or progress monitoring, especially when the outcomes are reported or made public (Harkin, 2016). However, the reverse is also true: the effect of feedback is influenced by the type of goal. Specifically, feedback is more effective when goals are clear, specific and challenging, but when task complexity is low (e.g. Locke & Latham, 2002, 2006; Brown, 2005; Brown & Warren, 2009; Brown et al 2011; Rahyuda et al, 2014). Goals must therefore be made as difficult but realistic as the individuals can cope with.

In addition, goals must be challenging and stimulating the individual motivation. However, when employees need to acquire knowledge or skills in order to perform a task, or when the task involved is complex, then learning goals tend to have a more positive effect on performance than outcome goals (Winters & Latham, 1996; Brown & Latham, 2002; Latham & Brown, 2006; Porter and Latham, 2013). Consequently, in those situations feedback should focus on the (learning) process rather than the (performance) outcome.



[2]The studies mentioned here are not included in this REA, so their quality was not evaluated.

Finding 7: The perceived fairness of the feedback has a medium to large moderating effect on performance (Level A)

A fair process is widely regarded as a prerequisite for the effectiveness of performance feedback, a construct that in academia is often referred to as procedural justice. This reflects 'the perceived fairness of decision-making processes and the degree to which they are consistent, accurate, unbiased, and open to voice and input' (Colquitt et al., 2013). Empirical research has demonstrated that when procedures are perceived as fair, reactions are favorable, generally regardless of the outcome. This interaction effect is called the fair process effect and has been shown empirically in several studies in different contexts (for a review, see Brockner & Wiesenfeld, 1996).

A before-after study found that performance appraisal incorporating the principles of fairness and due process tends to positively affect employees' reactions to feedback and their resulting overall job performance (Jawahar, 2010). In addition, a recent randomised controlled study confirmed this finding and demonstrated that employees' perceptions of fairness had an effect on the relationship between feedback and overall task performance (Budworth et al., 2014).

Finding 8: Feedback which provides detailed information leads to a higher improvement in performance (Level A)

Findings from randomised controlled studies demonstrate that feedback which provides elaborated, detailed, and specific information leads to a higher improvement in performance (e.g. Raemdonck, 2013; Casas-Arke, 2017). For this reason, task-related feedback is more effective than general feedback (Johnson, 2015).

Finding 9: The effect of feedback, particularly negative feedback, is moderated by the feedback source (Level A)

Findings from a recent controlled study suggests that the effectiveness of performance feedback, particularly negative feedback, depends on the feedback source (Holderness, 2017). This finding confirms the results of a cross-sectional study, indicating that employees are more motivated to rely on negative feedback when the supervisor's credibility is high. (Steelman & Rutkowski, 2004).



Finding 10: Negative feedback adversely affects perceived fairness (level C), whereas feedback that focusses only on positive aspects has a medium positive effect on both perceived fairness and overall job performance (Level A)

The outcome of a longitudinal study suggests that employees who receive negative performance-appraisal feedback report lower perceptions of fairness. This effect even persists six months after the performance appraisal (Lam et al., 2002). In addition, randomised controlled studies demonstrate that employees who receive feedback that focuses only on positive aspects (such as the employee's strength and accomplishments)[3] perform significantly better on the job four months later than employees who receive a 'traditional' feedback (Murthy, 2011; Budworth et al., 2014). This outcome confirms the findings of meta-analyses in the domain of education that indicate that feedback is more effective when it provides information on correct rather than incorrect responses (Hattie, 2009).

Finding 11: Feedback is less effective when it is perceived as threatening one's self esteem (Level A)

A recent longitudinal study suggests that negative feedback is associated with lower self-efficacy improvement. In addition, it was found that feedback is less affective when it is perceived as threatening one's self esteem (Dimotakis, 2017). This finding confirms the outcome of a large number of meta-analysis in the domain of education, showing that low threat conditions allow students to pay better attention to and follow up on feedback (Hattie, 2009)



[3]This type of feedback is also known as 'feedforward', see Kluger & Nir, 2010)

Other relevant findings

Finding 12: In general, managers overestimate how accurately their feedback is perceived by their employees, especially when the feedback is negative (Level D)

The outcome of a recent cross-sectional study suggests that managers overestimate how accurately their feedback is perceived by their employees (Schaerer, 2018). Managers generally anticipated that their feedback would be understood by their employees more negatively than employees actually understood. This gap between managers and employees is more pronounced when the feedback is negative than when it is positive. When the feedback was negative, managers' anticipated feedback rating was significantly lower than what employees actually understood. This gap may occur because managers are less motivated to be accurate when the feedback is negative, or that negative feedback is more difficult for employees to process.

Finding 13: Employees' reactions to feedback are influenced by the language managers use in their explanations (Level A)

Results from randomised controlled studies indicate that employees' cognitive processes and reactions to performance feedback are influenced by the language used in explanations (Murthy, 2011; Loftus, 2018). Specifically, when performance is low, the high use of causal language (eg "your performance is under avareage because ...") in the resulting negative performance feedback leads to a greater improvement in subsequent performance, compared to low use of causal language. However, when performance is high, greater use of causal language in delivering positive feedback results in a smaller improvement in performance (Loftus, 2018).

Finding 14: More (and more frequent) feedback does not always help improve performance (Level A)

Contrary to what is widely assumed, a recent randomised controlled study found that more and more frequent feedback does not always help improve performance. In fact, it was found that employees achieve the best outcomes when they receive detailed but more intermittent (monthly) feedback (Casas-Arke, 2017).

Conclusion

Based on the evidence found, we conclude that performance feedback can have large positive effects on work performance, but that these effects are highly contingent upon a wide range of moderating factors, many of which can be managed by effective feedback processes.

Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about the effects of feedback on work performance by using the systematic review method to search and critically appraise empirical studies. However, in order to be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases and a focus on empirical research published in the period 1990 to 2019 for meta-analyses and the period 2010 to 2019 for primary studies. As a consequence, some relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included, which did not incorporate a comprehensive review of the psychometric properties of the tests, scales and questionnaires used. In addition, it should be noted that some of the studies included used performance ratings as an outcome measure, not objective performance indicators.

A third limitation concerns the fact that the evidence on some moderators is based on only one study. Although most of these studies were well controlled or even randomised, no single study can be considered to be strong evidence – it is merely indicative.

Finally, this REA focused only on high-quality studies, i.e. studies with a control group and/or a before- and after-measurement. For this reason, cross-sectional studies were excluded. As a consequence, new, promising findings that are relevant for practice may have been missed.

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.

References

Akın, Z., & Karagözoğlu, E. (2017). The Role of Goals and Feedback in Incentivizing Performance. *Managerial & Decision Economics, 38*(2), 193-211.

Anseel, F., Beatty, A. S., Shen, W., Lievens, F., & Sackett, P. R. (2015). How Are We Doing After 30 Years? A Meta-Analytic Review of the Antecedents and Outcomes of Feedback-Seeking Behaviour. *Journal of Management, 41*(1), 318-348.

Azmat, G., & Iriberri, N. (2010). The importance of relative performance feedback information: Evidence from a natural experiment using high school students. *Journal of Public Economics, 94*(7/8), 435-452.

Bipp, T., & Kleingeld, A. (2018). Subconscious performance goals: Investigating the moderating effect of negative goal-discrepancy feedback. *Human Performance, 31*(5), 255-281.

Bos-Nehles, A., Renkema, M., & Janssen, M. (2017). HRM and innovative work behaviour: a systematic literature review. *Personnel Review, 46*(7), 1228-1253.

Boyce, M. B., & Browne, J. P. (2013). Does providing feedback on patient-reported outcomes to healthcare professionals result in better outcomes for patients? A systematic review. *Quality of Life Research, 22*(9), 2265-2278.

Brockner, J., & Wiesenfeld, B. M. (1996). An integrative framework for explaining reactions to decisions: interactive effects of outcomes and procedures. *Psychological Bulletin, 120*(2), 189.

Brown, T. C. (2005). Effectiveness of distal and proximal goals as transfer of training intervention: A field experiment. *Human Resource Development Quarterly, 16*(3), 369-387.

Brown, T. C. and Warren, A. M. (2009). Distal goal and proximal goal transfer of training interventions in an executive education program. *Human Resource Development Quarterly, 20*(3), 265-284.

Brown, T. C., & Latham, G. P. (2002). The effects of behavioural outcome goals, learning goals, and urging people to do their best on an individual's teamwork behaviour in a group problem-solving task. *Canadian Journal of Behavioural Science/ Revue canadienne des sciences du comportement, 34*(4), 276.

Brown, S. D., Lent, R. W., Telander, K., & Tramayne, S. (2011). Social cognitive career theory, conscientiousness, and work performance: A meta-analytic path analysis. *Journal of Vocational Behaviour, 79*(1), 81-90.

Budworth, M. H., Latham, G. P., & Manroop, L. (2015). Looking forward to performance improvement: a field test of the feedforward interview for performance management. *Human Resource Management, 54*(1), 45-54.

Casas-Arce, P., Lourenco, S. M., & Martinez-Jerez, F. A. (2017). The Performance Effect of Feedback Frequency and Detail: Evidence from a Field Experiment in Customer Satisfaction. *Journal of Accounting Research, 55*(5), 1051-1088

Choi, E., Johnson, D. A., Moon, K., & Oah, S. (2018). Effects of Positive and Negative Feedback Sequence on Work Performance and Emotional Responses. *Journal of Organisational Behaviour Management, 38*(2/3), 97-115.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O., & Ng, K. Y. (2001). Justice at the millennium: a meta-analytic review of 25 years of organisational justice research. *Journal of applied psychology, 86*(3), 425.

Colquitt, J. A., Scott, B. A., Rodell, J. B., Long, D. M., Zapata, C. P., Conlon, D. E., & Wesson, M. J. (2013). Justice at the millennium, a decade later: a meta-analytic test of social exchange and affect-based perspectives. *Journal of Applied Psychology, 98*(2), 199.

Donnelly, J., & Trochim, W. (2007). *The research methods knowledge base.* Ohio: Atomic Dog Publishing.

Donnon, T., Al Ansari, A., Al Alawi, S., & Violato, C. (2014). The reliability, validity, and feasibility of multisource feedback physician assessment: A systematic review. *Academic Medicine, 89*(3), 511-516.

DeNisi, Angelo S, & Pritchard, Robert D. (2006). Performance appraisal, performance management and improving individual performance: A motivational framework. *Management and Organisation Review, 2*(2), 253-277.

Dimotakis, N., Mitchell, D., & Maurer, T. (2017). Positive and negative assessment center feedback in relation to development self-efficacy, feedback seeking, and promotion. *Journal of Applied Psychology, 102*(11), 1514.

Elicker, J.D., Levy, P.E., & Hall, R.J. (2006). The role of leader-member exchange in the performance appraisal process. *Journal of Management, 32*(4), 531-551.

Epton, T., Currie, S., & Armitage, C. J. (2017). Unique effects of setting goals on behaviour change: Systematic review and meta-analysis. *Journal of Consulting and Clinical Psychology, 85*(12), 1182-1198.

Festinger, L. (1954). A theory of social comparison processes. *Human relations, 7*(2), 117-140.

Gjedrem, W. G. (2018). Relative performance feedback: Effective or dismaying? *Journal of Behavioural and Experimental Economics, 74*, 1.

Harkin, B., Webb, T. L., Chang, B. P., Prestwich, A., Conner, M., Kellar, I., ... & Sheeran, P. (2015). Does monitoring goal progress promote goal attainment? A meta-analysis of the experimental evidence. *Psychological Bulletin, Vol 142*(2), 198-229.

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Holderness, D. K., Jr., Olsen, K. J., & Thornock, T. A. (2017). Who Are You to Tell Me That?! The Moderating Effect of Performance Feedback Source and Psychological Entitlement on Individual Performance. *Journal of Management Accounting Research, 29*(2), 33.

Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behaviour in organisation. *Journal of Applied Psychology, 64,* 349-371.

Ilgen, D., Barnes-Farell, J. & McKellin, D. (1993). Performance appraisal process in the 1980s: What has it contributed to appraisals in use? *Organisational Behaviour and Human Decision Processes, 54*, 321-368.

Ilies, R., Judge, T. A., & Wagner, D. T. (2010). The influence of cognitive and affective reactions to feedback on subsequent goals: Role of behavioural inhibition/activation. *European Psychologist, 15*(2), 121-131.

Jaakson, K., Reino, A., & McClenaghan, P. B. (2019). The space between – linking trust with individual and team performance in virtual teams. *Team Performance Management, 25*(1/2), 30-46.

Jawahar, I.M. (2010). The Mediating Role of Appraisal Feedback Reactions on the Relationship Between Rater Feedback-Related Behaviours and Ratee Performance. *Group and Organisation Management, 35*(4), 494-526.

Jawahar, I.M. & Williams, C. (1997). Where all the children are above average: the performance appraisal purpose effect. *Personnel Psychology, 50*.

Johnson, D. A., Rocheleau, J. M., & Tilka, R. E. (2015). Considerations in Feedback Delivery: The Role of Accuracy and Type of Evaluation. *Journal of Organisational Behaviour Management, 35*(3-4), 240.

Jones, R. J., Woods, S. A., & Guillaume, Y. R. F. (2016). The effectiveness of workplace coaching: A meta-analysis of learning and performance outcomes from coaching. *Journal of Occupational & Organisational Psychology, 89*(2), 249-277.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*(2), 254.

Kluger, A. N., & Nir, D. (2010). The feedforward interview. *Human Resource Management Review, 20*, 235–246.

Korsgaard, A., Meglino, B. M., & Lester, S. W. (1994, August). *The virtue of being altruistic: The role of the value of helping and concern in individuals' reactions to feedback from others.* Paper presented at the 1994 meeting of the Academy of Management, Dallas, TX.

Kraiger, Kurt, & Ford, J. Kevin. (1985). A meta-analysis of ratee race effects in performance ratings. *Journal of Applied Psychology, 70*(1), 56-65.

Kuhl, J. (1992). A theory of self-regulation: Actions vs. state orientation, self-discrimination, and some applications. *Applied Psychology: An International Review, 41*,97-129.

Lam, S., Yik, M. & Schaubroeck, J. (2002). Responses to formal performance appraisal feedback: The role of negative affectivity. *Journal of Applied Psychology, 87*(1), 192-201.

Latham, G. P., & Brown, T. C. (2006). The effect of learning vs. outcome goals on self-Efficacy, satisfaction and performance in an MBA program. *Applied Psychology, 55*(4), 606-623.

Lefkowitz, J. (2000). The role of interpersonal affective regard in supervisory performance ratings: Aliterature review and proposed causal model. *Journal of Occupational and Organisational Psychology, 73*, 67–85.

Linna, Elovainio, M., Van den Bos, K., Kivimaki, M., Pentti, J. & Vahtera, J. (2012). Can usefulness of performance appraisal interviews change organisational justice perceptions? A 4-year longitudinal study among public sector employees. *The International Journal of Human Resource Management, 23*(7), 1360-1375.

Locke, E. A. and Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57*(9), 705–717.

Locke, E. A., & Latham, G. P. (2006). New directions in goal-setting theory. *Current directions in psychological science, 15*(5), 265-268.

Loftus, S., & Tanlu, L. J. (2018). Because of "Because": Examining the Use of Causal Language in Relative Performance Feedback. *The Accounting Review, 93*(2), 277.

Mikulincer, M. (1989a). Cognitive interference and learned helplessness: The effects of off-task cognitions on performance following unsolvable problems. *Journal of Personality and Social Psychology, 57,* 129-135.

Miller, A., & Archer, J. (2010). Impact of workplace based assessment on doctors' education and performance: A systematic review. *BMJ: British Medical Journal, 341*(7775), 1-6.

Murthy, U. S., & Schafer, B. A. (2011). The Effects of Relative Performance Information and Framed Information Systems Feedback on Performance in a Production Task. *Journal of Information Systems, 25*(1), 159-184.

Palmer, M. G., Johnson, C. M., & Johnson, D. A. (2015). Objective Performance Feedback: Is Numerical Accuracy Necessary? *Journal of Organisational Behaviour Management, 35*(3-4), 206.

Petticrew, M., & Roberts, H. (2006). *How to appraise the studies: an introduction to assessing study quality.* Systematic reviews in the social sciences: A practical guide, 125-163.

Porter, R. L., & Latham, G. P. (2013). The effect of employee learning goals and goal commitment on departmental performance. *Journal of Leadership & Organisational Studies, 20*(1), 62-68.

Raver, J. L., Jensen, J. M., Lee, J., & O'Reilly, J. (2012). Destructive Criticism Revisited: Appraisals, Task Outcomes, and the Moderating Role of Competitiveness. *Applied Psychology: An International Review, 61*(2), 177-203.

Raemdonck, I., & Jan-Willem, S. (2013). Feedback perceptions and attribution by secretarial employees. *European Journal of Training and Development, 37*(1), 24-48.

Rahyuda, A., Syed, J., & Soltani, E. (2014). The role of relapse prevention and goal setting in training transfer enhancement. *Human Resource Development Review, 13*(4), 413-436.

Schaerer, M., Kern, M., Berger, G., Medvec, V., & Swaab, R. I. (2018). The illusion of transparency in performance appraisals: When and why accuracy motivation explains unintentional feedback inflation. *Organisational Behaviour & Human Decision Processes, 144,* 171-186.

Seifert, C. F., Yukl, G., & McDonald, R. A. (2003). Effects of multisource feedback and a feedback facilitator on the influence behaviour of managers toward subordinates. *Journal of Applied Psychology, 88*(3), 561.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Smither, London & Reilly, R. (2005). Does performance improves following multisource feedback? A theoretical model, meta-analysis and review of empirical findings. *Personnel Psychology, 58*(1), 33-66.

Smither J. Reilly, R. & Buda, R. (1988). The effects of prior performance information on ratings of present performance: Contrast versus assimilation revisited. *Journal of Applied Psychology, 73,* 487-496.

Van Dijk, D., & Kluger, A. N. (2011). Task type as a moderator of positive/negative feedback effects on motivation and performance: A regulatory focus perspective. *Journal of Organisational Behaviour, 32*(8), 1084

Winters, D., & Latham, G.P. (1996). The effect of learning versus outcome goals on a simple versus a complex task. *Group and Organisation Management, 21,* 236– 250.

Young, S. F., Richard, E. M., Moukarzel, R. G., Steelman, L. A., & Gentry, W. A. (2017). How empathic concern helps leaders in providing negative feedback: A two-study examination. *Journal of Occupational & Organisational Psychology, 90*(4), 535-558.

Appendix I

Search terms & hits

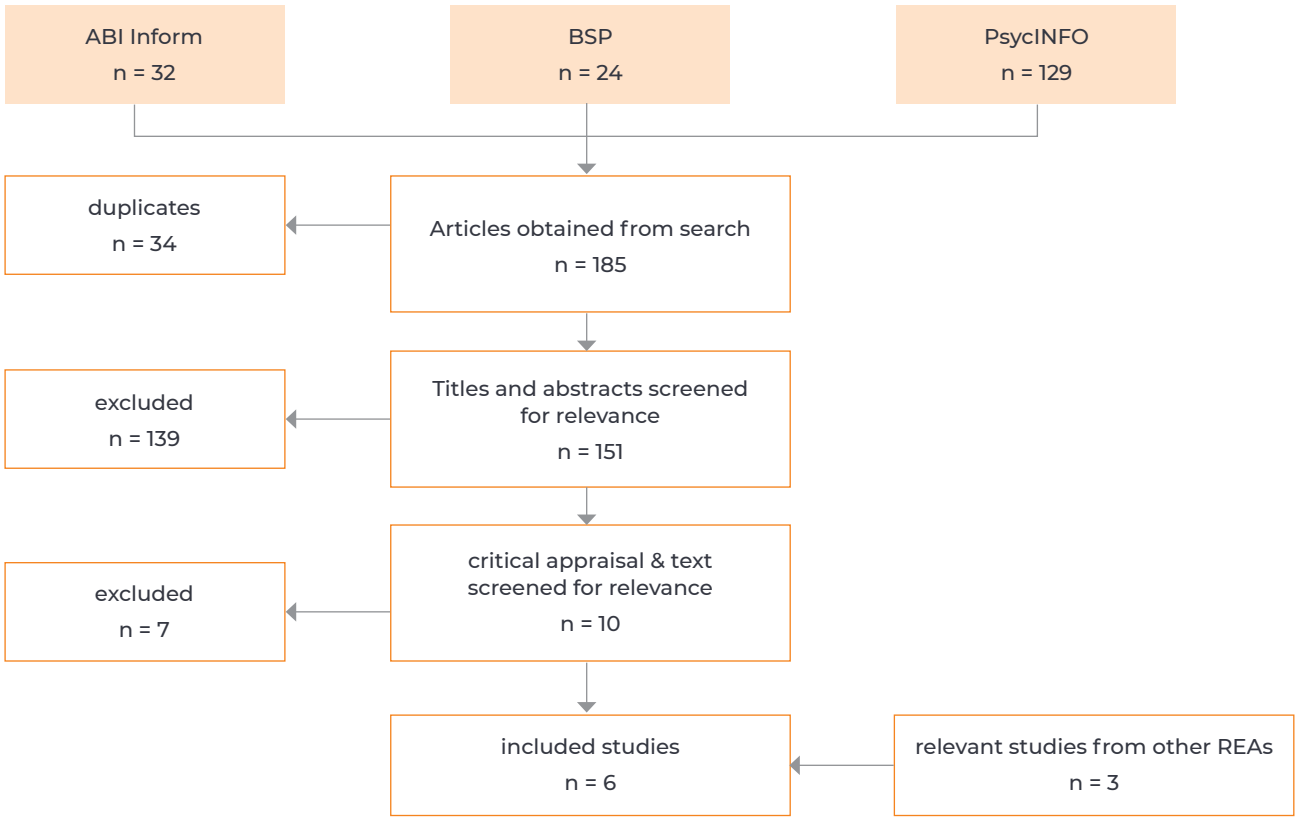
ABI/Inform Global, Business Source Elite, PsycINFO peer reviewed, scholarly journals, June 2019

Search terms	ABI	BSP	PSY
S1: ti(feedback) OR ab(feedback)	19,610	29,832	47,226
S2: ab(work*) OR ab(employe*) OR ab(performance)	552,997	509,023	758,864
S3: S1 AND S2	8,061	9,625	16,903
S4: ab("performance feedback")	521	228	898
S5: S3 filter meta-analysis or systematic reviews > 2010	32	24	129
S6: S4 filter controlled and/or longitudinal studies > 2010	62	71	25

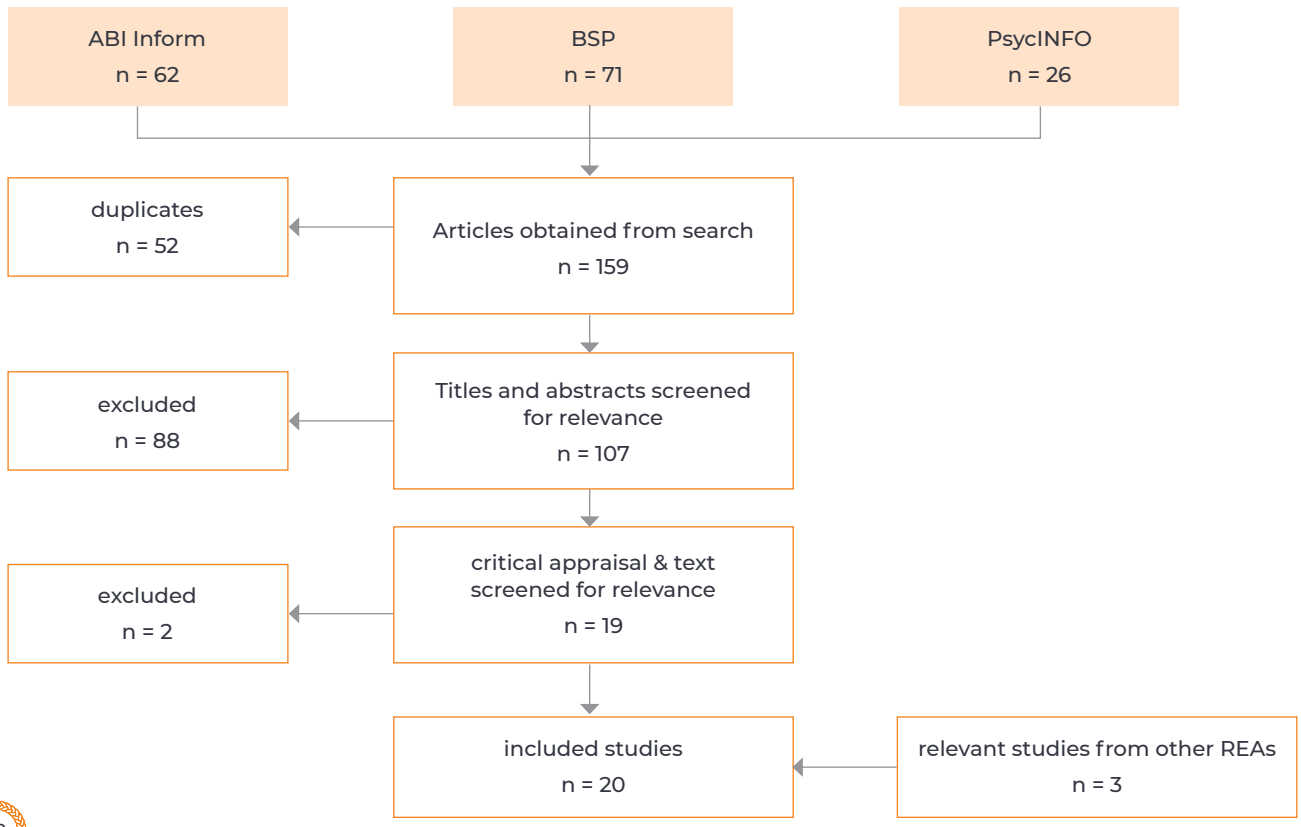
Appendix II

Selection of studies

Meta-analyses or Systematic Reviews



Primary studies



Appendix III

Overview of included meta-analyses

1st Author & year	Design included studies & sample size	Sector / Population	Main findings	Effect sizes	Limitations	Level
Anseel, 2015	Not specified k = 96	general	1. There is a small positive relationship between FSB and task performance. 2. Value perceptions (e.g. uncertainty reduction) is positively related to FSB. 3. Organisational tenure, job tenure, and age is negatively related to FSB. 4. There is a positive relationship between the amount of positive feedback received and FSB. 5. There is a positive relationship between the amount of negative feedback received and FSB.	1: ρ = ns (.07) 2: ρ = .44 3: ρ = -.19 / -.15/ -.13 4. ρ = .23 5. ρ = .46	No serious limitations	C
Bozer, 2018	Studies reporting psychometric qualities of MSF instruments k = 43	physicians	The use of MSF has been shown to be an effective method for providing feedback to physicians from a multitude of specialties about their clinical and nonclinical (i.e., professionalism, communication, interpersonal relationship, management) performance. The use of MSF employing medical colleagues, coworkers, and patients as a method to assess physicians in practice has been shown to have high reliability, validity, and feasibility.	not reported	No serious limitations	A
Epton, 2017	Controlled and uncontrolled studies k = 25	Diverse	The study did not add support to the claim of goal setting theory that feedback increases the effectiveness of goal setting as including feedback (k = 25) was not associated with a significant effect on behaviour and outcomes ; however the sample size was moderate so strong conclusions cannot be drawn.	0	Very diverse population (children, adults, athletes, etc), type of goals unclear, quality of the included studies not evaluated.	B

Harkin, 2016	RCT's k = 138	Diverse	Results showed that, on average, interventions were successful at increasing the frequency of monitoring goal progress (1) and promoted goal attainment (2). Furthermore, changes in the frequency of progress monitoring mediated the effect of the interventions on goal attainment. Moderation tests revealed that progress monitoring had larger effects on goal attainment when the outcomes were reported or made public, and when the information was physically recorded. Taken together, the findings suggest that monitoring goal progress is an effective self-regulation strategy, and that interventions that increase the frequency of progress monitoring are likely to promote behaviour change.	1: d= 1.98 2: d= 0.40	No serious limitations	AA
Kluger (1996)	Controlled studies, k = 131	Diverse	Findings suggests that feedback intervention (FI) improved performance on average but that over 1/3 of the FI's decreased performance. FI effectiveness decreases as attention moves up the hierarchy closer to the self and away from the task.	d = .41	No serious limitations	A
Smither, 2005	Controlled and longitudinal studies k = 24	Diverse	Effect of multisource feedback on performance improvement is examined. Improvement in direct report, peer and supervisor ratings over time is generally small. Differences in effect sizes for different study methodologies were not significant. Neither were effect sizes for direct report feedback to whether rates received feedback only from direct reports versus direct reports and other sources. For direct report and self-ratings, effect sizes were significantly larger when two administrations of the feedback program were separated by less than 12 months. Improvement is most likely to occur when feedback indicates that change is necessary, recipients have a positive feedback orientation, perceive a need to change their behaviour, react positively to the feedback, believe change is feasible, set appropriate goals to regulate their behaviour and take actions that lead to skill and performance improvement.	Direct reports d = .15 Peers d = .05 Supervisors d = .15 Self d = -.04 Direct reports - time: <12 months corrected mean d = .28; > 12 months d = .13 Self - time: <12 months corrected mean d = .14; > 12 months d = -.14	Publication bias? Quality of the studies included not assessed	A

Overview of excluded meta-analyses

Bos-Nehles, 2017	Qualitative review, no quantitative outcomes are reported.
Boyce, 2013	Not relevant given the REA population: the study population concerns physicians and the outcome concerns patient-reported outcome measures, not necessarily provided through a supervisor or manager.
Bozer, 2018	Qualitative review, no quantitative outcomes are reported.
Byron, 2012	Examines whether performance feedback moderates rewards–creative performance relationship.
Jones, 2016	The study reports only the effects of coaching combined with multi-source feedback on affective, skill-based, and individual-level results outcomes, without differentiating between outcomes.
Miller, 2010	Qualitative review, no quantitative outcomes are reported.
Nowack, 2012	Qualitative review, no quantitative outcomes are reported.

Appendix IV

Overview Controlled and Longitudinal Studies

Author & year	Sector / Population	Design and sample size	Main findings	Effect size	Limitations	Level
Bipp, 2018	Engineering students at a Dutch technical university	Study1: RCT (2x2 factorial between-subjects design) n=80 Study2: RCT (3x2 factorial between-subjects design) n=90	The results of the Study 1 demonstrate that persons holding subconscious goals report higher self-efficacy (H1a) and higher performance (H1b) compared with persons not holding subconscious goals when receiving no feedback, whereas they report lower self-efficacy/lower performance, when receiving negative personal-discrepancy feedback. Moreover, the findings of this study suggest that self-efficacy mediates the interaction effect of subconscious goals and (negative goal-discrepancy and comparison) feedback on performance (H4). According to the results of the Study 2, neither the interaction effect of priming and feedback (H2a), nor the interaction effect of subconscious goals and feedback was evident. However, the findings show that persons holding subconscious goals report lower self-efficacy/lower performance compared with persons not holding subconscious goals when receiving negative personal feedback alone, whereas persons holding subconscious goals will report higher self-efficacy (H3.2a) and higher performance (H3.2b) compared with persons not holding subconscious goals when comparison feedback that indicates a negative discrepancy between one's own and others' performance is also provided. The findings of the Study 2 did not support hypothesis 4.	Study 1: H1 (a): ß=.07, (b): ß=.06, H4: b=.07 Study 2: H2 (a): ns (b): ns H3 (2a): ß=.12, (2b): ß=.14, H4: ns	no serious weaknesses	A
Budworth, 2014	Managers and their subordinates in a Canadian business equipment firm	RCT n=25 (managers) & 70 (subordinates)	Employees who engaged in a feed-forward interview with their manager were observed by an anonymous peer to perform significantly better on the job four months later than employees who received the company's traditional performance appraisal interview. In addition, it was found that perceived fairness functioned as a suppressor variable.	d = .41	no serious limitations	A
Casas-Arke, 2017	Home repair workers at Spanish insurance repair company	RCT (field experiment), n=800	Findings demonstrate that feedback which provide detailed information leads to a significant improvement in performance. However, contrary to what was expected, if professionals used all the information available, detailed information is only useful when provided over a sufficient time interval. When feedback is too frequent, professionals perform significantly worse than a group with detailed and less frequent information.	not reported	no serious weaknesses	A

Choi, 2018	Undergraduate and graduate students of a large Korean university	RCT, (between/ within-subject design), n=120	Findings demonstrate that work performance showed a significant increase in all feedback sequences (positive-positive, positive-negative, negative-positive, negative-negative). Moreover, uniform feedback delivery (i.e., only positive or only negative feedback) resulted in higher performance than inconsistent feedback (i.e., positive-negative, negative-positive). Inconsistent feedback, however, resulted in lessened negative emotional responses.	not reported, not enough data to calculate them	no serious weaknesses	A
Dimotakis, 2017	employees from a large telecommunication center	Longitudinal study n = 126	Negative feedback is associated with lower improvement self-efficacy. Higher levels of social support reduced the impact of negative feedback.	small	Large number of dropouts	C
van Dijk, 2011	MBA and undergrad students of an Israelian university	RCT (within subject design) n = 171 and 247	Findings demonstrate that the effect of feedback on motivation and performance is moderated by task type. Some tasks (e.g., tasks requiring creativity) are perceived as promotion tasks, whereas others (e.g., those requiring vigilance and attention to detail) are perceived as prevention tasks. It was found that positive feedback increased (self-reported) motivation and actual performance among people working on promotion tasks, relative to negative feedback (H1). Positive feedback, however, decreased motivation and performance among individuals working on prevention tasks, relative to negative feedback (H2).	H1: motivation d = .43 H1: performance d =.67 H2: motivation d = -.33 H2: performance d =-.37	no serious weaknesses	A
Gjedrem, 2018	Students of the Business School at the University of Stavanger in Norway	RCT, n=221	Findings suggest that average performance rise when feedback is provided (H1a, H1b). However, this relationship between feedback and performance may depend on feedback environment (high vs low competitive), perceived ability to solve a task, and direction of the feedback (positive vs negative). Participants who were ranked relative to the performance of many subjects in the past (low competitiveness, CPF), performed better* when the feedback they received was negative (H3a), or when their perceived ability to solve the task was high (H2a); contrarily, when they perceived their ability as low, their performance was worse* (H2a). Participants who were compared to the three participants working alongside themselves (high competitiveness) performed better* when their perceived ability to solve the task was high (H2b ns) or when the feedback they received was positive (H3b ns). * comparing to the baseline group (APF), in which participants received simple feedback on their performance (number of solved tasks and a graph).	not reported	no serious weaknesses	A

Holderness, 2018	Undergraduate students from an introductory business course at a large Midwestern university	Controlled before-after study, n=52	Results suggest that when providing negative performance feedback, the effect of feedback source on performance is moderated by the level of psychological entitlement (i.e., a pervasive sense that one deserves more and is entitled to more than others) of the feedback recipient. Specifically, psychological entitlement moderates the effectiveness of negative feedback from a peer-level source such that performance improvement decreases as the level of psychological entitlement increases (H1), and from the superior-level source such that performance improvement increases as the level of psychological entitlement increases. (Note: Psychological entitlement and source level do not affect responses to positive feedback.)	not reported	no serious weaknesses	A
Ilies, 2010	Undergraduate students from a large public university	Longitudinal study, n=493	Both, emotions and self-efficacy play important roles in the goal-setting process, that is, emotional reactions to feedback influenced future goals and this effect was realized primarily through task (exam) self-efficacy. Positive (but not negative) emotional reactions demonstrate some additional direct effect on future goals.	see table in paper	Not a workplace setting (domain of education)	C
Jaakson, 2019	Students at masters' courses in business strategy in four universities in Finland, Russia, Estonia and Latvia	Longitudinal study, n=71	Relatively high levels of initial trust did not change over the period of the teams' projects in general, but in teams where feedback on performance was negative, both trust and trustworthiness declined significantly. Trust had a small mediating effect between group performances in two consecutive measurement points, meaning that past performance had an impact on trust, which in turn impacted the teams' next performance. However, no mediating effect was present between individual and team performance.	Individual performance & VT performance: ß=.16 Direct effect of Week 4 VT performance on Week 8 VT performance: ß=.48 Trustworthiness mediation effect: ß=.18 Indirect effect of VT past performance: ß=.18	no serious limitations	C

Jawahar, 2010	Employees of a software company located in the West Coast of United States	Longitudinal study, n=256	Findings demonstrate that ratees' reactions to feedback mediate the influence of feedback-related characteristics on performance (H8). Moreover, perceived accuracy and satisfaction with received feedback, influence ratees' performance (H7a, H7c). Surprisingly, perceived utility was not significantly related to performance (H7b). Feedback characteristics, which were found to be associated with positive ratees' reactions to feedback are: rater's job knowledge: related to perceptions of accuracy (H1a), perceptions of utility (H1b), and satisfaction with feedback (H1c); rater's criticism: related to perceptions of accuracy (H2a), and perceptions of utility (H2b); job-relatedness of criteria: related to perceptions of accuracy (H4a), perceptions of utility (H4b), and satisfaction with feedback (H4c); goal-setting: related to perceptions of accuracy (H5a), perceptions of utility (H5b), and satisfaction with feedback (H5c) and suggesting ways to improve performance: related to perceptions of utility (H6b), and satisfaction with feedback (H6c). No association was found for rater's criticism and satisfaction with feedback (H2c); for the opportunity to participate in feedback discussion perceived accuracy (H3a), perceived utility (H3b), satisfaction with feedback (H3c), and for suggesting ways to improve performance with perceived utility (H6c).	H1 (a): ß=.11, (b): ß=.14, (c): ß=.30, H2 (a): ß=-.16, (b): ß=.12, (c): ns H3 (a): ns (b): ns (c): ns H4 (a): ß=.55, (b): ß=.23, (c): ß=.22, H5 (a): ß=.24, (b): ß=.17, (c): ß=.30, H6 (a): ns (b): ß=.38, (c): ß=.22, H7 (a): ß=.61, (b): ns (c): ß=.22,	no serious weaknesses	C
Johnson, 2015	Undergraduate students at a Midwestern university in the United States.	RCT, n=75	Findings suggest that task related feedback improved performance relative to general feedback, however, no differences were found between supportive and critical types of feedback.	not reported	no serious limitations	A

Lam, 2002	Tellers in a large international bank in Hong Kong	Before-after study n = 329	1. In the short run (i.e., less than 3 months), employees who had received negative performance appraisal feedback did not report lower perceptions of organisational justice, organisational commitment, or job satisfaction or higher propensities to leave the organisation. 2. In the short run (i.e., less than 3 months), employees who had received positive performance appraisal feedback did report increased perceptions of organisational justice, organisational commitment, and job satisfaction and lower propensities to leave the organisation. 3. In the long run (i.e., more than 3 months), the initial improvement in perceived organisational justice and job-related attitudes was maintained by employees with good performance appraisal results and with low NA (=personality trait: the tendency to focus on the negative side of others and being less satisfied yourself and your live); however, perceived organisational justice and job-rated attitudes returned to baseline levels among those with high NA. To sum up, trait NA was found to moderate the attitudinal effects of positive performance feedback on employees' reactions.	not reported	no serious limitations	C
Loftus, 2018	Undergraduate business students from a large, public state university.	RCT, (2x2 between-subject experimental design), n=108	Results indicate that employees' cognitive processes and reactions to performance feedback are influenced by the language used in explanations. Specifically, in the case where initial relative performance is low, the high use of causal language in the resulting negative performance feedback leads to a greater improvement in subsequent performance, compared to low use of causal language (H1). On the contrary, when initial relative performance is high, greater use of causal language in delivering positive feedback results in a smaller improvement in performance (H2).	H1: d=0.27, 95%CI (-0.26; 0.80) H2: d=1.18 95%CI (0.34; 2.01)	Not all effect sizes were reported	A
Murthy, 2011	Undergraduate students at a large university in the Southeastern United State	RCT (3x4x2 factorial experimental design) n=289	Results revealed a significant positive effect of providing relative performance feedback (H1) and positively framed feedback on performance (H2a); the effect of negatively framed feedback on performance (H2b) was not found. The results also indicate an interaction between worker performance level and feedback framing, such that low-performing workers improved performance in response to positive feed-back significantly more than average and high-performing workers (H3).	not reported	no serious weaknesses	A

Palmer, 2015	Participants from the Psychology Department subject pool at a Midwestern university in the US.	RCT, n=56	NOTE: Study 1 was excluded, sample size too small (n =3) Results show that accurate and exaggerated objective performance feedback is better than no feedback and underreported feedback: accurate and tripled (= exaggerated) feedback significantly improved performance over the control and low-inaccurate feedback groups. Performance feedback may have reduced time off-task across all three feedback conditions (accurate, tripled and low-inaccurate) compared to the control.	Effect of the different types of feedback on performance after initial first-session: η^2=.17	no serious weaknesses	A
Raver, 2012	Undergraduate students enrolled in a business course at a Mid-Atlantic US university	RCT, Study 1: n=235 Study 2: n=105	Findings suggest that highly competitive people outperform low-competitiveness people when criticized constructively, yet low-competitiveness people performed better than highly competitive people when they received destructive criticism (H4). Moreover, working harder intentions are higher when highly competitive people receive destructive criticism (H3). Regarding to reactions to feedback: Participants who experience destructive criticism are more likely to perceive that the offender intended to harm them (H1a), more likely to blame the offender for any harm experienced (H1b), and less likely to trust the offender than participants who receive constructive criticism (H1c). Participants who experience destructive criticism are more likely than participants who receive constructive criticism to report high levels of state anger (H2).	H1 (a): η^2=.22 (b): η^2=.17 (c): η^2=.15 H2: η^2=.26 H3: η^2=.04 H4: η^2=.06	no serious weaknesses	A
Raemdonck, 2013	Secretarial employees of 12 Dutch organisations	RCT (2x2x2 factorial experimental design), n = 173	The findings show that elaborated specific feedback is perceived as more adequate (PAF), leads to more willingness to improve (WI), a more positive affect (AF) and a more positive attribution (AT) as compared to concise general feedback (RQ1, H1a). Moreover, complex three-way interaction effects were found for educational level on affect and attribution, and for career phase on willingness to improve and affect (RQ2). Low-educated employees reacted more strongly to supervisor feedback. Employees in the late career phase were more oriented towards the content of the feedback than feedback sender status, whereas the latter was of more concern for employees in the early and middle career phase.	H1a: PAF: η^2=.35 WI: η^2=.11 AF: η^2=.12 AT: η^2=.19 H1b:ns	no serious weaknesses	A

Schaerer, 2018	multinational organisation in the education sector	Cross-sectional study n = 173 managers and 566 employees	Findings suggest that managers overestimate how accurately their feedback is perceived by their employees (Hypothesis 1). Managers generally anticipated that their feedback would be under- stood by their employees more negatively than employees actually understood. This gap between managers and employees is more pronounced when the feedback is negative than when it is positive (Hypothesis 2). When the feedback was negative, managers' anticipated feedback rating was significantly lower than what employees actually understood (2a). However, when the feedback was positive, managers' anticipated feedback rating was no longer statistically different from employees' actual understanding (2b).	H1: ß = 0.41, d = .35 H2a: ß = 1.05, d = .55 H2b: ns	no serious weaknesses	D
Young, 2017	Part-time workers at Amazon's Mechanical Turk (Mturk, an online marketplace for work)	RCT, n=177	Empathic leader providing feedback increased positive affect more than a non-empathic leader who in all other ways provided appropriate feedback. Leader empathic concern has an indirect effect on evaluations of the leader's feedback-giving effectiveness through positive and affective reactions to negative feedback.	H1a: η^2=.09 H1b (NS): η^2=.01 H3a: ß=.45 H3b: ß=-.30	no serious weaknesses	A

Excluded studies

Author & year	Reason for exclusion
Akin, 2017	Not a workplace setting (computerised experiment with students).
Azmat, 2009	Not a workplace setting (high school students).

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EXECUTIVE SUMMARY

Rapid Evidence Assessment (REA)



EFFECT OF FEEDBACK ON WORKPLACE PERFORMANCE

a summary of research literature

July 2019

Culture Review **Implementation**

our journey of positive change

ACT Government

The REA that this Executive Summary is based upon was produced by the Center for Evidence Based Management (CEBMa). The ACT Government acknowledges and thanks the CEBMa for allowing ACT Health to reproduce and redesign the content of their REA.

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What is a Rapid Evidence Assessment (REA)?



Rapid Evidence Assessments (REAs) use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and as a result, the likelihood of bias is considerably smaller.

Background

Novartis, a global pharmaceutical company commissioned the Center for Evidence Based Management (CEBMa) to undertake a Rapid Evidence Assessment (REA) to understand what is known in scientific literature about the link between culture and performance. Specifically, this REA was conducted to help Novartis replace their current performance appraisal practices with a performance management system based on whether the following three hypotheses of worker performance were supported by scientific evidence:

1. When employees know that their contribution matters, their performance will increase
2. When employees receive frequent and quality feedback, their performance will increase
3. When employees are recognised and rewarded for their contributions, their performance will increase.

What this REA assesses

This REA assesses research literature about the link between an employee's or team's performance and receiving feedback. In answering the three hypotheses above, the REA also considers the following questions:

1. **What is feedback?**
2. **What is the assumed logic model – how is it supposed to enhance performance?**
3. **What is the overall effect of feedback on workplace performance?**
4. **What is known about the positive or negative effects of possible moderators or mediators?**

Main findings

1. What is feedback?

In general terms 'feedback' is defined as information about a person's performance which is used as a basis for improvement. In the domain of management, feedback is referred to as 'feedback intervention' or 'performance feedback' and is often defined as 'actions taken by (an) external agent(s) to provide information regarding some aspect(s) of one's task performance.' (Kluger & Denisi, 1996).

2. What is the assumed logic model – how is it supposed to enhance performance?

The assumed logic model is based on two theories:

- Social comparison theory (Festinger, 1954)
- Feedback intervention theory (Kluger & Denisi, 1996).

Social comparison theory suggests that people compare themselves to others to make judgements on their individual performance. They are concerned with not only their own performance, but also how they compare to their peers. This theory also notes that individuals are likely to have a strong desire to improve their own performance when faced with unfavourable comparative information from their peers.

Feedback intervention theory suggests that when individuals are given feedback that varies from what they believed they achieved; individuals are strongly motivated to get a higher level of performance. The practice of performance feedback, therefore, assumes that informing an employee about discrepancies between what they achieved and what the organisation expected – implying that what they achieved was less than other colleagues – will motivate the employee to get a higher level of performance in future.

3. What is the overall effect of feedback on workplace performance?

A couple of findings were discovered in answering this question:

- There is strong evidence that feedback can have a large effect on people's learning and performance. For example, the seminal work of John Hattie that is based on a review of 23 meta-analyses demonstrates large effect sizes (d=.73) In the realm of management, this finding is confirmed by the meta-analysis by Kluger and Denisi (1996). This meta-analysis included 131 controlled studies and was based on 12,652 participants with an average effect size of d=.41.
- The effect sizes reported show considerable variability, indicating that the effect of feedback is contingent upon various moderating factors Several researchers found that feedback may not always be effective. With some studies showing that feedback interventions have highly variable effects on performance – in some situations feedback improves performance, whilst in other it has no effect or may even harm it (Kluger & Denisi, 1996; Smither et al., 2005).



4. What is known about the positive or negative effect of possible moderators or mediators?



Several findings were discovered in answering this question:

- **Reactions to feedback, rather than the feedback itself, influence performance.** While the research found that although feedback generally improves performance, in more than one-third of studies, feedback lowered performance. People have several behavioural options when confronted with a discrepancy in what they wish to achieve, and the actual performance feedback received. They can choose to accept the feedback and put in more effort to improve their performance, but they can also reject the feedback, feel angry or disappointed and shift their attention away from their tasks. The last option is likely when the feedback threatens a worker's self-esteem (Kluger & Denisi, 1996). Further, employees who express positive emotions directly after receiving feedback show higher performance ratings, but those who express negative emotions show lower performance ratings (Smither et al., 2005).
- **Personality variables moderate an individual's reaction to feedback and they impact reactions to feedback which likely determine the extent to which they will use it to improve performance.** Some variables that impact feedback include: self-esteem and locus of control; tendency for cognitive interference; competitiveness; altruism, and: openness to feedback.
- **The effect of feedback is moderated by task type.** A randomised, controlled study that noted promotion tasks (tasks requiring creativity) and prevention tasks (tasks requiring vigilance and attention to detail) revealed that positive feedback on promotion tasks increased motivation and actual performance for people working on those tasks, whereas positive feedback on prevention tasks, decreased motivation and performance for people working on those tasks (Van Dijk, 2011).
- **The effect of feedback is moderated by the type of goal.** Several research studies show that goal setting has a positive effect on performance when combined with performance feedback or progress reporting, especially when the outcomes are reported or made public (Harkin, 2016). However, the reverse is also true: the effect of feedback is influenced by the type of goal. Feedback is more effective when goals are clear, specific and challenging (but realistic as what the workers can cope with). In addition, when employees need to acquire knowledge or skills in order to perform a task, or when the task involved is complex, then learning goals tend to have a more positive effect on performance than outcome goals (Winters & Latham, 1996; Brown & Latham, 2002; Latham & Brown, 2006; Porter & Latham, 2013). Consequently, in those situations, feedback should focus on the learning process rather than the performance outcome.
- **The perceived fairness of the feedback has a medium to large moderating effect on performance.** A fair process is a pre-requisite for the effectiveness of performance feedback. This reflects 'the perceived fairness of decision-making processes and the degree to which they are consistent, accurate, unbiased, and open to voice and input' (Colquitt et al., 2013).
- **Feedback which provides detailed information leads to a higher improvement in performance.** Feedback that provides elaborate, detailed and specific information leads to a higher improvement in performance (Raemdonck, 2013; Casas-Arke, 2017). Therefore, task-related feedback is more effective than general feedback (Johnson, 2015).

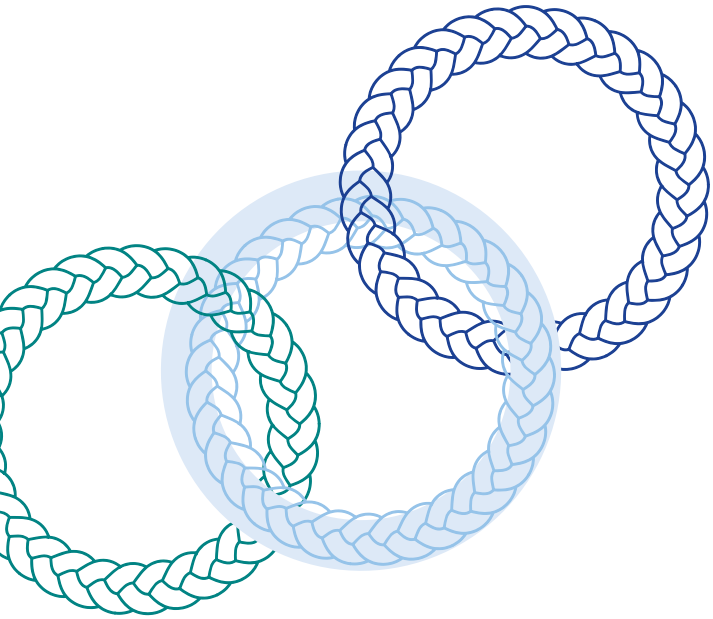
- **The effect of feedback, particularly negative feedback, is moderated by the feedback source.** Employees are more motivated to rely on negative feedback when the supervisor's credibility is high (Steelman & Rutkowski, 2004).
- **Negative feedback adversely affects perceived fairness, whereas feedback that focuses only on positive aspects has a medium positive effect on both perceived fairness and overall job performance.** Feedback is more effective when it provides information on correct rather than incorrect responses (Hattie, 2009).
- **Feedback is less effective when it is perceived as threatening one's self esteem.** This finding confirms a large number of research studies in the domain of education where low threat conditions allow students to pay better attention to and follow up on feedback (Hattie, 2009).
- **In general, managers overestimate how accurately their feedback is perceived by their employees, especially when the feedback is negative.**
- **Employees' reactions to feedback are influenced by the language managers use in their explanations.** For example, when performance is low, the high use of causal language (eg "your performance is under average because …") leads to a greater improvement in subsequent performance, compared to low use of causal language.
- **Additional and more frequent feedback does not always help improve performance.** Research revealed that employees achieve the best results when they receive detailed but more intermittent (monthly) feedback (Casas-Arke, 2017).

Conclusion

The evidence concludes that performance feedback can have large positive effects on work performance, but the effects are highly dependant upon a wide range of moderating factors, many of which can be managed by effective feedback processes.

More information

You can access more information in the *Rapid Evidence Assessment (REA) – The Effect of Feedback on Workplace Performance, a summary of research literature, July 2019.*



References

Akın, Z., & Karagözoğlu, E. (2017). The Role of Goals and Feedback in Incentivizing Performance. *Managerial & Decision Economics, 38*(2), 193-211.

Anseel, F., Beatty, A. S., Shen, W., Lievens, F., & Sackett, P. R. (2015). How Are We Doing After 30 Years? A Meta-Analytic Review of the Antecedents and Outcomes of Feedback-Seeking Behaviour. *Journal of Management, 41*(1), 318-348.

Azmat, G., & Iriberri, N. (2010). The importance of relative performance feedback information: Evidence from a natural experiment using high school students. *Journal of Public Economics, 94*(7/8), 435-452.

Bipp, T., & Kleingeld, A. (2018). Subconscious performance goals: Investigating the moderating effect of negative goal-discrepancy feedback. *Human Performance, 31*(5), 255-281.

Bos-Nehles, A., Renkema, M., & Janssen, M. (2017). HRM and innovative work behaviour: a systematic literature review. *Personnel Review, 46*(7), 1228-1253.

Boyce, M. B., & Browne, J. P. (2013). Does providing feedback on patient-reported outcomes to healthcare professionals result in better outcomes for patients? A systematic review. *Quality of Life Research, 22*(9), 2265-2278.

Brockner, J., & Wiesenfeld, B. M. (1996). An integrative framework for explaining reactions to decisions: interactive effects of outcomes and procedures. *Psychological Bulletin, 120*(2), 189.

Brown, T. C. (2005). Effectiveness of distal and proximal goals as transfer of training intervention: A field experiment. *Human Resource Development Quarterly, 16*(3), 369- 387.

Brown, T. C. and Warren, A. M. (2009). Distal goal and proximal goal transfer of training interventions in an executive education program. *Human Resource Development Quarterly, 20*(3), 265-284.

Brown, T. C., & Latham, G. P. (2002). The effects of behavioural outcome goals, learning goals, and urging people to do their best on an individual's teamwork behaviour in a group problem-solving task. *Canadian Journal of Behavioural Science/ Revue canadienne des sciences du comportement, 34*(4), 276.

Brown, S. D., Lent, R. W., Telander, K., & Tramayne, S. (2011). Social cognitive career theory, conscientiousness, and work performance: A meta-analytic path analysis. *Journal of Vocational Behaviour, 79*(1), 81-90.

Budworth, M. H., Latham, G. P., & Manroop, L. (2015). Looking forward to performance improvement: a field test of the feedforward interview for performance management. *Human Resource Management, 54*(1), 45-54.

Casas-Arce, P., Lourenco, S. M., & Martinez-Jerez, F. A. (2017). The Performance Effect of Feedback Frequency and Detail: Evidence from a Field Experiment in Customer Satisfaction. *Journal of Accounting Research, 55*(5), 1051-1088

Choi, E., Johnson, D. A., Moon, K., & Oah, S. (2018). Effects of Positive and Negative Feedback Sequence on Work Performance and Emotional Responses. *Journal of Organisational Behaviour Management, 38*(2/3), 97-115.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O., & Ng, K. Y. (2001). Justice at the millennium: a meta-analytic review of 25 years of organisational justice research. *Journal of applied psychology, 86*(3), 425.

Colquitt, J. A., Scott, B. A., Rodell, J. B., Long, D. M., Zapata, C. P., Conlon, D. E., & Wesson, M. J. (2013). Justice at the millennium, a decade later: a meta-analytic test of social exchange and affect-based perspectives. *Journal of Applied Psychology, 98*(2), 199.

Donnelly, J., & Trochim, W. (2007). *The research methods knowledge base.* Ohio: Atomic Dog Publishing.

Donnon, T., Al Ansari, A., Al Alawi, S., & Violato, C. (2014). The reliability, validity, and feasibility of multisource feedback physician assessment: A systematic review. *Academic Medicine, 89*(3), 511-516.

DeNisi, Angelo S, & Pritchard, Robert D. (2006). Performance appraisal, performance management and improving individual performance: A motivational framework. *Management and Organisation Review, 2*(2), 253-277.

Dimotakis, N., Mitchell, D., & Maurer, T. (2017). Positive and negative assessment center feedback in relation to development self-efficacy, feedback seeking, and promotion. *Journal of Applied Psychology, 102*(11), 1514.

Elicker, J.D., Levy, P.E., & Hall, R.J. (2006). The role of leader-member exchange in the performance appraisal process. *Journal of Management, 32*(4), 531-551.

Epton, T., Currie, S., & Armitage, C. J. (2017). Unique effects of setting goals on behaviour change: Systematic review and meta-analysis. *Journal of Consulting and Clinical Psychology, 85*(12), 1182-1198.

Festinger, L. (1954). A theory of social comparison processes. *Human relations, 7*(2), 117-140.

Gjedrem, W. G. (2018). Relative performance feedback: Effective or dismaying? *Journal of Behavioural and Experimental Economics, 74*, 1.

Harkin, B., Webb, T. L., Chang, B. P., Prestwich, A., Conner, M., Kellar, I., ... & Sheeran, P. (2015). Does monitoring goal progress promote goal attainment? A meta-analysis of the experimental evidence. *Psychological Bulletin, Vol 142*(2), 198-229.

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Holderness, D. K., Jr., Olsen, K. J., & Thornock, T. A. (2017). Who Are You to Tell Me That?! The Moderating Effect of Performance Feedback Source and Psychological Entitlement on Individual Performance. *Journal of Management Accounting Research, 29*(2), 33.

Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behaviour in organisation. *Journal of Applied Psychology, 64,* 349-371.

Ilgen, D., Barnes-Farell, J. & McKellin, D. (1993). Performance appraisal process in the 1980s: What has it contributed to appraisals in use? *Organisational Behaviour and Human Decision Processes, 54*, 321-368.

Ilies, R., Judge, T. A., & Wagner, D. T. (2010). The influence of cognitive and affective reactions to feedback on subsequent goals: Role of behavioural inhibition/activation. *European Psychologist, 15*(2), 121-131.

Jaakson, K., Reino, A., & McClenaghan, P. B. (2019). The space between – linking trust with individual and team performance in virtual teams. *Team Performance Management, 25*(1/2), 30-46.

Jawahar, I.M. (2010). The Mediating Role of Appraisal Feedback Reactions on the Relationship Between Rater Feedback-Related Behaviours and Ratee Performance. *Group and Organisation Management, 35*(4), 494-526.

Jawahar, I.M. & Williams, C. (1997). Where all the children are above average: the performance appraisal purpose effect. *Personnel Psychology, 50*.

Johnson, D. A., Rocheleau, J. M., & Tilka, R. E. (2015). Considerations in Feedback Delivery: The Role of Accuracy and Type of Evaluation. *Journal of Organisational Behaviour Management, 35*(3-4), 240.

Jones, R. J., Woods, S. A., & Guillaume, Y. R. F. (2016). The effectiveness of workplace coaching: A meta-analysis of learning and performance outcomes from coaching. *Journal of Occupational & Organisational Psychology, 89*(2), 249-277.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*(2), 254.

Kluger, A. N., & Nir, D. (2010). The feedforward interview. *Human Resource Management Review, 20*, 235–246.

Korsgaard, A., Meglino, B. M., & Lester, S. W. (1994, August). *The virtue of being altruistic: The role of the value of helping and concern in individuals' reactions to feedback from others.* Paper presented at the 1994 meeting of the Academy of Management, Dallas, TX.

Kraiger, Kurt, & Ford, J. Kevin. (1985). A meta-analysis of ratee race effects in performance ratings. *Journal of Applied Psychology, 70*(1), 56-65.

Kuhl, J. (1992). A theory of self-regulation: Actions vs. state orientation, self-discrimination, and some applications. *Applied Psychology: An International Review, 41*,97-129.

Lam, S., Yik, M. & Schaubroeck, J. (2002). Responses to formal performance appraisal feedback: The role of negative affectivity. *Journal of Applied Psychology, 87*(1), 192-201.

Latham, G. P., & Brown, T. C. (2006). The effect of learning vs. outcome goals on self-Efficacy, satisfaction and performance in an MBA program. *Applied Psychology, 55*(4), 606-623.

Lefkowitz, J. (2000). The role of interpersonal affective regard in supervisory performance ratings: Aliterature review and proposed causal model. *Journal of Occupational and Organisational Psychology, 73*, 67–85.

Linna, Elovainio, M., Van den Bos, K., Kivimaki, M., Pentti, J. & Vahtera, J. (2012). Can usefulness of performance appraisal interviews change organisational justice perceptions? A 4-year longitudinal study among public sector employees. *The International Journal of Human Resource Management, 23*(7), 1360-1375.

Locke, E. A. and Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57*(9), 705–717.

Locke, E. A., & Latham, G. P. (2006). New directions in goal-setting theory. *Current directions in psychological science, 15*(5), 265-268.

Loftus, S., & Tanlu, L. J. (2018). Because of "Because": Examining the Use of Causal Language in Relative Performance Feedback. *The Accounting Review, 93*(2), 277.

Mikulincer, M. (1989a). Cognitive interference and learned helplessness: The effects of off-task cognitions on performance following unsolvable problems. *Journal of Personality and Social Psychology, 57,* 129-135.

Miller, A., & Archer, J. (2010). Impact of workplace based assessment on doctors' education and performance: A systematic review. *BMJ: British Medical Journal, 341*(7775), 1-6.

Murthy, U. S., & Schafer, B. A. (2011). The Effects of Relative Performance Information and Framed Information Systems Feedback on Performance in a Production Task. *Journal of Information Systems, 25*(1), 159-184.

Palmer, M. G., Johnson, C. M., & Johnson, D. A. (2015). Objective Performance Feedback: Is Numerical Accuracy Necessary? *Journal of Organisational Behaviour Management, 35*(3-4), 206.

Petticrew, M., & Roberts, H. (2006). *How to appraise the studies: an introduction to assessing study quality.* Systematic reviews in the social sciences: A practical guide, 125-163.

Porter, R. L., & Latham, G. P. (2013). The effect of employee learning goals and goal commitment on departmental performance. *Journal of Leadership & Organisational Studies, 20*(1), 62-68.

Raver, J. L., Jensen, J. M., Lee, J., & O'Reilly, J. (2012). Destructive Criticism Revisited: Appraisals, Task Outcomes, and the Moderating Role of Competitiveness. *Applied Psychology: An International Review, 61*(2), 177-203.

Raemdonck, I., & Jan-Willem, S. (2013). Feedback perceptions and attribution by secretarial employees. *European Journal of Training and Development, 37*(1), 24-48.

Rahyuda, A., Syed, J., & Soltani, E. (2014). The role of relapse prevention and goal setting in training transfer enhancement. *Human Resource Development Review, 13*(4), 413-436.

Schaerer, M., Kern, M., Berger, G., Medvec, V., & Swaab, R. I. (2018). The illusion of transparency in performance appraisals: When and why accuracy motivation explains unintentional feedback inflation. *Organisational Behaviour & Human Decision Processes, 144,* 171-186.

Seifert, C. F., Yukl, G., & McDonald, R. A. (2003). Effects of multisource feedback and a feedback facilitator on the influence behaviour of managers toward subordinates. *Journal of Applied Psychology, 88*(3), 561.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Smither, London & Reilly, R. (2005). Does performance improves following multisource feedback? A theoretical model, meta-analysis and review of empirical findings. *Personnel Psychology, 58*(1), 33-66.

Smither J. Reilly, R. & Buda, R. (1988). The effects of prior performance information on ratings of present performance: Contrast versus assimilation revisited. *Journal of Applied Psychology, 73,* 487-496.

Van Dijk, D., & Kluger, A. N. (2011). Task type as a moderator of positive/negative feedback effects on motivation and performance: A regulatory focus perspective. *Journal of Organisational Behaviour, 32*(8), 1084.

Winters, D., & Latham, G.P. (1996). The effect of learning versus outcome goals on a simple versus a complex task. *Group and Organisation Management, 21,* 236– 250.

Young, S. F., Richard, E. M., Moukarzel, R. G., Steelman, L. A., & Gentry, W. A. (2017). How empathic concern helps leaders in providing negative feedback: A two-study examination. *Journal of Occupational & Organisational Psychology, 90*(4), 535-558.

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Rapid Evidence Assessment (REA)



FACTORS ASSOCIATED WITH KNOWLEDGE WORKER PERFORMANCE

a summary of research literature

July 2019

Culture Review **Implementation**

our journey of positive change

ACT Government

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Background

In 2013, a group of eight companies sought to understand what academic research has discovered about the determinants of knowledge worker performance. For each company the pay-off for enhancing knowledge worker performance would be huge, not only in terms of finance, but also in terms of innovation, which for some participants is a key success factor for long term profitability and growth. Although all organisations used various measures and controls to monitor and enhance performance, they lacked a basic understanding of what really drives knowledge worker performance.

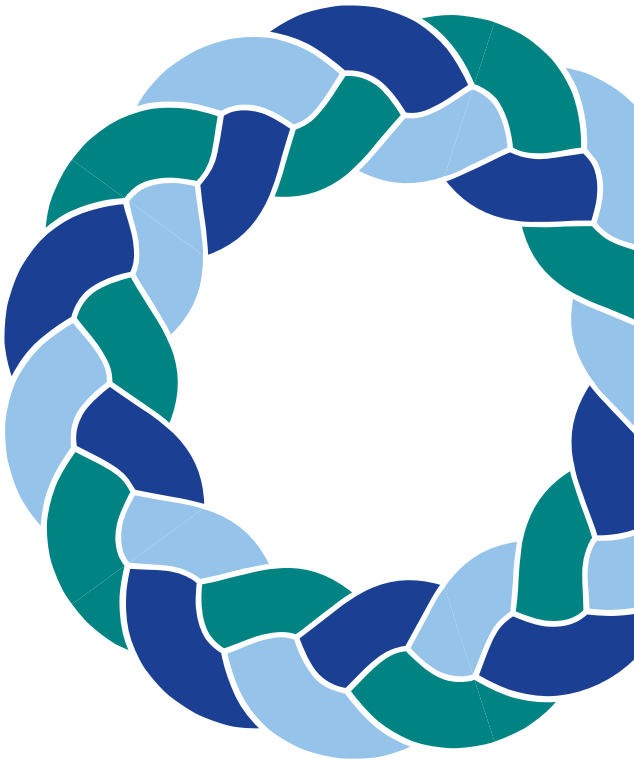
For this reason the organisations commissioned the Center for Evidence-Based Management (CEBMa) to conduct a Rapid Evidence Assessment (REA) of the scientific literature on factors associated with knowledge worker productivity. In July 2019, the REA was updated. This update was funded by Novartis and Advanced Workplace Associates (AWA).

What is a Rapid Evidence Assessment (REA)?

Evidence reviews come in many forms. One of the best-known types is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: clear criteria for inclusion is often lacking and studies are selected based on the researcher's individual preferences. As a result conventional literature reviews are prone to severe bias. This is why 'rapid evidence assessments' (REAs) are being used.

This type of review is a specific research methodology that aims to identify the most relevant studies on a specific topic as comprehensively as possible, and to select appropriate studies based on explicit criteria. In addition, the methodological quality of the studies included is assessed by two independent reviewers on the basis of explicit criteria. In contrast to a conventional literature review, a REA is transparent, verifiable, and reproducible, and, as a result, the likelihood of bias is considerably smaller.





Main question: What does this REA answer?

What is known in the scientific literature about factors associated with knowledge worker performance?

Supplementary questions:

1. **What is 'knowledge work'?**
2. **Which of the factors that have an impact on the performance of knowledge workers are most widely studied and what is known of their effect?**
3. **Which six factors have the biggest impact on performance?**
4. **How do these six actors enhance the performance of knowledge workers and how can they be measured?**

Search strategy: How was the research evidence sought?

The following three databases were used to identify studies: ABI/INFORM Global from ProQuest, Business Source Premier from EBSCO and PsycINFO from Ovid. The following generic search filters were applied to all databases during the search:

1. **Scholarly journals, peer-reviewed.**
2. **Published in the period 1980 to 2019.**
3. **Articles in English.**

A search was conducted using combinations of different search terms, such as 'productivity', 'performance', 'knowledge work' and 'knowledge based business'. We conducted six different search queries, which yielded a total of more than 600 studies. All queries, criteria and search results are described in detail in Appendix I.

Selection process: How were the studies selected?

Study selection took place in two phases. First, the titles and abstracts of the 600+ studies were screened for their relevance to this REA. In case of doubt, lack of information, or disagreement, the study was included. Duplicate publications were removed. This first phase yielded 52 (2013) and 66 (2019) studies.

Secondly, studies were selected based on the full text of the article according to the following inclusion criteria.

1. Only meta-analyses.
2. Only studies in which the association with (knowledge worker) performance are measured.
3. Only studies related to workplace settings.
4. Only studies that were graded Level C or above (see below).

Two reviewers worked independently to identify which studies were included. Where the reviewers disagreed on inclusion, a third reviewer assessed whether the study was appropriate for inclusion with no prior knowledge of the initial reviewers' assessments.

The decision of the third reviewer was final. This second phase yielded 35 (2013) and 44 (2019) meta-analyses, making a total of 79 meta-analyses. An overview of the selection procedure is provided in Appendix II

Critical appraisal: How were the quality of the included studies judged?

Methodological Appropriateness

In almost any situation it is possible to find a scientific study to support or refute a theory or a claim, and sometimes to quite a large degree. It is therefore important to determine which studies are trustworthy (i.e. valid and reliable) and which are not. The trustworthiness of a scientific study is first determined by its methodological appropriateness. For cause-and-effect claims (i.e. if we do A, will it result in B?), a study has a high methodological appropriateness when it fulfils the three conditions required for causal inference: co-variation, time-order relationship, and elimination of plausible alternative causes (Shaughnessy & Zechmeister, 2006).

A study that uses a control group, random assignment and a before-and-after measurement is therefore regarded as the 'gold standard'. Non-randomised studies and before-after studies came next in terms of appropriateness. Cross-sectional studies (surveys) and case studies are regarded as having the greatest chance of showing bias in the outcome and therefore sit lower down in the ranking in terms of appropriateness. Meta-analyses in which statistical analysis techniques are used to pool the results of controlled studies are therefore regarded as the most appropriate design.

To determine the methodological appropriateness of the included studies' research design, the classification system of Shadish, Cook and Campbell (2002), and Petticrew and Roberts (2006) was used. The following four levels of appropriateness were used for the classification:

Design	Level
Systematic review or meta-analysis of randomised controlled studies.	AA
Systematic review or meta-analysis of controlled and/or before-after studies.	A
Randomised controlled study.	
Systematic review or meta-analysis of cross-sectional studies.	B
Non randomised controlled before-after study.	
Interrupted time series.	
Controlled studies without a pretest or uncontrolled study with a pretest.	C
Cross-sectional studies.	D

It should be noted, however, that the level of methodological appropriateness as explained above is only relevant in assessing the validity of a cause-and-effect relationship that might exist between a predictor/driver (organisational culture) and its outcomes (performance), which is the purpose of this review.

Methodological Quality

In addition, a study's trustworthiness is determined by its methodological quality (its strengths and weaknesses). For instance, was the sample size large enough and were reliable measurement methods used? To determine methodological quality, all the studies included were systematically assessed on explicit quality criteria. Based on a tally of the number of weaknesses, the trustworthiness was downgraded and the final level was determined as follows: a downgrade of one level if two weaknesses were identified; a downgrade of two levels if four weaknesses were identified, etc.

Effect sizes

Finally, the effect sizes were identified. An effect (e.g. a correlation, Cohen's d or omega) can be statistically significant but may not necessarily be of practical relevance: even a trivial effect can be statistically significant if the sample size is big enough. For this reason, the effect size – a standard measure of the magnitude of the effect – of the studies included was assessed. To determine the magnitude of an effect, Cohen's rules of thumb (Cohen, 1988) were applied. According to Cohen a 'small' effect is an effect that is only visible through careful examination. A 'medium' effect, however, is one that is 'visible to the naked eye of the careful observer'. Finally, a 'large' effect is one that anybody can easily see because it is substantial.

Outcome of the critical appraisal

The overall quality of the studies included in this review is moderate to high. Most of the meta-analyses were based on cross-sectional studies, and where therefore qualified as Level C. Twelve meta-analyses were graded Level B or higher. An overview of all studies included is provided in Appendix III.

Main findings

1. What is knowledge work?

The term ‘knowledge work’ was coined in 1959 by Peter Drucker to describe work that occurs primarily because of mental processes rather than physical labor (Drucker, 1959). In the past century, the proportion of the workforce engaged in knowledge work has increased dramatically, as organisations have moved from manual production to more knowledge-driven production as these estimates suggest:

1920: 30% (Davenport et al., 2002)

1956: 50% (Naisbitt, 1982)

1980: 70% (Thomas & Baron, 1994)

Since then many definitions have been put forward and there are nearly as many definitions of both ‘knowledge work’ and ‘knowledge workers’ as there are publications on the topic. When examined closely most definitions seem to have the following common elements:

- Distribution or application of knowledge.
- Highly educated, autonomous professionals.
- Use of information technology as an integral part of the work process.
- A work process that is difficult to standardise.
- Complex and intangible outcomes.

Most studies acknowledge that the difference between manual work and knowledge work is a continuum. In addition, even the highest level of knowledge work includes mundane tasks such as storing information, returning telephone calls, and composing and responding to emails (Heerwagen et al, 2004). To assess the level of knowledge work different aspects of the job should be examined such as[1]:

- Autonomy (the degree of worker control over how a task is done).
- Structure (the degree of established rules, policies, or procedures about how a task is done).
- Knowledge (the degree to which having previous knowledge and executing cognitive processes are part of the task).
- Complexity (the degree to which a task offers difficulty in understanding or has confusing interrelated sub-tasks).
- Routine and repetitiveness (the degree to which a task is part of a regular or established procedure characterised by habitual or mechanical performance of tasks).
- Physical effort (the degree to which a task requires body strength, coordination, and skill in order to be performed).

[1]Adapted from: Ramirez, Y.W. (2006), Defining Measures for the Intensity of Knowledge Work in Tasks and Workers, Department of Industrial Engineering, University of Wisconsin-Madison, Madison, WI.

2. Which of the factors that have an impact on the performance of knowledge workers are most widely studied and what is known of their effect?

A total of 85 factors were identified, accounting for more than 145 effect sizes. An overview of all factors and effect sizes is provided in Appendix III.

Based on the analysis of the 66 included studies we can assume that, with regard to the performance of knowledge workers, the factors presented in the table below are the factors that demonstrated a large effect size (i.e. greater than ρ = 0.40).

Factor	Nr of studies	Level of evidence	Mean correlation weighed by sample size
Social cohesion	40+	C	.49* / .70**
Perceived supervisory support	9	C	.53*
Perceived support for innovation	10	C	.58*
Vision / goal clarity	17	C	.49*
External communication	7	C	.48*
Information sharing	50+	AA	.51*
Team empowerment	20+	C	.43* / .60**
Psychological safety	100+	B	.43*
Group goals	40+	AA	d = .8 / 1.2

* objective vs **subjective (self-rated) performance.

3. How do these factors enhance the performance of knowledge workers and how can they be measured?

Factor 1: Social Cohesion

Social cohesion refers to a shared liking or attraction to the group, emotional bonds of friendship, caring and closeness among group members, and enjoyment of each other's company (Chiocchio, 2009). Social cohesion is not a stable trait; it can (and most likely does) change over time in both its form and intensity throughout the processes of group formation, group development, group maintenance, and group dissolution (Carron & Chelladurai, 1981). Although social cohesion is dynamic it is unlikely to change dramatically on a moment-to-moment basis.

How does Social Cohesion enhance performance?

A high level of social cohesion among team members creates a psychologically safe environment in which team members feel free to explore new ways of doing things (Hülsheger, Anderson, & Salgado, 2009). The notion that a person is more willing to take risk in a situation in which they have a reliable bond with an important other has been confirmed in other areas of psychology, such as developmental psychology (e.g. child development theories suggests that children who are well bonded with their parents engage in more exploratory and learning behaviour).

Furthermore, knowledge workers who have strong feelings of belongingness and attachment to their colleagues are more likely to cooperate and interact with each other, and thus more likely to exchange ideas and share information (Hülsheger et al., 2009). For example, operating room nurses are more likely to share innovative ideas to improve patient safety with surgeons when there is a high level of social cohesion between these two professional groups.



How can Social Cohesion be measured?

The level of social cohesion can be measured with the five questions adapted from the Group Cohesion Questionnaire (GCQ, Carless & De Paola 2000) that are listed in Appendix IV.

Factor 2: Perceived Supervisory Support

When knowledge workers interact with and receive feedback from their manager (supervisor), they form perceptions of how the manager supports them. This perception is based on how the workers feel the manager helps in times of need, praises the workers or the team for a task well done or recognises them for extra effort. This is known as perceived supervisory support (PSS). A related construct is 'support for innovation', which refers to the expectation, approval and practical support of a worker's attempt to introduce new ways of doing things.

Why does strong Supervisory Support enhance performance?

The construct of perceived supervisory support stems from the norm of reciprocity, which states that people treat others as they would like to be treated, repaying kindness with kindness and retaliating against those who inflict harm (Brunell et al., 2013; Gouldner, 1960). Put differently, when a manager helps his or her employees well in times of need or recognises them for extra effort, the employees will feel inclined to act in a way that is of value to the manager (such as meeting goals and objectives) and thus the organisation as a whole (Edmondson & Boyer, 2013; Eisenberger, Huntington, Hutchison, & Sowa, 1986).

The same applies to the construct of support for innovation: if workers experience approval and practical support for new ways of doing things, they are more likely to experiment and try out innovative solutions (Hulsheger, 2009).



Factor 3: Information Sharing

Information sharing (IS) refers to the extent to which teams are utilising the individual members' distinctive knowledge or expertise for the team's benefit. Especially if complex problems have to be addressed, IS is indispensable in that it allows team members to share their knowledge and past experiences and exchange and discuss ideas, which is particularly important for the generation of new ideas (Hülsheger et al., 2009).

Transactive Memory System

An important concept related to IS is that of Transactive Memory System (TMS). The concept was originally developed through the observation of dating couples. Researchers noticed that dating couples in a close relationship treat their partners as an external memory device. TMS within a team refers to a form of knowledge that is embedded in a team's collective memory. This collective memory works like an indexing system that tells members who knows what.

How does Information Sharing enhance performance?

It is believed that the more team members share information, the better the group decisions will be, and as a result the better overall group performance (Hackman, 1990). In addition IS is believed to increase the awareness of who knows what in the group (TMS). A well-developed TMS is thought to improve team performance because it gives members quick and coordinated access to one another's specialised expertise, enabling them to effectively combine knowledge to solve complex problems (Hsu, Shih, Chiang, & Liu, 2012).

How can Information Sharing and Transactive Memory System be measured?

The level of IS and TMS can be measured with the five questions adapted from questionnaires by Bock et al (2005), Yeung Choi (2010), Lewis (2003) and Bunderson (2002) that are listed in Appendix IV.

Factor 4: Vision and Goal Clarity

The notion of vision refers to an idea of a valued outcome which represents a higher order goal and motivating force at work (Kouzes & Pozner, 1987; West, 1990). Several studies have demonstrated that a clear vision at the team level tends to have a positive effect on the performance of individual teams as well. In this sense the notion of 'vision' refers to the extent to which knowledge workers have a common understanding of objectives and display high commitment to those team goals. For this reason 'vison' at the team level is also referred to as 'goal clarity'.

Why does a clear Vision and Goal Clarity enhance performance?

Several researchers have pointed out that for a team to be effective, team members need to be committed to team objectives and should share a sense of purpose and responsibility (Hülsheger et al., 2009). Such commitment can help to point a team of knowledge workers in the same direction, which enhances cooperative and goal-directed behaviour. In addition, clear goals help knowledge workers see connections between their personal values and the values of the team, which increases the degree to which they find meaning in their work (Wright & Pandey, 2011). As such, a clear vision and commitment to long-term objectives plays an important role in allowing 'freedom to act', while at the same time making sure knowledge workers are responsible for producing results (Simon et al 2011).

How can Vision and Goal Clarity be measured?

The level of vision and (perceived) goal clarity can be measured with the five questions adapted from validated questionnaires by Rainey (1983), Locke (1984), and Simon (2011) that are listed in Appendix IV.



Factor 5: External Communication

External communication refers to the ability of teams to span boundaries (team and organisational) to seek information and resources from others. Research has demonstrated that the more external communication knowledge workers experience with colleagues outside their team or organisation, the more likely they are to be innovative (Hülsheger et al., 2009). For example, a study of over 400 California hospitals over ten years found considerable support for the relationship between inter-organisational links and innovation in hospital services and technology (Goes & Park, 1997).

How does External Communication enhance performance?

External communication enhances the likelihood of obtaining new knowledge and discloses new perspectives. These in turn spark the development of new ideas (creativity) or the adoption of new ways of doing things (innovation). Knowledge worker teams whose tasks require creativity and innovation tend to experience enhanced performance when they undertake external communication (Ancona et al 1992).

How can External Communication be measured?

The level of external communication can be measured with the three questions adapted from validated questionnaires by Teigland & Wasko (2003) and Ancona & Caldwell (1992) that are listed in Appendix IV.

Factor 6: Team Empowerment

Psychological empowerment refers to the perception that workers can perform their tasks competently and have autonomy to decide how to do their jobs, and that their behaviour makes a difference. As such, team empowerment refers to shared perceptions among team members regarding the team's collective level of empowerment. Teams that are more empowered feel that they have more intrinsically meaningful or worthwhile work and, as a group, have a higher degree of choice or discretion in deciding how they carry out their team tasks (Seibert, 2011).

How does Team Empowerment enhance the level of performance?

Psychological empowerment has been associated with a wide range of outcomes, such as job satisfaction, organisational commitment and turnover. It has been demonstrated, however, that psychological empowerment is also positively related to work performance. It is assumed it enhances performance because it increases:

- the amount of information and control workers have over their work;
- the level of work-related knowledge, skills, and abilities possessed by employees; and
- the level of motivation employees have to achieve the goals of the organisation (Seibert, 2011).

How can Team Empowerment be measured?

The level of team empowerment can be measured with the six questions adapted from Kirkman and Rosen's (1999) team empowerment scale that are listed in Appendix IV.



Factor 7: Psychological Safety

Psychological safety is a group-level phenomenon that refers to the shared belief held by members of a group that the group is safe for 'interpersonal risk taking' - a sense of confidence that others will not embarrass, reject or punish someone for speaking up (Edmondson, 1999). Psychological safety is related to 'intra-team trust', but includes:

- respect for each other's competence.
- caring about each other as people.
- trust in each other's intentions.

Amy Edmondson, who first identified the concept of psychological safety in work teams in 1999, emphasizes that psychological safety does increase by talking about the need for it or to urge others to trust, because it is determined by the group members' experiences.

How does Psychological Safety enhance the level of performance?

Psychological safety is assumed to be a prerequisite for group learning. If group members feel psychologically safe they will be more willing to ask for help, admit an error or seek feedback; and those actions will foster learning in the group, which improves their performance.

How can Psychological Safety be measured?

The level of psychological safety can be measured with the seven questions adapted from Edmondson's (1999) psychological safety questionnaire that are listed in Appendix IV.

Factor 8: Group Goals

In one's personal life, a goal is simply something you are trying to do or achieve. In the domain of management, a goal can be defined as an observational or measurable organisational outcome to be achieved within a specified time limit (Locke & Latham, 2002). As such, organisational goal-setting can refer to desired work or business outcomes, as well as the intention or plan to act towards them. Goal setting is one of the most researched topics in the field of industrial and organisational psychology.

A large number of high quality studies have consistently demonstrated that specific, difficult goals yield higher performance than nonspecific ("do-your best") goals, and specific difficult goals yield higher performance than specific easy goals. Several studies suggest that setting goals at the group level may yield higher performance than individual goals (Kleingeld, 2011). In addition, it is assumed that group goals trigger unique motivational mechanisms such as planning, cooperation, morale-building communication, and collective efficacy within a team.

How do Group Goals enhance the level of performance?

According to goal-setting theory, goals affect performance through four causal mechanisms (Latham, 2004). Firstly, goals serve a directive function. They direct an employee's attention and effort towards goal-relevant activities and away from goal-irrelevant ones. Secondly, goals have an energising function. As such, high goals lead to greater effort than low goals. Thirdly, goals also affect persistence. When employees are allowed to control the time they spend on a task, hard goals prolong effort. Finally, goals affect action indirectly by leading to the arousal, discovery and/or use of task-relevant knowledge and strategies, which increases the odds for success (Locke & Latham, 2002).



Conclusion

Knowledge worker productivity is widely studied and the available evidence is rich in both quantity and quality. Based on this evidence, we conclude that there are a wide range of factors that are associated with knowledge worker productivity, of which social cohesion, perceived supervisory support, information sharing, vision/goal clarity, external communication, team empowerment, psychological safety and group goals tend to demonstrate the largest associations.

Limitations

To provide a 'rapid' review, concessions were made in the breadth and depth of the search process. As a consequence, some relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included: this REA does not incorporate a comprehensive review of the psychometric properties of the tests, scales and questionnaires used.

A third limitation concerns the fact that this REA focused only on the (zero order) correlations and did not take into account possible moderators and/or mediators that may influence the impact of the effect sizes found.

Finally, this REA focused only on meta-analyses. As a consequence, new, promising findings published in primary studies may have been missed. Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.

References

Ancona, D. G., & Caldwell, D. F. (1992). External Activity and Performance in Organisational Teams. *Administrative Science Quarterly, 37*(4), 634-665.

Antman, E. M. (1992). A comparison of results of meta-analyses of randomised controlled trials and reccommendations of clinical experts. *Journal of the American Medical Association, 286*(2), pp. 240-248.

Bowling, N. A. (2007). Is the job satisfaction-job performance relationship spurious? A meta- analytic examination. *Journal of Vocational Behaviour, 71*(2), 167.

Brunell, A. B., Davis, M. S., Schley, D. R., Eng, A. L., van Dulmen, M. H. M., Wester, K. L., & Flannery, D. J. (2013). A New Measure of Interpersonal Exploitativeness. *Frontiers in Psychology, 4*(299).

Burton, P., Y., W., & Prybutok, V. R. (2012). Differential Effects of the Volume and Diversity of Communication Network Ties on Knowledge Workers' Performance. *IEEE Transactions On Professional Communication, 55*(3).

Bushman, B., & Wells, G. (2001). Narrative impressions of literature: The availability bias and corrective properties of meta-analytic approaches. *Personality and Social Psycholgy Bulletin, 27*(9), 1123-1130.

Caron, A. V., & Spinks, K. S. (1995). The Group Size-Cohesion Relationship in Minimal Groups. *Small Group Research, 26*(1), 86-105.

Carron, A. V., & Chelladurai, P. (1981). The dynamics of group cohesion in sport. *Journal of Sport Psychology, 3,* 123-139.

Chalmers, I., Enkin, M., & Keirse, M. (1993). Preparing and updating systematic reviews of randomised controlled trials of health care. *Millbank Quarterly(71),* 411-437.

Chiocchio, F. (2009). Cohesion and Performance: A Meta-Analytic Review of Disparities Between Project Teams, Production Teams, and Service Teams. *Small Group Research, 40*(4), 382-420.

Clarke, C., Harcourt, M., & Flynn, M. (2013). Clinical Governance, Performance Appraisal and Interactional and Procedural Fairness at a New Zealand Public Hospital. *Journal of Business Ethics(117),* 667-678.

Connell, J., Ferres, N., & Travaglione, T. (2003). Engendering trust in manager- subordinate relationships: Predictors and outcomes. *Personnel Review, 32*(5), 569-587.

Cunningham, T. R., & Austin, J. (2007). Using Goal Setting, Task Clarification, and Feedback to Increase the Use of the Hands-Free Technique by Hospital Operating Room Staff. *Journal of Applied Behaviour Analis, 40*(4), 673-677.

Daly, J. (2005). *Evidence-Based Medicine and the Search for a Science of Clinical Care.* Berkeley: University of California Press.

Davenport, T., Thomas, R., & Cantrell, S. (2002). The Mysterious Art and Science of Knowledge-Worker Performance. *MIT Sloan Management Review, October.*

Dirks, K. T., & Ferrin, D. L. (2002). Trust in leadership: Meta-analytic findings and implications for research and practice. *Journal of Applied Psychology, 87*(4), 611-628.

Drucker, P. (1959). *The Landmarks of Tomorrow.* New York, NY: Harper & Row.

Edmondson, D. R., & Boyer, S. L. (2013). The Moderating Effect of the Boundary Spanning Role on Perceived Supervisory Support: A Meta-Analytic Review. *Journal of Business Research, 66*(11), 2186.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organisational support. *Journal of Applied Psychology, 71,* 500-507.

Erez, M. (1977). Feedback: a necessary condition for the goal setting-performance relationship. *Journal of Applied Psychology, 62,* 624-627.

Fink, A. (1998). *Conducting Research Literature Reviews: From Paper to the Internet.* London: Sage Publications.

Gambetta, D. G. (1988). *Can we Trust Trust?* . In D. G. Gambetta (Ed.), Trust: Making and Breaking Cooperative Relations (pp. 213-217). New York: Basil Blackwell.

Goes, J. B., & Park, S. H. (1997). Interorganisational Links And Innovation: The Case Of Hospital Services. *Academy of Management Journal, 40*(3), 673-696.

Gouldner, A. (1960). The norm of reciprocity: a preliminary statement. *Am. Sociol. Rev., 25,* 161- 178.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of Innovations in Service Organisations: Systematic Review and Recommendations. *Milbank Quarterly, 82,* 581-629.

Hackman, J. R. (Ed.). (1990). *Groups that work (and those that don't): Conditions for effective teamwork.* San Francisco: Jossey-Bass.

Heerwagen, J., Kampschroer, K., Powell, K., & Loftness, V. (2004). Collaborative knowledge work environments. *Building Research & Information, 32*(6), 510- 528. doi: 10.1080/09613210412331313025

Higgins, J., & Green, S. (Eds.). (2006). *Cochrane Handbook for Systematic Reviews of Interventions (Vol. Version 5.1.0. (updated March 2011)).* Chichester, UK: John Wiley & Sons, Ltd.

Hsu, J. S.-C., Shih, S.-P., Chiang, J. C., & Liu, J. Y.-C. (2012). The impact of transactive memory systems on IS development teams' coordination, communication, and performance. *International Journal of Project Management, 30*(3), 329-340. doi: 10.1016/j.ijproman.2011.08.003

Hülsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: a comprehensive meta- analysis spanning three decades of research. *Journal of Applied Psychology, 94*(5), 1128-1145.

Klein, C., DiazGranados, D., Salas, E., Huy, L., Burke, C. S., Lyons, R., & Goodwin, G. F. (2009). Does Team Building Work? *Small Group Research, 40*(2), 181-222.

Korsgaard, A. M., Schweiger, D. M., & Sapienza, H. J. (1995). Building Commitment, Attachment, and Trust in Strategic Decision-Making Teams: The Role of Procedural Justice. *Academy of Management Journal, 38*(1), 60-84.

Kouzes, J. M., & Pozner, B. Z. (1987). *The leadership challenge.* San Francisco, CA.: Jossey- Bass.

Laschinger, H. K., Spence, R. N., Finegan, J., Shamian, J., & Casier, S. (2000). Organisational Trust and Empowerment in Restructured Healthcare Settings: Effects on Staff Nurse Commitment. *Journal of Nursing Administration, 30*(9), 413-425.

Latham, G. (2009). Motivate employee performance through goal setting. In E. A. Locke (Ed.), *Handbook of principles of organisational behaviour (pp. 161-179).* Chichester, UK: Wiley.

Locke, E. A., & Latham, G. (1990). *A Theory of Goal-setting and Task Performance.* Englewood Cliffs, NJ.: Prentice Hall.

March, J. G., & Olsen, J. (1975). The Uncertainty of the Past: Organisational Learning Under Ambiguity. *European Journal of Political Research, 3,* 149-171.

Moore, A., & Mamiseishvili, K. (2012). Examining the relationship between emotional intelligence and group cohesion. *Journal of Education for Business, 87*(5), 296-302.

Morello, R. T., Lowthian, J. A., Barker, A. L., McGinnes, R., Dunt, D., & Brand, C. (2013). Strategies for improving patient safety culture in hospitals: a systematic review. *BMJ Quality and Safety, 22*(8).

Naisbitt, J. (1982). *Megatrends.* New York, NY: Warner Brooks.

Petticrew, M. (2001). Systematic reviews from astronomy to zoology: myths and misconceptions. *British Medical Journal, 322*(January), 98-101.

Petticrew, M., & Roberts, H. (2006). *Systematic Reviews in the Social Sciences: A Practical Guide.* Oxford: Blackwell Publishing.

Robertson, R., Gockel, C., & Brauner, E. (2012). Trust your teammates or bosses? Differential effects of trust on transactive memory, job satisfaction, and performance. *Employee Relations, 35*(2), 222-242.

Shadish, W., Cook, T., & Campbell, D. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference.* Boston: Houghton Mifflin Company.

Simon, M., Staschel, C., & Covin, J. G. (2011). The Effects of Entrepreneurial Orientation and Commitment to Objectives on Performance. *New England Journal of Entrepreneurship, 14*(2).

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal, 38*(5), 1442-1465.

Straus, S. E., Soobiah, C., & Levinson, W. (2013). The impact of leadership training programs on physicians in academic medical centers: a systematic review. Acad Med 2013; 88(5):710-723. *Academic Medicine, 88*(5), 710-723.

Tan, K. T., Adzhahar, F., Lim, I., Chan, M., & Lim, W. S. (2014). Transactive memory system as a measure of collaborative practice in a geriatrics team: implications for continuing interprofessional education. *Journal of Interprofessional Care, 28*(3), 239.

Tayfur, O., & Arslan, M. (2013). The Role Of Lack Of Reciprocity, Supervisory Support, Workload And Work—Family Conflict On Exhaustion Evidence From Physicians. *Psychology Health & Medicine, 18*(5), 564-575.

Thomas, B. E., & Baron, J. P. (1994). Evaluating knowledge worker productivity: literature review. *Interim Report, No. FF-94/27, USACERL, pp. 1-27.*

West, M. A. (1990). The social psychology of innovation in groups. In J. L. Farr (Ed.), *Innovation and Creativity at Work: Psychological and Organisational Strategies. (pp. 309-333).* Chichester, UK: Wiley.

Wright, B. E., & Pandey, S. K. (2011). Public Organisations and Mission Valence: When Does Mission Matter? *Administration & Society, 43*(1), 22-44.

Xu, R., Carty, M. J., Orgill, D. P., Lipsitz, S. R., & Duclos, A. (2013). The teaming curve: a longitudinal study of the influence of surgical team familiarity on operative time. *Annals of Surgery, 258*(6), 953-95.

Appendix I

Search terms & hits

ABI/Inform Global, Business Source Elite, PsycINFO peer reviewed, scholarly journals, Oct 2013

Search terms	ABI	BSP	PSY
S1: ab(productivity) AND su(meta-analysis)	33	42	18
S2: ab(performance) AND su(meta-analysis)	299	262	264
S3: ab(employee*) OR ab(worker*) OR ab(team*)	87,517	139,500	135,288
S4: S2 AND S3, limit > 1980	81	49	17

ABI/Inform Global, Business Source Elite, PsycINFO peer reviewed, scholarly journals, May 2019

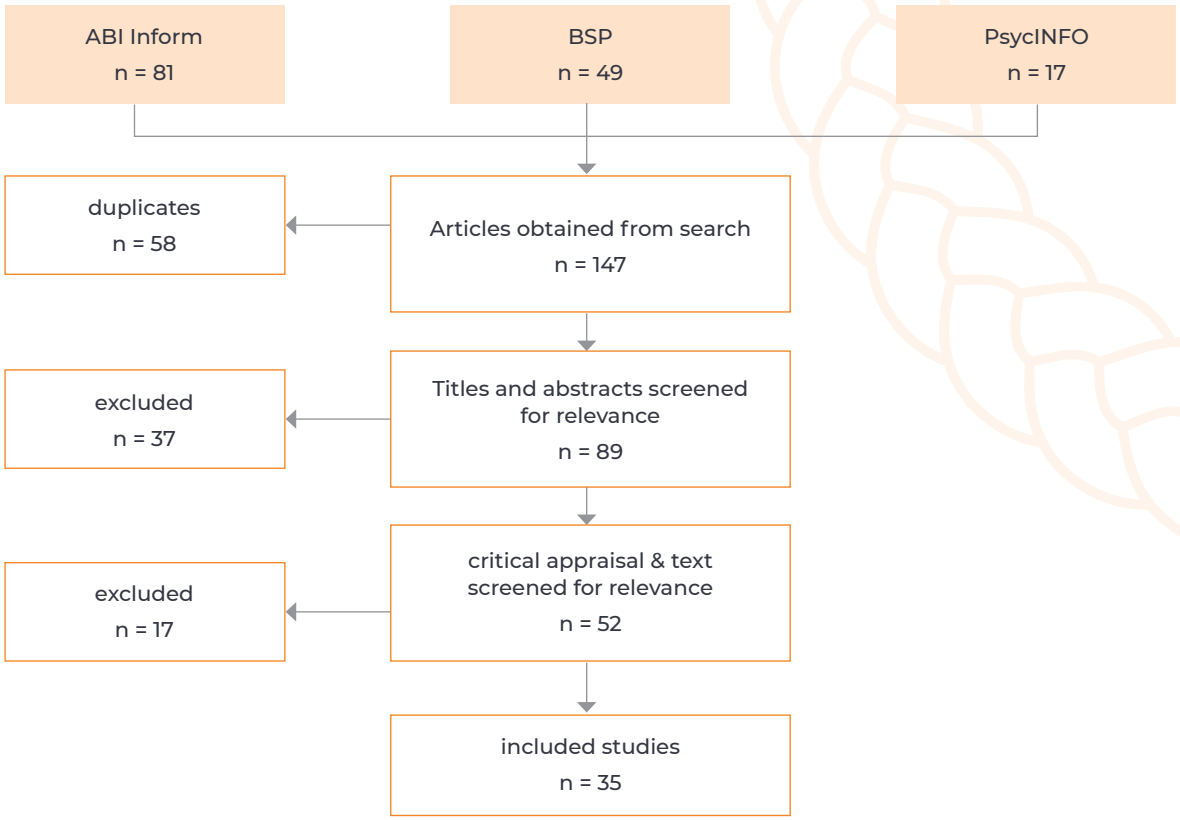
Search terms	ABI	BSP	PSY
S1: ab(productiv*) OR ab(perform*)	312,784	445,239	438,353
S2: ab(work*) OR ab(employe*) OR ab(team*)	414,753	510,869	565,736
S3: S1 AND S2	83,977	102,518	86,745
S4: ti(meta-analy*) OR ab(meta-analy*) OR ti("systematic review") OR ab("systematic review")	7,894	8,270	na
S5: S3 AND S4, limit > 2010	514	289	580



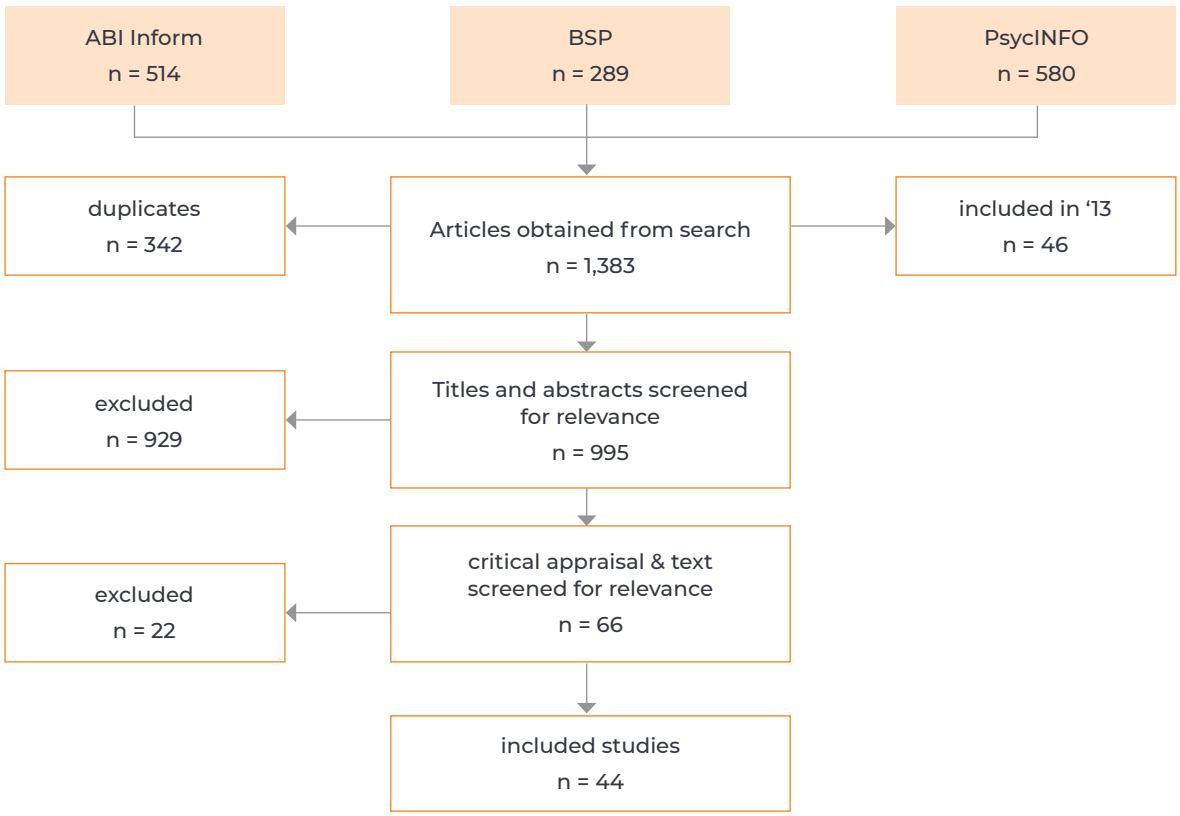
Appendix II

Selection of studies

Study selection, 2013



Study selection, 2019



Appendix III

Overview of included meta-analyses

1st Author & year	Design included studies & sample size	Sector / Population	Main findings	I & D Variables	Effect sizes	Limitations	Level
Allan, 2019	not specified k 44 N = 23,144		Using job characteristics theory as a framework, meta-analytic effect sizes were calculated between meaningful work and various outcomes and was a mediated model tested of meaningful work predicting proximal and distal outcomes with meta-analytic structural equation modelling (MASEM). The best MASEM fitting model was meaningful work predicting work engagement, commitment, and job satisfaction and these variables subsequently predicting self-rated performance, organisational citizenship behaviours, and withdrawal intentions.	I = meaningful work D = self-rated job performance, organisational citizenship behaviour, negative affect	OCB r =.33 (k=3) Performance r = .33 (k=5)	no serious limitations	C
Avey, 2011	experimental, quasi-experimental and correlational studies k = 51 N=12,567		Psychological capital (PsyCap) consists of the four positive psychological resources of hope, optimism, efficacy, and resilience. The results indicated positive relationships between PsyCap and desirable employee attitudes (job satisfaction, organisational commitment, psychological well-being), desirable employee behaviours (citizenship), and multiple measures of performance (self, supervisor evaluations, and objective). A sub-analysis found no major differences between the types of performance measures used (i.e., between self, subjective, and objective).	I = positive psychological capital D = employee performance, behaviour (OCB)	OCB r = .43 Employee performance r = .26 (overall) r = .31 (s) r = .29 (sv) r = .26 (obj)	High percentage unpublished data	AA

Bachrach, 2019	not specified k = 76 N = 6,869		Research on moderators of TMS to performance relationship. A transactive memory system (TMS) is a collective system for encoding, storing, and retrieving information. Behavioural indicators of TMS are specialisation, credibility and coordination. TMS to performance relationship varies, depending on contextual antecedents.	I = TMS D = performance	Team performance r = .45 Credibility – team performance r = .45 Specialization – team performance r = .36 Coordination – team performance r = .47 TMS – type of performance Task performance r = .44 Affective performance r = .58 Creative performance r = .42	no serious limitations	C
Banks, 2014	not specified k = 27 N = 7836		Leader–member exchange (LMX) and team–member exchange (TMX) are associated with workplace outcomes. TMX is positively related to LMX. There appears to be mixed evidence of the contribution from TMX in predicting work outcomes relative to LMX. While TMX does explain practically significant amounts of variance over and above LMX when predicting organisational commitment and job satisfaction, TMX appeared to add little value when predicting job performance and turnover intentions. Also, LMX shows greater relative importance across all four outcomes. For practitioners, these results demonstrate the importance of developing both supervisor–subordinate relationships and team member relationships.	I = LMX and TMX D =. Workplace outcomes	LMX – TMX r = .37 TMX Performance r = .25 Satisfaction r = .43 Commitment r = .45 Turnover intentions r = -.16 LMX Performance r = .40 Satisfaction r = .51 Commitment r = .49 Turnover intentions r = -.32	no serious limitations	C

Banks, 2017	not specified k = 76 N = 36,031		Results indicate that the Big Five traits and cognitive ability vary in their association with charismatic leadership. Charisma in leaders proved to be an important predictor of supervisor-rated task performance as well as group- or firm-level performance. Due to the relatively small amount of samples explicitly studied in the charismatic leadership literature, more research should focus on the antecedents and outcomes of charisma to increase the robustness of our findings.	I = charismatic leadership D = workplace outcomes	Task performance (sv) Inspirational motivation r = .20 Vision r = .21 CK r = .45 OCB (sv) Idealized influence r = .12 Inspirational motivation r = .28 Group / organisation performance Inspirational motivation r = .08	Some results based on small k	C
Breuer, 2016	cross-sectional and longitudinal studies k = 54 N = 12,615 (1,850 teams)	Teams	Team trust facilitates coordination and cooperation in teams, and is therefore positively related with team effectiveness (attitudes, information processing and team performance). The relationship between team trust and team task performance was stronger in virtual teams than in face-to-face teams.	I = team trust D = team effectiveness	Team effectiveness overall r = .33 Team attitudes r = .64 Team information processing r = .54 Team performance r = .27 (task performance r = .27, contextual performance r = .27)	Search terms not specified	B

Carter, 2019	not specified k = 428		The review integrates research concerning team composition, task design, and team leadership to provide a meta-analytic and comprehensive review of team design characteristics. Regarding team composition research continues to emphasise complex, configurational models that best capture the asymmetric inputs of team members. For task design characteristics, the results situate autonomy, feedback, interdependence, and meaningfulness as important factors. For leadership, not only do leaders need to provide empowering and transformational approaches, but relational and directive approaches also hold promise as influential drivers of team performance.	I = team characteristics (team composition, task design, team leadership) D = team performance	See table 1-3 for correlations team composition r -.14 - .15 task design r -0.5 - .30 team leadership r -.27 - .30	Data extraction not specified Some results based on small k Many characteristics	D
Cerasoli, 2014	not specified k = 183 N = 212,468	School, work, physical domain	Review focussed on the interrelationship among intrinsic motivation, extrinsic incentives, and performance, with reference to two moderators: performance type (quality vs. quantity) and incentive contingency (directly performance-salient vs. indirectly performance- salient). Intrinsic motivation is a medium to strong predictor of performance regardless of whether incentives are present. Intrinsic motivation was less important to performance when incentives were directly tied to performance and was more important when incentives were indirectly tied to performance. Intrinsic motivation predicted more unique variance in quality of performance, whereas incentives were a better predictor of quantity of performance.	I = intrinsic motivation, extrinsic incentives D = performance (quality, quantity)	Intrinsic motivation - performance overall r = .26 Intrinsic motivation - performance quality r = .35 Intrinsic motivation - performance quantity r = .26 Intrinsic motivation - performance – indirect incentive r = .45 Intrinsic motivation - performance – direct incentive r = .30	no serious limitations	C

Ceri-Booms, 2017	not specified k = 89		Meta-analytic review of the relationship between person and task-focused leader behaviours, on the one hand, and team performance, on the other hand. There is a moderate positive association between both types of leadership behaviours and subjective team performance. For objective team performance, the effect sizes are smaller, yet positive for task-focused leadership behaviours and for person-focused leadership behaviours. The relationship is moderated by measurement method, level of analysis, team type and task independence.	I = task and person-focused leadership behaviours D = team performance	Subjective team performance ρ = 0.33 Objective team performance ρ = 0.19 (task-focused leadership behaviour) ρ = 0.18 (person-focused leadership behaviour)	no serious limitations	C
Chamberlin, 2017	correlational studies k = 189 N = 71,820		Undifferentiated constructive voice is associated with a wide range of antecedents. We also find that undifferentiated constructive voice has a moderate zero- order association with job performance (1) that is nonsignificant when task performance and organisational citizenship behaviour are also considered (2). Although promotive voice has a positive association with job performance, the opposite is true for prohibitive voice. Voice could potentially be managed through a wide array of organisational practices and policies. whereas speaking up with ideas that reflect opportunities for the organisation may be rewarded, speaking up to prevent harm or loss to the organisation may be punished.	I = Voice (promotive and prohibitive) D = Job performance	(1) Job performance r = .30 (2) Job performance Task performance b = .48 OCB b = .20 Voice b = .02	Many variables	C
Chamberlin, 2017	correlational studies k = 151 N = 53,200	Employees	Empowerment and voice independently transmit the effects of high-performance managerial practices HPMP (skill-enhancing, motivation-enhancing, opportunity-enhancing) to job performance, but they sequentially mediate the relationship as well. The study reinforces the idea that HPMP are positively associated with feelings of empowerment, voice, and ultimately job performance.	I = HPMP D = job performance, empowerment, voice	Job performance r = 16 Empowerment r = .42 Voice r = .30 More ES in Table 2	no serious limitations	C

D'Innocenzo, 2016a	not specified k = 50 n = 3,198 (teams) N = 16,010		There is support for the positive relationship between shared leadership and team performance. There are a number of moderators (e.g. measurement technique, task complexity, team type). There is empirical support of adopting network conceptualisations. Understanding the network structure can provide specific information about who is dominating the interaction, who is peripheral, and if interactions are entrenched between two or three competing factions. The results suggest that, once established, shared leadership offers benefits in terms of higher team performance.	I = shared leadership D = team performance	Team performance r = .21	no serious limitations	C
De Jong, 2016	not specified k = 112 N = 7.763		Intrateam trust is positively related to team performance. The trust– performance relationship is contingent upon the level of task interdependence, authority differentiation, and skill differentiation in teams. Cognitive-based trust and affect-based trust dimensions have unique, positive relationships with team performance. The authors suggest to maximise team performance, trust building initiatives should focus on developing both cognitive and affective bases of trust within the team, and enhance team members' trust both in each other and in the team leader. Team trust will be most critical when team members work in a highly interdependent manner, with other members who possess unique skills and have different levels of authority in the team.	I = intrateam trust D = team performance	Team performance overall r = .30 Cognitive-based trust b = .24 Affect-based trust b = .15 Moderator analyses results in Table 1	Search terms not specified	C

Frazier, 2017	not specified k = 136 N = > 22,000, (5,000 groups)		Psychological safety impacts important organisational outcomes. It is positively related to information sharing, citizenship behaviours and task performance. There are personality traits that are positively related to psychological safety. The results indicate that psychological safety is impacted by positive leader relations (e.g. transformational leadership), workplace support (e.g. peer support), and work design (e.g. interdependence).	I = psychological safety D = task performance, OCB	Task performance r = .43 Information sharing r = .52 OCB r = .32	Search terms not specified	B
Garbers, 2014	laboratory experiments and quasi-experimental studies k = 146 N = 31,861		Individual and team-based financial incentives are positively related to peoples' performance. For individual incentives the effect size was larger for qualitative than quantitative performance measures, and smaller for less complex tasks. For team-based incentives equitably distributed rewards resulted in higher performance than equally distributed rewards. The effect of team-based rewards depends on team size and gender composition.	I = financial incentives D = job performance	g = .35 (overall) g = .32 (individual) g = .45 (team)	Search terms not specified No attempt to search for grey literature	
Greer, 2018	not specified k = 54 N = 13,914 teams		Hierarchy has the potential to both benefit and harm team effectiveness. On net, hierarchy negatively impacts team performance. This effect is mediated by increased conflict-enabling states. The negative relationship between hierarchy and team performance is exacerbated by aspects of the team structure (i.e., membership instability, skill differentiation) and the hierarchy itself (i.e., mutability), which make hierarchical teams prone to conflict. The predictions regarding the positive effect of hierarchy on team performance as mediated by coordination-enabling processes, and the moderating roles of several aspects of team tasks (i.e., interdependence, complexity) and the hierarchy (i.e., form) were not supported.	I = hierarchy D = team performance	r = -.08 More moderator	no serious limitations	

Gully, 2012	not specified k = 51		The research assessed the effects of level of analysis and task interdependence on the cohesion-performance relationship. Cohesion is positively related to performance. Level of analysis and task interdependence moderate the cohesion-performance relationship. There is a stronger relationship on the group level as compared to the individual level and for high task interdependence compared to low task interdependence.	I = cohesion D = performance	r = .199 overall	Some studies have small sample sizes	C
Hartnell, 2019	not specified k = 148 N = 26,196 organisations, 556,945 informants		The study assessed whether organisational culture dimensions CVF (Cameron & Quinn) explain additional variance in organisational outcomes apart from variance explained by leadership and high-performance work practices (HPWPs). Results show that organisational culture dimensions are collectively the most significant drivers (relative to leadership and HPWPs) of employee and operational outcomes, suggesting that adhocracy and clan values should be prioritised to support employee outcomes and adhocracy and market values should be emphasised to support operational outcomes. Results also indicate that HPWPs have the most important impact on organisational criteria such as innovation, customer, and financial outcomes.	I = culture D = organisational effectiveness	For overview of effect sizes see Table 4	no serious limitations	C

Kleingeld, 2011	3/4 lab studies, 1/4 field studies; only studies with pre-test and control group k = 49, N(groups) = 739; N(individuals) = 2954		Specific difficult goals yield considerably higher group performance compared with nonspecific goals. Moderately difficult and easy goals were also associated with performance benefits relative to nonspecific goals, but these effects were smaller. Unexpectedly, task interdependence, task complexity, and participation did not moderate the effect of group goals. Our inventory of multilevel goals in interdependent groups indicated that the effect of individual goals in groups on group performance was contingent upon the focus of the goal: 'Egocentric' individual goals, aimed at maximising individual performance, yielded a particularly negative group-performance effect, whereas 'group centric' goals, aimed at maximising the individual contribution to the group's performance, showed a positive effect. These findings demonstrate that group goals have a robust effect on group performance. Individual goals can also promote group performance but should be used with caution in interdependent groups.	I = group goals D = group performance	overall d = .56 specific & difficult d = 0.80 group centric d=1.2	No serious limitations	AA
Kurtessis, 2017	not specified k= 558		Perceived Organisational Support (POS) was positively related to effort on behalf of the organisation; in-role performance, and OCB. Note: perceived supervisory support correlates .6 (ß = .20) with POS.	I = perceived organisational support D = individual task performance	ρ = .19 (m) ρ = .22 (s) ρ = .16 (sv)	31 hypothesis were tested	C

Lee, 2018	not specified k = varying from 5 to 27, (n varies from 1000 to 8000)	population:	Evidence was found for the positive effects of Empowering Leadership (EL) on performance, organisational citizenship behaviour, and creativity at both the individual and team levels. At the individual level, both trust in leader and psychological empowerment mediated the relationships of EL with task performance, organisational citizenship behaviour, and creativity. We also found evidence that leader–member exchange was a significant mediator between EL and task performance. At the team level, empowerment mediated the effects of EL on team performance, whereas knowledge sharing showed no significant indirect effect.	I = empowering leadership D = task performance, OCB, creative performance (both individual and team)	ind task perf = ρ = .21 (m) ind task perf = ρ = .26 (s) ind task perf = ρ = .08 (obj) team perf = ρ = .24 (m) team perf = ρ = .29 (s) team perf = ρ = .24 (oth) ind OCB = ρ = .37 (m) ind OCB = ρ = .44 (s) ind OCB = ρ = .30 (oth) ind crea = ρ = .35 (m) ind crea = ρ = .40 (s) ind crea = ρ = .33 (oth) team crea = ρ = .32 (m)	Search strategy somewhat not specified CI's for task perf and creativity rather wide	C

Marlow, 2018	field and lab/ experimental studies k = 150	population	First, communication quality had a significantly stronger relationship with team performance than communication frequency. Second, further distinguishing between different communication types, classifying communication into the eight most commonly measured communication forms (e.g., knowledge sharing, information elaboration), has further value; information elaboration has the strongest relationship with performance while self-report frequency and objective frequency have the weakest relationships. Third, familiar and face-to-face teams exhibited a stronger relationship between communication and performance. Fourth, there was a significant difference between fully virtual teams and face-to-face teams. However, the difference between hybrid teams and face-to-face teams was not significant. Note: Shared leadership, task type, task interdependency, gender composition, publication year, sample type, study type, performance source, communication source, team size, team age, organisational tenure, and type of performance did not impact the strength of the relationship.	I = communication (general, information elaboration, knowledge sharing, information sharing) D = team performance	comm in general ρ = 0.31 knowledge sharing ρ = 0.44 general information sharing ρ = 0.30 information elaboration ρ = 0.52 Effect of familiarity on the relationship between communication and performance = ρ = 0.30	No serious limitations	AA

Martin, 2016	not specified k varies from 146 to 19	population	The results show a positive relationship between LMX and task performance and citizenship performance and negatively with counterproductive performance. Trust, motivation, empowerment and job satisfaction mediated the relationship between LMX and task and citizenship performance with trust in the leader having the largest effect.	I = LMX D = individual task performance & OCB	task performance ρ= .30 objective task performance ρ = .24 OCB ρ= .34	no serious limitations	C
Mathieu, 2015	longitudinal studies (and two additional single longitudinal studies) k=15 ((N = 737 teams)	Population:	Cohesion and performance were related positively and reciprocally over time (while controlling for previous performance). However, on average, the cohesion > performance relationship exceeded the performance > cohesion relationship. Moreover, the cohesion > performance relationship grew stronger over time whereas the performance > cohesion relationship did not. Our results suggest that it takes time for team cohesion, as an emergent state, to develop and solidify before it begins to relate significantly to later performance. Following this logic, one might conclude that it would be beneficial to try and accelerate the process by engaging in team building, chartering exercises, and other activities that are designed to enhance team morale and cohesion.	I = Group cohesion D = team performance	MA: ρ= .27 (T1) to .35 (T2)	No serious limitations	B

McEwan, 2017	RCT's, and controlled/ longitudinal studies k=72 (194 effect sizes and 8439 participants)	Population:	Balanced against the contributions and insights provided by the various moderator analyses conducted in this study, the overall take-home message is that teamwork training is an effective way to foster teamwork and team performance. These effects appear to be evident across a range of samples, utilising numerous intervention methods, and when considering various measurement characteristics. Interventions appear to be particularly effective when they target multiple dimensions of teamwork and include experiential activities for team members to actively learn about, practice, and continually develop teamwork (see section 'What Type of Training Works?')	I = teamwork training (see paper for types) D = team performance	overall d = 0.92. intact teams d= .99 new teams d = .54 ES's vary across settings: d= .4 - 1.76	No serious limitations	AA
Mesmer Magmus, 2017-1	not specified k = 270 (N = 58,592) note: performance ES based on 12 studies		With regards to personal benefits, trait mindfulness was found to be positively correlated with confidence, mental health, emotional regulation, and life satisfaction, and negatively correlated with perceived life stress, negative emotions, anxiety, and depression. Professionally, results suggest trait mindfulness may benefit job satisfaction, performance, and interpersonal relations, while also reducing burnout and work withdrawal. Note difference state vs trait mindfulness!	I = trait mindfulness D = individual job performance	ρ = .34	no serious limitations	C

Mesmer Magnus, 2017-2 (NOTE: update of DeChurch 2010)	not specified k = 28 (results from 4,943 teams / 19,575 individuals).		Results show consistent effects for team cognition in team process and performance. However, whereas originally compilational cognition was more strongly related to both team process and team performance than was compositional cognition, in the updated database, compilational cognition is more strongly related to team performance. In essence, this updated finding suggests that knowing who knows what (e.g. transactive memory) is more important to predicting effective and efficient team process, while having a shared understanding of the problem, task, or team (e.g. SMMs) is more influential in predicting the extent to which a team will be successful.	I = team cognition D = team performance Note: team cognition includes SMM (compositional cognition) and TMS (compilation cognition)	overall ρ = .36 compositional ρ = .39 compilational ρ = .029	no serious limitations	C
Mesmer Magnus, 2018	not specified k=39 (N = 5,618)		As hypothesised, we find that whereas team identity fully mediates the relationship between organisational identity and team affective constructs (i.e., aspects of team functioning not instrumental to the fulfillment of organisational identity), organisational identity uniquely and directly affects cooperative team behaviour and team performance.	I = organisational identity D = team performance	ρ = 31 ρ = 0.18	No differentiation between self-, sv, or objective measures of team performance	C

Murayama, 2012	not specified k = 65		The first meta-analysis revealed that there is no noteworthy relation between competition and performance. The second meta-analysis showed, in accord with the opposing processes model, that the absence of a direct effect is the result of inconsistent mediation via achievement goals: Competition prompts performance-approach goals which, in turn, facilitate performance; and competition also prompts performance- avoidance goals which, in turn, undermine performance. Note: no difference between US vs non-US, gender, type of performance, or sector.	I = interpersonal competition (trait or environmental) D = individual task performance	overall r = .05 (excluding outliers = .03)	no serious limitations	C
Ng, 2017	not specified k = 600+		The findings showed that TFL was related to variables that represented these mechanisms, which in turn were associated with non-self-report measures of employees' task performance, citizenship behaviour, and innovative behaviour.	I = transformational leadership D = task performance, OCB and innovative behaviour	self-report all around r = .4 non self report all around r = .25	no serious limitations	C
Nicolaides, 2014	not specified k = 467		Examines the relationship between shared leadership and team performance. Mediation analyses supported the hypothesis that team confidence partially mediates the effects of shared leadership on team performance. We also found support for the notion that shared leadership explains unique variance in team performance, over and above that of vertical leadership.	I = shared leadership D = team performance	ρ = .35 Note: SL explained an additional 5.7% of the variance in team performance beyond vertical leadership	no serious limitations	C

Nyberg, 2018	not specified k = 41		Provides a review of the theory and evidence pertaining to the relationships between different collective pay for performance (PFP) types and collective outcomes. We also provide a meta-analysis that shows that collective PFP has desirable outcomes, substantiating the value of studying collective PFP separately from individual PFP.	I = collective/team pay for performance D = performance (finaicial, operational, etc.)	low effect sizes (r = .1), irrespective of type of collective pay or type of performance outcome	inadequate search strategy	C
O'Boyle, 2017	not specified k = 102		Employee ownership has a small, but positive and statistically significant relation to firm performance (r = 0.04).	I = employee ownership (eg employee stock ownership plans) D = firm performance	r = .04	no serious limitations	C
Rudolph, 2017	not specified k = 122 (N = 35,670)		Findings from a meta-analysis of relationships between job crafting behaviours and their various antecedents and work outcomes.	I = job crafting D = individual task performance	self-rated R2 = 12% other-rated R2 = 11%	no serious limitations	C
Rudolph, 2018	cross-sectional and longitudinal studies k = 40 (N = 19,112)		Occupational future time perspective (OFTP) refers to employees' perceptions of their future in the employment context. OFTP is associated with ....., task and contextual performance.	I = OFTP D = individual task and contextual performance	task ρ = 0.11 cont ρ = 0.20	no serious limitations	B
Saridakis, 2017	longitudinal studies k = 8		The results demonstrate an overall reported correlation of 0.287. Additionally we find that a set of integrated, mutually reinforcing HPWPs has a stronger impact on firm performance than do HRM practices individually and that, this effect is statistically invariant between operational performance and financial performance.	I = HR practices D = firm performance	r = .21	Construct HRM practices is very broad (varies from training and personal development, to job design and compensation)	B

Schneid, 2016	not specified k = 74		The purpose of this paper is to synthesise the literature on the relationship between age diversity (AD) and the essential team outcomes (i.e. performance quality, financial performance, innovation and creativity, effectiveness, satisfaction, and turnover).	I = age diversity D = financial performance, effectiveness, performance quality, innovation and creativity	all ES close to zero and ns (irrespective of the way the outcome was measured)	no serious limitations	C
Shockley, 2012	not specified k = 114		The dimensional state affect results support the affect–behaviour congruence trend, such that positive affect positively related to behaviour that benefits the organisation (task performance and OCB) and negative affect showed a positive association with harmful organisational behaviour (CWB). Similarly, positive affect was negatively related to CWB, and negative affect was negatively related to task performance, although it did not relate to OCB.	I = affect state (emotions, mood) D = individual job performance	negative affect ρ = –.14 positive affect ρ = .20	no serious limitations	C
Sui, 2019	(all types of) experimental studies k = 45		Examined the impact of environmental, behavioural, and combined interventions to reduce occupational sedentary behaviour on work performance and productivity outcomes. Overall, standing interventions do not appear to impact productivity/ performance outcomes, whereas walking and cycling interventions demonstrate mixed null/negative associations for productivity outcomes.	I = interventions to reduce occupational sedentary behaviour D = productivity outcomes	0 or practically irrelevant	no serious limitations	AA

Turner, 2014	k = 18 (768 teams, n = 13,491)		The primary focus of this meta-analysis is to identify which measure of the six team cognition constructs (shared mental models, SMM; team mental models, TMM; information sharing, IS; transactive memory systems, TMS; cognitive consensus, CC; group learning, GL) produced the best performance outcome results. The one team cognition construct that stood out was that of IS, with statistical findings greater than the constructs of TMM, GL, and TMS. The two shared cognitive constructs that were not statistically different from IS were SMM and CC; neither of these constructs was found to be significantly different from TMM, GL, or TMS. Note: see discussion & conclusion.	I = team cognition D = team performance	SMM r = .39 TMM r = .19 ns IS r = .51 TMS r = .30 CC = .42 GL = .15 ns	no serious limitations	AA
Tzabbar, 2017	not specified k = 89		Despite the voluminous research on this issue, the differences in the relationships of various HRM practices explains only 4% of the variance in performance, whereas, societal context, industry sector and firm size explain 33%, 12% and 8%, respectively. Empirical contingencies including four categories of performance outcomes and four types of participants explain 13% and 9% of the variance in the results, respectively.	I = HR practices D = financial and operational performance	z/r = .09 r2 = 4%	search strategy not specified Construct HRM practices is very broad (varies from career opportunities to profit sharing)	D

Wang, 2014	not specified k = 42 (covering 3,439 teams and 32,616 individuals, with an average size of 9.48 members per team)		We meta-analytically cumulated 42 independent samples of shared leadership and examined its relationship to team effectiveness. Our findings reveal an overall positive relationship (.34). But perhaps more important, what is actually shared among members appears to matter with regard to team effectiveness. That is, shared traditional forms of leadership (e.g., initiating structure and consideration) show a lower relationship (.18) than either shared new-genre leadership (e.g., charismatic and transformational leadership; (.34) or cumulative, overall shared leadership (.35). In addition, shared leadership tends to be more strongly related to team attitudinal outcomes and behavioural processes and emergent team states, compared with team performance.	I = shared leadership D = subjective and objective team performance	subjective performance ρ = .22 objective performance ρ = .18	no serious limitations	C
Wendsche, 2017	not specified k = 91 (n = 38,124)		Results indicated average positive correlations between detachment and self-reported mental (i.e., less exhaustion, higher life satisfaction, more well-being, better sleep) and physical (i.e., lower physical discomfort) health, state well-being (i.e., less fatigue, higher positive affect, more intensive state of recovery), and task performance (small to medium sized effects).	I = detachment from work D = individual performance	task performance ρ = .09 contextual performance ρ = - .13 creativity ρ = - .11	Person characteristics (eg negative affectivity/ neuroticism) and work characteristics moderates the effect	C
Yu, 2018	not specified k = 41 (4,114 workgroups made up of 21,745 individuals)		In a meta-analytic investigation, we found that Leader Member Exchange (LMX) differentiation was detrimental to collective harmony and solidarity, as indicated by a consistent negative relationship with emergent states and group processes. In addition, we found that emergent states and group processes not only mediated the negative indirect relationship, but also suppressed the positive direct relationship between LMX differentiation and group performance.	I = Leader member exchange differentiation D = group performance	objective ρ = .06 subjective ρ = - .04 creative ρ = - .06	no serious limitations	C

Overview of excluded meta-analyses

Ahmad & Karim, 2019	Narrative review on impact of knowledge sharing, no quantitative performance outcomes provided.
Alegre et al, 2018	Narrative review on mission statements, no quantitative performance outcomes provided.
Aquilani et al, 2016	Narrative review on TQM success factors, no quantitative performance outcomes provided.
Aufegger et al, 2019	Narrative review on shared leadership, no quantitative performance outcomes provided.
Christian, Garza & Slaughter, 2011	The goals of this study were to identify an agreed-upon definition of engagement. We also found that engagement is related to several key antecedents and consequences.
Chung et al, 2018	Off topic: friendship and group performance. Many studies concern children. Many studies groups size is 2 or 3.
D'Innocenzo et al (2016b)	No meta-analysis or systematic review. The study advances and tests a multi-level model of empowerment which seeks to better understand the unique and synergistic effects between unit and individual empowerment in hospital units.
De Menezes & Kelliher, 2011)	Narrative review on flexible working arrangements and worker performance. The evidence fails to demonstrate a business case for the use of flexible working arrangements.
Erdogan et al, 2012	Narrative review and meta-analysis on life satisfaction and performance. Too many methodological flaws (r = 1.4 ??).
Evans & Dion, 1991	Article from 1991, included in earlier review?
Haas, 2010	Narrative review on diversity and team performance.
Han & Beyerlein, 2016	Systematic review effect of multinational cultural diversity on virtual team processes, framework development.
Knight, 2017	No performance outcomes were measured.
Knight, 2019	No performance outcomes were measured.
MacKay, 2017	Investigates the incremental validity of employee engagement in the prediction of employee effectiveness / performance (result: very low!).
Magpili, 2018	Narrative review, no quantitative performance outcomes provided.
Nielsen, 2017	Too many methodological shortcoming (e.g. construct 'resources' not specified, inclusion of only 'high impact journal' studies, etc).
Nye, 2017	Independent variable is vocational interests (= limited relevance given the REA question).
Paglis, 2010	Traditional, narrative review - no quantitative findings are provided.
Rafique, 2018	Outcome of interest is job satisfaction, no performance measures reported.
Shihag, 2019	Very broad construct ("Controls are defined as any process through which controllers motivate and direct controlees to behave in ways that are aligned with the controllers' objectives"), but only combinations with the word 'control' were used in the search strategy.
Zhou, 2014	No quantitative performance outcomes reported

Appendix IV

Factors/constructs that correlate with performance

Variable	Performance outcome	Knowledge work	Impact	ρ	k	Level	1st author & year
Task cohesion Shared commitment or attraction to the group task or goal as well as motivation to coordinate team efforts to achieve common work-related goals.	Team performance (Hard outcome measures)	+ -	++ -	.38 .12	185 21	C	Chiocchio, 2009
Social cohesion Shared liking or attraction to the group, emotional bonds of friendship, caring and closeness among group members, enjoyment of other's company or social time together.	Team performance (Hard vs Behavioural)	+ -	+++ ++	B= .70 H= .49 B= .30 H= .14	40 30 160 131		
Group cohesion The commitment of team members to their work team and their desire to maintain group membership.	Team innovation Team performance	+	++	I = .30 P = .19/.35	11 51 15	C/B	Hulsheger, 2009 Gully, 2012 Mathieu, 2015
Team Member Exchange (TMX) Horizontal relationships among team memberships.	Team performance		+	.25	27	C	Banks, 2014
Teamwork training Teamwork refers to the range of interactive and interdependent behavioural processes among team members that convert team inputs into outcomes.	Team performance	+	+++	d = .92	72	AA	McEwan, 2017

Interpersonal ties (instrumental & expressive) Patterns of informal connections (ties) among individuals within a team.	Team performance	+	+	I = .15 E = .22	17 9		Balkundi, 2008
Collectivism Loyal to their in-group and sacrifice for the sake of the group.	Team performance	+	+	.25	14		Bell, 2007
Team agreeableness Considerate, trusting, friendly: the degree to which team members engage in positive interpersonal processes.	Team performance	+	+	.12	29		
Job-relevant / task-related diversity The heterogeneity of team members with respect to job- or task-related attributes, such as function, profession, education, tenure, knowledge, skills, or expertise.	Team innovation	+	+	.16 .20	15 3		Horwitz 2007
				<.1	18		van Dijk, 2011
	Team performance	+/-	0	<.1	24		Horwitz, 2007
					48		Joshi, 2009
					55		van Dijk, 2011
Background / bio-demographic diversity Non-task-related differences such as age, gender, or ethnicity.	Team innovation	+	-	.13	8		Horwitz, 2007
				<.1	19		van Dijk, 2011
	Team performance	+/-	0	<.1	17		Horwitz, 2007
					69		Joshi, 2009
					84		van Dijk, 2011
					74	C	Schneid, 2016
Role ambiguity Lack of input from the environment to guide behaviour.	Employee performance	+/-	-	-.24	114		Gilboa, 2008

Role / task conflict Situation of conflict over task assignments, as well as the scheduling of delivery / Disagreements among team members about the content of the tasks being performed, including differences in viewpoints, ideas, and opinions.	Employee performance	+/-	-	.10	112		Gilboa, 2008
	Team innovation	+	0	<.1	13	C	Hulsheger, 2009
	Team performance	+/-	0	<.1	95		De Wit, 2012
Relationship conflict Social emotional conflicts stemming from interpersonal disagreements.	Team innovation	+	0	<.1	6	C	Hulsheger, 2009
	Team performance	+	-	.16	80		De Wit, 2012
Employee satisfaction	BU Performance	+/-	+	.22	42?		Harter, 2002
Employee engagement				.22			
Perceived organisational support	Individual task performance	+/-	+	.16/.23	80	C	Riggle, 2009 Kurtessis, 2017
Perceived supervisory support (*= boundary spanners, **= non boundary spanners).	Employee performance	+/-	+/+++	.53* .18**	5 4	C	Edmond-son, 2013
Support for innovation The expectation, approval and practical support of attempts to introduce new and improved ways of doing things in the work environment.	Individual innovation	+	+	.26	17	C	Hulsheger, 2009
	Team innovation		+++	.58	10		
Organisational commitment (affective / attitudinal)	Performance (White collar vs Blue collar)	+/-	+	WC= .20 BC= .10	84 4		Riketta, 2002

Organisational identity The psychological bonds employees form with their work teams and organisations.	Team performance		++	.31	39	C	Mesmer-Magnus, 2018
Individual empowerment (psychological) Intrinsic task motivation reflecting a sense of control in relation to one's work and an active orientation to one's work role that is manifest in four cognitions: meaning, self- determination, competence, and impact.	Task performance (self-rated)	+/-	+++	.54	12 (s)	C	Seibert, 2011
	Task performance (non-self rated)	+/-	+	.27	22 (s)		
	Innovation at work	+/-	++	.33	9 (s)		
Team empowerment Refers to shared perceptions among team members regarding the team's collective level of empowerment.	Task performance (self-rated)	+/-	+++	.60	6 (s)		
	Task performance (non-self rated)	+/-	++	.43	18 (s)		
Empowering leadership	Task performance (individual > objective) (team > other rated)		+	I = .08 T = .24	27	C	Lee, 2018
Participative safety Participative safety is characterised by two components: participation in decision-making and intragroup safety.	Individual innovation	+	+	.17	17	C	Hulsheger, 2009
	Team innovation			.15	15		
Leader-Member Exchange (LMX) Vertical relationships among supervisors and subordinates.	Team performance		+	.25	27	C	Banks, 2014
	Objective task performance		+	.24	146 to 19	C	Martin, 2016
Leader-Member Exchange (LMX) differentiation	objective performance		0	< .1	41	C	Yu, 2018
	subjective performance						
	creative performance						

Team trust	Team performance	+	+	.33	112	B/C	Breuer, 2016 De Jong, 2016
Psychological safety The belief that the workplace is safe for interpersonal risk taking.	Task performance Information sharing		+++	.43 .52	136	B	Frazier, 2017
Vision The extent to which team members have a common understanding of objectives and display high commitment to those team goals (syn: goal clarity or commitment to objectives).	Team innovation	+	+++	.49	17	C	Hulsheger, 2009
Internal communication Sharing of information and ideas within one's own team.	Team innovation	+	++	.36	13	C	Hulsheger, 2009
External communication Sharing of information and ideas with people outside the team or organisation.		+	++	.48	7		
Sense of humor Employees / leaders	Employee performance	+/-	++	E = .36 L = .16	3 9		Mesmer-Magnus, 2012
Task focused leadership	Objective team performance	+/-	+	.19	89	C	Burke, 2006 Ceri-Booms, 2017
Person focused leadership		+/-	+	.18	89		
Shared leadership	Team performance	+/-	++	.21 .35	50 467	C	D'Inno-cenz, 2016a Nicolaides, 2014
	Subjective performance			.22	42	C	Wang, 2014
	Objective performance			.18			
Transformational leadership	Task performance (self report & non-self report)		++	s = .4 ns = .25	600	C	Ng, 2017

Task interdependence The extent to which team members are dependent on one another to carry out their tasks and perform effectively.	Team innovation	+	0	<. 1	4	C	Hulsheger, 2009
Goal interdependence The extent to which team members' goals and rewards are related in such a way that an individual team member can only reach his or her goal if the other team members achieve their goals as well.			++	.28	5		
Telework	Productivity (perceived)	+	+	.23	5		Harker, 2001
Flexible work (telecommuting)	Employee performance (self rated)	+	0	< .1	9		Gajendran, 2007
	Employee performance (objective)	+	+	.18	4		
Flextime work (schedules)	Productivity	+/-	++	d = .45	4		Baltes, 1999
	Performance (self rated)	+/-	0	d = .04	5		
Compressed work schedules	Productivity	+/-	0	d = .04	4		
	Performance (supervisory rated)	+/-	++	d = .4	4		
Preference for teamwork	Team performance	+	+	.18	10		Bell, 2007
Voice Employee suggestions regarding opportunities and initiatives to improve future organisational functioning.	Job performance		++	.30	189	C	Chamber-lin, 2017
Situational constraints	Employee performance	+/-	-	.19	8		Gilboa, 2008

Emotional intelligence	Team performance	+	+	.18	6		Bell, 2007
Organisational cynicism Negative attitude toward one's employing organisation.	Job performance (self report)	+/-	0	<.1	4		Chiabaru, 2013
Intrinsic motivation	Performance quality	+/-	++	.35	183	C	Cerasoli, 2014
	Performance quantity			.26			
Intrinsic motivation & direct incentives	Performance			.30			
Intrinsic motivation & indirect incentives	Performance			.45			
Financial incentives (individual and team based).	Job performance		++	g = .32 (ind) g = .45 (team)	146	A	Garbers, 2014
Collective pay for performance	Performance (financial, operational)		0	< .1	41	C	Nyberg, 2018
Employee ownership (e.g. employee stock ownership plans).	Firm performance		0	< .1	102	C	O'Boyle, 2017

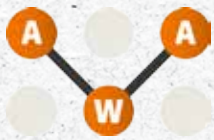




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EXECUTIVE SUMMARY

Rapid Evidence Assessment (REA)



FACTORS ASSOCIATED WITH KNOWLEDGE WORKER PERFORMANCE

a summary of research literature

July 2019

Culture Review **Implementation**

our journey of positive change

ACT Government

The REA that this Executive Summary is based upon was produced by the Center for Evidence Based Management (CEBMa). The ACT Government acknowledges and thanks the CEBMa for allowing ACT Health to reproduce and redesign the content of their REA.

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What is a Rapid Evidence Assessment (REA)?



Rapid Evidence Assessments (REAs) use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and as a result, the likelihood of bias is considerably smaller.

Background

In mid-2013 this REA was commissioned by the Center for Evidence Based Management (CEBMa) for a group of eight companies to understand the factors that determine knowledge worker performance. In July 2019, the REA was updated and funded by Novartis and Advanced Workplace Associates (AWA).

What this REA assesses

This REA attempts to confirm the factors associated with knowledge worker performance. It also considers the following supplementary questions:

1. **What is 'knowledge work'?**
2. **Which of the factors that have an impact on the performance of knowledge workers are most widely studied and what is known of their effect?**
3. **Which eight factors have the biggest impact on performance?**

Main findings

1. What is ‘knowledge work’?

Defined in 1959 by Peter Drucker, the term ‘knowledge work’ describes work that occurs primarily because of mental processes rather than physical labour. In the last century, the proportion of the global workforce engaged in ‘knowledge work’ has increased dramatically as organisations have moved from manual production to more knowledge-driven production, as the following estimates suggest:

1920: 30% (Davenport, et al., 2002).

1956: 50% (Naisbitt, 1982).

1980: 70% (Thomas & Baron, 1994).

Since then many definitions and publications on the topic have been put forward. When examined in more detail the definitions have the following common elements:

- Distribution of application of knowledge.
- Highly educated, autonomous professionals.
- Use of information technology as an integral part of the work process.
- A work process that is difficult to standardise
- Complex and intangible outcomes.

To assess the level of knowledge work in a particular job, the following aspects of the role need to be examined:

- **Autonomy** – the degree of worker control over how a task is done.
- **Structure** – the degree of established rules, policies, or procedures about how a task is done.
- **Knowledge** – the degree to which having previous knowledge and executing cognitive processes are part of the task.
- **Complexity** – the degree to which a task offers difficulty in understanding or has confusing interrelated sub-tasks.
- **Routine and repetitiveness** – the degree to which a task is part of a regular or established procedure characterised by habitual or mechanical performance of tasks.
- **Physical effort** – the degree to which a task requires body strength, coordination, and skill in order to be performed.

2. Which of the factors that have an impact on the performance of knowledge workers are most widely studied and what is known of their effect?

A total of 85 factors were identified, accounting for more than 145 effect sizes. More detail is provided in Annex III of the REA.

The following eight factors demonstrated a large effect on performance – for more details refer to the table under Question 2 in the complete version of 'Rapid Evidence Assessment (REA) Factors related to Knowledge Worker Performance – a summary of research literature, July 2019':

- Social cohesion.
- Perceived Supervisory Support and Perceived Support for Innovation.
- Information Sharing.
- Vision and goal clarity.
- External communication.
- Team Empowerment.
- Psychological Safety.
- Group Goals.



3. Which eight factors have the biggest impact on performance?

Factor 1 Social cohesion

Social cohesion refers to a shared liking or attraction to the group, emotional bonds of friendship, caring and closeness among group members and enjoyment of each other's company (Chiocchio, 2009). Whilst social cohesion is dynamic it is unlikely to change dramatically in the short term.

Social cohesion can enhance performance when there is high levels of psychological safety. This means that members of a group feel free to explore new ways of doing things and are more able to take risks in situations in which they have a reliable bond with other significant team members. Knowledge workers who have strong feelings of belonging and attachment to their colleagues are more likely to cooperate and interact with each other and are therefore more able to exchange ideas and share information (Hulsheger et al., 2009). For example, operating room nurses are more likely to share innovative ideas to improve patient safety with surgeons when there is a high level of social cohesion between these two professional groups.

Factor 2 Perceived Supervisory Support & Support for Innovation

Perceived Supervisory Support (PSS) refers to how knowledge workers feel their supervisor helps them in times of need, praises them or the team for a task well done or recognises them for extra effort. A related term, Support for Innovation (SFI) refers to the expectation, approval and practical support of a worker's attempt to introduce new ways of doing things.

Both constructs are important in allowing workers to perform at high levels, to meet defined goals and objectives and therefore be of value to their supervisor and organisation.

Factor 3 Information Sharing (IS)

IS is the extent to which teams use each individual member's distinctive knowledge or expertise for the broader team's benefit. IS is particularly important to solve complex problems by individuals sharing their knowledge and past experiences to discuss ideas and generate new ideas.

An important concept related to IS is Transactive Memory System (TMS). This concept was first developed through the observation of dating couples. Researchers noted that dating couples in a close relationship treat their partners as an external memory device. TMS within a team refers to a form of knowledge that is embedded in a team's collective memory. This collective memory works like an indexing system that tells members who knows what.

It is believed that the more team members share information, the better the group decisions will be, and as a result the better overall group performance (Hackman, 1990). IS is also believed to increase the awareness of who knows what in a group (TMS). In addition, a well-developed TMS will enable teams to more effectively solve complex problems because they access and make best use of every team member's expertise.

Factor 4 Vision and Goal Clarity

Vision refers to an idea of a valued outcome which represents a higher order goal and motivating force at work (Kouzes & Pozner, 1987; West, 1990). Several studies support the finding that a clear vision at the team level tends to also have a positive effect on the performance of individual teams. Vision at the team level is also referred to as 'goal clarity.'

Vision and Goal Clarity can enhance performance as several research studies have confirmed that for a team to be effective individual members need to be committed to team objectives and share a sense of purpose and responsibility (Hulsheger et al., 2009). This shared commitment can help to point a team of knowledge workers in the same direction; enhancing cooperative and goal-directed behaviour. Clear goals also help knowledge workers see connections between their personal values and team values, which increases the degree to which they find meaning in their work (Wright & Pandey, 2011). A clear vision and commitment to long-term objectives, therefore, plays an important role in allowing knowledge workers the 'freedom to act' as well as ensuring they are responsible for producing results (Simon, Staschel, & Covin, 2011).



Factor 5 External Communication

External communication refers to the ability of teams to span boundaries (team and organisational) to seek information and resources from others. Research has shown that the more external communication knowledge workers experience with colleagues outside of their team or organisation, the more likely they are to be innovative (Hulsheger et al., 2009). A study of over 400 Californian hospitals over 10 years found considerable support for the relationship between inter-organisational links and innovation in hospital services and technology (Goes & Park, 1997).

External communication provides knowledge workers with new knowledge and perspectives. This triggers the development of new ideas or levels of creativity to adopt new ways of doing things (innovation). Knowledge worker teams who use external communication to solve creative tasks tend to enable enhanced performance and results.

Factor 6 Team Empowerment

Psychological empowerment refers to the perception that workers can perform their tasks competently and have autonomy to decide how to do their jobs, and that their behaviour makes a difference. Team empowerment therefore refers to the shared

perceptions among team members regarding the team's collective level of empowerment. Teams that are more empowered feel that they have more meaningful work, and as a group, have a higher degree of choice or discretion in deciding how they carry out their team tasks (Seibert, 2011).

Psychological empowerment enables teams to perform well because they have increased:

- Amounts of information and control over their own work.
- Work-related knowledge, skills and abilities.
- Motivation to achieve the goals of their organisation.

Factor 7 Psychological safety

In 1999, Amy Edmondson, a Novartis professor of leadership and management at the Harvard Business School developed the term 'psychological safety' - 'a shared belief held by members of a group that it is safe for 'interpersonal risk taking' – a sense of confidence that others will not embarrass, reject or punish someone for speaking up.' She notes that psychological safety is related to intra-team trust, and includes:

- Respect for each other's competence.
- Care for each other as individual people.
- Trust in each other's intentions.

She emphasises that psychological safety does increase by talking about the need for it or to urge others to trust, because it is determined by the group members' experiences.

Group learning is more effective when a high level of psychological safety is present in the group. If members of a group feel psychologically safe, they will be more willing to ask for help, admit errors and seek feedback. And the responses they receive will foster learning in the group and improve team performance.

Factor 8 Group goals

In people's personal lives, a goal is something they are trying to do or achieve. In management, a goal can be defined as an observational or measureable organisational outcome to be achieved within a specified time limit (Locke & Latham, 2002). Organisational goal setting can refer to desired work or business outcomes, as well as the intention or plan to act towards them.



Goal setting is one of the most highly researched topics in the field of industrial and organisational psychology. A large number of high-quality studies have consistently demonstrated that specific, difficult goals yield higher performance than non-specific goals, and specific, difficult goals yield higher performance than specific, easy goals. Several studies also reveal that setting goals at the group level may yield higher performance than individual goals (Kleingeld, 2011). Additionally, group goals tend to trigger unique motivational mechanisms such as planning, cooperation, morale-building communication, and collective efficacy within a team.

According to goal-setting theory, goals affect performance through the following four causal mechanisms (Latham, 2004):

- Goals serve a directive function. The focus a worker's attention and effort towards goal-relevant activities.
- Goals have an energising function. High goals lead to greater effort than low goals.
- Goals affect persistence. When workers are allowed to control the time they spend on a task, hard goals prolong effort.
- Goals affect action indirectly by leading to the arousal, discovery and/or use of task-relevant knowledge and strategies, which increases the odds for success.

Conclusion

Knowledge worker productivity is widely studied, with the available evidence rich in quantity and quality. There is a wide range of factors that are associated with knowledge worker productivity of which all eight factors referenced in this REA demonstrates the largest positive correlations.

More information

You can access more information in the *Rapid Evidence Assessment (REA) - Factors related to Knowledge Worker Performance – a summary of research literature, July 2019.*

References

Ancona, D. G., & Caldwell, D. F. (1992). External Activity and Performance in Organisational Teams. *Administrative Science Quarterly, 37*(4), 634-665.

Antman, E. M. (1992). A comparison of results of meta-analyses of randomised controlled trials and reccommendations of clinical experts. *Journal of the American Medical Association, 286*(2), pp. 240-248.

Bowling, N. A. (2007). Is the job satisfaction-job performance relationship spurious? A meta- analytic examination. *Journal of Vocational Behaviour, 71*(2), 167.

Brunell, A. B., Davis, M. S., Schley, D. R., Eng, A. L., van Dulmen, M. H. M., Wester, K. L., & Flannery, D. J. (2013). A New Measure of Interpersonal Exploitativeness. *Frontiers in Psychology, 4*(299).

Burton, P., Y., W., & Prybutok, V. R. (2012). Differential Effects of the Volume and Diversity of Communication Network Ties on Knowledge Workers' Performance. *IEEE Transactions On Professional Communication, 55*(3).

Bushman, B., & Wells, G. (2001). Narrative impressions of literature: The availability bias and corrective properties of meta-analytic approaches. *Personality and Social Psycholgy Bulletin, 27*(9), 1123-1130.

Caron, A. V., & Spinks, K. S. (1995). The Group Size-Cohesion Relationship in Minimal Groups. *Small Group Research, 26*(1), 86-105.

Carron, A. V., & Chelladurai, P. (1981). The dynamics of group cohesion in sport. *Journal of Sport Psychology, 3,* 123-139.

Chalmers, I., Enkin, M., & Keirse, M. (1993). Preparing and updating systematic reviews of randomised controlled trials of health care. *Millbank Quarterly(71),* 411-437.

Chiocchio, F. (2009). Cohesion and Performance: A Meta-Analytic Review of Disparities Between Project Teams, Production Teams, and Service Teams. *Small Group Research, 40*(4), 382-420.

Clarke, C., Harcourt, M., & Flynn, M. (2013). Clinical Governance, Performance Appraisal and Interactional and Procedural Fairness at a New Zealand Public Hospital. *Journal of Business Ethics(117),* 667-678.

Connell, J., Ferres, N., & Travaglione, T. (2003). Engendering trust in manager- subordinate relationships: Predictors and outcomes. *Personnel Review, 32*(5), 569-587.

Cunningham, T. R., & Austin, J. (2007). Using Goal Setting, Task Clarification, and Feedback to Increase the Use of the Hands-Free Technique by Hospital Operating Room Staff. *Journal of Applied Behaviour Analis, 40*(4), 673-677.

Daly, J. (2005). *Evidence-Based Medicine and the Search for a Science of Clinical Care.* Berkeley: University of California Press.

Davenport, T., Thomas, R., & Cantrell, S. (2002). The Mysterious Art and Science of Knowledge-Worker Performance. *MIT Sloan Management Review, October.*

Dirks, K. T., & Ferrin, D. L. (2002). Trust in leadership: Meta-analytic findings and implications for research and practice. *Journal of Applied Psychology, 87*(4), 611-628.

Drucker, P. (1959). *The Landmarks of Tomorrow.* New York, NY: Harper & Row.

Edmondson, D. R., & Boyer, S. L. (2013). The Moderating Effect of the Boundary Spanning Role on Perceived Supervisory Support: A Meta-Analytic Review. J*ournal of Business Research, 66*(11), 2186.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organisational support. *Journal of Applied Psychology, 71,* 500-507.

Erez, M. (1977). Feedback: a necessary condition for the goal setting-performance relationship. *Journal of Applied Psychology, 62,* 624-627.

Fink, A. (1998). *Conducting Research Literature Reviews: From Paper to the Internet.* London: Sage Publications.

Gambetta, D. G. (1988). *Can we Trust Trust?* . In D. G. Gambetta (Ed.), Trust: Making and Breaking Cooperative Relations (pp. 213-217). New York: Basil Blackwell.

Goes, J. B., & Park, S. H. (1997). Interorganisational Links And Innovation: The Case Of Hospital Services. *Academy of Management Journal, 40*(3), 673-696.

Gouldner, A. (1960). The norm of reciprocity: a preliminary statement. *Am. Sociol. Rev., 25,* 161- 178.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of Innovations in Service Organisations: Systematic Review and Recommendations. *Milbank Quarterly, 82,* 581-629.

Hackman, J. R. (Ed.). (1990). *Groups that work (and those that don't): Conditions for effective teamwork.* San Francisco: Jossey-Bass.

Heerwagen, J., Kampschroer, K., Powell, K., & Loftness, V. (2004). Collaborative knowledge work environments. *Building Research & Information, 32*(6), 510- 528. doi: 10.1080/09613210412331313025

Higgins, J., & Green, S. (Eds.). (2006). *Cochrane Handbook for Systematic Reviews of Interventions (Vol. Version 5.1.0. (updated March 2011)).* Chichester, UK: John Wiley & Sons, Ltd.

Hsu, J. S.-C., Shih, S.-P., Chiang, J. C., & Liu, J. Y.-C. (2012). The impact of transactive memory systems on IS development teams' coordination, communication, and performance. *International Journal of Project Management, 30*(3), 329-340. doi: 10.1016/j.ijproman.2011.08.003

Hülsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: a comprehensive meta- analysis spanning three decades of research. *Journal of Applied Psychology, 94*(5), 1128-1145.

Klein, C., DiazGranados, D., Salas, E., Huy, L., Burke, C. S., Lyons, R., & Goodwin, G. F. (2009). Does Team Building Work? *Small Group Research, 40*(2), 181-222.

Korsgaard, A. M., Schweiger, D. M., & Sapienza, H. J. (1995). Building Commitment, Attachment, and Trust in Strategic Decision-Making Teams: The Role of Procedural Justice. *Academy of Management Journal, 38*(1), 60-84.

Kouzes, J. M., & Pozner, B. Z. (1987). *The leadership challenge.* San Francisco, CA.: Jossey- Bass.

Laschinger, H. K., Spence, R. N., Finegan, J., Shamian, J., & Casier, S. (2000). Organisational Trust and Empowerment in Restructured Healthcare Settings: Effects on Staff Nurse Commitment. *Journal of Nursing Administration, 30*(9), 413-425.

Latham, G. (2009). Motivate employee performance through goal setting. In E. A. Locke (Ed.), *Handbook of principles of organisational behaviour (pp. 161-179).* Chichester, UK: Wiley.

Locke, E. A., & Latham, G. (1990). *A Theory of Goal-setting and Task Performance.* Englewood Cliffs, NJ.: Prentice Hall.

March, J. G., & Olsen, J. (1975). The Uncertainty of the Past: Organisational Learning Under Ambiguity. *European Journal of Political Research, 3,* 149-171.

Moore, A., & Mamiseishvili, K. (2012). Examining the relationship between emotional intelligence and group cohesion. *Journal of Education for Business, 87*(5), 296-302.

Morello, R. T., Lowthian, J. A., Barker, A. L., McGinnes, R., Dunt, D., & Brand, C. (2013). Strategies for improving patient safety culture in hospitals: a systematic review. *BMJ Quality and Safety, 22*(8).

Naisbitt, J. (1982). *Megatrends.* New York, NY: Warner Brooks.

Petticrew, M. (2001). Systematic reviews from astronomy to zoology: myths and misconceptions. *British Medical Journal, 322*(January), 98-101.

Petticrew, M., & Roberts, H. (2006). *Systematic Reviews in the Social Sciences: A Practical Guide.* Oxford: Blackwell Publishing.

Robertson, R., Gockel, C., & Brauner, E. (2012). Trust your teammates or bosses? Differential effects of trust on transactive memory, job satisfaction, and performance. *Employee Relations, 35*(2), 222-242.

Shadish, W., Cook, T., & Campbell, D. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference.* Boston: Houghton Mifflin Company.

Simon, M., Staschel, C., & Covin, J. G. (2011). The Effects of Entrepreneurial Orientation and Commitment to Objectives on Performance. *New England Journal of Entrepreneurship, 14*(2).

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal, 38*(5), 1442-1465.

Straus, S. E., Soobiah, C., & Levinson, W. (2013). The impact of leadership training programs on physicians in academic medical centers: a systematic review. Acad Med 2013; 88(5):710-723. *Academic Medicine, 88*(5), 710-723.

Tan, K. T., Adzhahar, F., Lim, I., Chan, M., & Lim, W. S. (2014). Transactive memory system as a measure of collaborative practice in a geriatrics team: implications for continuing interprofessional education. *Journal of Interprofessional Care, 28*(3), 239.

Tayfur, O., & Arslan, M. (2013). The Role Of Lack Of Reciprocity, Supervisory Support, Workload And Work—Family Conflict On Exhaustion Evidence From Physicians. *Psychology Health & Medicine, 18*(5), 564-575.

Thomas, B. E., & Baron, J. P. (1994). Evaluating knowledge worker productivity: literature review. *Interim Report, No. FF-94/27, USACERL, pp. 1-27.*

West, M. A. (1990). The social psychology of innovation in groups. In J. L. Farr (Ed.), *Innovation and Creativity at Work: Psychological and Organisational Strategies. (pp. 309-333).* Chichester, UK: Wiley.

Wright, B. E., & Pandey, S. K. (2011). Public Organisations and Mission Valence: When Does Mission Matter? *Administration & Society, 43*(1), 22-44.

Xu, R., Carty, M. J., Orgill, D. P., Lipsitz, S. R., & Duclos, A. (2013). The teaming curve: a longitudinal study of the influence of surgical team familiarity on operative time. *Annals of Surgery, 258*(6), 953-95.

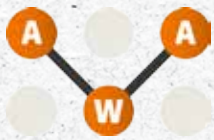




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Rapid Evidence Assessment (REA)



THE EFFECTIVENESS OF LEADERSHIP TRAINING

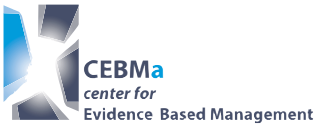
a summary of research literature

January 2020

Culture Review **Implementation**

our journey of positive change

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Background

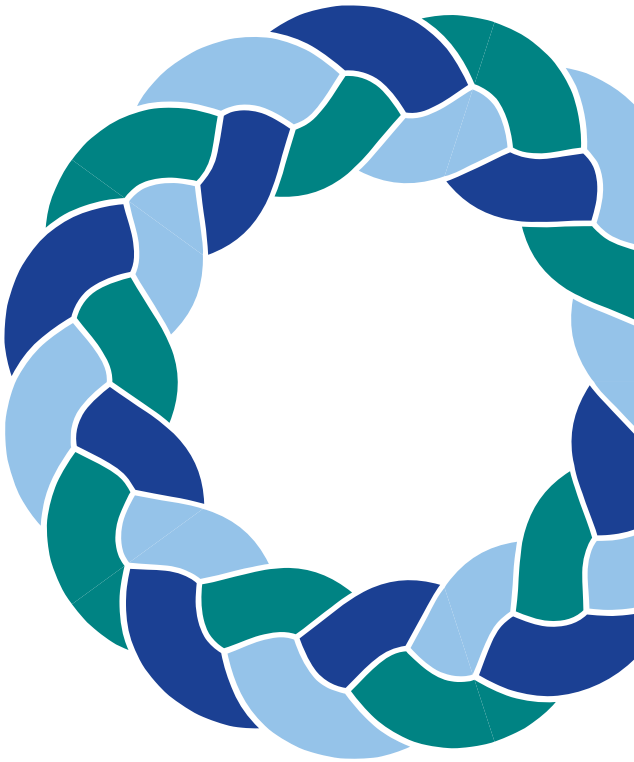
In 2013, a group of Dutch hospitals sought to review the effectiveness of their leadership training programs that were offered to their managers and physician executives. For this reason, the hospitals commissioned the Center for Evidence Based Management (CEBMa) to conduct a Rapid Evidence Assessment (REA) of the scientific literature on the attributes of effective leadership training programs. In 2019, CEBMa was approached by the ACT public health system to conduct an update of this review.

What is a Rapid Evidence Assessment (REA)?

Evidence reviews come in many forms. One of the best-known types is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: clear criteria for inclusion are often lacking and studies are selected based on the researcher's individual preferences. As a result conventional literature reviews are prone to severe bias. This is why 'rapid evidence assessments' (REAs) are being used.

This type of review is a specific research methodology that aims to identify the most relevant studies on a specific topic as comprehensively as possible, and to select appropriate studies based on explicit criteria. In addition, the methodological quality of the studies included is assessed by two independent reviewers on the basis of explicit criteria. In contrast to a conventional literature review, a REA is transparent, verifiable, and reproducible, and, as a result, the likelihood of bias is considerably smaller.





Main question: What does this REA answer?

What is known in the scientific literature about the effectiveness of leadership training programs? In addition, what are the characteristics of effective leadership training programs?

Supplementary questions

1. **What is leadership?**
2. **How can leadership be measured?**
3. **What is the effect of leadership training?**
4. **What are the characteristics of effective leadership training programs?**

Search strategy: How was the research evidence sought?

The following four databases were used to identify studies: ABI/INFORM Global from ProQuest; Business Source Premier from EBSCO; PsycINFO from Ovid; and, Web of Science from Thomson Reuters. The following generic search filters were applied to all databases during the search:

1. **Scholarly journals, peer-reviewed.**
2. **Published in the period 1995 to 2019.**
3. **Articles in English.**

A search was conducted using combinations of different search terms, such as 'leadership', 'training', and 'course'. We conducted 53 different search queries and screened the titles and abstracts of more than 700 studies. All queries, criteria and search results are described in detail in Appendix 1.

Selection process: How were the studies selected?

Study selection took place in two phases. First, the titles and abstracts of the 700+ studies were screened for their relevance to this REA. In case of doubt, lack of information, or disagreement, the study was included. Duplicate publications were removed. This first phase yielded 25 (2013) and 21 (2019) studies. Secondly, studies were selected based on the full text of the article according to the following inclusion criteria:

1. Only meta-analyses, systematic reviews, or controlled/ longitudinal studies.
2. Only studies in which the association with (knowledge worker) performance were measured.
3. Only studies related to workplace settings.
4. Only studies that were graded level C or above (see below).

Two reviewers worked independently to identify which studies would be included. Where the reviewers disagreed on inclusion, a third reviewer assessed whether the study was appropriate for inclusion with no prior knowledge of the initial reviewers' assessments. The decision of the third reviewer was final. This second phase yielded 17 (2013) and 14 (2019) studies, making a total of 31. An overview of the selection procedure is provided in Appendix II.

Critical appraisal: How were the quality of the included studies judged?

Methodological Appropriateness

In almost any situation it is possible to find a scientific study to support or refute a theory or a claim, and sometimes to quite a large degree. It is therefore important to determine which studies are trustworthy (i.e. valid and reliable) and which are not. The trustworthiness of a scientific study is first determined by its methodological appropriateness. For cause-and-effect claims (i.e. if we do A, will it result in B?) a study has a high methodological appropriateness when it fulfils the three conditions required for causal inference: co-variation, time-order relationship, and elimination of plausible alternative causes (Shaughnessy & Zechmeister, 2006).

A study that uses a control group, random assignment and a before-and-after measurement is therefore regarded as the 'gold standard'. Non-randomised studies and before-after studies come next in terms of appropriateness. Cross-sectional studies (surveys) and case studies are regarded as having the greatest chance of showing bias in the outcome and therefore sit lower down in the ranking in terms of appropriateness. Meta-analyses in which statistical analysis techniques are used to pool the results of controlled studies are therefore regarded as the most appropriate design.

To determine the methodological appropriateness of the included studies' research design, the classification system of Shadish, Cook and Campbell (2002), and Petticrew and Roberts (2006) was used. The following four levels of appropriateness were used for the classification:

Design	Level
Systematic review or meta-analysis of randomised controlled studies	AA
Systematic review or meta-analysis of controlled and/or before-after studies	A
Randomised controlled studies	
Systematic review or meta-analysis of cross-sectional studies	B
Non-randomised controlled before-after studies	
Interrupted time series	
Controlled studies without a pretest or uncontrolled studies with a pretest	C
Cross-sectional studies	D

It should be noted, however, that the level of methodological appropriateness as explained above is only relevant in assessing the validity of a cause-and-effect relationship that might exist between a predictor/driver (organisational culture) and its outcomes (performance), which is the purpose of this review.

Methodological Quality

In addition, a study's trustworthiness is determined by its methodological quality (its strengths and weaknesses). For instance, was the sample size large enough and were reliable measurement methods used? To determine methodological quality, all the studies included were systematically assessed on explicit quality criteria. Based on a tally of the number of weaknesses, the trustworthiness was downgraded and the final level was determined as follows: a downgrade of one level if two weaknesses were identified; a downgrade of two levels if four weaknesses were identified, etc.

Effect sizes

Finally, the effect sizes were identified. An effect (e.g. a correlation, Cohen's d or omega) can be statistically significant but may not necessarily be of practical relevance: even a trivial effect can be statistically significant if the sample size is big enough. For this reason, the effect size – a standard measure of the magnitude of the effect – of the studies included was assessed. To determine the magnitude of an effect, Cohen's rules of thumb (Cohen, 1988) were applied. According to Cohen a 'small' effect is an effect that is only visible through careful examination. A 'medium' effect, however, is one that is 'visible to the naked eye of the careful observer'. Finally, a 'large' effect is one that anybody can easily see because it is substantial.

Outcome of the critical appraisal

The overall quality of the 31 studies included in this review is moderate to high: 18 studies were graded level B or higher. An overview of all studies is provided in Appendix III.

Main findings

1. What is leadership?

In the domain of management and organisations, the term, 'leadership' is a popular term. In management books as well as in the scientific literature the effect of leadership is widely discussed and studied. Amazon offers thousands of management books with 'leadership' in the title, and the research database ABI/INFORM contains more than 15,000 peer reviewed papers on this topic. In fact, both scholars and practitioners, view leadership as an important if not fundamental driver for organisational performance (Pfeffer, 2015).

Despite the large number of publications, however, there is no consensus of what 'leadership' entails. As a result, there are many definitions of leadership available. For example, the Oxford dictionary defines leadership as 'the ability to be a leader or the qualities a good leader should have', whereas Wikipedia refers to leadership as 'a process of social influence in which a person can enlist the aid and support of others in the accomplishment of a common task'. Sometimes the term 'leadership' is limited to 'personal influence resulting in enthusiastic commitment of followers' (Schyns, 2013). For example, some management thinkers simply define leadership as 'the capacity to translate vision into reality' (Warren Bennis), or 'empowering others' (Bill Gates).

In addition, there is an ongoing controversy regarding the distinction between leadership and management. Conventional wisdom has it that managers are concerned with how things get done, whereas leaders build commitment and vision (Kotter, 1990). However, as Yukl (1989) stated, 'Nobody has proposed that managing and leading are equivalent, but the degree of overlap is a point of sharp disagreement' (Collins, 2002). In this review, however, the terms 'leadership' and 'management' are used interchangeably.

The lack of a widely-accepted definition of leadership and what it entails complicates research on the effect of leadership training programs. Leadership training programs use a plethora of definitions and core attributes of leadership, which makes a robust and comparable evaluation of their impact difficult.

2. How can leadership be measured?

There are many assessment tools and questionnaires available that claim to measure leadership. Most of these tools focus on a specific element or type of leadership, such as the Leadership Style Questionnaire (Northouse, 2011) and the Servant Leadership Behaviour Scale (Sendjaya, 2008). A recent systematic review that evaluates the psychometric properties of 17 leadership scales found that the majority lack some degree of rigour. Partly for this reason, most studies included in this review don't measure leadership as such, but rather evaluate the impact (transfer) of leadership training programs by using Kirkpatrick's model (Collins, 2001; Fritch, 2015). Kirkpatrick's assessment model comprises four levels, presented as a sequence:

1. **Reaction:** what participants think and feel about the training program.
2. **Learning:** the resulting increase in knowledge, skills, and change attitudes.
3. **Behaviour:** the resulting change in practice and behaviour.
4. **Results:** the resulting organisational benefits (e.g. performance, service delivery, clinical outcomes).

3. What is the effectiveness of leadership training programs?

Finding 1: **Overall, leadership training has a moderate effect (Level AA)**

Finding 2: **The effectiveness of leadership training has somewhat improved over the past decades (Level A)**

Finding 3: **The effects on some outcomes seem to be stable over time (Level A)**

Overall, leadership training and development programs have a moderate positive effect on a wide range of outcomes (Au, 2005; Avolio, 2009; Collins, 2004; Eden, 2000; Lacerenza, 2017; Mesmer, 2010; Taylor, 2009). This result is largely replicated across studies irrespective of the source of evaluation (self-, superior-, peer-, or subordinate ratings) or study designs (meta-analysis and controlled studies). The effects on learning outcomes, however, tend to be larger than the effects on performance outcomes (Fritch, 2015; Taylor, 2005).

Surprisingly, although there have been numerous innovations in leadership theory and training techniques, the effectiveness of leadership training seems to have only slightly improved over the past 20 years (Lacerenza, 2017; Powel, 2010). Finally, a meta-analysis of randomised controlled studies showed that, although effects on declarative knowledge decayed over time, training effects on skills and job behaviour remained stable or even increased (Taylor, 2005).



Finding 4: The evidence on the economic return on investment of leadership training is unclear (Level B)

The studies included in this REA provide limited information on the economic utility or Return on Investment (ROI) of leadership training. A meta-analysis that attempted to calculate the ROI of leadership training, caution that the financial returns are unclear, especially for higher-level managers and leaders (Morrow, 1997). It is therefore recommended by some authors to limit the expenses through, for example, controlling additional expenses such as travel and accommodation, and avoiding expensive 'high-end' training.

Finding 5: The effectiveness of leadership training for nurses and physicians seems to be somewhat lower (Level C)

In relation to the target group for this review, being the health sector, meta-analyses that examined the effect of leadership training and development programs that aim to support nurses and physicians in leadership positions (e.g. Kiesewetter, 2013; Webb, 2014) showed lower effect sizes than meta-analyses that examined the effect of leadership training in general (e.g. Taylor, 2015). A possible explanation for this finding is provided by the outcome of a recent meta-analysis, indicating that leadership training programs for physicians and nurses show considerable heterogeneity concerning conceptual frameworks, teaching and learning methods, educational content, evaluation design, and outcomes measured (Frich, 2015; Lyons, 2018).

In addition, it was found the leadership programs described in the medical literature focus more on the 'know' and 'do' elements of leadership than the 'be' component, which some argue is fundamental in attaining the capacity to lead.

Finally, it was found that the concepts underlying leadership skills in medical training show little agreement as to what content should be emphasised in the development of leadership skill (Kiesewetter, 2013; Lyons, 2018), and is centred on imparting conceptual knowledge to physicians as individuals, for which lectures and seminars may be suitable, and has directed fewer resources to efforts in building self-awareness, for which action-based learning, feedback, and self-development activities may be more appropriate (see below).



4. What are the characteristics of effective leadership training programs?

The studies included in this review show a large variation of effectiveness of the training programs. These findings suggest that the effect of leadership training is moderated and/or mediated by several factors, such as delivery and implementation characteristics (Lacerenza, 2017; Morrow, 1997). Below is an overview of moderators and mediators.

Finding 6: Leadership training programs with the following characteristics tend to be more effective

6.1. Start with a 'training needs analysis' (Level B)

With regard to the training or learning content of leadership training programs, the studies included in this review indicate that a careful training needs analysis (e.g. through a survey, interview, focus group, or critical incidents) before the start of the program tends to increase its effectiveness (Lacerenza, 2017; Leskiw, 2017; Mesmer, 2010; Taylor, 2005). More specifically:

a. Programs designed on the basis of an analysis of tasks and skill requirements and skills gaps are more effective than generic untailored programs, and

b. Training need analyses have a positive impact on the motivation of trainees to learn, and

c. Learning transfer is greater when trainees set clear and specific learning goals.

6.2. Focus on general management skills and interpersonal skills (Level B)

A meta-analysis of controlled studies (Taylor, 2009) indicates that skills that seem to transfer best to leader behaviour seem to be general management skills (e.g. goal setting, performance appraisal, time management) and, to a lesser extent, interpersonal skills (e.g. listening, questioning, negotiating, mentoring).

6.3. Duration and repetition (Level A)

In relation to design, several meta-analyses and high quality studies indicate that leadership training and development programs should be of reasonable length (at least 3 days or longer) and repeated periodically, to be effective (e.g. Lacerenza, 2017; Taylor, 2005). In addition, leadership training programs with spaced distribution are more effective than one-off trainings (Au, 2005). However, long and complex courses may not be required to achieve positive change; short (several days), punchy courses with clear objectives may well be as effective (Lyons, 2018).

6.4. Use multiple learning and instruction methods (Level A)

Several studies report that effective training programs are characterised by the use of a combination of didactic learning, tutorials and reflective learning (Lyons, 2018). In addition, these programs tend to use multiple instruction methods, such as lectures, group work, and action learning projects (Frich, 2015; Lacerenza, 2015; Steinert, 2012).

6.5. Provide opportunity to practice (Level A)

Although the use of multiple methods tend to be effective, the training program should clearly include opportunities for practice, linked to real world situations or trainee-generated scenarios (Frich, 2015; Lacerenza, 2015; Mianda, 2018; Steinert, 2012). This type of training is often referred to as 'experiential' or 'problem-based' learning.

In fact, in the domain of evidence-based education, there are a large number of studies that provide strong evidence that, in general, experiential learning tends to be more effective than traditional learning, especially when it concerns the teaching of practical skills and vocational knowledge. For example, several systematic reviews indicate that courses that include (simulations of) real-life situations yield better outcomes and have a larger (positive) effect on students' performance when compared with traditional teaching methods (Boet, 2014; Fung, 2015; Norman, 2012; Zelechowski, 2017).

6.6. Recognition and support (Level A)

In order for leadership training and development programs to be effective, it seems important, as is the case for other forms of training, to create and maintain a working climate that supports the transfer to the workplace of what was learned. Recognition, feedback, mentorship, and support from the organisation and the supervisor or peers for acquiring and applying new skills, can motivate trainees to transfer what they learned to their day-to-day work behaviour (Lacerenza, 2017; Leskiw, 2007; Steinert, 2012; Taylor, 2005). As such, leadership training should not be treated as a one-shot event. On the contrary, leadership development should be strongly and systematically integrated and communicated in the organisational culture and processes.



Conclusion

Leadership training programs are effective, but this effect is contingent on various design, delivery, and implementation characteristics. This REA supports the use of needs analysis, a focus on general management skills and interpersonal skills, multiple delivery methods, opportunity to practice, spaced training sessions, and organisational support.

Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about the characteristics of effective leadership training programs, by using the systematic review method to search and critically appraise empirical studies. However, in order to be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases and a focus on meta-analyses and controlled studies published in the period 1995 to 2019. As a consequence, some relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included, which did not incorporate a comprehensive review of the psychometric properties of the tests, scales and questionnaires used.

Finally, this REA focused only on quantitative studies, i.e. studies in which the link between leadership programs and performance/organisational outcomes was quantitatively measured. For this reason, findings from qualitative studies were not reported. As a consequence, qualitative findings that are relevant for practice may have been missed.

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.



References

Abdullah, D., & Suring, J. C. (2010, Dec 28-30). *The Relationship Between Motivation To Transfer, Training Design, Transfer Climate and Transfer of Training.* Paper presented at the International Conference on E-business, Management and Economics (ICEME 2010), Hong Kong

Amagoh, F. (2009). Leadership development and and leadership effectiveness. *Management Decision, 47*(5-6), 989-999.

Avolio, B. J., Reichard, R. J., Hannah, S. T., Walumbwa, F. O., & Chan, A. (2009). A meta-analytic review of leadership impact research: Experimental and quasi-experimental studies. *Leadership Quarterly, 20*(5), 764-784.

Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of Training: A Meta-Analytic Review. *Journal of Management, 36*(4),

Ciucur, D., & Pirvut, A. F. (2012). The effects of a transactional analysis training programme on team leadership factors in automotive industry. *Psiworld 2011, 33*, 667-671.

Cummings, G., Lee, H., MacGregor, T., Davey, M., Wong, C., Paul, L., & Stafford, E. (2008). Factors contributing to nursing leadership: a systematic review. *Journal of Health Services Research & Policy, 13*(4), 240-248.

Day, D. V. (2000). Leadership development: A review in context. *Leadership Quarterly, 11*(4), 581-613.

DeRue, D. S., Nahrgang, J. D., Hollenbeck, J. R., & Workman, K. (2012). A Quasi-Experimental Study of After-Event Reviews and Leadership Development. *Journal of Applied Psychology, 97*(5), 997-1015.

Duygulu, S., & Kublay, G. (2011). Transformational leadership training programme for charge nurses. *Journal of Advanced Nursing, 67*(3), 633-642.

Eden, D., Geller, D., Gewirtz, A., Gordon-Terner, R., Inbar, I., Liberman, M., . . . Shalit, M. (2000). Implanting Pygmalion Leadership Style through workshop training: Seven field experiments. *Leadership Quarterly, 11*(2), 171-210.

Edwards, G., Elliott, C., Iszatt-White, M., & Schedlitzki, D. (2013). Critical and alternative approaches to leadership learning and development Introduction. *Management Learning, 44*(1), 3-10.

Ely, K., Boyce, L. A., Nelson, J. K., Zaccaro, S. J., Hernez-Broome, G., & Whyman, W. (2010). Evaluating leadership coaching: A review and integrated framework. *Leadership Quarterly, 21*(4), 585-599.

Gilbert, A., Hockey, P., Vaithianathan, R., Curzen, N., & Lees, P. (2012). Perceptions of junior doctors in the NHS about their training: results of a regional questionnaire. *Bmj Quality & Safety, 21*(3), 234-238.

Gordon, M., Darbyshire, D., & Baker, P. (2012). Non-technical skills training to enhance patient safety: a systematic review. *Medical Education, 46*(11), 1042-1054.

Keith, N., & Frese, M. (2008). Effectiveness of error management training: A meta-analysis. *Journal of Applied Psychology, 93*(1), 59-69.

Kelloway, E. K., & Barling, J. (2010). Leadership development as an intervention in occupational health psychology. *Work and Stress, 24*(3), 260-279.

Krejci, J. W., & Malin, S. (1997). Impact of leadership development on competencies. *Nursing Economics, 15*(5), 235-&.

Leslie, L. K., Miotto, M. B., Liu, G. C., Ziemnik, S., Cabrera, A. G., Calma, S., . . . Slaw, K. (2005). Training young pediatricians as leaders for the 21st century. *Pediatrics, 115*(3), 765-773.

Mabey, C., & Gooderham, P. N. (2005). The impact of management development on perceptions of organisational performance in European firms. *European Management Review, 2*(2), 131-142.

Malling, B., Mortensen, L., Bonderup, T., Scherpbier, A., & Ringsted, C. (2009). Combining a leadership course and multi- source feedback has no effect on leadership skills of leaders in postgraduate medical education. An intervention study with a control group. *Bmc Medical Education, 9*, 7.

Markuns, J. F., Fraser, B., & Orlander, J. D. (2010). The Path to Physician Leadership in Community Health Centers: Implications for Training. *Family Medicine, 42*(6), 403-407.

Morahan, P. S., Kasperbauer, D., McDade, S. A., Aschenbrener, C. A., Triolo, P. K., Monteleone, P. L., . . . Meyer, M. J. (1998). Training future leaders of academic medicine: Internal programs at three academic health centers. *Academic Medicine, 73*(11), 1159-1168.

Morrow, C. C., Jarrett, M. Q., & Rupinski, M. T. (1997). An investigation of the effect and economic utility of corporate-wide training. *Personnel Psychology, 50*(1), 91-119.

Powell, K. S., & Yalcin, S. (2010). Managerial training effectiveness A meta-analysis 1952-2002. *Personnel Review, 39*(1-2), 227-241.

Serembus, J. F., Solecki, S., Meloy, F., & Olszewski, J. (2011). Preparing Tomorrow's Leaders A Leadership Course for Real-World Challenges. *Nurse Educator, 36*(3), 91-92.

Solansky, S. T. (2010). The evaluation of two key leadership development program components: Leadership skills assessment and leadership mentoring. *Leadership Quarterly, 21*(4), 675-681.

Steinert, Y., Naismith, L., & Mann, K. (2012). Faculty development initiatives designed to promote leadership in medical education. A BEME systematic review: BEME Guide No. 19. *Medical Teacher, 34*(6), 483-503.

Stoller, J. K. (2013). Commentary: Recommendations and Remaining Questions for Health Care Leadership Training Programs. *Academic Medicine, 88*(1), 12-15.

Storey, D. J. (2004). Exploring the link, among small firms, between management training and firm performance: a comparison between the UK and other OECD countries. *International Journal of Human Resource Management, 15*(1), 112-130.

Straus, S. E., Soobiah, C., & Levinson, W. (2013). The Impact of Leadership Training Programs on Physicians in Academic Medical Centers: A Systematic Review. *Academic Medicine, 88*(5), 710-723. doi: 10.1097/ACM.0b013e31828af493

Taylor, P. J., Russ-Eft, D. F., & Chan, D. W. L. (2005). A meta-analytic review of behaviour modeling training. *Journal of Applied Psychology, 90*(4), 692-709. doi: 10.1037/0021-9010.90.4.692

Taylor, P. J., Taylor, H., & Russ-Eft, D. F. (2009). Transfer of Management Training From Alternative Perspectives. *Journal of Applied Psychology, 94*(1), 104-121. doi: 10.1037/a0013006

Williams, A. P. (1973). Evaluation of management training - review - Whitelaw,M. *Occupational Psychology, 47*(1-2), 98-99.

Yeung, J. H. Y., Ong, G. J., Davies, R. P., Gao, F., & Perkins, G. D. (2012). Factors affecting team leadership skills and their relationship with quality of cardiopulmonary resuscitation. *Critical Care Medicine, 40*(9), 2617-2621.

Appendix I

Search terms & hits

Web of Science, ABI/Inform Global, Business Source Elite, Business Source Elite peer reviewed, scholarly journals, June 2013

Search terms	WSc	ABI	BSP
S1. ab(leader*) AND ab(training)	5,664	1,675	2,416
S2. ab(meta-anal*) AND S1	30	6	6
S3. ab("systematic review") AND S1	37	4	2
S4. ab("leader* training")	438	181	319
S5. ab("meta-anal*") AND S4	1	1	1
S6. ab(review) AND S4	36	12	17
S7. ab(leader*) AND ab(develop*)	23,453	9,734	12,515
S8. ab("meta-anal*") AND S7	90	16	17
S9. ab(review) AND S7	2,600	709	972
S10. ab("systematic review") AND S7	100	13	9
S11. ab("leader* develop*")	1,510	672	1,131
S12. ab("meta-anal*") AND S11	5	3	2
S13. ab(review) AND S11	108	52	122
S14: S11 AND filter WSc: management OR psychology applied OR health care sciences services OR nursing	53	-	-
S15. ab("systematic review") AND S11	5	1	0
S16. ab(leader*) AND ab(course*)	2,130	794	1,046
S17. ab("meta-anal*) AND S16	0	0	0
S18. ab(review) AND S16	215	45	186
S19. ab("systematic review") AND S16	4	0	0
S20. ab("leader* course")	39	14	25
S21. ab(manag*) AND ab(training)	44,064	8920	12,703
S22. ("meta-anal*) AND S21	280	20	23
S23. ab(review) AND S21	5.578	608	969

S24. ab("systematic review") AND 21	323	12	8
S25. ab("manag* training")	1,963	790	1,321
S26. ab("meta-anal*") AND S25	20	6	6
S27. ab(review) AND S25	156	48	120
S28. S25 AND filter: management OR psychology applied OR health care sciences services OR nursing	48	-	-
S29. ab("systematic review") AND S25	11	1	0
S30. ab(manag*) AND ab(develop*)	349,722	6,4872	4,639
S31. ab("meta-anal*") AND S30	1,395	92	38
S32. ab(review) AND S30	50,492	5,119	3,744
S33. ab("systematic review") AND S30	1,652	63	48
S34. ab("manag* develop*")	1,694	1,481	2,639
S35. ab("meta-anal*") AND S34	5	0	0
S36. ab(review) AND S34	120	128	744
S37. S34 AND filter: management OR psychology applied OR health care sciences services OR nursing	35	-	-
S38. ab("systematic review") AND S34	2	0	0
S39. ab(manag*) AND ab(course*)	38,501	4,319	6,830
S40. ab("meta-anal*") AND S39	178	2	5
S41. ab(review) AND S39	7.384	273	455
S42. ab("systematic review") AND S39	204	2	1
S43: ab("manag* course*")	652	193	285
S44. ab("meta-anal*") AND S43	6	0	0
S45. ab(review) AND S43	69	10	25
S46. ab("systematic review") AND S43	5	0	0
S47. ab("leader* training") AND ("health care" OR doctor* OR nurs* OR physician OR hospital)	77	13	35
S48. ab("manag* training") AND ab("health care" OR doctor* OR nurs* OR physician OR hospital)	271	173	191
S49. ab("meta-anal*") AND S48	3	0	0
Total	**1,161**	**126**	**202**

ABI/Inform Global, Business Source Elite, PsycINFO, ERIC and MEDLINE peer reviewed, scholarly journals, Nov 2019

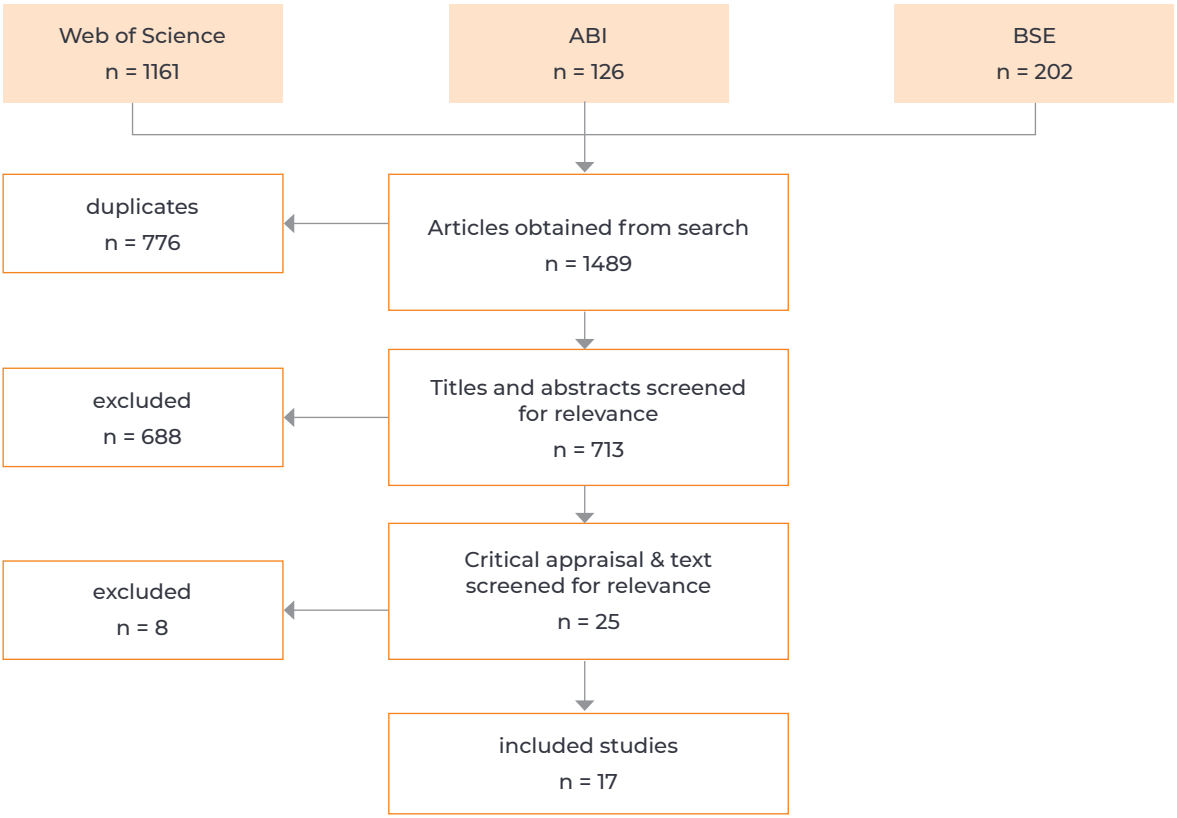
Search terms	ABI	BSP	PSY	ERIC	Medline
S1: ti(leader*) OR ti(manage*)	121,639	141,529	62,223	22,143	415,236
S2: ti(train*) OR ti(develop*)	95,185	123,695	172,020	76,214	707,490
S3: S1 AND S2	7,753	8,494	5,010	2,805	10,077
S4: S3 AND filter MAs, SRs or reviews	37	32	64	12	112*

* additional (database specific) filters were used

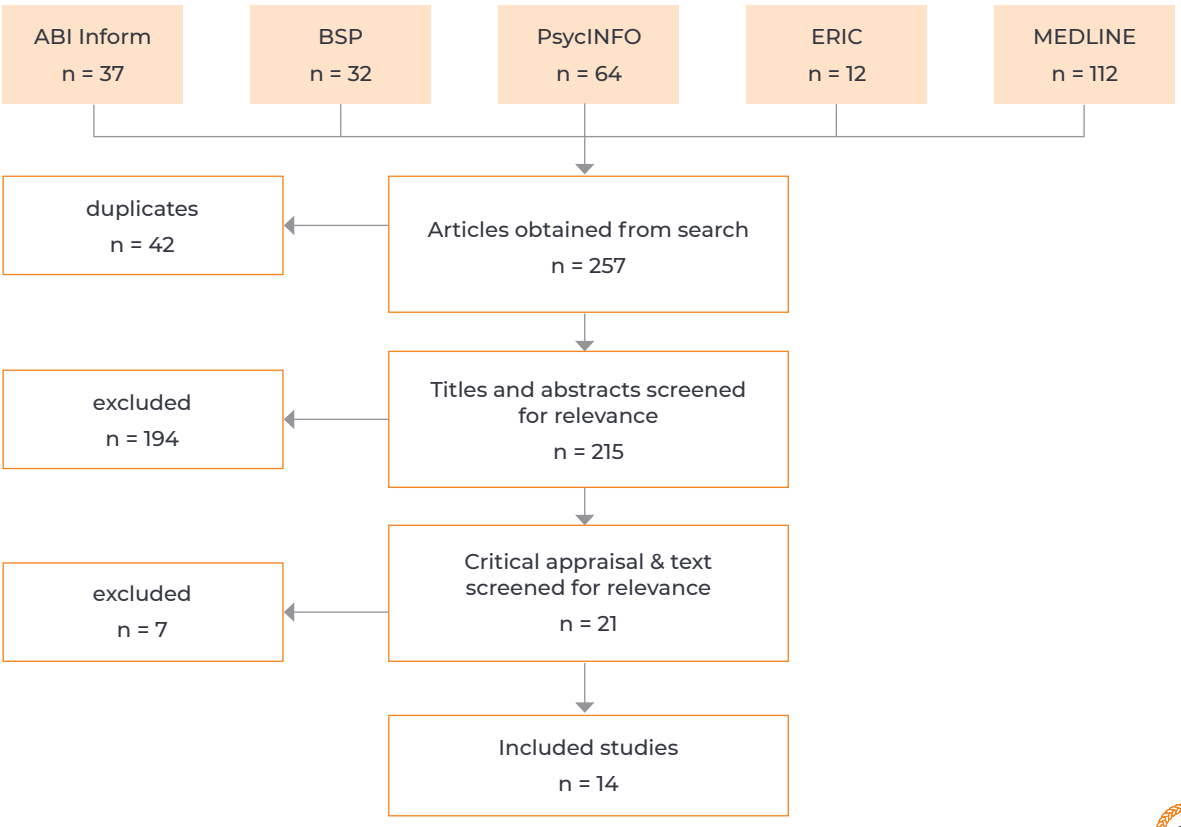
Appendix II

Selection of studies

Study selection, 2013



Study selection, 2020



Appendix III

Data extraction table - Leadership Training

Author & year	Design & sample size	Sector / Population	Main findings	Effect sizes	Limitations	Level
Abdullah, 2010	Cross-sectional study n = 120,	various, public, Malaysia	All of the transfer factors have a positive and significant relationship.	r = .53 to .59	Self-report, small sample, questionable validity of measures	D-
Au, 2005	Meta-analysis k = 58	Working population and vocational trainees	1. There is a moderate effect size of overall leadership training programs. 2. Leadership training programs with a theoretical basis (a) were more effective, especially the application of Fiedler's contingency theory (b). 3. Leadership training programs with spaced distribution are more effective (a) than one-off trainings (b). 4. Leadership training programs using lower levels of a) evaluation criteria, b) subjective criteria, c) self-reported measurements and d) multiple-source evaluation criteria, as well as e) weak experimental designs, upwardly bias the results.	1) Overall d = .64 2a) d = .74 2b) d = 1.10 3a) d = .65 3b) d = .50 4a) Reaction d = .82; Learning d = .71; Behaviour d = .40; Results d = .50 4b) Subjective only d = .68; Objective only d = .42. With objective d = .44 4c) Self d = .70; Others d = .65; Both d = 69 4d) Single d = .51; Multiple d = .96 4e) SGPP d = .80 POWC d = .68 PPWC d = .46 Random d = .37; Non-random d = .72	Quality of the included studies not assessed	A

Avolio, 2009	Meta- analysis, including experiments and quasi- experiments k = 13/28,	various, profit/ military	Training or development interventions have a moderate effect on 1) affective, 2) behavioural and 3) cognitive outcomes.	1. d = .39 2. d = .43 3. d = .62	Conclusions are not drawn on development interventions in particular, but on experimental leadership interventions in general.	AA
Ayeleke, 2019	systematic review including various low quality designs k = 19	healthcare	Quantitative studies (n = 3) showed that participation of health managers in a leadership development programme resulted in (some) improvement in leadership practices.	No standardised effect sizes were reported (only unstandardised MD's).	Criteria for quality appraisal not provided Limited nr of quantitative studies	C
Blume, 2010	Meta- analysis including field and lab studies k = 89 studies,	students/ managerial/ non-managerial/ mainly USA and Canada	1. Learning transfer is related to trainee characteristics (e.g., cognitive ability, experience, personality, motivation), work environment factors (i.e., support, climate, constraints/opportunity), training interventions, learning outcomes (i.e., knowledge, self-efficacy), and trainee reactions. 2. The predictor–transfer relationships after removing same-source and same- measurement-context (SS/ SMC) bias is weaker. 3. Regarding transfer measurement, predictor–transfer relationship is stronger in the case of (a) no time lag between training and the transfer measure, (b) self-measures compared to non-self (i.e., peer or objective) measures, and (c) use as measurement of transfer compared to effectiveness. 4. In general predictor–transfer relationships are stronger for open than for closed skills. 5. Predictor–transfer relationships are stronger in the laboratory context for cognitive ability and posttraining self-efficacy; for pretraining self-efficacy, motivation, posttraining knowledge and goal-setting the relationship is stronger in the field context.	1) See table 1 for complete overview. Examples: Cognitive ability ρ = .37 Neuroticism ρ = -.19 Posttraining self-efficacy ρ = .22 2) See table 1 Example: Posttraining self-efficacy SS/SMC ρ = .46 Not SS/SMS ρ = .20 3) See table 2. a) Example posttraining self-efficacy Time lag ρ = .11 no time lag ρ = .38 b) Example Motivation Self ρ = .33 other/objective ρ = .11 c) Example Motivation Use ρ = .36 Effectiveness ρ = .10 4) See table 3. 5) See table 4.	Concrete and elaborate information on the variables is lacking. Large number of variables	A

			6. For all predictors except posttraining knowledge the predictor–transfer relationships were stronger in a published than an unpublished study. 7. The longer the length of time between training and the transfer measure the weaker the predictor–transfer relationships for a) posttraining knowledge and b) posttraining self-efficacy but not for c) pretraining self-efficacy d) motivation and e) work environment (ns). 8. There is a moderate relationship between trainees' rating versus a) supervisor's and b) peers' assessment of transfer and c) a large relationship between measures at different times by the same source.	6) See table 5. 7) See table 6. a) ß = -.25 b) ß = -.64 c) ß = -.08 (ns) d) ß = -.29 (ns) e) ß = .07 (ns) 8) See table 7 a) ρ = .28 b) ρ = .26 c) ρ = .57		
Ciucur, 2012	Quasi- experiment n = 30	managerial, automotive industry, Romania	Significant differences for emotional stability and social boldness.	not reported	Small sample	B
Collins, 2001	Systematic review k = 54	Managers, leaders and/ or executives	1. Thirty percent of the studies reported organisational performance improvement as outcome. Seventy percent measured learning. 2. 81% of studies with performance-level outcomes measured system performance while 19% addressed financial-level performance as the outcome variable. 3. Strategic leadership is most frequently researched leadership development content area (33%), then employee development (20%) and supportive environment (15%). 4. Formal training is primary leadership development intervention (41%), then job assignments (32%).	Not reported	Quality of the included studies unclear Qualitative review	C

Collins, 2004	Meta-analysis k = 83 Posttest only control group (POWC), pretest posttest with control group (PPWC), single group pretest posttest (SGPP), correlational	Managers, leaders, executives, officers, supervisors, and/or foremen Various sectors	1. Leadership development programs are associated with knowledge objective outcomes. 2. Leadership development programs are associated with expertise objective outcomes. 3. Leadership development programs are associated with expertise subjective outcomes. 4. Leadership development programs are associated with system objective outcomes.	1) POWC .96 CI95 .82 1.12 SGPP .1.36 CI95 1.18 1.56 2) POWC .54 CI95 .14 .95 PPWC .35 CI95 .20 .50 SGPP 1.01 CI95 .87 1.15 3) POWC .41 CI95 .25 .58 PPWC .40 CI95 .20 .61 SGPP .38 CI95 .30 .46 4) POWC .39 CI95 .19 .59	Quality of the included studies unclear Wide CI's	B
Cummings, 2008	Systematic review k = 9?	Nurses in leadership positions	All nine studies found positive results for (mostly) self-rated leadership and observed leadership.	not reported	Design of included studies unclear	C
DeRue, 2012	Cohort study (9 months) n = 173	MBA students, various, USA	Small positive effect on leadership development.	not reported	-Same source bias -Low incremental validity	B
Duygulu, 2011	Before – after study, repeated measures n = 30	nurses, health sector, Turkey	Significant effect on leadership practices (?).	not reported	Effect unclear Small sample size	C
Eden, 2000	Meta analysis of RCT's k = 7	various	Small to moderate overall effect.	not reported	no serious limitations	A

Frich, 2015	systematic review of longitudinal and controlled studies k = 45	physicians	1. The studies showed considerable heterogeneity concerning conceptual frameworks, teaching and learning methods, educational content, evaluation design, and outcomes measured. 2. All 45 studies reported positive outcomes, but few studies reported system-level (4) effects, such as improved performance on quality indicators for disease management or increased customer satisfaction. 3. Our findings suggest that the leadership programs described in the medical literature focus more on the 'know' and 'do' elements of leadership than the 'be' component, which some argue is fundamental in attaining the capacity to lead. 4. It was found that the literature on physician leadership development has been centred on imparting conceptual knowledge to physicians as individuals, for which lectures and seminars may be suitable, and has directed fewer resources to efforts in building self-awareness, for which action-based learning, feedback, and self-development activities may be more appropriate. 5. Importantly, the few studies that documented favourable organisational outcomes, such as improvement in quality indicators for disease management, were characterised by the use of multiple learning methods, including lectures, seminars, and group work, and involved action learning projects in multidisciplinary teams. The implication of this finding is that greater investment in programs using teamwork and multiple learning methods is likely to have the largest impact in the area of leadership development for physicians.	Not reported	Limited search Most studies included evaluated the effect on KP level 1 or 2 (only 6 out of 45 reported on level 3 or 4)	B

Kiesewetter, 2013	systematic review, k = 8	healthcare, physicians	1. The small number of studies included in the review shows that the systematic and evidence-based development of leadership skills does not currently play a prominent role in the training of physicians. 2. The range of training programs is very broad and leadership skill components are diverse. 3. The diverse concepts underlying leadership skills in medical training show little agreement as to what content should be emphasised in the development of leadership skills. 4. Reactions of participants to trainings were positive (KP level 1), yet no behavioural changes (KP level 3 and 4) through training were examined.	not reported	Limited nr of studies included Design & quality of the studies unclear	C
Krejci, 1997	Before- after study n = 87	nurses, health care, USA	Significant difference in the perception of the understanding and the ability of the leadership competencies.	No effect sizes reported	Self report Halo effect	C
Lacerenza, 2017	Meta-analysis k = 335 Repeated measure design, independent groups design, independent groups design with repeated measures	various	1. Leadership training programs have a positive effect. 2. Leadership training programs have a positive effect on trainee reactions. 3. Leadership training programs have a positive effect on affective-, cognitive-, and skill-based learning outcomes. 4. Leadership training programs lead to the transfer of trained affective-, cognitive-, and skill-based concepts. 5. Leadership training programs positively influence organisational and subordinate outcomes. The strength of these effects differs based on various design, delivery, and implementation characteristics. Moderator analyses support the use of needs analysis, feedback, multiple delivery methods (especially practice), spaced training sessions, a location that is on-site, and face-to-face delivery that is not self-administered. Results also suggest that the content of training, attendance policy, and duration influence the effectiveness of the training program.	1) δ = .76 CI95 .64 .89 2) δ = .63 CI95 .12 1.15 3) δ = .73 CI95 .62 .85 4) δ = .82 CI95 .58 1.06 5) δ = .72 CI95 .60 .84 6) See tables 1 - 7	Many hypotheses and moderators tested Studies from 1951 included Quality of the included studies unclear	B

Leskiw, 2007	Systematic review k = ?	Best practice organisa-tions	Six key factors were found to be vital for effective leadership development: a thorough needs assessment, the selection of a suitable audience, the design of an appropriate infrastructure to support the initiative, the design and implementation of an entire learning system, an evaluation system, and corresponding actions to reward success and improve on deficiencies.	Not reported	Very limited search Number, design and quality of included studies unclear	D
Leslie, 2005	Before - after study n = 56	paediatri-cians, health care, USA	» Participants were confident in many of their leadership qualities but desired increased training, particularly in areas of time and priority management and leading 'from the middle'. » Participants positively evaluated the training program and improved in self- reported basic competencies; 87% also reported fully or partially achieving a leadership-related goal.	not reported	Self-report Small sample	C
Lyons, 2018	systematic review, k = 11 including RCTs	medical students	1. Leadership curricula evaluated were markedly heterogeneous in their duration and composition. 2. The lack of a widely-accepted definition of clinical leadership and what it entails further complicates training, assessment and comparison of approaches. 3. A wide range of leadership curricula have shown subjective effectiveness. There is limited objective evidence however, and few studies have measured effectiveness at the system and patient levels (KP 4). 4. Effective programs tended to utilise a combination of didactic learning, tutorials and reflective learning. 5. Because all durations of intervention showed positive results, long and complex courses may not be required to achieve positive change; short, punchy courses with clear objectives may well be as effective.	not reported	no serious limitations	A
Malling, 2009	Controlled before-after study n = 56	consultants responsible for postgrad-uate medical education, health sector	1. No differences in multi-source feedback scores at one year follow up compared to baseline measurements, either in the intervention or in the control group. 2. Leadership course following a MSF procedure compared to MSF alone does not improve leadership skills.	0 / ns	Prone to selection bias High dropout in control group	B

Mesmer, 2010	Meta-analysis k = 159	Adults	Meta-analysis on impact of pre-training interventions on learning. 1. Trainees provided with attentional advice prior to training will have higher average learning scores on measures of cognitive (H1a) and skill-based (H1b) learning than trainees not provided with such advice. 2. Trainees provided with general attentional advice prior to training did NOT have higher average learning scores on measures of cognitive (H2a) but did on skill-based (H2b) learning than trainees provided with specific attentional advice. 3. Trainees provided with meta-cognitive strategies prior to training have higher average learning scores on measures of cognitive (H3a), skill-based (H3b), and partially on affective (H3c) learning than trainees not provided with meta-cognitive strategies. 4. Trainees provided with 'why-based' meta-cognitive strategies may perform better on cognitive measures of learning than trainees provided with "think aloud" strategies, but NOT on skill-based learning. 5. Trainees provided with advance organizers performed better on indicators of cognitive (H5a) and skill-based (H5b) learning than trainees not provided with advance organizers. Stronger results were found for graphic rather than textual organizers for skill-based learning outcomes. 6. Trainees provided with a pre-training goal orientation (whether mastery- or performance-oriented) performed better on indicators of cognitive (H6a), skill-based (H6b), and affective (H6c) learning than trainees not provided with a pre - training goal. 7. Trainees provided with a mastery goal orientation will perform better on indicators of cognitive (H7a), skill-based (H7b), and affective (H7c) learning than trainees provided with a performance goal orientation. 8. Trainees provided with preparatory information will perform better on indicators of cognitive (H8a), skill-based (H8b), and affective (H8c) learning than trainees not provided with preparatory information.	1) a δ = .67 b δ = .80 2) a δ = .71 vs .66 b δ = .88 vs .65 3) a δ = .61 b δ = .51 c δ = .40 4) Cognitive average Think δ = .62 (ns) Why δ = .60 Skills average Think δ = .57 Why δ = .40 5) a δ = .54 b δ = .71 6) a δ = .71 b δ = .71 c δ = .85 7) a not tested b δ = .89 vs δ = .60 c δ = .47 (direct comparison) 8) n not tested b δ = .48 c δ = .45 See tables 2 - 7 for more detailed effect sizes	Design and quality of included studies unclear	B

Morrow, 1997	Meta analysis of controlled and uncontrolled studies k = 18	various managerial levels, pharmaceutical sector, USA	Large variation of effectiveness of the programs.	1. Range of d-.09 to 1.11 Managerial training d.31, utility (ROI) 45%, with less than d.64 and ROI 418% for sales/technical training	Rater bias Small sample sizes	B
Mianda, 2018	systematic review of pre-post and cross-sectional studies k = 24	frontline healthcare providers	1. Clinical leadership development is an on-going process and must target both novice and veteran frontline health care providers. 2. The content of clinical leadership development interventions must encompass a holistic conceptualisation of clinical leadership. 3. Interventions for clinical leadership development should use work-based learning approaches, and experiential and practice-based learning, as these are reported as the most effective.	not reported	merely descriptive & anecdotal review	B
Powell, 2010	Meta- analysis of various designs k = 85 n = 4.779	entry level and middle management	1. The overall effect of managerial training interventions is small. 2. The effects did not improve over time (50 years). 3. When the outcome being sought, or at least tested for, is a learning outcome, the effect size magnitudes are consistently larger than the other outcome groups and these effects are more consistently significant.	1. r = .25 2. Between .18 and .38 3. Between .17 and .55	Limited information on the measures or characteristics of the interventions.	A/B
Solansky, 2010	Survey with posttest n = 303,	administrators & leadership mentors, education, USA	1. Note: Differences between self-report and observer report. 2. Coaching time (a) and number of contacts (b) are both significantly, positively and moderately related to mentees willingness to share information with mentors and the mentee group regarding their leadership.	2a. ß .18 2b. ß .02	Observers were chosen by the participants	C
Steinert, 2012	systematic review (mostly pre-post) k = 41	clinical faculty members (US and Canada)	1. Participants value leadership development activities and report changes in attitudes, knowledge, skills and behaviour. 2. Despite methodological limitations, certain program characteristics seem to be associated with positive outcomes: 1) the use of multiple instructional methods; 2) experiential learning and reflective practice; 3) individual and group projects; 4) peer support; 5) mentorship; and 6) institutional support.	not reported	no serious limitations	B

Storey, 2004	Review of cross-sectional studies k =?	various sectors, SME's, various countries	Mixed evidence for the effect of formal training.	not reported	sample unclear	C

Taylor, 2005	Meta analysis of randomised and non-randomised studies
	
	k = 117
		various sectors, employees and countries	1. Effects were largest for learning outcomes, smaller for job behaviour and results outcomes.
			2. Although effects on declarative knowledge decayed over time, training effects on skills and job behaviour remained stable or even increased.
			3. Skill development was greatest when learning points were used and presented as rule codes and when training time was longest.
			4. Transfer was greatest when a) mixed (negative and positive) models were presented; b) practice included trainee-generated scenarios; c) trainees were instructed to set goals; d) when trainees' superiors were also trained; e) when rewards and sanctions were instituted in trainees' work environments.
				1. declarative knowledge d = 1.20;
				
				procedural knowledge d = 1.18;
				
				attitudes d = .33;
				
				job behaviour d = .27; workgroup productivity d = .13;
				
				workgroup climate d = .11
					Contains 0 in some of the confidence intervals	A

Taylor, 2009	Meta-analysis of randomised and non- randomised studies k = 107	Various samples, managers, various countries	1. Managerial training is positively related to transfer of learning for all rating sources. 2. Population effect size estimates for studies without control groups were larger than studies with control groups when based on a) superior and b) peer ratings, but smaller when based on c) self- and d) subordinate ratings. 3. For self-ratings sources, superior ratings and subordinate ratings the standardised betas were relatively small, positive, and nonsignificant with regard to time lag between training and posttest. 4. Transfer effect sizes for interpersonal skills management training programs, followed a similar pattern across the four rating sources as when all studies were compared. 5. The topic with the greatest training transfer perceived by subordinates was for a) general management skills training compared to b) interpersonal skills and c) goal setting or performance appraisal skills.	1) Self δ =.64 Superior δ = .53 Peer δ = .26 Subordinate δ = .13 2) a δ =.55 vs .45 b δ = .35 vs .21 c δ = .60 vs .90 d δ = .10 vs .18 4) Table 5 5) a δ =.50 b δ = .11 c δ = .34 More effect sizes in tables 2 - 6	Sometimes conclusions are drawn on a rather small amount of studies (and small total n)	B

Van der Locht, 2013	Cross-sectional N = 595	Managers	1. The use of identical elements* is positively related to training transfer. 2. The relationship between the use of identical elements and training transfer is partially mediated by motivation to transfer. 3. Motivation to learn is positively related to training transfer. 4. The relationship between motivation to learn and training transfer is mediated by motivation to transfer. 5. Expected utility is positively related to training transfer. 6. The relationship between expected utility and training transfer is partially mediated by motivation to transfer. 7. Identical elements will predict training transfer over and above trainees' motivation to learn and expected utility. * Identical elements refers to the extent to which the stimuli and responses in the training setting are identical to those in the actual performance environment.	1) r = 0.53 3) r = 0.42 5) r = 0.57	No serious limitations	D
Webb, 2014	systematic review k = 24	medical students	Overall, evaluation of effectiveness and quality of evidence showed that most curricula did not demonstrate changes in student behaviour or quantifiable results.	not reported	design and quality of the included studies unclear	C

Excluded studies

Author & year	Reason for exclusion
Amagoh, 2009	Narrative literature review / expert opinion.
Avolio, 2010	Study calculates Return on leadership development investment (RODI) for training at different organisational levels for on-site, off-site and on-line training. Effect sizes are taken from an earlier meta-analysis by Avolio (2009).
Burke, 1986	Publication date out of scope (1986), often cited study though. Results of 70 managerial training studies to empirically integrate the findings of the studies. The meta- analysis results for 34 distributions of managerial training effects representing six training content areas, seven training methods, and four types of criteria (subjective learning, objective learning, subjective behaviour, and objective results) indicated that managerial training is, on the average, moderately effective.
Day, 2000	Narrative literature review / expert opinion.
Jeyaraman, 2018	Scoping review, descriptive.
Kelloway, 2010	Narrative literature review / expert opinion.
Lopes, 2013	Review into characteristics of the use of business games in leadership development. in SCOPUS, ISI, and BKL (Bernie Keys Library) databases. The review identified five games that met the criteria and objectives of this research. This study shows that using business games for leadership development is still a hard task. It points up some problems and difficulties in this task and suggests ways to develop more effective methods for leadership development with business games.
Markuns, 2010	Expert opinion.
Morahan, 1998	Expert opinion.
Niemiec, 1992	Publication date out of scope (1992). The meta-analysis synthesized the results of 22 studies of management education in institutional settings. The results indicate that the treatment's median effect size is .7 -a fairly substantial effect. Several differential effects were noticed, including the experience level of the managers and the types of instrumentation and institutional setting.
Pearson, 2007	Does not concern leadership training.
Salas, 2012	Unsystematic literature review on effectiveness of training. Does provide an overview of previous meta-analysis and checklists for different phases of the training process.
Straus, 2013	Not relevant given the REA question: findings suggest that (some) leadership training programs affected participants advancement in academic rank and hospital leadership position and that participants were more successful in publishing papers. Other outcomes were based on too limited nr of studies.
Stoller, 2013	Expert opinion.
Yeung, 2012	Outcome measure (association between team leadership skills and cardiac arrest simulation test score, pre-shock pause, and hands off ratio) not relevant.

A partnership between the ACT Government through the ACT public health system and the ANU Research School of Management.

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EXECUTIVE SUMMARY

Rapid Evidence Assessment (REA)



THE EFFECTIVENESS OF LEADERSHIP TRAINING

a summary of research literature

January 2020

Culture Review **Implementation**

our journey of positive change

ACT Government

CEBMa
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Evidence Based Management

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What is a Rapid Evidence Assessment (REA)?

Rapid Evidence Assessments (REAs) use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and as a result, the likelihood of bias is considerably smaller.

Background

In 2013, a group of Dutch hospitals appointed the Center for Evidence Based Management (CEBMa) to conduct a REA of the most trustworthy scientific research on the attributes and key characteristics of effective leadership training programs. This REA is an update by the CEBMa to take into consideration other forms of scientific research and its applicability to ACT Health.

Main findings



1. What is leadership?

This REA confirms that despite the thousands of management books with 'leadership' in their titles, there is no consensus of what the term encompasses. As a result, there are many definitions of what 'leadership' means. This varies from the Oxford Dictionary defining it as 'the ability to be a leader or the qualities a good leader should have,' whilst Wikipedia defines it as 'a process of social influence in which a person can enlist the aid and support of others in the accomplishment of a common task.'

In addition, the term can be limited to 'personal influence resulting in enthusiastic commitment of followers' (Schyns, 2013). For example, some management thinkers simply define it as 'the capacity to translate vision into reality' (Warren Bernis), or 'empowering others' (Bill Gates). Further, there remains ongoing controversy of the distinction between 'leadership' and 'management.' It is widely noted that 'managers are concerned with how things get done, whereas leaders build commitment and vision (Kotter, 1990). However, Yukl in 1989 stated that 'Nobody has proposed that managing and leading are equivalent, but the degree of overlap is a point of sharp disagreement.'

The terms 'leadership' and 'management' are used interchangeably throughout the REA.

2. How can leadership be measured?

Many assessment tools and questionnaires claim to measure leadership. However, the REA notes that most of them focus on a specific element or type of leadership. A recent systematic review that evaluated the psychometric properties of 17 leadership scales, found that the majority lack a degree of rigour. Therefore, most studies noted in this REA will not measure leadership, but rather the impact of leadership training programs using Kirkpatrick's model (Collins, 2001; Fritch, 2015).

Kirkpatrick's assessment model includes four sequential levels:

1. **Reaction** – what participants think and feel about a training program.
2. **Learning** – increase in knowledge, skills and change attitudes.
3. **Behaviour** – changes in practice and behaviour.
4. **Results** – organisational benefits (impacts on performance, service delivery and clinical outcomes).

3. What is the effectiveness of leadership training programs?

Several findings of the effectiveness of leadership training programs include:

1. Overall, leadership training has a moderate effect, on a range of outcomes.
2. The effects on learning outcomes tends to be larger than effects on performance outcomes.
3. Only slight improvements on the effectiveness of leadership training over the last 20 years, despite advances in numerous innovations in leadership theory and training techniques.
4. The evidence on a strong Return on Investment (ROI) of leadership training is unclear.
5. Lower level of effectiveness of leadership training for nurses and physicians. The research shows causes of this may include programs focusing on the 'know' and 'do' elements of leadership, rather than the 'be' – which some argue is fundamental in gaining the capacity to lead.

Conclusion

Leadership training programs are effective, but it depends on various design, delivery and implementation characteristics.

More information

You can access more information in the *Rapid Evidence Assessment (REA) - The Effectiveness of Leadership Training – a summary of research literature, January 2020.*

References

Abdullah, D., & Suring, J. C. (2010, Dec 28-30). *The Relationship Between Motivation To Transfer, Training Design, Transfer Climate and Transfer of Training.* Paper presented at the International Conference on E-business, Management and Economics (ICEME 2010), Hong Kong.

Amagoh, F. (2009). Leadership development and and leadership effectiveness. *Management Decision, 47*(5-6), 989-999.

Avolio, B. J., Reichard, R. J., Hannah, S. T., Walumbwa, F. O., & Chan, A. (2009). A meta-analytic review of leadership impact research: Experimental and quasi-experimental studies. *Leadership Quarterly, 20*(5), 764-784.

Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of Training: A Meta-Analytic Review. *Journal of Management, 36*(4),

Ciucur, D., & Pirvut, A. F. (2012). The effects of a transactional analysis training programme on team leadership factors in automotive industry. *Psiworld 2011, 33*, 667-671.

Cummings, G., Lee, H., MacGregor, T., Davey, M., Wong, C., Paul, L., & Stafford, E. (2008). Factors contributing to nursing leadership: a systematic review. *Journal of Health Services Research & Policy, 13*(4), 240-248.

Day, D. V. (2000). Leadership development: A review in context. *Leadership Quarterly, 11*(4), 581-613.

DeRue, D. S., Nahrgang, J. D., Hollenbeck, J. R., & Workman, K. (2012). A Quasi-Experimental Study of After-Event Reviews and Leadership Development. *Journal of Applied Psychology, 97*(5), 997-1015.

Duygulu, S., & Kublay, G. (2011). Transformational leadership training programme for charge nurses. *Journal of Advanced Nursing, 67*(3), 633-642.

Eden, D., Geller, D., Gewirtz, A., Gordon-Terner, R., Inbar, I., Liberman, M., . . . Shalit, M. (2000). Implanting Pygmalion Leadership Style through workshop training: Seven field experiments. *Leadership Quarterly, 11*(2), 171-210.

Edwards, G., Elliott, C., Iszatt-White, M., & Schedlitzki, D. (2013). Critical and alternative approaches to leadership learning and development Introduction. *Management Learning, 44*(1), 3-10.

Ely, K., Boyce, L. A., Nelson, J. K., Zaccaro, S. J., Hernez-Broome, G., & Whyman, W. (2010). Evaluating leadership coaching: A review and integrated framework. *Leadership Quarterly, 21*(4), 585-599.

Gilbert, A., Hockey, P., Vaithianathan, R., Curzen, N., & Lees, P. (2012). Perceptions of junior doctors in the NHS about their training: results of a regional questionnaire. *Bmj Quality & Safety, 21*(3), 234-238.

Gordon, M., Darbyshire, D., & Baker, P. (2012). Non-technical skills training to enhance patient safety: a systematic review. *Medical Education, 46*(11), 1042-1054.

Keith, N., & Frese, M. (2008). Effectiveness of error management training: A meta-analysis. *Journal of Applied Psychology, 93*(1), 59-69.

Kelloway, E. K., & Barling, J. (2010). Leadership development as an intervention in occupational health psychology. *Work and Stress, 24*(3), 260-279.

Krejci, J. W., & Malin, S. (1997). Impact of leadership development on competencies. *Nursing Economics, 15*(5), 235-&.

Leslie, L. K., Miotto, M. B., Liu, G. C., Ziemnik, S., Cabrera, A. G., Calma, S., . . . Slaw, K. (2005). Training young pediatricians as leaders for the 21st century. *Pediatrics, 115*(3), 765-773.

Mabey, C., & Gooderham, P. N. (2005). The impact of management development on perceptions of organisational performance in European firms. *European Management Review, 2*(2), 131-142.

Malling, B., Mortensen, L., Bonderup, T., Scherpbier, A., & Ringsted, C. (2009). Combining a leadership course and multi- source feedback has no effect on leadership skills of leaders in postgraduate medical education. An intervention study with a control group. *Bmc Medical Education, 9*, 7.

Markuns, J. F., Fraser, B., & Orlander, J. D. (2010). The Path to Physician Leadership in Community Health Centers: Implications for Training. *Family Medicine, 42*(6), 403-407.

Morahan, P. S., Kasperbauer, D., McDade, S. A., Aschenbrener, C. A., Triolo, P. K., Monteleone, P. L., . . . Meyer, M. J. (1998). Training future leaders of academic medicine: Internal programs at three academic health centers. *Academic Medicine, 73*(11), 1159-1168.

Morrow, C. C., Jarrett, M. Q., & Rupinski, M. T. (1997). An investigation of the effect and economic utility of corporate-wide training. *Personnel Psychology, 50*(1), 91-119.

Powell, K. S., & Yalcin, S. (2010). Managerial training effectiveness A meta-analysis 1952-2002. *Personnel Review, 39*(1-2), 227-241.

Serembus, J. F., Solecki, S., Meloy, F., & Olszewski, J. (2011). Preparing Tomorrow's Leaders A Leadership Course for Real-World Challenges. *Nurse Educator, 36*(3), 91-92.

Solansky, S. T. (2010). The evaluation of two key leadership development program components: Leadership skills assessment and leadership mentoring. *Leadership Quarterly, 21*(4), 675-681.

Steinert, Y., Naismith, L., & Mann, K. (2012). Faculty development initiatives designed to promote leadership in medical education. A BEME systematic review: BEME Guide No. 19. *Medical Teacher, 34*(6), 483-503.

Stoller, J. K. (2013). Commentary: Recommendations and Remaining Questions for Health Care Leadership Training Programs. *Academic Medicine, 88*(1), 12-15.

Storey, D. J. (2004). Exploring the link, among small firms, between management training and firm performance: a comparison between the UK and other OECD countries. *International Journal of Human Resource Management, 15*(1), 112-130.

Straus, S. E., Soobiah, C., & Levinson, W. (2013). The Impact of Leadership Training Programs on Physicians in Academic Medical Centers: A Systematic Review. *Academic Medicine, 88*(5), 710-723. doi: 10.1097/ACM.0b013e31828af493

Taylor, P. J., Russ-Eft, D. F., & Chan, D. W. L. (2005). A meta-analytic review of behaviour modeling training. *Journal of Applied Psychology, 90*(4), 692-709. doi: 10.1037/0021-9010.90.4.692

Taylor, P. J., Taylor, H., & Russ-Eft, D. F. (2009). Transfer of Management Training From Alternative Perspectives. *Journal of Applied Psychology, 94*(1), 104-121. doi: 10.1037/a0013006

Williams, A. P. (1973). Evaluation of management training - review - Whitelaw,M. *Occupational Psychology, 47*(1-2), 98-99.

Yeung, J. H. Y., Ong, G. J., Davies, R. P., Gao, F., & Perkins, G. D. (2012). Factors affecting team leadership skills and their relationship with quality of cardiopulmonary resuscitation. *Critical Care Medicine, 40*(9), 2617-2621.

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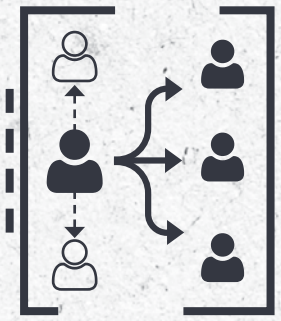
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Rapid Evidence Assessment (REA)



IMPACT OF LINE AND/ OR MIDDLE MANAGERS ON WORKPLACE PERFORMANCE

a summary of scientific literature

October 2019

Culture Review **Implementation**

our journey of positive change

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Rationale for this review

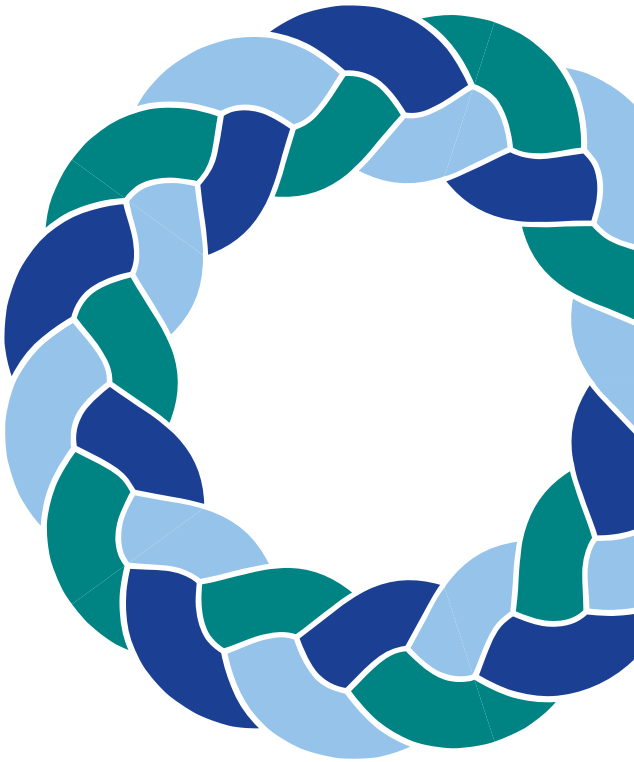
Line and/or middle managers have an important place in the National Health Service's management structure. Through their intermediate position in the organisation, these managers serve as an important interface between otherwise disconnected actors, such as nurses, doctors and top management. However, their roles and responsibilities as well as their impact on workplace performance often remain unclear. For this reason, NHS Employers approached the Center for Evidence Based Management (CEBMa) to undertake an abbreviated rapid evidence assessment (REA) to understand what is known in the scientific literature about the roles, practices and impact of line and/or middle managers on workplace performance.

What is a Rapid Evidence Assessment (REA)?

Evidence reviews come in many forms. One of the best-known types is the conventional literature review, which provides an overview of the relevant scientific literature on a topic. However, a conventional literature review's trustworthiness is often low: clear criteria for inclusion is often lacking and studies are selected based on the researcher's personal preferences. As a result, conventional literature reviews are prone to severe bias.

This is why rapid evidence assessments (REAs) are used. This type of review uses a specific methodology to identify comprehensively the most relevant studies on a topic, and select studies based on explicit criteria. The methodological quality of these studies is assessed by one or more independent reviewers on explicit criteria. In contrast to a conventional literature review, an REA is transparent, verifiable, and reproducible, making likelihood of bias smaller.





Main question: What does this REA answer?

What is known in the scientific literature about the impact of line and/or middle managers on workplace performance?

Supplementary questions

Other issues raised, which form the basis of our conclusion regarding the main question above, include:

1. **What are line and middle managers?**
2. **What are the roles and practices of line/middle managers?**
3. **What is known about the impact of these roles and practices on workplace performance?**
4. **What roles and practices have the biggest impact on performance?**

Inclusion criteria: Which studies were taken into account?

To determine the studies to include we applied the following criteria:

1. **Date:** published in the period 1990 to 2019 for meta-analyses and the period 2000 to 2019 for primary studies.
2. **Language:** articles in English.
3. **Type of studies:** empirical, quantitative.
4. **Measurement:** studies in which the effect of roles and practices of middle managers on workplace performance is quantitatively measured.
5. **Context:** studies of workplace settings.

In addition, the following exclusion criteria were applied:

- Studies that focus on characteristics, profiles, preferences, needs and perceptions of middle managers.
- Studies that focus on determinants of particular middle manager behaviour.
- Studies in domains or settings that are remote from healthcare.

Search strategy: How were the studies identified?

The following three databases were used: ABI/INFORM Global, PsycINFO, and EMBASE. A basic filter applied across all databases returned only scholarly and peer-reviewed journals.

A search was conducted for research articles with the term 'line manage*' or 'middle manager*' in the title. This yielded more than 1,000 studies. Based on a review of the first 100 titles and abstracts it was concluded that the term 'line manager' and 'middle manager', are often used – although technically different – interchangeably. For this reason, as a rapid assessment, the search first included studies using the term 'middle manager', and then conducted an additional more limited[1] search for studies using the term 'line manager'. This search strategy yielded a total of 719 studies.

Selection process: How were the studies selected?

Studies were selected for inclusion through a two-phase process. In the first phase, duplicates were removed and then the titles and abstract of 357 studies were screened for relevance. This first phase yielded 30 studies.

In the second phase, studies were selected based on the full text of the article if they satisfied the inclusion criteria listed under 4. The second phase yielded a final sample of 24 studies. An overview of the selection process is provided in Appendix I.



[1]Specifically, this additional search was limited to quantitative studies in PsycINFO. This search yielded 109 studies

Critical appraisal: How were the quality of the included studies judged?

In almost any situation it is possible to find a scientific study to support or refute a theory or a claim. Thus it is important to determine which studies are trustworthy (i.e. valid and reliable). The trustworthiness of a scientific study is first determined by its methodological appropriateness. For cause-and-effect claims (i.e. if we do A, will it result in B?), a study has a high methodological appropriateness when it fulfils the three conditions required for causal inference: co-variation, time-order relationship, and elimination of plausible alternative causes (Shaughnessy & Zechmeister, 2006).

A randomised, controlled trial examining the relationship between two factors is the 'gold standard' for causal research questions- and going one step further, meta-analytic or systematic reviews integrating results of multiple randomised controlled trials are 'even better'. In contrast, for claims regarding predictors or antecedents of a particular outcome or phenomenon (i.e. does A predict/precede B?), a study has a high methodological appropriateness when it uses at minimum a pre- and post-measure.

Research design	Level	Appropriateness
MAs or SRs of randomised controlled trials.	Level A+	Very High
Randomised controlled trial.	Level A	High
MAs or SRs of non-randomised controlled before-after studies.		
Non-randomised controlled before-after study.	Level B	Moderate
MAs or SRs of controlled studies without a pre-test or before-after studies without a control group.		
Controlled study without a pre-test.	Level C	Limited
Before-after study without a control group.		
MAs or SRs of cross-sectional studies.		
Cross-sectional studies or case studies.	Level D	Low

In addition, a study's trustworthiness is determined by its methodological quality (its strengths and weaknesses). For instance, was the sample size large enough and measurement methods reliable? To determine methodological quality, all included studies were assessed on explicit quality criteria. Based on a tally of the number of weaknesses, their trustworthiness was downgraded. Final quality level is determined as follows: a downgrade of one level if two weaknesses were identified; a downgrade of two levels if four weaknesses were identified, etc. (Since no study is perfect one weakness is allowed without penalty.)

With this in mind, the studies yielded by phase two were critically appraised and rated for methodological appropriateness and quality.

Critical appraisal: What was the quality of the included studies?

The overall quality of studies included is limited. Of the 24 studies included, only 2 studies were graded level A or B, meaning only a small proportion were high quality studies. The remaining 22 studies were graded level C or D, indicating that most of these studies were correlational. Thus, only limited inferences can be made regarding causality. An overview of all studies included and their year of publication, research design, sample size, population, main findings, effect sizes and limitations is provided in Appendix II.

Effect size: How was the 'impact' of the findings determined?

As part of the critical appraisal process, we identified the effect size for each relationship of interest. Effect size simply refers to the magnitude of an effect, which is determined by Cohen's rules of thumb (Cohen, 1988). Understanding the effect size is important because in large samples of data, even a small effect with little impact in practice can be statistically significant. According to Cohen, a 'small' effect is an effect visible only through careful examination, so many may not be practically relevant. A 'medium' effect is one 'visible to the naked eye of the careful observer'. Finally, a 'large' effect is one anybody can easily see because it is substantial.' In the main findings, + indicates a small effect, ++ indicates a moderate effect, and +++ indicates a large effect.

Main findings

1. What are line and/or middle managers?

Although this review identified a large number of research articles using 'line manager' in the title, the term is seldom defined. In some studies line managers are broadly described as 'the managerial position closest to employees.' (Lundmark, 2017). For this reason, line managers are also referred to as 'frontline' or 'first line' managers'. In other studies, line managers are defined as part of the (vertical) chain of command within an organisation's hierarchical system. As such, they are different from 'functional' managers (e.g. HR managers) or 'project' managers (e.g. change managers).

In management practice, however, the term 'line manager' is used interchangeably with the term 'middle manager' - managers who supervise frontline managers and who themselves are supervised by an organisation's senior managers. In the research literature, however, the term middle management is understood rather broadly. It extends to managers located below top managers and above first-level supervisors. The distinguishing feature of both line and middle managers, however, is not where they sit in the organisational chart. Rather, it is their access to top management coupled with their knowledge of operations (Wooldridge, 2008).

2. What are the roles and practices of line/middle managers?

The roles and practices of line and/or middle managers are diverse. In particular, the research literature demonstrates that these type of managers not only communicate information and coordinate activities (Schlesinger, 1984; Floyd, 1997) but also implement strategies and policies (Jackson, 1995), act as change agents, and oversee the day-to-day running of the business (Barton, 2013; O'Shannassy, 2014).

Other roles mentioned include supporting, coaching, supervising and evaluating employees. In the case of implementing healthcare policies, guidelines, or innovations, line and middle managers fulfill roles such as diffusing information, mediating between implementation strategy and day-to-day activities, 'selling' innovations, suggesting/developing alternatives, and shaping the implementation climate (Birken, 2016; Chen, 2017).

3. What is known about the impact of these roles and practices on workplace performance?

Finding 1: The roles and practices of line and middle managers have a substantial impact on a wide range of organisational outcomes (Level A, ++)

A wide number of studies demonstrate that the roles and practices of line and middle managers substantially impact a wide range of organisational outcomes, such as strategy development and implementation, innovation, support for change, compliance, performance, employee satisfaction, absenteeism, commitment, and workplace climate.

Finding 2: The roles and practices of line and middle managers have a small to moderate impact on a wide range of HR outcomes (Level C, +)

Several studies suggest that the role and (HR) practices of line and middle managers have a small to moderate impact on relevant HR outcomes (Ryu, 2013), such as employee commitment, involvement (Alhaqbani, 2016), engagement, innovative performance (Alfes, 2013), and task performance. In addition, line and middle managers play an important role in conflict management, which in turn affects outcomes such as staff turnover, absence rates and workplace climate (Teague, 2013).

Finding 3: The roles and practices of line and middle managers have a small to moderate impact on the outcome of workplace interventions and employees' support for change initiatives (Level B, ++)

A high-quality study demonstrated that middle managers' support for workplace interventions affects staff support and influences how they perceived the intervention. In addition, middle managers' support has a positive effect on learning climate (Henderson, 2014). Moreover, a recent cross-sectional study suggests that change interventions initiated by middle managers are positively related to employee support for change (Heyden, 2017).

Finding 4: The roles and practices of line and middle managers have a moderate impact on implementation effectiveness (Level A, ++)

A recent systematic review shows that middle managers in healthcare organisations play an important role in facilitating implementation of new (evidence-based) practices (Birken, 2018). This outcome is consistent with findings from other studies that indicate that line managers' involvement and 'upward' activities (developing/ suggesting new alternatives) increases implementation success (Birken, 2013; Chen, 2017; Fryer, 2018).

Finding 5: The roles and practices of line and middle managers have a moderate impact on organisational performance (Level C, ++)

A recent longitudinal study suggests that middle managers' practices such as setting clear goals, communication, participative management, human resource practices, and resource distribution have a positive effect on objective performance measures. This finding is consistent with findings from other studies that indicate that middle managers' behaviours and activities are positively linked with organisational performance (Ahearne, 2014; Mair, 2005).

Finding 6: The roles and practices of line and middle managers have a small impact on innovation (Level C, +)

A recent longitudinal study of more than 2,000 organisations showed that start-ups with middle managers are more likely to introduce innovative products and services. A possible explanation for this finding is that establishing a middle management level to attend to issues of coordination frees up time and attention for innovators in the organisation to introduce new products and services (Grimpe, 2019).

Finding 7: The involvement of line and middle managers in strategy development has a moderate impact on strategy implementation and consequently organisational capabilities (Level D, ++)

Several studies suggest that middle managers' involvement in strategy development has a positive impact on strategy implementation and, consequently, organisational capabilities (Ouakouak, 2014). In particular, it was found that line managers' knowledge of internal resources and capabilities, the organisation's competitive environment, and his/her position in the social network of managers contribute to strategic consensus (Pappas, 2003).



Finding 8: The effect of the roles and practices of line and middle managers on organisational outcomes is most likely moderated by several factors

Several studies indicate that the effect of the roles and practices of line and middle managers is moderated by several factors, such as their work experience and education (Mair, 2005). However, a recent systematic review suggests that most studies offer little understanding regarding the relative impact of these factors (Birken, 2018).

4. What roles and practices have the biggest impact on performance?

The effect sizes of the findings presented above are all in the range of small to moderate. It should be noted, however, that most of the studies included in this review focus on topics such as strategy, change, and implementation – topics that involve multiple variables that affect each other and for which high quality (controlled) studies are often not available. Other topics that are in the sphere of influence by line- and middle managers – for example HR related activities – are strikingly absent.

Because of the limitations observed in the primary studies this review identified, we here offer further insights from findings of other recent CEBMa reviews. These reviews identify five factors pertinent to middle management, all shown to have large impact on organisational outcomes.

An overview of these factors is provided below:

Factor 1. Social cohesion

Social cohesion refers to a shared liking or attraction to the group, emotional bonds of friendship, caring and closeness among group members, and enjoyment of each other's company (Chiocchio, 2009). Social cohesion is a state and not a stable trait; it can (and most likely does) change over time in both its form and intensity through processes of group formation, group development, group maintenance, and group dissolution (Carron & Chelladurai, 1981). Although social cohesion is dynamic it is unlikely to change dramatically on a moment-to-moment basis. It is influenced by the kind of support and directional clarity managers provide.



How does social cohesion enhance performance?

A high level of social cohesion among team members creates a psychologically safe environment in which team members feel free to explore new ways of doing things (Hülsheger, Anderson, & Salgado, 2009). The notion that a person is more willing to take risks in a situation in which he/she has a reliable bond with an important other has been confirmed in other areas of psychology, such as developmental psychology. For example, child development theories suggest that children who are well bonded with their parents engage in more exploratory and learning behaviour.

Further, knowledge workers with strong feelings of belongingness and attachment to their colleagues are more likely to cooperate and interact with each other, and thus more likely to exchange ideas and share information (Hülsheger et al., 2009). For example, operating room nurses are more likely to share innovative ideas to improve patient safety with surgeons when there is a high level of social cohesion between these two professional groups.



Factor 2. Perceived supervisory support

When knowledge workers interact with and receive feedback from their line manager (supervisor), they form perceptions of how the manager supports them. This perception is based on how the workers feel the manager helps them in times of need, praises them or the team for a task well done or recognises them for extra effort. This is known as perceived supervisory support (PSS).

Why does perceived supervisory support enhance performance?

The construct of perceived supervisory support stems from the norm of reciprocity, that is, when people treat others as they would like to be treated, repaying kindness with kindness and retaliating against those who inflict harm (Brunell et al., 2013; Gouldner, 1960). Put differently, when a manager helps his or her employees in times of need or recognises them for extra effort, these employees tend to act in a way of value to the manager, such as meeting goals and objectives, and to the organisation as a whole (Edmondson, 2013; Eisenberger, 1986).

Factor 3. Team empowerment

Psychological empowerment refers to the belief by workers that they can perform their tasks competently, decide how to do their jobs, and behave in ways that make a difference. As such, team empowerment refers to shared perceptions among team members regarding the team's collective level of empowerment. Teams that are empowered feel that they perform intrinsically meaningful work and, as a group, have a higher degree of choice or discretion in deciding how to carry out team tasks (Seibert, 2011). Managers contribute to team empowerment through the support (skill development and information) they provide to teams and their respect for the decisions teams make.



How does team empowerment enhance performance?

Psychological empowerment has been associated with a wide range of outcomes, such as job satisfaction, organisational commitment and turnover intentions. Psychological empowerment is also positively related to work performance. It is assumed that psychological empowerment enhances performance by increasing: 1) the amount of information and control workers have over their work; 2) the level of work-related knowledge, skills, and abilities of employees; and 3) the motivation employees have to achieve organisational goals (Seibert, 2011).

Factor 4. Psychological safety

Psychological safety is a group-level phenomenon that refers to the shared belief held by members that the group is safe for 'interpersonal risk taking' – i.e. a sense of confidence that others will not embarrass, reject or punish someone for speaking up (Edmondson, 1999). Psychological safety is related to 'intra-team trust', but includes: 1) respect for each other's competence, 2) caring about each other as people and 3) trust in each other's intentions. Managers influence psychological safety through the consideration they show for team wellbeing and their respect for the input teams provide and the decisions they make.

How does psychological safety enhance the level of performance?

Psychological safety is assumed to be a prerequisite for group learning. If group members feel psychologically safe, they will: 1) be more willing to ask for help, admit an error, seek feedback, etc. and those actions, 2) foster learning in the group which, 3) improves their performance.

Factor 5. Group goals



In one's personal life, a goal is something you are trying to do or achieve. In the domain of management, a goal can be defined as an observational or measurable organisational outcome to be achieved within a specified time limit (Locke & Latham, 2002). As such, organisational goal-setting can refer to desired work or business outcomes, as well as the intention or plan to act towards these outcomes. Goal setting is one of the most researched topics in the field of industrial and organisational psychology. A large number of high-quality studies consistently demonstrate that specific, difficult goals yield higher performance than non-specific ('do your best') goals, and specific difficult goals yield higher performance than specific easy goals.

Several studies suggest that setting goals at the group level may yield higher performance than individual goals (Kleingeld, 2011). In addition, it is assumed that group goals trigger unique motivational mechanisms such as planning, cooperation, morale-building communication, and collective efficacy within a team. Managers contribute to appropriate group goals by promoting two-way information sharing and their own efforts to support team performance.

How do group goals enhance the level of performance?

According to goal-setting theory, goals affect performance through four causal mechanisms (Latham, 2004). First, goals serve a directive function. They call an employee's attention and effort towards goal-relevant activities and away from goal-irrelevant ones. Second, goals have an energising function: high goals lead to greater effort than low goals. Third, goals affect persistence. When employees are allowed to control the time spent on a task, hard goals prolong effort. Finally, goals affect action indirectly, that is, by generating arousal, discovery and/or use of task-relevant knowledge and strategies, which increase odds of success (Locke & Latham, 2002).

Conclusion

The roles and practices of line and middle managers and their effect on organisational outcomes are widely studied. However, the available evidence is rich in quantity but not quality. Based on this evidence, we conclude that the roles and practices of line and middle managers substantially affect a wide range of organisational outcomes. Thus, they are an indispensable link between the organisation's top management and its frontline employees.

Limitations

To provide a 'rapid' review, concessions were made in the breadth and depth of the search process. As a consequence, relevant studies may have been missed.

A second limitation concerns the critical appraisal of included studies. We did not perform a comprehensive evaluation of their measures (i.e. the psychometric properties of the tests, scales and questionnaires used).

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.

References

Ahearne, M., Lam, S. K., & Kraus, F. (2014). Performance impact of middle managers' adaptive strategy implementation: The role of social capital. *Strategic Management Journal, 35*(1), 68.

Alfes, K., Truss, C., Soane, E. C., Rees, C., & Gatenby, M. (2013). The relationship between line manager behavior, perceived HRM practices, and individual performance: Examining the mediating role of engagement. *Human Resource Management, 52*(6), 839-859.

Alhaqbani, A., Reed, D. M., Savage, B. M., & Ries, J. (2016). The impact of middle management commitment on improvement initiatives in public organisations. *Business Process Management Journal, 22*(5), 924-938.

Barton, L. C., & Ambrosini, V. (2013). The moderating effect of organisational change cynicism on middle manager strategy commitment. *The International Journal of Human Resource Management, 24*(4), 721.

Birken, S. A., DiMartino, L. D., Kirk, M. A., Lee, S. Y. D., McClelland, M., & Albert, N. M. (2016). Elaborating on theory with middle managers' experience implementing healthcare innovations in practice. *Implementation Science : IS, 11*, 2.

Birken, S., Clary, A., Tabriz, A. A., Turner, K., Meza, R., Zizzi, A., . . . Charns, M. (2018). Middle managers' role in implementing evidence-based practices in healthcare: a systematic review. *Implementation Science : IS, 13*(1), 149.

Brunell, A. B., Davis, M. S., Schley, D. R., Eng, A. L., van Dulmen, M. H. M., Wester, K. L., & Flannery, D. J. (2013). A New Measure of Interpersonal Exploitativeness. *Frontiers in Psychology, 4*(299).

Carron, A. V., & Chelladurai, P. (1981). The dynamics of group cohesion in sport. *Journal of Sport Psychology, 3,* 123-139.

Chen, C.-A., Berman, E. M., & Wang, C.-Y. (2017). Middle Managers' Upward Roles in the Public Sector. *Administration & Society, 49*(5), 700-729.

Chiocchio, F. (2009). Cohesion and Performance: A Meta-Analytic Review of Disparities Between Project Teams, Production Teams, and Service Teams. *Small Group Research, 40*(4), 382-420.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Edmondson, A. 1999. Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*: 350–383.

Edmondson, D. R., & Boyer, S. L. (2013). The Moderating Effect of the Boundary Spanning Role on Perceived Supervisory Support: A Meta-Analytic Review. *Journal of Business Research, 66*(11), 2186.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organisational support. *Journal of Applied Psychology, 71,* 500-507.

Floyd, S. W., & Wooldridge, B. (1997). Middle managements strategic influence and organisational performance. *Journal of Management Studies, 34,* 465–485.

Fryer, A.-K., Tucker, A. L., & Singer, S. J. (2018). The impact of middle manager affective commitment on perceived improvement program implementation success. *Health Care Management Review, 43*(3), 218.

Grimpe, C., Murmann, M., & Sofka, W. (2019). Organisational design choices of high-tech startups: How middle management drives innovation performance. *Strategic Entrepreneurship Journal, 13*(3), 359-378.

Gouldner, A. (1960). The norm of reciprocity: a preliminary statement. *Am. Sociol. Rev., 25,* 161- 178.

Heyden, M. L. M., Fourne, S. P. L., Koene, B. A. S., Werkman, R., & Ansari, S. (2017). Rethinking 'Top-Down' and 'Bottom-Up' Roles of Top and Middle Managers in Organisational Change: Implications for Employee Support. *The Journal of Management Studies, 54*(7), 961-985.

Hülsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: a comprehensive meta- analysis spanning three decades of research. *Journal of Applied Psychology, 94*(5), 1128-1145.

Kleingeld, A., van Mierlo, H., & Arends, L. (2011). The effect of goal setting on group performance: a meta-analysis. *Journal of Applied Psychology, 96*(6), 1289.

Latham, G.P. (2004). The motivational benefits of goal setting. *Academy of Management Executive, 18*(4), 126-129.

Locke, E. A., & Latham, G. (1990). *A Theory of Goal-setting and Task Performance.* Englewood Cliffs.

Locke, E. A. and Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57*(9), 705–717.

Lundmark, R., Hasson, H., von Thiele Schwarz, U., Hasson, D., & Tafvelin, S. (2017). Leading for change: Line managers' influence on the outcomes of an occupational health intervention. *Work & Stress, 31*(3), 276-296.

Mair, J. (2005). Exploring the Determinants of Unit Performance: The role of middle managers in stimulating profit growth. *Group & Organisation Management, 30*(3), 263-288.

O'Shannassy, T. (2014). Investigating the role of middle managers in strategy-making process: An Australian mixed method study. *Journal of Management and Organisation, 20*(2), 187-205.

Ouakouak, M. L., Ouedraogo, N., & Mbengue, A. (2014). The mediating role of organisational capabilities in the relationship between middle managers' involvement and firm performance: A European study. *European Management Journal, 32*(2), 305.

Pappas, J. M., Flaherty, K. E., & Wooldridge, B. (2003). Achieving Strategic Consensus in the Hospital Setting: A Middle Management Perspective. *Hospital Topics, 81*(1), 15-22.

Petticrew, M., & Roberts, H. (2006). *How to appraise the studies: an introduction to assessing study quality. Systematic reviews in the social sciences: A practical guide,* 125-163.

Ryu, S., & Kim, S. (2013). First-line managers' HR involvement and HR effectiveness: The case of South Korea. *Human Resource Management, 52*(6), 947-966.

Seibert, S. E., Wang, G., & Courtright, S. H. (2011). Antecedents and Consequences of Psychological and Team Empowerment in Organisations: A Meta-Analytic Review. *Journal of Applied Psychology , Vol. 96, No. 5,* 981–1003.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Teague, P., & Roche, W. K. (2012). Line managers and the management of workplace conflict: Evidence from Ireland. *Human Resource Management Journal, 22*(3), 235-251.

Wooldridge, B., Schmid, T., & Floyd, S. W. (2008). The Middle Management Perspective on Strategy Process: Contributions, Synthesis, and Future Research. *Journal of Management, 34*(6), 1190.

Appendix I

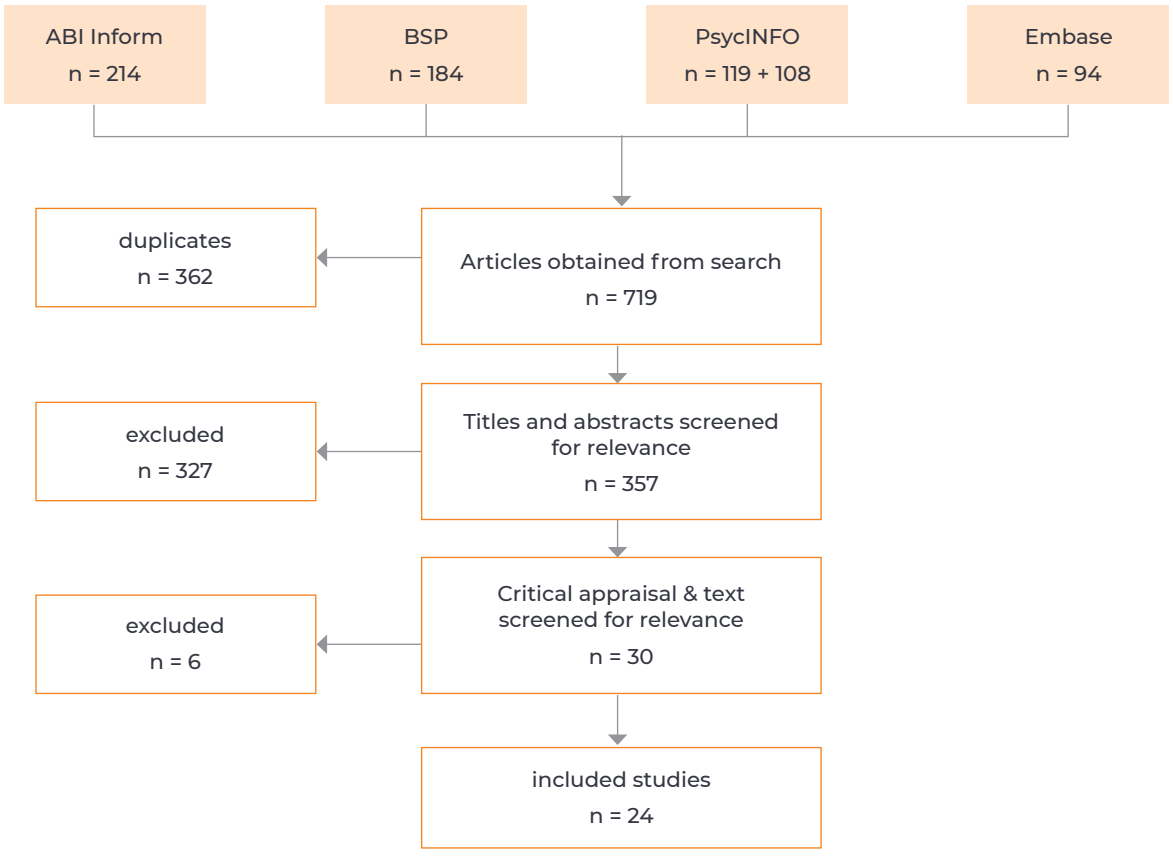
Search terms & hits

ABI/Inform Global, PsycINFO, ERIC, EMBASE, CINAHL
peer reviewed, scholarly journals, September 2019

Search terms	ABI	BSP	PSY	EMBASE
S1: ti("middle manage*"), limit 2010, limit studies	214	184	119	94

Selection of studies

Study selection – Line & Middle Managers



Appendix II

Line & Middle Management: Included studies

Author & year	Design & sample size	Sector / Population	Main findings	Effect sizes	Limitations	Level
Ahearne, 2014	Cross-sectional and longitudinal study n = 43 sales directors and 285 sales managers	Business unit of a Fortune 500 company that operates in the industrial cleaning and sanitising industry	1. The relationship between middle managers' facilitating adaptability (i.e. downward influence behavior / involvement in and influence on strategy) and objective business unit performance does NOT follow an inverted U shape. > apparently extreme adaptation does NOT lead to a lack of focus in the overall strategy. 2. The relationship between middle managers' championing alternatives (i.e. upward influence behavior) and objective business unit performance follows an inverted U shape. > When managers engage in championing alternatives to the extreme, their behavior may backfire: senior managers may perceive middle managers' extreme upward influence as acts that question their positional power, which in turn can intensify affective strategic dissensus and impair effective strategy implementation. 3. The rate of business unit performance gain associated with middle managers' facilitating adaptability is higher when a middle manager has high informational social capital (i.e. informal social ties with peers in neighboring areas). 4. The rate of business unit performance gain associated with middle managers' facilitating adaptability is higher when the middle manager manages a large business unit network. 5. The rate of business unit performance gain associated with middle managers' championing alternatives is higher when a middle manager's reputational social capital in the management network is high. 6. The rate of business unit performance gain associated with middle managers' championing alternatives is higher when a senior manager's regional network size is large.	direct linear correlations: 1. r = .34 2. r = .39 3. r = .17 4. r = .02 5. r = .14 6. r = -.07	Single organisation	C

Alhaqbani, 2016	mixed methods, cross-sectional and qualitative (interviews) n = 149	Saudi public service organisation	Lack of commitment of line managers leads to poor employee commitment, low employee involvement, and consequently poor implementation of improvement programs/initiatives.	not reported	single organisation	D
Birken, 2013	mixed methods, cross-sectional and qualitative (interviews) n = 120 + 103	Managers and CEOs at 149 community health centers in 21 Midwestern and West Central states in the US	Middle managers' commitment is positively related to implementation effectiveness. Qual: Middle managers' commitment influenced implementation effectiveness when middle managers engaged in extra-role behaviors with a positive attitude.	Varies from ß = .14 to ß = .44, depending on the type of implementation	no serious limitations	D
Birken, 2015	mixed methods, cross-sectional (n = 120) and qualitative (interviews, n = 16)	middle managers in 120 US health centers	Top managers increase middle managers' commitment by directly conveying to middle managers that innovation implementation is an organisational priority. Qual: Middle managers may maximise the influence of top managers' support on their commitment by communicating with top managers about what kind of support would be most effective in increasing their commitment to innovation implementation.	ß = .37	no serious limitations	D
Birken, 2016	cross-sectional study n = 63	nurse managers, Cleveland Clinic	The theory of middle managers' role in implementing healthcare innovations states that middle managers influence implementation effectiveness by fulfilling the following four roles: diffusing information, synthesising information, mediating between strategy and day-to-day activities, and selling innovation implementation. Middle managers rated all of the theory's hypothesised four roles as "extremely important" but ranked diffusing and synthesising information as the most important and selling innovation implementation as the least important. They reported engaging in several activities that were consistent with the theory's hypothesised roles and activities such as diffusing information via meetings and training.	not reported	mainly descriptive study	D

Birken, 2018	systematic review of observational, quasi-experimental, and experimental studies s = 105	middle managers from healthcare organisations	Middle managers play an important role in facilitating EBP implementation. » Mediating between strategy and day-to-day activities. » Diffusing information. » Selling implementation. » Synthesising information. » Shaping implementation climate. However, included studies offered little understanding regarding the relative importance of various roles, potential moderators of the relationship between middle managers' roles and EBP implementation, or determinants of middle managers' role in EBP implementation.	n.a.	no serious weaknesses	A
Bos-Nehles, 2013	cross-sectional study n = 174 + 1,065	Line managers and subordinates of an international naval defense company and a Dutch construction company.	The ability of line managers in terms of performing HRM practices is not related to how effectively they implement these practices on the work floor.	r = .05 ns	no serious weaknesses	D
Chen, 2017	cross-sectional study n = 644	random sample of senior employees, supervisors, and line managers from seven ministries of Taiwan's central government	1. Line managers in public organisations are frequently involved in upward roles (= suggesting/developing new alternatives and synthesising information). 2. High-performance-related practices are positively associated with public line managers' upward activities.	2. new alternatives r = .41 synthesising info r = .38	no serious weaknesses	D

Fryer, 2018	cross-sectional study n = 67	nurse managers from 19 U.S. hospitals	Higher levels of middle manager affective commitment to a quality improvement program are associated with higher levels of program implementation success.	r = .69 ß = .40	no serious weaknesses	D
Grimpe, 2019	Longitudinal study (7-year panel study) n = 2,431	German high-tech start-ups founded	Start-ups with middle managers are more likely to introduce product innovations (establishing a middle management level frees up attention for innovation).	r = .12 marginal effect = .04	no serious limitations	C
Henderson, 2014	quasi-experimental study n = 336	nurse managers from four general surgical and four general medical inpatient matched units in two settings in South East Queensland, Australia.	Middle managements' supports for a (workplace) intervention increases: » staff support for the intervention. » positive perceptions. » behaviours that promote learning (learning climate).	not reported (only M and SD)	no serious limitations	B
Heyden, 2017	cross-sectional study n = 3,200	managers, frontline supervisors, and internal consultants of 602 organisations	1. Change initiated and executed by top managers is negatively related to employee support for change. 2. Change initiated by top managers and executed by middle managers is positively related to employee support for change. 3. Change initiated by middle managers and executed by top managers will be positively related to employee support for change. 4. Change initiated and executed by middle managers will be positively related to employee support for change.	1. ß = .04 ns 2. ß = .01 ns 3. ß = .49 4. ß = .25	no serious limitations	D
Jaoua, 2016	cross-sectional study n = 350	CEOs of large Tunisian companies	Line managers have a central role in the relationship between creativity in strategy and organisational performance.	not reported (only SEM coefficients)	mainly self-report, highly anecdotal	D -

Jaoua, 2018	cross-sectional study n = 364	Tunisian companies	Middle managers roles (facilitating adaptability, implementing strategy, championing alternatives, but not synthesising information) has a direct positive effect on strategy implementation and organisational performance.	not reported (only SEM coefficients)	same study as Jaoua 2016	D -
Johansen, 2016	Longitudinal study (4-year panel study) n = 250	public schools in Hawai	1. Organisations with middle managers who engage in tasks related to setting clear goals experience better organisational performance. 2. Organisations with middle managers who engage in communication tasks experience better organisational performance. 3. Organisations with middle managers who engage in human resources management tasks experience better organisational performance. 4. Organisations with middle managers who engage in participative management tasks experience better organisational performance. 5. Organisations with middle managers who engage in resource distribution tasks experience better organisational performance. 6. Organisations with middle managers who have a higher level of engagement in management tasks experience better organisational performance.	only unstandardized b's are reported	no serious limitations	C
Alfes, 2013	cross-sectional study, n = 924	employees from service-sector organisations in the United Kingdom	Perceived line manager behavior is positively related to 1) employee engagement, 2) task performance and 3) innovative work behaviour.	1. r = .36 2. r = .18 3. r = .21	all self-report	D
Lundmark, 2017	longitudinal (before-after) study n = 180	employees from a white-collar organisation in Sweden	1. Line managers' attitudes and actions during the intervention process positively predict changes in a) self-rated health and b) work ability among employees. 2. Line managers' general transformational leadership during the intervention process positively predicts changes in self-rated health and work ability among employees.	1a. r = .23, ß = .23 1b. r = .22, ß = .25 2a. r = .16, ß = ns 2b. r = .12, ß = ns	no serious limitations	C

Mair, 2005	Longitudinal study (3-year panel study) n = 119	area units from a Dutch financial service company	1. Enacted strategy—actual behavior of middle managers that is aligned with the company's strategy—has a positive and significant effect on unit performance over time. 2. The background of the middle manager in charge of a unit has a significant effect on the performance of that unit over time. Middle managers with a variety of work experience perform better. 3. The educational level of the middle manager in charge of a unit has an effect on the performance of that unit over time. Middle managers with a high level of formal education perform worse.	only SEM path coefficients are reported, but all direct correlations are small	no serious limitations	C
O'Shannassy, 2014	cross-sectional and qualitative study n = 72	Australian Executive Master of Business Administration students working in a range of industries	Line managers are the 'doers' of strategy, with important 'analyst', 'coordinator', 'information source' and 'communicator' roles.	n.a.	no serious limitations	D
Ouakouak, 2014	cross-sectional study n = 372	managers from 372 companies from 33 different European countries	1. Middle managers' involvement in the strategy formulation positively affects organisational capabilities. 2. Middle managers' involvement in the strategy implementation positively affects organisational capabilities. 3. Middle managers' autonomy positively affects organisational capabilities.	only SEM path coefficients are reported – all small to moderate	no serious limitations	D
Pappas, 2003	cross-sectional study n = 88	managers from a medium-sized hospital in an urban setting located in the northeastern United States	Line managers' knowledge of the (1) internal resources and capabilities and the (2) external competitive environment of an organisation and (3) his/her position in the social management structure significantly affect the realization of strategic consensus.	1. r = .34 2. r = .34 3. r = .15	no serious limitations	D

Ryu, 2013	Longitudinal study (3-year panel study) n = 119	450 Korean firms that employ more than 100 workers	First-line managers' HR involvement is positively associated with HR effectiveness.	r = .15 ß = .18	no serious limitations	C
Schaefer, 2016	cross-sectional study n = 164	Large German firms	1. Implementation success is more strongly positively related to organisational performance when top managers (relative to middle managers) dominate participation in the strategic planning process . 2. Strategic planning effectiveness is more strongly positively related to organisational performance when middle managers (relative to top managers) dominate participation in the strategic planning process.	only SEM path coefficients are reported	no serious limitations	D
Teague, 2013	cross-sectional study n = 360	360 enterprises in the private sector and state-owned commercial enterprises employing 50 or more employees in the Republic of Ireland	Line- and supervisory-management engagement in conflict management affects key organisational outcomes of concern to employers: the employment relations climate, voluntary staff turnover, absence rates, productivity and the capacity to achieve organisational change.	small beta's	population somewhat unclear (single-survey respondents)	D

Excluded studies

Author & year	Reason for exclusion
Gunnarsdottir, 2009	Not relevant: After controlling for nurses' personal characteristics, job satisfaction, emotional exhaustion and nurse rated quality of care were found to be independently associated with perceptions of support from unit-level managers, staffing adequacy, and nurse–doctor relations.
Iasbech, 2018	Provides an overview of the most relevant articles, according to the citations, in research on SAP and the role of the MM inside organisations – no research findings or outcomes are reported.
Longenecker, 2003	Qualitative study, type of manager unclear.
Purcell, 2007	Mainly qualitative study, sectors very remote from healthcare (eg ladieswear and household departments).
Shipton, 2016	Outcome is only partly relevant (employees' affective commitment) Note: correlations are all < .1.
Wooldridge, 2008	Traditional literature review, no (pooled) effect sizes reported.

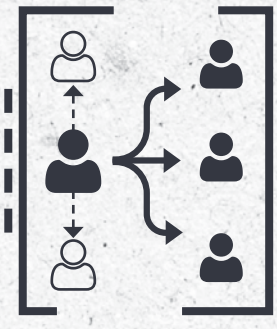
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EXECUTIVE SUMMARY

Rapid Evidence Assessment (REA)



IMPACT OF LINE AND/ OR MIDDLE MANAGERS ON WORKPLACE PERFORMANCE

a summary of scientific literature

October 2019

Culture Review **Implementation**

our journey of positive change

ACT Government

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What is a Rapid Evidence Assessment (REA)?



Rapid Evidence Assessments (REAs) use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and as a result, the likelihood of bias is considerably smaller.

Background

The National Health Service (NHS) in the United Kingdom, acknowledge the important interface their line and/or middle managers have with nurses, doctors and top management. However, their roles and responsibilities as well as their impact on workplace performance was unclear. For this reason, the NHS commissioned the Center for Evidence Based Management (CEBMa) to undertake a Rapid Evidence Assessment (REA) to understand what is known in scientific literature about the roles, practices and impact of line and/or middle managers on workplace performance.

What this REA assesses

In answering the main question, this REA also considers answers to the following questions:

1. **What are line and middle managers?**
2. **What are the roles and practices of line/middle managers?**
3. **What is known about the impact of these roles and practices on workplace performance?**
4. **What roles and practices have the biggest impact on performance?**

Main findings

1. What are line and/or middle managers?

While the review identified many research articles using the term 'line manager', it was not clearly defined. Some studies referred to line managers as 'the managerial position closest to employees (Lundmark, 2017). For this reason, line managers are referred to as 'frontline' or 'first line managers.' Whilst other studies refer to line managers as part of the vertical chain of command within an organisations hierarchical system, different from 'functional' managers, for example, HR managers or project managers.

In management practice, 'line manager' is used interchangeably with the term 'middle manager' – those who supervise frontline managers and are supervised by senior managers. The term 'middle manager' is understood more broadly, extending to manager located below top managers and above first-level supervisors.

The distinguishing feature of both line and middle managers is not where they sit in the organisational chart, but their access to top management plus their knowledge of operations (Wooldridge, 2008).

2. What are the roles and practices of line/middle managers?

The roles and practices of both line and middle managers are diverse. They not only communicate information and coordinate activities (Schlesinger, 1984; Floyd, 1997) but also implement strategies and policies (Jackson, 1995), act as change agents, and oversee the day-to-day running of the business (Barton, 2013; O'Shannassy, 2014).

Other roles include supporting, coaching, supervising and evaluating employees. In the case of implementing health care policies, guidelines, or innovations, line and middle managers diffuse information, mediate between implementation of strategies and day-to-day activities, 'sell' innovations, suggest and develop alternatives and shape the implementation climate (Birken, 2016; Chen, 2017).

3. What is known about the impact of these roles and practices on workplace performance?

Several findings were discovered in answering this question:

- **The roles and practices of line and middle managers have a substantial impact on a wide range of organisational outcomes.** These organisational outcomes include, strategy development and implementation, innovation, support for change, compliance, performance, employee satisfaction, absenteeism, commitment, and workplace climate.
- **The roles and practices of line and middle managers have a small to moderate impact on a wide range of HR outcomes.** HR outcomes impacted by line and middle managers includes, employee commitment, involvement (Alhaqbani, 2016) engagement and innovative performance (Alfes, 2013), and task performance. Additionally, these managers play an important role in conflict management, that in turn affect staff turnover, absence rates and workplace climate (Teague, 2013).
- **The roles and practices of line and middle managers have a small to moderate impact on the outcome of workplace interventions and employees support for change initiatives.** A high-quality study found that middle managers' support for workplace interventions affects staff support and influences how the intervention is perceived. In addition, middle managers' support has a positive effect on learning climate (Henderson, 2014). Further, a cross-sectional study undertaken by Hayden in 2017, showed that change interventions initiated by middle managers are positively related to employee support for change.
- **The roles and practices of line and middle managers have a moderate impact on implementation effectiveness.** A systematic review undertaken by Birken in 2018, showed that middle managers in healthcare organisations play an important role in facilitating the implementation of new evidence-based practices. This outcome is consistent with findings from other studies that line managers' involvement and 'upward' activities like developing or suggesting alternatives, increases implementation success (Birken, 2013; Chen, 2017; Fryer, 2018).
- **The roles and practices of line and middle managers have a moderate impact on organisational performance.** A longitudinal study suggests that middle managers' who set clear goals, provide clear communication, are participative managers, use their resources and HR practices effectively, have a positive effect on objective performance measures. This finding is consistent with other results from other studies that indicate middle managers' behaviours and activities are positively linked with organisational performance (Ahearne, 2014; Mair, 2005).
- **The roles and practices of line and middle managers have a small impact on innovation.** A longitudinal study of more than 2,000 organisations showed that start-up companies with middle managers are more likely to introduce innovative products and services. One possible reason is that having a middle management level to look after issues of coordination frees up time and attention for innovators in the company to introduce new products and services (Grimpe, 2019).
- **The involvement of line and middle managers in strategy development has a moderate impact on strategy implementation and consequently organisational capabilities.** Studies have revealed that line managers knowledge of internal resources and capabilities, the organisation's competitive environment, and their position in the social network of managers contribute to strategic consensus (Pappas, 2003).
- **The effect of the roles and practices of line and middle managers on organisational outcomes is most likely moderated by several factors.** These factors include the work experience and education of the line and middle managers (Mair, 2005). However, a recent systematic review revealed that most studies offer little understanding regarding the relative impact of these factors (Birken, 2018).

4. What roles and practices have the biggest impact on performance?

Most of the topics studied in the review focused on strategy, change and implementation. All of which involved multiple variables that affect each other and that high quality (controlled) studies were often not available. Other topics that can be influenced by line and middle managers, including HR related activities, are absent from this review.

Due to the limitations observed in the primary studies that this REA identified, the following are further insights from other recent CEBMa reviews. These reviews identified the five following factors that are relevant to middle management and have a large impact on organisational outcomes:

Factor 1 Social cohesion

Social cohesion refers to a shared liking or attraction to the group, emotional bonds of friendship, caring and closeness among group members, and enjoyment of each other's company (Chiocchio, 2009). It can and does change over time due to processes of group formation, development, maintenance and dissolution (Carron & Chelladurai, 1981). It is unlikely to change moment to moment and is influenced by the kind of support and directional clarity managers provide.



How does social cohesion enhance performance?
High levels of social cohesion among team members creates a psychologically safe environment in which team members feel free to explore new ways of doing things (Hulsheger , Anderson, & Salgado, 2009). The notion that a person is more willing to take risks in a situation in which they have a reliable bond with an important other has been confirmed in other areas of psychology, including developmental psychology. Knowledge workers with strong feelings of belongingness and attachment to their colleagues are more likely to cooperate and interact with each other, and therefore are more likely to exchange ideas and share information (Hulsheger et al., 2009). For example, operating room nurses are more likely to share innovative ideas to improve patient safety with surgeons when there is a high level of social cohesion between these two professional groups.

Factor 2 Perceived supervisory support

Feedback supervisors to knowledge workers allows them to perceive how their manager supports them. This perception is obtained from how the manager helps them in times of need, the level of praise they receive and recognition for extra effort. This is known as 'perceived supervisory support' (PSS).

Why does PSS enhance performance?

This terms stems from the 'norm of reciprocity' that when people treat others as they would like to be treated, they will repay kindness with kindness and retaliate against those who inflict harm (Brunell et al., 2013; Gouldner, 1960). If a manager helps their employees in times of need and recognises them for their efforts, then the employees will act in a way of value to the manager, such as meeting goals and objectives, and to the organisation as a whole (Edmondson, 2013; Eisenberger, 1986).

Factor 3 Team empowerment

Refers to the shared perceptions among team members regarding the team's collective level of empowerment. Teams that are empowered feel that they perform intrinsically meaningful work and, as a group, have a higher degree of choice or discretion in deciding how to complete team tasks (Seibert, 2011). Managers contribute to team empowerment through support, such as skills development and information, they give to their teams and the respect they provide for the team decisions made.

How does team empowerment enhance performance ?

Psychological empowerment enhances team performance by increasing: the amount of information and control workers have over their work; the level of work-related knowledge, skills and abilities of workers; and the motivation of team members to achieve organisational goals (Seibert, 2011).

Factor 4 Psychological safety

In 1999 Amy Edmondson defined the term as a group-level phenomenon that refers to the shared belief held by members that the group is safe for 'interpersonal risk taking' – a sense of confidence that others will not embarrass, reject or punish someone for speaking up. It includes respect for each other's competence, caring about each other as people and trust in each other's intentions. Managers can influence psychological safety through the consideration they show for team wellbeing and their respect for the input team provide and the decisions they make.



How does psychological safety enhance the level of performance?

Psychological safety is a pre-requisite for group learning. If group members feel psychologically safe, they will, be more willing to ask for help, admit an error and seek feedback. These actions will foster greater learning in the group and improve their overall performance.

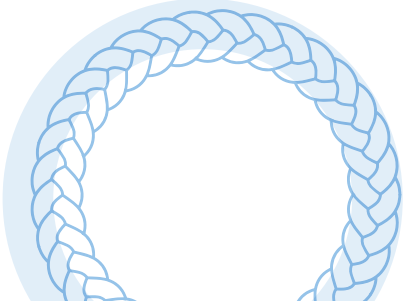
Factor 5 Group goals

In management a goal is defined as an observational or measureable organisational outcome to be achieved within a specified time limit (Locke & Latham, 2002). Organisational goal setting can refer to desired work or business outcomes, as well as the intention or plan to act towards these outcomes. Goal setting is one of the most researched topics in the field of industrial and organisational psychology. Several studies suggest that setting goals at the group level may yield higher performance than individual goals (Kleingeld, 2011). Managers contribute to appropriate group goals by promoting two-way information sharing and their own efforts to support team performance.

How do group goals enhance the level of performance?

According to goal setting theory, goals affect performance through four causal mechanisms (Latham, 2004):

- Goals serve a directive function – focus an employee's attention and effort towards goal-oriented activities and away from goal-irrelevant activities.
- Goals have an energising function – high goals lead to greater effort than low goals.
- Goals affect persistence – when employees can control the time spent on tasks, hard goals prolong effort.
- Goals affect action indirectly – generates arousal, discovery and use of task-relevant knowledge and strategies that increase the odds of success (Locke & Latham, 2002).



Conclusion

The roles and practices of line and middle managers and their effect on organisational outcomes are widely studied. However, the available evidence is rich in quantity, but not in quality. Yet, based on the evidence, the roles and practices of line and middle managers substantially affect a wide range of organisational outcomes, and are an indispensable link between the organisation's top management and its frontline employees.

More information

You can access more information in the *Rapid Evidence Assessment (REA) – The Impact of Line and/or Middle Managers on Workplace Performance – a summary of research literature, October 2019.*

References

Ahearne, M., Lam, S. K., & Kraus, F. (2014). Performance impact of middle managers' adaptive strategy implementation: The role of social capital. *Strategic Management Journal, 35*(1), 68.

Alfes, K., Truss, C., Soane, E. C., Rees, C., & Gatenby, M. (2013). The relationship between line manager behavior, perceived HRM practices, and individual performance: Examining the mediating role of engagement. *Human Resource Management, 52*(6), 839-859.

Alhaqbani, A., Reed, D. M., Savage, B. M., & Ries, J. (2016). The impact of middle management commitment on improvement initiatives in public organisations. *Business Process Management Journal, 22*(5), 924-938.

Barton, L. C., & Ambrosini, V. (2013). The moderating effect of organisational change cynicism on middle manager strategy commitment. *The International Journal of Human Resource Management, 24*(4), 721.

Birken, S. A., DiMartino, L. D., Kirk, M. A., Lee, S. Y. D., McClelland, M., & Albert, N. M. (2016). Elaborating on theory with middle managers' experience implementing healthcare innovations in practice. *Implementation Science : IS, 11*, 2.

Birken, S., Clary, A., Tabriz, A. A., Turner, K., Meza, R., Zizzi, A., . . . Charns, M. (2018). Middle managers' role in implementing evidence-based practices in healthcare: a systematic review. *Implementation Science : IS, 13*(1), 149.

Brunell, A. B., Davis, M. S., Schley, D. R., Eng, A. L., van Dulmen, M. H. M., Wester, K. L., & Flannery, D. J. (2013). A New Measure of Interpersonal Exploitativeness. *Frontiers in Psychology, 4*(299).

Carron, A. V., & Chelladurai, P. (1981). The dynamics of group cohesion in sport. *Journal of Sport Psychology, 3,* 123-139.

Chen, C.-A., Berman, E. M., & Wang, C.-Y. (2017). Middle Managers' Upward Roles in the Public Sector. *Administration & Society, 49*(5), 700-729.

Chiocchio, F. (2009). Cohesion and Performance: A Meta-Analytic Review of Disparities Between Project Teams, Production Teams, and Service Teams. *Small Group Research, 40*(4), 382-420.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Edmondson, A. 1999. Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*: 350–383.

Edmondson, D. R., & Boyer, S. L. (2013). The Moderating Effect of the Boundary Spanning Role on Perceived Supervisory Support: A Meta-Analytic Review. *Journal of Business Research, 66*(11), 2186.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organisational support. *Journal of Applied Psychology, 71,* 500-507.

Floyd, S. W., & Wooldridge, B. (1997). Middle managements strategic influence and organisational performance. *Journal of Management Studies, 34,* 465–485.

Fryer, A.-K., Tucker, A. L., & Singer, S. J. (2018). The impact of middle manager affective commitment on perceived improvement program implementation success. *Health Care Management Review, 43*(3), 218.

Grimpe, C., Murmann, M., & Sofka, W. (2019). Organisational design choices of high-tech startups: How middle management drives innovation performance. *Strategic Entrepreneurship Journal, 13*(3), 359-378.

Gouldner, A. (1960). The norm of reciprocity: a preliminary statement. *Am. Sociol. Rev., 25,* 161- 178.

Heyden, M. L. M., Fourne, S. P. L., Koene, B. A. S., Werkman, R., & Ansari, S. (2017). Rethinking 'Top-Down' and 'Bottom-Up' Roles of Top and Middle Managers in Organisational Change: Implications for Employee Support. *The Journal of Management Studies, 54*(7), 961-985.

Hülsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: a comprehensive meta- analysis spanning three decades of research. *Journal of Applied Psychology, 94*(5), 1128-1145.

Kleingeld, A., van Mierlo, H., & Arends, L. (2011). The effect of goal setting on group performance: a meta-analysis. *Journal of Applied Psychology, 96*(6), 1289.

Latham, G.P. (2004). The motivational benefits of goal setting. *Academy of Management Executive, 18*(4), 126-129.

Locke, E. A., & Latham, G. (1990). *A Theory of Goal-setting and Task Performance.* Englewood Cliffs.

Locke, E. A. and Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57*(9), 705–717.

Lundmark, R., Hasson, H., von Thiele Schwarz, U., Hasson, D., & Tafvelin, S. (2017). Leading for change: Line managers' influence on the outcomes of an occupational health intervention. *Work & Stress, 31*(3), 276-296.

Mair, J. (2005). Exploring the Determinants of Unit Performance: The role of middle managers in stimulating profit growth. *Group & Organisation Management, 30*(3), 263-288.

O'Shannassy, T. (2014). Investigating the role of middle managers in strategy-making process: An Australian mixed method study. *Journal of Management and Organisation, 20*(2), 187-205.

Ouakouak, M. L., Ouedraogo, N., & Mbengue, A. (2014). The mediating role of organisational capabilities in the relationship between middle managers' involvement and firm performance: A European study. *European Management Journal, 32*(2), 305.

Pappas, J. M., Flaherty, K. E., & Wooldridge, B. (2003). Achieving Strategic Consensus in the Hospital Setting: A Middle Management Perspective. *Hospital Topics, 81*(1), 15-22.

Petticrew, M., & Roberts, H. (2006). *How to appraise the studies: an introduction to assessing study quality. Systematic reviews in the social sciences: A practical guide,* 125-163.

Ryu, S., & Kim, S. (2013). First-line managers' HR involvement and HR effectiveness: The case of South Korea. *Human Resource Management, 52*(6), 947-966.

Seibert, S. E., Wang, G., & Courtright, S. H. (2011). Antecedents and Consequences of Psychological and Team Empowerment in Organisations: A Meta-Analytic Review. *Journal of Applied Psychology , Vol. 96, No. 5,* 981–1003.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Teague, P., & Roche, W. K. (2012). Line managers and the management of workplace conflict: Evidence from Ireland. *Human Resource Management Journal, 22*(3), 235-251.

Wooldridge, B., Schmid, T., & Floyd, S. W. (2008). The Middle Management Perspective on Strategy Process: Contributions, Synthesis, and Future Research. *Journal of Management, 34*(6), 1190.

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Rapid Evidence Assessment (REA)

IMPACT AND ANTECEDENTS* OF PSYCHOLOGICAL SAFETY IN WORKPLACES

a summary of scientific literature

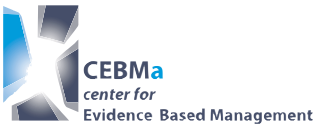
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Culture Review **Implementation**

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***For the purposes of this REA 'antecedents' refers to the 'drivers' that may cause psychological safety.**



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Background

The ACT public health system plays a critical role in the provision of healthcare to the people of the Australian Capital Territory (ACT) and surrounding New South Wales (NSW) region. Following the Independent Review into workplace culture within the ACT public health system which outlined recommendations to improve workplace experiences system-wide, the ACT Government through the ACT public health system engaged the Australian National University (ANU) Research School of Management to identify key priority areas for change. One of these key priority areas is psychological safety.

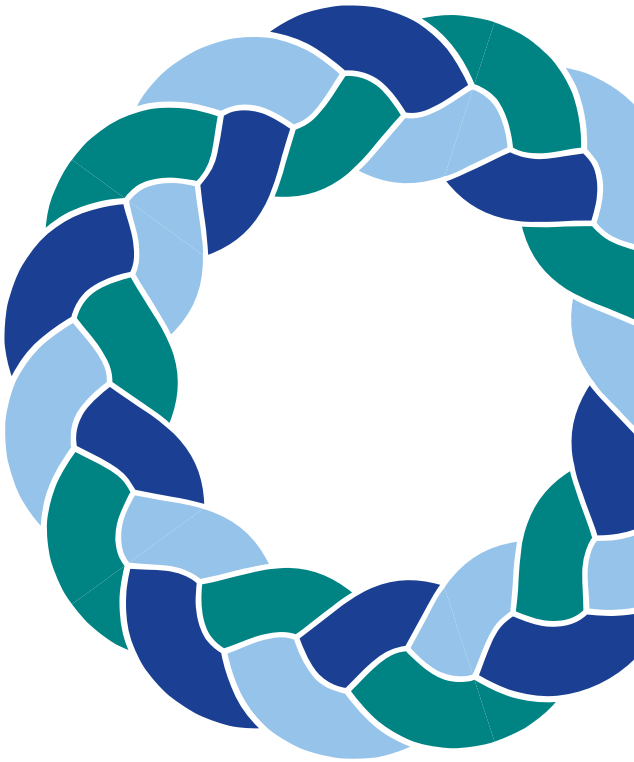
For this reason, the ACT public health system approached the Center for Evidence Based Management (CEBMa) to undertake a Rapid Evidence Assessment (REA) to understand what is known in the scientific literature about the impact and antecedents of psychological safety in teams and organisations. This review presents an overview of the findings.

What is a Rapid Evidence Assessment (REA)?

Evidence reviews come in many forms. One of the best-known types is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: Clear criteria for inclusion is often lacking and studies are selected based on the researcher's personal preferences. As a result, conventional literature reviews are prone to severe bias.

This is why 'rapid evidence assessments' (REAs) are used. REAs use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies REAs include using explicit criteria. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and, as a result, the likelihood of bias is considerably smaller.





Main question: What does this REA answer?

What is known in the scientific literature about the impact and antecedents of psychological safety in teams and organisations?

Other issues raised, which will form the basis of our conclusion regarding the main question above, are:

1. **What is psychological safety?**
2. **How can psychological safety be measured?**
3. **What is the impact of psychological safety on organisational outcomes?**
4. **What are the antecedents of psychological safety?**

Search strategy: How was the research evidence sought?

Four databases were used to identify studies: ABI/INFORM Global, Business Source Premier, PsycINFO, and Medline. The search applied the following generic search filters:

1. **Scholarly journals, peer-reviewed.**
2. **Published in the period 2000 to 2019.**
3. **Articles in English.**

A search was conducted using combinations of various search terms, including 'psychological safety', 'antecedents', 'predict', 'characteristics', and 'factors'. We conducted five different search queries and screened the titles and abstracts of 300+ studies. An overview of all search terms and queries is provided in Appendix I.

Selection process: How were the studies selected?

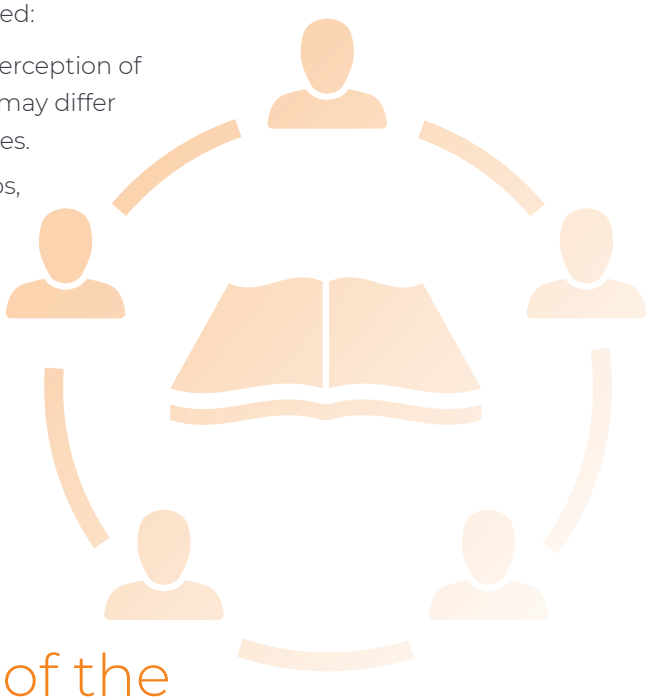
Study selection took place in two phases. First, titles and abstracts of the 300+ studies identified were screened for relevance. In case of doubt or lack of information, the study was included. Duplicate publications were removed. This first phase yielded 173 studies. Second, studies were selected based on the full text of the article using these inclusion criteria:

1. **Type of studies:** Focusing on quantitative, empirical studies.
2. **Measurement:** Only studies in which relationships among team or organisational attributes, interventions and outcomes were quantitatively measured.
3. **Context:** Only studies related to workplace settings.
4. **Level of trustworthiness:** Only studies that were graded Level C or above (see below).

In addition, the following exclusion criteria were applied:

- Studies in non-western countries in which the perception of psychological safety and its effect on outcomes may differ from western countries due to cultural differences.
- Studies on psychological safety in specific groups, such as employees with a chronic illness.
- Studies on psychological safety in virtual, dispersed, or global teams.

This second phase yielded a total number of 66 studies. An overview of the selection process is provided in Appendix II.



Critical appraisal: How were the quality of the included studies judged?

The overall quality of the included studies was rather low. Of the 66 studies included, most (44) studies had a cross-sectional design and were therefore graded quality-Level D. Only six studies were classified as Level B or higher, including two meta-analyses. An overview of all studies included and their year of publication, research design, sample size, population, main findings, effect sizes and limitations is provided in Appendix III.

Main findings

1. What is psychological safety?

'Psychological safety' was introduced a half century ago by MIT professors Edgar Schein and Warren Bennis (1965). They argued that psychological safety is essential for making employees feel secure and being able of changing their behaviour in response to organisational change.

About 30 years later, Schein argued that psychological safety helps people overcome their defensiveness, and makes them focus on collective goals and problem prevention rather than on self-protection (Schein, 1993). In the past two decades, research on psychological safety has flourished, mainly due to the seminal work of Harvard professor Amy Edmondson. Edmondson argues that psychological safety 'helps to explain why employees share information and knowledge, speak up with suggestions for organisational improvements, and take initiative to develop new products and services' (Edmondson, 2014).

This review provides compelling evidence that psychological safety, indeed, does enable people to ask critical questions, seek help, report mistakes, raise concerns, and offer suggestions without the fear of negative consequences. For example, a recent study found that physicians who experienced more psychological safety were more likely to accept corrective and positive performance feedback from peers, explanations of feedback, and suggestions for improvement (Scheepers, 2018).

A construct related but distinct from psychological safety is trust, often defined as the willingness to be vulnerable to the actions of others (Mayer, 1995). However, Edmondson distinguishes the two constructs by emphasising their different focus. Specifically, trust captures a person's willingness to be vulnerable to others - thus reflecting his/her willingness to give the other person the benefit of the doubt. In contrast, psychological safety captures the extent to which a person believes that the other person will give him/her the benefit of the doubt when taking risks (Edmondson, 2004).

2. How can psychological safety be measured?

The level of psychological safety in a team or organisation can be measured with the seven items adapted from Edmondson's (1999) psychological safety scale.

3. What is the impact of psychological safety on organisational outcomes?

This review identified a large number of studies confirming that psychological safety is related to an array of (direct and indirect) organisational outcomes, thus making it a critical concept for managing teams and organisations. Table 1 provides an overview of these outcomes. Effect sizes indicate that psychological safety is strongly associated with co-workers' support, employee voice, information sharing, learning behaviour, team performance, pro-activity, psychological empowerment, retention/ turnover, social network ties, team cohesion, and work engagement, with zero-order correlations larger than 0.5.

Studies included in this review also indicate that psychological safety moderates and/or mediates[1] several relationships between a wide range of constructs relevant to management and organisational outcomes. For example, even when a team has a learning orientation, team learning takes place only when psychological safety is high (Harvey, 2019). The same counts for empowering, authentic, transformational, inclusive and ethical leadership styles. Their positive effect on outcomes such as innovation, pro-active behaviour, constructive voice, organisational citizenship behaviour, and occupational safety only occurs when employees perceive their organisation and/or team as psychologically safe (Huyghebaert, 208; Ifzal, 2019; Kim, 2019; Liu, 2018; Malik, 2018; Rao, 2018).

Finally, a recent study indicates that psychological safety also mediates the relationship between functional dominance (i.e. when a team is dominated by a single function, for example medical specialists or engineers) and the performance of multi-disciplinary teams (Malhotra, 2017).

[1]A moderator is a variable that affects the direction and/or strength of the relation between an independent or predictor variable and an outcome variable. A mediator is a variable that specifies how or why a particular effect or relationship occurs. Thus, if you remove the effect of the mediator, the relationship between the independent or predictor variable and the outcome variable will no longer exist. In short, moderators specify when a certain effect will hold, whereas mediators determine whether the effect will occur.

Table 1 - Psychological Safety - Zero Order Correlations

Outcome	Effect size	Level	Studies
Adaptability	.65	D	Cai, 2018
Commitment	.48	B	Frazier, 2017
Co-workers' support	.72 .25	D A	Da Silva, 2012; Guchait, 2016
Creative performance	.25 .35 .23 .13 .14 .19 ns ns	D A D B D D D D	Ahmad, 2019; Castro, 2018; Da Silva, 2012, Frazier, 2017; Gonzalves, 2017; Ji, 2017; Liu, 2016; Mura, 2016
Employee voice	.24 .50 .19 .60	C C D D	Chamberlin, 2017; Elsaied, 2019; Erkutlu, 2015; Rao, 2018
Fear	-.34	C	Chamberlin, 2017
Helping behaviour	.46	A	Guchait, 2015
Incident reporting (involved / observed)	.36 / .22	D	Lee, 2016
Information sharing	.52 .51	B D	Frazier, 2017; Chi-Cheng, 2018
Internal whistleblowing	.37 .36	D D	Anugerah, 2019; Malik, 2018
Learning behaviour	.51 .62 .61 .45	A B A D	Ashauer, 2013; Frazier, 2017; Guchait, 2014; Jha, 2019-2
Organisational deviance	-.33	D	Erkutlu, 2019
Organisational identification	.34	D	Erkutlu, 2015
Performance, task	.43	B	Frazier, 2017
Performance, team	.23 .50 .63 .71 .40	A D D C D	Applebaum, 2019; Ashauer, 2013; Chi-Cheng, 2018; Guchait, 2014; Jha, 2019-2
Pro-activity	.61	D	Cai, 2018
Problem solving capacity	.30	C	Carmeli, 2014
Psychological empowerment	.55	D	Jha, 2019-1
Psychological well-being	.33	D	Erkutlu, 2016
Psychological contract breach	-.27	D	Erkutlu, 2016
Reflexivity	.23	C	Carmeli, 2014
Resilience	.31	D	Cai, 2018
Satisfaction	.43	B	Frazier, 2017
Social network ties	.55	D	Chi-Cheng, 2018
Supportive work context	.49	B	Frazier, 2017
Surface acting (faking)	.33	C	Shumski, 2018
Team cohesion	.47 .68	D C	Applebaum, 2019; Guchait, 2014
Transactive memory system	.59 .40 .77	D C D	Chi-Cheng, 2018; Hood, 2016; Guchait, 2014
Turnover intentions	-.27 -.58 -.46 -.40	D D D D	Ahmad, 2017; Da Silva, 2012; Jha, 2019-1; Yanchus, 2015
Trust in team members	.63	D	Aamir, 2013
Trust in top management	.28	D	Aamir, 2013
Work engagement	.39 .54 .45	D D B	Amir, 2013; Basit, 2017; Frazier, 2017



4. What are the antecedents of psychological safety?

In addition to studies examining the consequences of workplace incivility, this review identified several studies of the antecedents or predictors. Table 1 provides an overview of these antecedents. The effect sizes indicate that the following factors are strong predictors of workplace incivility in teams and/or organisations:

Leadership style

The findings indicate that leaders perceived by their employees as authentic, benevolent, ethical, humble, supportive, and trustworthy positively affect the psychological safety within a team and/or the organisation (e.g. Anugerah, 2019). The same counts for leaders perceived as non-judgmental, empathic, and respectful listeners (Castro, 2018). Not surprisingly, leaders perceived as abusive, untrustworthy, or psychopathic negatively affect psychological safety.

Empowerment

Leaders who share power with their teams, give them the autonomy to make decisions by displaying trust in them and encouraging participative decision-making have a positive effect on psychological safety. Such empowering leaders create an environment of openness; this openness acts as a signal for employees to express themselves freely and speak up with suggestions for improvements (Rao, 2018).



Leader-assigned mastery goals

Goal setting is a well-researched topic in industrial and organisational psychology. A large number of high quality studies consistently demonstrate that specific, difficult goals yield higher performance than non-specific ('do-your best') goals; and specific difficult goals yield higher performance than specific easy goals (see CEBMa's REA on goal setting). However, when learning new tasks or working on ill-structured problems, employees will inevitably make errors, which may be embarrassing or threatening to their self-esteem.

In these situations, mastery or learning goals tend to be more effective. Mastery goals lead employees to view unsolved problems as challenges to be 'mastered' rather than focus on performance or how they will be judged (Ashauer, 2013). Thus, leaders who set mastery goals for their team members create an environment in which members feel safe in taking interpersonal risks and will not feel that speaking up about problems will be held against them.

Diversity climate

Diversity climate refers to employee perceptions regarding the organisation's diversity-related policies and practices. In a positive diversity climate, employees perceive that their organisation treats all members with respect and dignity and provides equal access to opportunities for career advancement, thereby creating a psychologically safe environment (Guchait, 2017).

Conflict management style

Managers and leaders who use a cooperative conflict management style display high levels of concern, respect for others and open communication. As such, this style for managing conflicts correlates with characteristics of supportive leadership, organisational justice and participative decision making, which are major antecedents of trust (Erkutlu, 2015). As explained above, when employees trust their leaders, they are more likely to openly express their thoughts and opinions.



Quality of the managerial relationship

When employees have suggestions, concerns, or knowledge they want to share with their managers, whether they do or don't decide to voice these is based on their past experiences with their manager. Employees who feel they are fairly and positively treated by their manager will speak up more comfortably, whereas those who perceive the relationship with their manager as negative or problematic are more likely to feel uncomfortable in doing so (Unler, 2019).

Team tenure

Team tenure is likely to have a curvilinear (U-shaped) influence on team interpersonal dynamics and (as a result) psychological safety (Koopman, 2019). Newly formed teams tend to experience more positive interpersonal dynamics than do long-tenured teams because the newly adopted group membership creates a "newgroup" identity that engenders positive perceptions about teammates and high trust. This trust originates because the new members do not have adequate information (yet) to judge the trustworthiness of their teammates. Members of moderately tenured teams, however, had more social interactions, and as a result may have discovered differences in personal values and opinions about how the team should approach task or interpersonal relationships. As a result, they are more likely to face conflicts and feelings of uncertainty, which are known to harm team psychological safety.

In contrast to moderately tenured teams, members of longer tenured teams have had extensive time to obtain a deeper understanding of each other. Moreover, when the team is managed effectively, it will have established team norms that enable its members to interact in a manner that focuses on effective goal completion, assisting other team members in their tasks, and avoiding unproductive conflict, which leads to higher team psychological safety (Koopman, 2019).



It should be noted, however, that many factors listed in Table 1 are based on cross-sectional research, which makes the nature or direction of the effect uncertain. This means that some of these factors, such as helping behaviour, a supportive work context, reflexivity, and team cohesion may be an antecedent rather than a result of psychological safety.

Table 2 - Antecedents of Psychological Safety

Antecedent	Effect size	Level	Studies
Abusive supervision	r = -.35	C	Liu, 2016
Authentic leadership	r = .36; .46	D D	Anugerah, 2019; Liu, 2018
Benevolent leadership	r = .31	D	Erkutlu, 2016
Cooperative conflict management style	r = .23 / .31	D	Erkutlu, 2015
Diversity climate	r = .52	D	Guchait, 2017
Empowering leadership	r = .63	D	Rao, 2018
Ethical leadership	r = .30	D	Malik, 2018
Individuation	d = 1.22	A	Kim, 2019
Supervisor's listening	ß = .38	AA	Castro, 2018
Transformational leadership	r = .22	C	Carmeli, 2014
Leader's age	r = .23	D	Gonzalves, 2017
Leader-assigned mastery goals	d = .78	A	Ashauer, 2013
Leader humility	r = .39; .64	D D	Gonzalves, 2017; Walters, 2016
Leader psychopathy	r = -.37	D	Erkutlu, 2019
Managerial relationship	ß = .65	D	Unler, 2019
Moral disengagement	r = -.28	D	Erkutlu, 2019
Organisational politics	ß = -.20	D	Lee, 2016
Power distance	r = -.36	D	Applebaum, 2019
Servant leadership	r = .37	D	Schaubroek, 2011
Supportive leadership	r = .32	C	Elsaied, 2019
Team affect (pos/neg)	r = .34 / -.37	C	Hood, 2016
Team tenure	U-shaped	D	Koopman, 2019
Trust in supervisor	r = .69	D	Basit, 2017

Conclusion

The studies identified through this review clearly demonstrate that psychological safety has a large, positive relationship with a wide range of organisational outcomes, and as such is likely to be an important condition for the effectiveness of teams, workgroups, and the organisation as a whole. Review findings also indicate that the leadership style and skills of managers and team leaders directly enhance, or undermine, the establishment of psychological safety.

Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about the impact and attributes of psychological safety on teams and organisations by using the systematic review method to search and critically appraise empirical studies. However, in order to be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases and a focus on empirical research published in the period 2000 to 2019. As a consequence, relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included, which did not incorporate a comprehensive review of the psychometric properties of their tests, scales and questionnaires.

Finally, the findings of this review are sometimes based on low-quality studies, i.e. studies without a control group and/or pre-test. As a result, a causal relationship between the impact and antecedents of psychological safety can't be confirmed, which means that alternative explanations for the effects found are possible.

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.

References

Aamir Ali, C., & Buckley, F. (2013). Exploring the impact of trust on research scientists' work engagement. *Personnel Review, 42*(4), 396-421.

Ahmad, I., & Mujtaba, A. (2017). The dark side of Corporate Social Responsibility: Evidence from a Public Sector Oil Company. *NUML International Journal of Business & Management, 12*(1), 15-27.

Ahmad, I., Donia, M. B. L., & Shahzad, K. (2019). Impact of Corporate Social Responsibility Attributions on Employees' Creative Performance: The Mediating Role of Psychological Safety. *Ethics & Behavior, 29*(6), 490-509.

Anugerah, R., Abdillah, M. R., & Anita, R. (2019). Authentic leadership and internal whistleblowing intention: The mediating role of psychological safety. *Journal of Financial Crime, 26*(2), 556-567.

Appelbaum, N. P., Lockeman, K. S., Orr, S., Huff, T. A., Hogan, C. J., Queen, B. A., & Dow, A. W. (2019). Perceived influence of power distance, psychological safety, and team cohesion on team effectiveness. *Journal of Interprofessional Care*, 1-7.

Ashauer, S. A., & Macan, T. (2013). How Can Leaders Foster Team Learning? Effects of Leader-Assigned Mastery and Performance Goals and Psychological Safety. *The Journal of Psychology, 147*(6), 541.

Basit, A. A. (2017). Trust in Supervisor and Job Engagement: Mediating Effects of Psychological Safety and Felt Obligation. *The Journal of Psychology, 151*(8), 701-721.

Cai, Z., Huang, Q., Liu, H., & Wang, X. (2018). Improving the agility of employees through enterprise social media: The mediating role of psychological conditions. *International Journal of Information Management, 38*(1), 52-63.

Carmeli, A., Sheaffer, Z., Binyamin, G., Reiter-Palmon, R., & Shimoni, T. (2014). Transformational leadership and creative problem-solving: The mediating role of psychological safety and reflexivity. *The Journal of Creative Behavior, 48*(2), 115-135.

Castro, D. R., Anseel, F., Kluger, A. N., Lloyd, K. J., & Turjeman-Levi, Y. (2018). Mere listening effect on creativity and the mediating role of psychological safety. *Psychology of Aesthetics, Creativity, and the Arts, 12*(4), 489-502.

Chamberlin, M., Newton, D. W., & Lepine, J. A. (2017). A Meta-Analysis of Voice and Its Promotive and Prohibitive Forms: Identification of Key Associations, Distinctions, and Future Research Directions. *Personnel Psychology, 70*(1), 11-71.

Chi-Cheng, H., & Ping-Kuo, C. (2018). Exploring the antecedents and consequences of the transactive memory system: an empirical analysis. *Journal of Knowledge Management, 22*(1), 92-118.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Da Silva, N., & Oldham, G. R. (2012). Adopting employees' ideas: Moderators of the idea generation–idea implementation link. *Creativity Research Journal, 24*(2-3), 134-145.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*(2), 350-383.

Edmondson, A. C., & Lei, Z. (2014). Psychological safety: The history, renaissance, and future of an interpersonal construct. *Annual Review of Organizational Psychology and Organizational Behavior, 1,* 23-43.

Elsaied, M. M. (2019). Supportive leadership, proactive personality and employee voice behaviour: The mediating role of psychological safety. *American Journal of Business (Emerald Group Publishing Limited), 34*(1), 2-18.

Erkutlu, H., & Chafra, J. (2015). The mediating roles of psychological safety and employee voice on the relationship between conflict management styles and organisational identification. *American Journal of Business, 30*(1), 72-91.

Erkutlu, H., & Chafra, J. (2016). Benevolent leadership and psychological well-being: The moderating effects of psychological safety and psychological contract breach. *Leadership & Organization Development Journal, 37*(3), 369-386.

Erkutlu, H., & Chafra, J. (2019). Leader psychopathy and organizational deviance. *International Journal of Workplace Health Management, 12*(4), 197-213.

Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., & Vracheva, V. (2017). Psychological Safety: A Meta-Analytic Review and Extension. *Personnel Psychology, 70*(1), 113-165.

Gonçalves, L., & Brandão, F. (2017). The relation between leader's humility and team creativity: The mediating effect of psychological safety and psychological capital. *International Journal of Organizational Analysis, 25*(4), 687-702.

Guchait, P., Tews, M. J., & Simons, T. (2014). The Influence of Transactive Memory Systems and Psychological Safety on Effectiveness of Service Management Teams in a Restaurant Setting. *Journal of Human Resources in Hospitality & Tourism, 13*(3), 234.

Guchait, P., Madera, J., & Dawson, M. (2016). Learning in the service environment: the influence of diversity climate. *Journal of Service Theory and Practice, 26*(4), 448-470.

Guchait, P., Lee, C., Wang, C.-Y., & Abbott, J. L. (2016). Impact of error management practices on service recovery performance and helping behaviours in the hospitality industry: The mediating effects of psychological safety and learning behaviours. *Journal of Human Resources in Hospitality & Tourism, 15*(1), 1.

Harvey, J.-F., Johnson, K. J., Roloff, K. S., & Edmondson, A. C. (2019). From orientation to behaviour: The interplay between learning orientation, open-mindedness, and psychological safety in team learning. *Human Relations, 72*(11), 1726-1751.

Hood, A. C., Bachrach, D. G., Zivnuska, S., & Bendoly, E. (2016). Mediating effects of psychological safety in the relationship between team affectivity and transactive memory systems. *Journal of Organizational Behavior, 37*(3), 416-435.

Huyghebaert, T., Gillet, N., Fadi-Joseph, L., Dubois-Fleury, A., & Fouquereau, E. (2018). Psychological Safety Climate as a Human Resource Development Target: Effects on Workers Functioning Through Need Satisfaction and Thwarting. *Advances in Developing Human Resources, 20*(2), 169-181.

Ifzal, A., & Waheed Ali, U. (2019). The impact of ethical leadership style on job satisfaction. *Leadership & Organization Development Journal, 40*(5), 534-547.

Jha, S. (2019). Team psychological safety and team performance. *International Journal of Organizational Analysis, 27*(4), 903-924.

Kim, B.-J., Park, S., & Kim, T.-H. (2019). The effect of transformational leadership on team creativity: sequential mediating effect of employee's psychological safety and creativity. *Asian Journal of Technology Innovation, 27*(1), 90-107.

Kim, N. Y. (2019). Linking individuation and organisational identification: Mediation through psychological safety. *The Journal of Social Psychology.*

Koopmann, J., Lanaj, K., Wang, M., Zhou, L., & Shi, J. (2016). Nonlinear effects of team tenure on team psychological safety climate and climate strength: Implications for average team member performance. *Journal of Applied Psychology, 101*(7).

Lee, Y.-H., Yang, C.-C., & Chen, T.-T. (2016). Barriers to incident-reporting behavior among nursing staff: A study based on the theory of planned behavior. *Journal of Management and Organization, 22*(1), 1-18.

Liu, W., Zhang, P., Liao, J., Hao, P., & Mao, J. (2016). Abusive supervision and employee creativity: The mediating role of psychological safety and organizational identification. *Management Decision, 54*(1), 130-147.

Liu, Y., Fuller, B., Hester, K., Bennett, R. J., & Dickerson, M. S. (2018). Linking authentic leadership to subordinate behaviors. *Leadership & Organization Development Journal, 39*(2), 218-233.

Malhotra, M. K., Ahire, S., & Shang, G. (2017). Mitigating the Impact of Functional Dominance in Cross-Functional Process Improvement Teams. *Decision Sciences, 48*(1), 39.

Mura, M., Lettieri, E., Radaelli, G., & Spiller, N. (2016). Behavioral operations in healthcare: a knowledge sharing perspective. *International Journal of Operations & Production Management, 36*(10), 1222-1246.

Malik, M. S., & Nawaz, M. K. (2018). The Role of Ethical Leadership in Whistleblowing Intention among Bank Employees: Mediating Role of Psychological Safety. *Review of Integrative Business and Economics Research, 7*, 238-252.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*(3), 709-734.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: an introduction to assessing study quality. *Systematic reviews in the social sciences: A practical guide,* 125-163.

Rao, J. U., & Mukhopadhyay, S. (2018). Empowering leadership and constructive voice behavior: a moderated mediated model. *International Journal of Organizational Analysis, 26*(2), 226-241.

Schaubroeck, J., Lam, S. S. K., & Peng, A. C. (2011). Cognition-based and affect-based trust as mediators of leader behavior influences on team performance. *Journal of Applied Psychology, 96*(4), 863.

Scheepers, R. A., van den Goor, M., Arah, O. A., Heineman, M. J., & Lombarts, K. M. J. M. H. (2018). Physicians' Perceptions of Psychological Safety and Peer Performance Feedback. *The Journal of Continuing Education in the Health Professions, 38*(4), 250-254.

Schein, E.H., Bennis, W. (1965). *Personal and Organizational Change Through Group Methods.* NewYork: Wiley.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Shumski, J., Thomas, J., Olien, J. L., Allen, J. A., Rogelberg, S. G., & Kello, J. E. (2018). Faking It for the Higher-Ups: Status and Surface Acting in Workplace Meetings. *Group & Organization Management, 43*(1), 72-100.

Unler, E., & Caliskan, S. (2019). Individual and managerial predictors of the different forms of employee voice. *The Journal of Management Development, 38*(7), 582-603.

Walters, K. N., & Diab, D. L. (2016). Humble Leadership: Implications for Psychological Safety and Follower Engagement. *Journal of Leadership Studies, 10*(2), 7-18.

Yanchus, N. J., Periard, D., Moore, S. C., Carle, A. C., & Osatuke, K. (2015). Predictors of Job Satisfaction and Turnover Intention in VHA Mental Health Employees: A Comparison Between Psychiatrists, Psychologists, Social Workers, and Mental Health Nurses. Human Services Organizations. *Management, Leadership & Governance, 39*(3), 219.

Appendix I

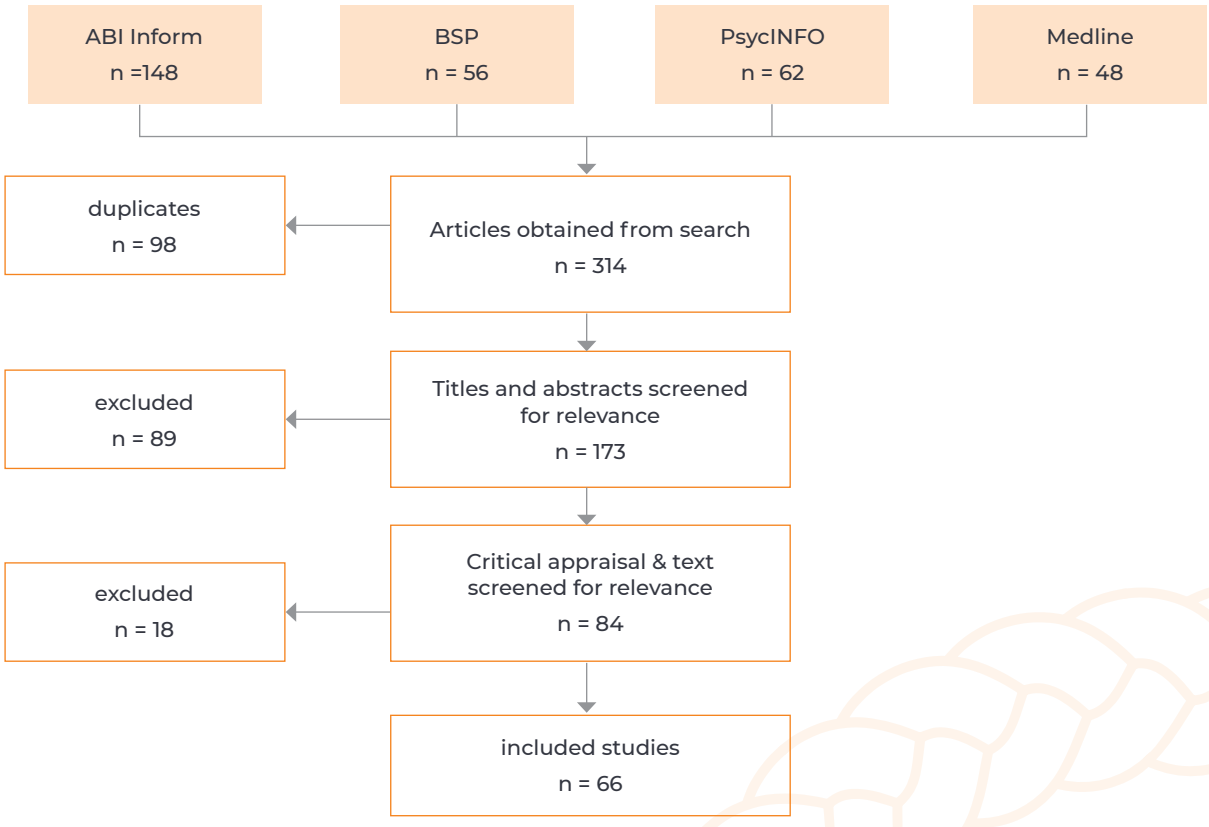
Search terms & hits

ABI/Inform Global, Business Source Elite, PsycINFO
peer reviewed, scholarly journals, Nov 2019

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S1: ti('psychological safety') or ab('psychological safety')	296	269	342	48
S2: filter MAs and/or SRs	9	6	10	-
S3: ti(predict*) OR ti(antecedent*) OR ti(characteristic*) OR ti(factor*) OR ti(moderat*) OR ti(mediat*) OR ab(antecedent*) OR ab(moderat*) OR ab(mediat*)	137,138	97,589	219,438	-
S4: S1 AND S3	142	51	45	-
S5: S2 OR S4	148	56	62	48

Appendix II

Selection of studies



Appendix III

Data extraction table – Psychological Safety

Author & year	Design & sample size	Sector / Population	Main findings	Effect sizes	Limitations	Level
Aamir, 2013	cross-sectional survey n = 170	Research scientists in Ireland	Predictors: 1. Trust in top management is positively associated with psychological safety. 2. Trust in team members is positively associated with psychological safety. Outcomes: 3. Team psychological safety is positively associated with work engagement.	r = .28 r = .63 r = .39	no serious limitations	D
Agarwal, 2017	cross-sectional survey (outcome reported by supervisors) n = 505 employees & 221 supervisors	Employees of a large pharmaceutical firm	Predictors: 1. Psychological capital (the positive and developmental state of an individual as characterised by high self-efficacy, optimism, hope and resilience) is positively associated with psychological safety. 2. High-performance work systems (an integrated system of HR practices that are internally consistent - alignment among HR practices - and externally consistent - alignment with organisational strategy) are positively associated with psychological safety. Outcomes: 3. Psychological safety is positively associated with creativity implementation.	r =.61 r =.72 r =.56	no serious limitations	D

Ahmad, 2019	cross-sectional survey (outcome reported by supervisors) n = 339 dyads (employee & supervisor)	Employees in the telecom industry in Pakistan	Predictors: 1. Employees' intrinsic corporate social responsibility (CSR) attributions are positively associated with psychological safety. 2. Employees' extrinsic CSR attributions are negatively related to psychological safety. Outcomes: 3. Psychological safety is positively associated with creative performance.	r = .31 r = -.42 r = .25	no serious limitations	D
Ahmand, 2017	cross-sectional survey n = 276 employees	Employees in a public oil & gas company in Pakistan	Predictors: 1. Employees' intrinsic corporate social responsibility (CSR) attributions are positively associated with psychological safety. 2. Employees' extrinsic CSR attributions are negatively related to psychological safety. Outcomes: 3. Psychological safety is negatively associated with turnover intentions.	r=.32 r=-.49 r=-.27	no serious limitations	D
Anugerah, 2019	cross-sectional survey n = 201 employees	Employees in public sector in Indonesia	Predictors: 1. Authentic leadership is positively associated with psychological safety. Outcomes: 2. Psychological safety is positively associated with internal whistleblowing.	r = .36 r = .37	no serious limitations	D
Applebaum, 2019	cross-sectional survey n = 243	Students in a nursing program and doctor of medicine program in the USA	Predictors: 1. Perceived power distance is negatively associated with psychological safety. Outcomes: 2. Psychological safety is positively associated with perceived team cohesion. 3. Psychological safety is positively associated with perceived team effectiveness.	r = -.36 r = .47 r = .50	no serious limitations	D

Ashauer, 2013	randomised controlled study without a premeasure n = 213 students in 71 teams of three	Students at a Midwestern university in the USA	Predictors: 1. Leader-assigned mastery goals are associated with higher team psychological safety than leader-assigned performance goals or no goals. Outcomes: 2. Team psychological safety is positively associated with team learning behaviour. 3. Team psychological safety is positively associated with team performance quality. 4. Team psychological safety is positively associated with team performance quantity. Note: Leader-assigned mastery goals alleviate concerns about threat to image, because they focus attention on rectifying a problematic situation (Dweck, 1986; Dweck & Leggett, 1988) as opposed to proving competence.	perf goal / no goal: d = .78 / d = .59 r = .51 r = .23 r = .12 (ns)	no serious limitations	A
Basit, 2017	cross-sectional survey n = 337	Nurses in a public hospital in Malaysia	Predictors: 1. Trust in supervisor is positively associated with psychological safety. Outcomes: 2. Psychological safety is positively associated with job engagement (physical, emotional and cognitive engagement). 3. Felt obligation partially mediates the relationship between psychological safety and job engagement.	r = .62 overall engagement: r=.54, structural path estimate for direct relationship= .29; physical eng.: r=.38; emotional eng.: r=.50; cognitive eng.: r=.52	no serious limitations	D
Byrne, 2017	cross-sectional survey n = 709	Amazon Mechanical Turk members	Predictors 1. Attachment anxiety is negatively associated with psychological safety. 2. Attachment avoidance is negatively associated with psychological safety. Outcomes 3. Psychological safety is positively associated with employee engagement.	r = -.24 r = -.36 r = .57	Uses M-Turk participants without clearly checking if they are employed	D-

Cai, 2018	cross-sectional survey n = 167	Employees in China	Predictors: 1. Enterprise social media (digital platform for internal communication and social interaction within an enterprise) usage is positively associated with psychological safety. Outcomes: 2. Psychological safety is positively associated with proactivity. 3. Psychological safety is positively associated with adaptability. 4. Psychological safety is positively associated with resilience.	r = .19 r = .61 r = .65 r = .31	no serious limitations	D
Castro, 2018	meta-analysis of 5 studies, including 2 exp studies total n = 744	online panel of 366 working employees in Israel,	H1. Supervisor's listening is positively associated with subordinate's psychological safety. H2. Psychological safety is positively related to creativity. H3. The effect of supervisor's listening on employee's creativity is mediated by employee's psychological safety.	ß = .38 95% CI [.27, .50]. d = 0.51 moderate r's	artificial tasks and settings	AA
Carmeli, 2014	time-lag study (3 waves, 2-week lag) n = 302	Part-time students (and employees) in business schools in Israel	Predictors: 1. Transformational leadership predicts psychological safety. Outcomes: 2. Psychological safety predicts reflexivity. 3. Psychological safety predicts creative problem-solving capacity. 4. Reflexivity partially mediates the relationship between psychological safety and creative problem-solving capacity.	r = .22 r = .23 r = .30	no serious limitations	C
Chamberlin, 2017	meta-analysis of correlational studies k = 189 n = 71,820	various	» Psychological safety is positively related to voice. » Psychological safety is negatively associated with fear.	ρ = .24 95% CI [.20, .28]) ρ = -.34	no serious limitations	C

Chi-Cheng, 2018	cross-sectional survey n = 366	R&D employees in organisations in Taiwan	Predictors: 1. Knowledge integration is positively associated with psychological safety. 2. Knowledge sharing is positively associated with psychological safety. 3. Social network ties are positively associated with psychological safety. 4. Transactive Memory Systems are positively related with psychological safety. Outcomes: 5. Team psychological safety is positively associated with team performance.	r=.50 r=.51 r=.55 r=.59 r=.63	No notable limitations	D
Clark, 2014	cross-sectional survey n = 94 dyads (nurse + coworker)	Nurses at hospitals in Midwestern USA	Outcomes: 1. Psychological safety climate (the employee's perception of safety behaviours and practices that are both formally and informally enforced and rewarded by the organisations) is positively associated with organisational citizenship behaviour. 2. Role definition (narrow – no OCB included vs. broad – OCB included) moderates the relationship between psychological safety and OCB, so that the association is stronger for people with narrow role definition.	r=.34, ß=.22 ß=-.03 for broad role definition vs. ß=.52 for narrow-role definition	no serious limitations	D
Cuellar, 2018	cross-sectional survey n = 2005	Clinicians and staff from primary care practices in Virginia, USA	Predictors: 1. Practice ownership (independent, hospital-owned, federally-qualified health center) is associated with psychological safety: highest levels are in hospital-owned practices, followed by independent practices and then by federally-qualified health centers.	ß=.36 for hospital-owned, ß=-.26 for federally-qualified health center (independent practice is the reference)	Psychological safety is measured with just one item	D-
Da Silva, 2012	cross-sectional study n = 93	Library employees	Outcomes: 1. Psychological safety is positively associated with average radicalness of ideas generated. 2. Psychological safety is negatively related to the number of ideas implemented. 3. Psychological safety is positively associated with employees' intention to stay. 4. Psychological safety is positively correlated with coworkers' support.	r = .23 r = -.11 r = .58 r = .72	no serious limitations	D

Elsaied, 2019	time-lag study (1-2 weeks lag) – outcome was assessed by supervisors n = 268 employees and 56 supervisors	Employees in the footwear and headgear sector in Egypt	Predictors: 1. Supportive leadership is positively related to psychological safety. 2. Proactive personality is positively related to psychological safety. Outcomes: 3. psychological safety is positively associated with employee voice behaviour.	r = .32 r = .42 r = .50	no serious limitations	C
Erkutlu, 2015	cross-sectional survey n = 1,023	Employees in multinational companies in Turkey	Predictors: 1. Cooperative conflict management styles (obliging, compromising, and integrating) are positively associated with psychological safety. Outcomes: 2. Psychological safety is positively associated with employees' organisational identification. 3. Psychological safety is positively associated with employees' voice behaviour.	obliging conflict management style: r=.23; compromising: r=.26; integrating: r=.31 r=.34 r=.19	no serious limitations	D
Erkutlu, 2016	cross-sectional survey n = 1,009	Employees in five-star hotels in Turkey	Predictors: 1. Benevolent leadership is positively associated with psychological safety. Outcomes: 2. Psychological safety is positively associated with psychological well-being. 3. Psychological safety is negatively associated with psychological contract breach.	r = .31 r = .33 r = -.27	Unclear if outcome measure was self-report or who was the focal leader.	D-
Erkutlu, 2019	cross-sectional survey n = 611	Nurses in university hospitals in Turkey	Predictors: 1. Leader psychopathy is negatively related to psychological safety. 2. Moral disengagement is negatively associated with psychological safety. Outcomes: 3. Psychological safety is negatively related to organisational deviance.	r = -.37 r = -.28 r =-.33	no serious limitations	D

Frazier, 2017	meta-analysis, includes longitudinal studies k = 136 n = 22,000 (5,000 groups)	various	H1. Psychological safety is positively related to (a) proactive personality, (b) emotional stability, (c) openness to experience, and (d) learning orientation. H2. Psychological safety is positively related to positive leader relations. H3. Psychological safety is positively related to the work design characteristics of (a) autonomy, (b) interdependence, and (c) role clarity. H4. Psychological safety is positively related to supportive work context. H5. Psychological safety is positively related to work engagement. H6. Psychological safety is positively related to task performance. H7. Psychological safety is positively related to (a) information sharing, (b) citizenship behaviours, (c) creativity, and (d) learning behaviour. H8. Psychological safety is positively related to (a) commitment and (b) satisfaction. R1. Psychological safety explains variance in task performance and citizenship behaviours over and beyond other variables.	H1a: ρ =.35 H1b: ρ = .17 H1c: ns H1d: ρ = .24 H2: ρ = .44 H3a: ρ = .47 H3b: ρ = .86) H3c: ρ = .63 H4: ρ = .49 H5: ρ = .45 H6: ρ = .43 H7a: ρ = .52 H7b: ρ = .32 H7c: ρ = .13 H7d: ρ = .62 H8a: ρ = .48 H8b: ρ = .43 R1: see table 3, last 3 columns	no serious limitations	B
Friedman, 2018	time lag study (1 month lag); n = 251	Employees in SMEs in Israel	Outcomes 1. Psychological safety does not predict job performance.	r = 0.04	no serious limitations	C
Gilmartin, 2018	cross-sectional study n = 294 units	Health care employees in the USA	Outcome 1. Psychological safety is negatively related to reporting of non-adherence to a safety checklist during central line insertion procedure.	not reported	Psychological safety is measured by only 1 item	D

Gonzalves, 2017	cross-sectional study n = 341 respondents in 73 teams	Organisations in industry and service sectors	Predictors: 1. Leader's humility predicts team's psychological safety. 2. Leader's age is positively related with team psychological safety. Outcomes: 3. Team's psychological safety predicts team's psychological capital. 4. Psychological safety is positively associated with team creativity.	self-described humility: r=-.01; others-described humility: r=.39 r=.23 r=.54 r=.14	no serious limitations	D
Greene, 2019	cross-sectional study n = 528 hospitals (data at hospital-level, 1 respondent per hospital)	Hospitals in USA	Outcomes: 1. Psychological safety is positively associated with using recommended health care–associated infection (HAI) prevention practices.	Odds ratio between .48 and 2.37 for different infection prevention practices	no serious limitations	D
Guchait, 2014	time-lag study (2 weeks lag) n = 178 (27 teams)	Students in hospitality mgmt. at a university in the USA	Predictors: 1. Transactive memory systems are positively associated with psychological safety. Outcomes: 2. Psychological safety is associated with team performance. 3. Psychological safety is associated with team cohesion.	r=76 r=.71 r=.68	Finding no. 1 is based on cross-sectional data	C
Guchait, 2016	randomised controlled trial (no before-measure) n = 284	Students in hospitality mgmt. at a university in the USA	Predictors: 1. Organisational, supervisor and coworker support are positively associated with psychological safety. Outcomes: 2. Psychological safety is positively associated with learning behaviours. 3. Psychological safety is positively associated with service recovery performance. 4. Psychological safety is positively associated with helping behaviours.	org. support: r=.34, supervisor support: r=.26; coworker support: r=.25 r=.61 r=.58 r=.46	Participants were asked to read a scenario and rate the variables based on the scenario (low external validity)	A

Guchait, 2017	cross-sectional study n = 128	Managers of hotels in S. USA	Predictors: 1. Diversity climate is positively associated with psychological safety. Outcomes: 2. Psychological safety is positively associated with learning behaviours.	r= .52 r= .61	no serious limitations	D
Harvey, 2019	cross-sectional study with time lagged design (3 questionnaires in 3 different times) n(T1) = 514, n(T2) = 452, n(T3) = 345	Teams (4-17 members) in the sales division of a large financial services firm in Canada	H2: Team psychological safety (TPS) mediates the relationship between team learning orientation (TLO) and team learning (TL), such that learning-oriented teams will create a psychologically safe climate that will enhance team learning. H3: Team open-mindedness (TOM) moderates the relationship between team learning orientation and team learning as mediated by team psychological safety, such that team learning orientation has a strong positive effect on team learning via increased psychological safety when team open-mindedness is low, but not when it is high. Results did not show a significant effect for high levels of team open-mindedness (1 SD), but there were significant effects for both average (b = .21, LLCI = .08, ULCI = .50) and low (–1 SD) levels (b = .35, LLCI = .17, ULCI = .64).	H2: Es of .31 TLO&TPS: ß= .64 TPS&TL: ß = .51 TLO&TL: ß = .16 (ns) H3: TLO&TPS: ß = .41 TPS&TL: ß = .51 TLO&TL: ß = .16 (ns) TLOxTOM&TPS = -.49	no serious limitation	C
Hetzner, 2015	cross-sectional study n = 84	Client advisors specialised in private customer consulting; retail banking departments in branches of a German bank	H3a: Psychological safety– colleagues exerts a positive effect on reflection. H3b (rejected): Psychological safety–supervisors exerts a positive effect on reflection.	H3a: ß = .24	No serious limitation	D

Hood, 2016	cross-sectional study with time lagged design (questionnaires in 2 different times) n = 590 (107 teams)	Software implementation project teams	H1: Team psychological safety (PS) is positively related to transactive memory system (TMS)*. H2a: Team negative affectivity (NA)** is negatively related to team PS. H2b: Team positive affectivity (PA)*** is positively related to group PS. H3 (partially supported – only "a"): Team PS mediates the relationship between team (a) negative and (b) positive affectivity and TMS. * TM – memory that is influenced by knowledge of the memory system of another person. ** NA - increases the tendency to overreact to and ruminate over unfavorable information regarding ones' self and others. *** PA - reflects the tendency to be energetic, cheerful, and optimistic.	H1: r = .40; ß = 0.25 ; ΔR2 = .13 H2a: ß = -0.37 ; ΔR2 = .33 H2b: ß = 0.34 ; ΔR2 = .33 H3a: NA&TMS: ß =.15; ΔR2 = .10, Mediation: ß = -.08, n.s. Medium es: κ2 = 0.15 (95% CI = [0.0664, 0.2572])	No serious limitation	C
Huyghebaert, 2018	cross-sectional study with time-lagged design n =658	Nurses from four acute-care hospitals in the Midwest United States	H2: Psychological safety toward one's supervisor mediates the impact of leader behavioural integrity on occupational safety such that (a) fewer injuries, (b) less severe injuries, and (c) higher proportion of injuries reported.	Unclear what coefficients are reported	The results could be more clear (e.g., by providing what coefficient is reported)	C
Ifzal, 2019	cross-sectional study n = 177	Public sector healthcare organisation of Pakistan	H2: Psychological safety mediates the relationship between ethical leadership style (ES) and job satisfaction (JS).	ß = 0.0570	No serious limitation	D

Javed, 2019	cross-sectional study with time lagged design (questionnaires in 2 different times) n = 180	Employees of the small and medium enterprises in the Textile Industry in Pakistan	H2: Psychological safety (partially) mediates the relationship between inclusive leadership (IL) and innovative work behaviour (IWB).	ß =0.22	No serious limitation	C
Jha, 2019-1	cross-sectional study n = 337	Managers and supervisors of the telecom industry in Mumbai, India	H1: Psychological safety (PS) is positively related to psychological empowerment (PE). H3: PE mediates the relationship between PS and employee retention (ER). H4a: Abusive leadership moderates the relationship between PS and PE. H4b: There is a conditional indirect effect of PS on ER in such a way that when abusive leadership is high the relationship is weak via PE and when abusive leadership is low the relationship is strong via PE.	H1: r = .55; ß = 0.46 H3: ß = 0.31 H4a: ß = 0.57 H4b: N/A PS – ER: r = .46	No serious limitation	D
Jha, 2019-2	cross-sectional study n = 345 (50 teams)	Functional teams from 20 different organisations from various sectors, such as manufacturing, FMCG, ITES, pharma, banking, and shipping organisations, in India	H1: Psychological safety is positively related to team performance. H2: Learning orientation mediates the relationship between psychological safety and team performance. H3b: Psychological empowerment moderates the indirect relationship between psychological safety and team performance through learning orientation such that the relationship is strong for team members with high psychological empowerment.	H1: ß = 0.26 H2: ß = 0.30 H3b: unclear	No serious limitation	D

Ji, 2017	cross-sectional study n = 325	Practitioners working in Beijing's knowledge and creative industry zones, cultural enterprises or high-tech enterprises of Beijing, and out of Beijing.	H3a: Relational capital of communities of practice (COP)* has a positive effect on practitioner's psychological safety. H3b: Structural capital of COP has a positive effect on practitioner's psychological safety. H3c (rejected): Cognitive capital of COP has a positive effect on practitioner's psychological safety. H5: Practitioner's psychological safety has a positive effect on practitioner's innovation performance. * Three dimensions of the social capital in COP: (1) Structural - Communities of practice improve the social network for personnel having the same interest. Communities of practice provide the opportunity for individuals to develop a network of individuals who have similar interests. It helps identifying those with relevant knowledge and helps individuals within the community make connections with one another. (2) Relational - Communities of practice foster the sense of trust and obligations critical to building social capital through the interpersonal interactions. (3) Cognitive - Communities of practice help shape the terminology, norms and values used by members and allow the development of a community memory in daily conversations.	H3a: ß = .59 H3b: ß = .17 H5: ß = .19	No serious limitation	D
Kim, 2019	cross-sectional study n = 196 (52 teams)	14 large firms in South Korea, which emphasize the importance of creative ability (e.g. telecommunication, electronics, bioengineering, informational technology)	H1: Team-level transformational leadership is positively related to employee's individual-level psychological safety. H2: Employee's individual-level psychological safety is positively related to employee's individual-level creativity. H4: An employee's individual-level psychological safety and creativity sequentially mediate the relationship between team-level transformational leadership and team-level creativity.	Unclear what coefficient is reported	The procedure of data collection could be clearer	D

Kim, 2019-2	Study 1: RCT n = 66 Study2: Cross-sectional study n = 176	Study 1: Participants from the US Study 2: 5 firms operating in the electronics, engineering, chemicals, energy, and trading industries in South Korea.	H1: There is a positive association between individuation* and the perception of psychological safety. H2a: Perceived psychological safety will be positively associated with organisational identification. H2b: Perception of psychological safety will mediate the relationship between individuation and organisational identification. *Individuation - a view that organisational members are all unique individuals.	Study 1: H1: d = 1.22 H2a & H2b: unclear, un-standardised coefficients are reported (not enough data to calcu-late effect size) Study 2: Unclear, un-standardised coefficients are reported (not enough data to calcu-late effect size)	No serious limitation	A

Koopman, 2016	cross-sectional study with time lagged design (questionnaires in 2 different times) n = 567 (115 teams)	Employees working in R&D teams for a major information technology company in China	H1a: Team tenure has a U-shaped curvilinear relationship with team psychological safety climate such that new and longer tenured teams have higher levels of team psychological safety climate. H1b: Team tenure has a U-shaped curvilinear relationship with team psychological safety climate strength such that new and longer tenured teams have higher levels of team psychological safety climate strength. H2a: Team psychological safety climate is positively associated with average team member creative performance. H2b (rejected): Team psychological safety climate is positively associated with average team member task performance. H3a: The curvilinear relationship between team tenure and average team member creative performance is partially mediated by team psychological safety climate. H3b (rejected): The curvilinear relationship between team tenure and average team member task performance is partially mediated by team psychological safety climate. H4a (rejected): The positive relationship between team psychological safety climate and average team member creative performance is moderated by team psychological safety climate strength, such that when team psychological safety climate strength is high (vs. low), the positive relationship is stronger. H4b: The positive relationship between team psychological safety climate and average team member task performance is moderated by team psychological safety climate strength, such that when team psychological safety climate strength is high (vs. low), the positive relationship is stronger. H5a (rejected): The indirect curvilinear relationship between team tenure and average team member creative performance through team psychological safety climate is moderated by team psychological safety climate strength, such that when team psychological safety climate strength is high (vs. low), the positive relationship is stronger. H5b: The indirect curvilinear relationship between team tenure and average team member task performance through team psychological safety climate is moderated by team psychological safety climate strength, such that when team psychological safety climate strength is high (vs. low), the positive relationship is stronger.	H1a, H1b, H2a & H4b : unclear, Y are reported H3a: small effect size, $\kappa 2 = .01$ H5b: unclear	No serious limitation	D
Kuo, 2019	uncontrolled study with a pretest n = 207 (39 groups)	Employees from 12 public fitness centers in Taiwan.	H2: The positive relationship between employees' proactive personality and changes in job satisfaction is moderated by psychological safety, such that the relationship between a proactive personality and changes in job satisfaction will be stronger when the psychological safety is low.	Unclear, Y are reported	No serious limitation	C

Lee, 2016	cross-sectional study n = 649	Nurses in 40 large hospitals in Taiwan	H10: Psychological safety has a positive effect on a person's intention to report incidents that person was involved (ITS). H11: Psychological safety has a positive effect on a person's intention to report incidents that person only has observed (ITO). H12 (rejected): Psychological safety has a positive effect on attitude toward incident-reporting behaviour. H13: Psychological safety has a positive effect on the subjective norms (SNs) of incident reporting. H14: Psychological safety has a positive effect on the perceived benefits (PBs) of reporting incidents.	H10: ß = 0.31 H11: ß = 0.18 H13: ß = 0.18 H14: ß = 0.35	No serious limitation	D
Li, 2014	cross-sectional study with time lagged design (questionnaires in 2 different times) n = 283 supervisor–subordinate dyads (283 subordinates and 112 supervisors)	Six electronic companies located in a major city of North China	H1: Perceptions of organisational politics (POP) is negatively related to psychological safety (PS). H2: Psychological safety mediates the relationship between POP and voice behaviour (VB). H3: Perceived insider status (PIS) moderates the negative relationship between POP and psychological safety as well as the negative relationship between POP and voice, such that the relationships are weaker for employees with high levels of perceived insider status than for those with low levels of perceived insider status. H4: Perceived insider status moderates the mediating effect of psychological safety on the POP–voice relationship, such that the mediating effect is weaker when the level of perceived insider status is high rather than low.	H1: ß = –.20 H2: POP&VB: ß = –.21 PS&VB: ß = .37 POP&VB&PS: ß= –.11, n.s. H3: POPxPIS&PS: ß = .14 POPxPIS&VB: ß = .16 POP&PS: PIS low: r = –.34 PIS high: r = –.06 POP&VB PIS low: r = –.37 PIS high: r = –.05 H4: unclear	No serious limitation	C

Liu, 2015	cross-sectional study with time lagged design (questionnaires in 2 different times) n = 718	Large telecom corporation in South China	H2: Employees' perceptions of team psychological safety mediate the relationship between authentic leadership and internal whistleblowing.	ß = 0.24 ß = 0.21	No serious limitation	C
Liu, 2016	cross-sectional study with time lagged design (questionnaires in 2 different times) n = 423	A company operating in a large state-owned enterprise in the city of Changsha in China	H1: Abusive supervision is negatively related to psychological safety. H3: Psychological safety mediates the effect of abusive supervision on organisation identification. H4 (rejected): Psychological safety is positively related to employee creativity. H6: Organisational identification mediates the effect of psychological safety on employee creativity. H7: The effect of abusive supervision on creativity is mediated by psychological safety.	H1: r = -.35	No serious limitation	C
Liu, 2018	cross-sectional study n = 107 matching pairs of employees and supervisors	A large health organisation with over 500 employees, southern part of the USA	H2: Authentic leadership is positively related to subordinates' perceptions of their psychological safety. H6: The positive relationship between authentic leadership and subordinates' proactive behaviour is mediated by psychological safety. H7: The negative relationship between authentic leadership and subordinates' workplace deviance behaviour is mediated by psychological safety.	H2: r = .46	No serious limitation	D
Malhotra, 2017	cross-sectional study n = 149 teams	U.S., various	H1: Psychological safety mediates the relationship between functional dominance and cross-functional teams (CFT) performance such that functional dominance negatively relates to psychological safety and psychological safety positively relates to performance. H2: Psychological safety mediates the relationship between interpersonal justice and CFT performance such that interpersonal justice positively relates to psychological safety and psychological safety positively relates to performance. H3: CFT leader's interpersonal justice moderates the relationship between functional dominance and psychological safety such that the negative impact of functional dominance on psychological safety is attenuated by CFT leader's interpersonal justice.	Not clear whether the reported coefficients are standardised or not.	No serious limitation	D

Malik, 2018	cross-sectional study n = 233	employees of top 5 banks of Pakistan	H2: Psychological safety is positively related to internal whistleblowing. H3: Ethical leadership is positively related to psychological safety. H4: Psychological safety mediates the relationship between ethical leadership and internal whistleblowing.	H2: r = .36 H3: r = .30 H4: Unclear	Procedure of data collection could have been described more in detail. Data analysis could be more clear	D-
Matteo, 2016	cross-sectional study n = 195	Physicians, psychologists, physiothera-pists, nurses and other healthcare oper-ators from three Italian H&PCOs (hospice and palliative care organisations?)	H2 (rejected): Employees' perception of psychological safety positively affects their innovative work behaviour (IWB). H3 (partially supported): Employees' perception of psychological safety positively affects their knowledge sharing behaviour. H5: Employees' perception of structural social capital positively affects their perception of psychological safety. H6: Employees' perception of relational social capital positively affects their perception of psychological safety.	H3: PS& seeking feedbacks: ß= .28 PS& sharing mistakes: ß = .38 PS& sharing of best practices: not supported H5: ß = .19 H6: ß = .57	The origin of the items used to measure psychological safety could be clearer	D
Mayfield, 2016	cross-sectional study n = 260 (58 teams)	Graduate and upper-division undergraduate students enrolled in business and education courses in a large southern-central university (USA)	H4: Team psychological safety will moderate the relationship between psychological collectivism and (a) team satisfaction, (b) team identification, and (c) willingness to work with teammates such that the effects of psychological collectivism will be weakened under conditions of high team psychological safety.	unclear	No serious limitation	D
Moore, 2017	cross-sectional study n = 200	Mentored executives and entrepreneurs from 14 countries	H2: The mentees' perception of psychological safety in the organisation mediates the relationship between the quality of mentoring they receive and their perception of organisational innovativeness.	unclear	The procedure of data collection could be clearer	D

Plomp, 2019	cross-sectional study n = 527 (temporary agency workers) n = 796 (permanent employees)	Temporary agency workers and permanent workers, various organisational industries (corporate and financial services, healthcare and social services, and government institutions, transport, production), Netherlands	H1: For permanent employees, psychological safety is positively related to (a) increasing structural job resources, (b) increasing social job resources, (c) increasing challenging job demands, and (d) decreasing hindering job demands. H2: For temporary employees, psychological safety is positively related to (a) increasing structural job resources, (b) increasing social job resources, (c) increasing challenging job demands, and (d) decreasing hindering job demands. H5: For permanent employees, psychological safety is positively related to perceived external employability through (a) increasing structural job resources, (b) increasing social job resources, and (c), increasing challenging job demands. Additionally, psychological safety is positively related to (d) decreasing hindering job demands, which is in turn negatively related to perceived external employability. H6: For temporary employees, psychological safety is positively related to perceived external employability through (a) increasing structural job resources. Additionally, psychological safety is positively related to (b) decreasing hindering job demands, which is in turn negatively related to perceived external employability.	H1a: ß = 0.26 H1b: ß = 0.19 H1c: ß = 0.16 H1d: ß = -0.19 ns H2a: ß = 0.13 ns H2b: ß = - 0.08 ns H2c: ß = 0.24 H2d: ß= - 0.15 H5a: unclear H5b, H5c, H5d: ns H6a, H6b: ns	No serious limitation	D
Rao, 2018	cross-sectional study n = 282	service executives across Indian organisations	H2: Empowering leadership is positively related to psychological safety. H3: Psychological safety positively related to constructive voice. H4: Psychological safety mediates the association between empowering leadership and constructive voice.	H2: r =.63 95 CI = (.56, .81) H3: r = .60 95 CI = (.09, .32) H4: partially	no serious limitations	D

Schaubroek, 2011	cross-sectional study n = 191	financial services teams in Hong Kong and the U.S.	F1: Affect-based trust in the leader is positively related to team performance through the mediating influence of team psychological safety. H4: Controlling for transformational leadership, servant leadership is positively related to team psychological safety through the mediating influence of team members' affect-based trust in the leader.	ZO correlations: psyc safety > performance: r = .44 servant leadership > psyc safety: r = .37 H2 & H4: only SEM coefficients are provided	no serious limitations	D
Scheepers, 2018	cross-sectional study n = 105	Dutch physicians	Physicians who experienced more psychological safety were more likely to receive corrective and positive performance feedback from peers, explanations of feedback, and suggestions for improvement.	only un-standardized regression coefficient are reported	no serious limitations	D
Shumski, 2018	longitudinal study n = 80	employees from a construction materials company in the southeast United States	H2. Surface acting in meetings is negatively related to perceptions of meeting psychological safety. H3. Job level moderates the negative relationships between surface acting during workplace meetings and perceptions of meeting psychological safety such that the negative relationship is stronger for those who surface act with a higher job level as compared with those who surface act with a lower job level. Note: Surface acting is a type of emotion regulation in which an individual simulates desired emotions without feeling them (Hochschild, 1983). For example, employees engage in surface acting when they smile and pretend to be happy, when they are actually angry and frustrated.	ZO corelations surf act – psyc safety: r = .33 H2 & H3: only unstandard-ized beta's are reported	high non response and drop-out	C
Spoelma, 2017	two RCT's n = 376 (184 teams)	undergraduate students at a large public university in the US	H2: The interactive effects of activated identity faultiness and threat on team creativity will be partially mediated by team psychological safety.	small to medium?	sloppy reporting of effect sizes	A

Subhakaran, 2018	cross-sectional study n = 575	employees from technology firms in India	H3. Psychological safety mediates the relationship between the co-workers' upward voice and employee upward voice. H4. Psychological safety mediates the relationship between manager pro-voice behaviour and employee upward voice.	ZO corr: psyc safety – c-workers upw voice: .45 mgr pr-voice beh: .59 empl upw voice: .54 H3 & H4: only SEM coeff are reported	no serious limitations	D
Torralba, 2016	cross-sectional study n = 13,044	resident physicians at VA medical centers (in the US?)	Psychological safety appears to be an important factor in resident satisfaction across 4 domains that evaluators of graduate medical education programs should consider when assessing clinical learning experiences.	OR = 5.7 95% CI 5.4–6 Respondents who reported 1 higher level of PS are 5.7 times more likely to report a higher level of satisfaction for their clinical learning environment	no serious limitations	D
Triplett, 2018	cross-sectional study n = 131	adult workers employed in organisations within Western Australia	H1. External work locus of control is negatively associated with psychological safety. H2. Trust will moderate the relationship between WLOC and psychological safety such that higher trust levels as opposed to lower trust levels will increase the positive relationship between internal WLOC and psychological safety.	H1: r = -.46	Results insufficiently differentiate between internal and external WLOC	D-

Unler, 2019	cross-sectional study n = 286	employees working in the telecommuni-cation industry in Istanbul.	H2: Perceived psychological safety mediates quality of managerial relationship and voice behaviour. Mediation of psychological safety for promotive voice (SV and CV) is positive (a), for prohibitive voice (DEFV and DESV) is negative (b). Hx: Managerial relationship significantly adds on perceived psychological safety Note: Supportive voice (SV): includes voluntary expression of supporting ideas to the existing work units. Constructive voice (CV): it includes voluntary expression of ideas or opinions for a functional change, which can improve the organisation positively. Defensive voice (DEFV): includes the expression of objections about probable changes in the organisation and verbally opposing changes to work policies, even though changes are required. For example, speaking out against changing work policies, even when the changes have merit. Destructive voice (DESV): it includes the voluntary expression of hurting the company by communicating hurtful or critical ideas related to the policies or procedures (i.e. bad-mouthing the organisation's policies or objectives).	H2; small to moderate r's and beta's Hx: R2=.0.4, ß = .65	no serious limitations	D
Walters, 2016	cross-sectional study n = 140	unclear (MTurk)	H1: Humble leadership is positively correlated with psychological safety Note: leader humility involves acting with a calm and quiet demeanour, motivating followers with inspiring standards rather than charisma, and giving credit for success to the team while accepting blame for poor results. Alternatively, characteristics of authentic leaders—a sense of self-awareness, expression of values, and transparency regarding desires and expectations—have also been described as intrinsically humble. Furthermore, both transformational leadership and servant leadership, two similar yet distinct perspectives, possess features that could be characterised as expressions of humility— appreciation of others, mentoring or teaching, and empowering followers.	H1: r = .64	Uses Baron and Kenny to test for moderation. Sample unclear	D-
Wang, 2019	cross-sectional study n = 173	hotel employees in Hong Kong	H1. Error management culture is positively related to psychological safety. H3. Psychological safety is positively related to organisational commitment.	unclear	small sample, results unclear	D-
Yanchus, 2015	cross-sectional study n = 11,726	psychiatrists, psychologists, social workers, and mental health nurses in the VHA	Psychological safety directly predicted turnover intention. There were no differences in the predictors across occupations.	large	Psychological safety was measured with only one item.	D
Yoon, 2017	longitudinal study n = 1,790	managers and employees from small and medium enterprises	Psychological safety moderates the (curvilinear) relationship between entrepreneurial orientation and firm performance.	ß = .54	no serious limitations	C

Excluded studies

Author & year	Reason for exclusion
Applebaum, 2018	Doesn't examine predictors or outcomes of psychological safety.
Aranzamendez, 2015	Literature review.
Aufegger, 2019	Narrative review, no quantitative outcomes or effect sizes are reported.
Rown, 2016	Qualitative study.
Cave, 2016	Insufficient data reported / not quantitative study.
Christian, 2009	Concerns psychological safety climate, a related but conceptually different construct (= individual perceptions of safety-related policies, practices, and procedures pertaining to safety matters that affect personal well-being at work).
Dahl, 2017	Study protocol.
Edmondson, 2014	Narrative review, no quantitative outcomes or effect sizes are reported.
Jahanzeb, 2018	This study investigates the sequential mediating effects of threats to efficacy needs and defensive silence between supervisor ostracism and emotional exhaustion, explained through need-threat/need fortification framework; psychological safety is not included in the tested model.
Jahanzeb, 2018-2	This study investigated the mediating effects of defensive silence and emotional exhaustion between ostracism and interpersonal deviance, explained through transactional theory of stress and coping; psychological safety is not included in the tested model.
Jimmieson, 2016	Not about psychological safety. Safety climate is operationalized in relation to hand hygiene. Authors' definition of psychological safety climate is 'individual's evaluation of the importance one's organisation (or workgroup) places on safe work practices.'
Halbesleben, 2013	Not about psychological safety. Psychological safety climate (PSC) is defined in this study as 'specific policies, practices, and procedures for the protection of worker psychological health and safety'.

Newman, 2017	Narrative review, no quantitative outcomes or effect sizes are reported.
Nielsen, 2016	Not about psychological safety. The Safety Climate Questionnaire (Zohar & Luria, 2005) were used to assess psychological safety climate. The items assess psychological safety climate in the work group. The safety climate items cover a range of interaction modes between supervisors and group members by which supervisors can indicate the priority of safety versus competing goals such as production speed or schedules.
O' Neil, 2018	Narrative review, no quantitative outcomes or effect sizes are reported.
Probst, 2010	Not psychological safety. The measure of organisational safety climate included: management values (e.g., "Management places a strong emphasis on workplace health and safety"), safety communication (e.g., There is open communication about safety issues within this workplace), safety training (e.g., Safety issues are given a high priority in training programs), and safety systems (e.g., There are systematic procedures in place for preventing breakdowns in workplace safety).
Salas, 2018	Narrative review, no quantitative outcomes or effect sizes are reported.
Wang, 2018	1. Concerns employees from software firms in the Guangdong province (China), DV (eg humble leadership) may be confounded due to culture differences. 2. Does address reversed causation. 3. Outcome (follower creativity) not relevant.





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EXECUTIVE SUMMARY

Rapid Evidence Assessment (REA)

IMPACT AND ANTECEDENTS* OF PSYCHOLOGICAL SAFETY IN WORKPLACES

a summary of scientific literature

January 2020

Culture Review **Implementation**

our journey of positive change

ACT Government

***For the purposes of this REA 'antecedents' refers to the 'drivers' that may cause psychological safety.**

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What is a Rapid Evidence Assessment (REA)?



Rapid Evidence Assessments (REAs) use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and as a result, the likelihood of bias is considerably smaller.

Background

Several months after the release of the Final Report: Independent Review into the Workplace Culture within ACT Public Health Services (Review) in late 2019 the ACT public health system partnered with the Australian National University Research School of Management (ANU-RSM) to develop an evidence-based Workplace Change Framework. The purpose of the Framework is to provide identification and prioritisation of targeted areas to improve the culture of the ACT public health system. Supporting the Framework is a range of Rapid Evidence Assessments (REAs) on key themes that were identified by the Center for Evidence Based Management (CEBMa).

What does this REA answer?

The ACT public health system approached the Center for Evidence Based Management (CEBMa) to conduct a REA of the most trustworthy scientific research on the impacts and antecedents of psychological safety in teams and organisations.

Other issues answered in this REA include the following questions:

1. **What is psychological safety?**
2. **What is the impact of psychological safety on organisational outcomes?**
3. **What are the antecedents of psychological safety?**

Main findings

1. What is psychological safety?

The term 'psychological safety' was first introduced in 1965 by MIT professors Edgar Schein and Warren Bennis. They defined it as essential for making employees feel secure and able to change their behaviour in response to organisational change. Less than 30 years later, Schein argued that psychological safety helps people overcome their defensiveness and makes them focus on collective goals and problem prevention rather than on self-protection (Schein, 1993).

Since that time research on psychological safety has flourished, mainly due to the work of Harvard professor, Amy Edmondson. She affirmed that psychological safety 'helps to explain why employees share information and knowledge, speak up with suggestions for organisational improvements, and take initiative to develop new products and services' (Edmondson, 2014).

This REA provides evidence that confirms that psychological safety describes the extent to which an employee believes they can openly speak up, ask for help, ask questions, and make suggestions to their colleagues or leaders without personal judgement or reputational repercussions. This is emphasised in many studies, including a recent study that found that physicians who experienced more psychological safety were more likely to accept corrective and positive performance feedback from peers, explanations of feedback, and suggestions for improvement (Scheepers, 2018).

A construct related but distinct from psychological safety is trust, often defined as the willingness to be vulnerable to the actions of others (Mayer, 1995). However, Edmondson differentiates the two terms by emphasising their different focus. She affirms that trust captures a person's willingness to be vulnerable to others – that in turn reflects the willingness to give the other person the benefit of the doubt. In contrast, she notes, psychological safety captures the extent to which a person believes that the other person will give the benefit of the doubt when taking risks (Edmondson, 2004).

2. What is the impact of psychological safety on organisational outcomes?

Many studies identified that psychological safety is related to both direct and indirect organisational outcomes. This therefore makes it a critical concept for managing teams and organisations. Psychological safety is strongly associated with employees' support, voice, information sharing, learning behaviour, team performance, level of pro-activity, psychological empowerment, retention and turnover, social network ties, team cohesion and work engagement.

Some studies also revealed that psychological safety can moderate or mediate several relationships between a wide range of constructs relevant to management and organisational outcomes. For example, even when a team has a learning orientation, team learning takes place only when psychological safety is high (Harvey, 2019). This also applies to the following leadership styles: empowering; authentic, transformational, inclusive and ethical, that in turn positively effects the following employee outcomes: innovation; pro-active behaviour; constructive voice; organisational citizenship behaviour; and occupational safety – all only occurring when employees perceive their organisation and leaders as psychologically safe (Huyghebaert, 2018; Ifzal, 2019; Kim, 2019; Liu, 2018; Malik, 2018; Rao, 2018). Finally, a recent study indicates that psychological safety also mediates the relationship between functional dominance (when a team is dominated by a single function, i.e. medical specialists or engineers) and the performance of multi-disciplinary teams (Malhotra, 2017).

3. What are the antecedents of psychological safety?

This REA also identified the following factors as the strongest antecedents or predictors of psychological safety:

- **Leadership style** – the studies show that leaders perceived by their employees as authentic, benevolent, ethical, humble, supportive, and trustworthy positively affect the psychological safety within a team or organisation (Anugerah, 2019). The same applies to leaders perceived as non-judgemental, empathic and respectful listeners (Castro, 2018). Not surprisingly, leaders perceived as abusive, untrustworthy or psychopathic negatively affect psychological safety.
- **Empowerment** – Psychological safety increases when leaders share power with employees, give them autonomy to make decisions by putting trust in them and encouraging participative decision making. These types of leaders create an environment of openness that acts as a signal for employees to express themselves freely and speak up with suggestions for improvements (Rao, 2018).
- **Leader-assigned mastery goals** – when learning new tasks or working on ill-structured problems, employees will inevitably make errors. This may be embarrassing or threatening to their self-esteem. In these situations, mastery or learning goals tend to be more effective. Mastery goals lead employees to view unsolved problems as challenges to be 'mastered' rather than focus on performance or how they will be judged (Ashauer, 2013). Therefore, leaders who set mastery goals for their team members create an environment in which they will feel safe in being able to take interpersonal risks and not feel that speaking up about problems will be held against them.
- **Diversity climate** – this term refers to employee perceptions about their organisation's diversity-related policies and practices. In a positive diversity climate, employees will perceive that their organisation treats all staff with respect and dignity and provides equal access to opportunities for career advancement, which creates a psychologically safe environment (Guchait, 2017).
- **Conflict management style** – managers and leaders who use an integrating conflict management style display high levels of concern, respect for others and open communication. This style for managing conflicts correlates with characteristics of supportive leadership, organisational justice and participative decision making, which are major antecedents of trust (Erkutlu, 2015). When employees trust their leaders, they are more likely to openly express their thoughts and opinions.
- **Quality of the managerial relationship** – an employee's ability to share with their managers suggestions, concerns or knowledge is based on their past experiences with their manager. Therefore, those employees who feel they are fairly and positively treated by their manager will speak up more comfortably, whereas those who perceive the relationship with their manager as negative or problematic are more likely to feel uncomfortable is doing so (Unler, 2019).
- **Team tenure** – the length of time teams have worked with each other can impact interpersonal dynamics and the level of



psychological safety. Newly formed teams tend to experience more positive interpersonal dynamics than teams who have been with each other for long periods. This is because the new team creates a 'new group' identity that engenders positive perceptions about teammates and high trust. This trust originates because the new members do not have adequate information to judge the trustworthiness of their teammates. Members of moderately tenured teams, however, had more social interactions and as a result may have discovered differences in personal values and opinions about how the team should approach task or interpersonal relationships.

As a result, they are more likely to face conflicts and feelings of uncertainty, which are known to harm team psychological safety. In contract to moderately tenured teams, members of longer tenured teams have had extensive time to obtain a deeper understanding of each other. When the team is managed effectively, it will have established team norms that enable its members to interact in a manner that focuses on effective goal completion, assisting other team members in their tasks, and avoiding unproductive conflict, which leads to higher team psychological safety (Koopman, 2019).

Conclusion

The studies assessed in this REA clearly demonstrate that psychological safety has a large, positive relationship with a wide range of organisational outcomes. Therefore, this is likely to be an important condition for the effectiveness of teams, work groups, and the organisation as a whole. Review findings also indicate that the leadership style and skills of managers and team leaders directly enhance or undermine the establishment of psychological safety.

More information

You can access more information in the *Rapid Evidence Assessment – The Impact and Antecedents of Psychological Safety – a summary of the scientific literature, January 2020.*

References

Aamir Ali, C., & Buckley, F. (2013). Exploring the impact of trust on research scientists' work engagement. *Personnel Review, 42*(4), 396-421.

Ahmad, I., & Mujtaba, A. (2017). The dark side of Corporate Social Responsibility: Evidence from a Public Sector Oil Company. *NUML International Journal of Business & Management, 12*(1), 15-27.

Ahmad, I., Donia, M. B. L., & Shahzad, K. (2019). Impact of Corporate Social Responsibility Attributions on Employees' Creative Performance: The Mediating Role of Psychological Safety. *Ethics & Behavior, 29*(6), 490-509.

Anugerah, R., Abdillah, M. R., & Anita, R. (2019). Authentic leadership and internal whistleblowing intention: The mediating role of psychological safety. *Journal of Financial Crime, 26*(2), 556-567.

Appelbaum, N. P., Lockeman, K. S., Orr, S., Huff, T. A., Hogan, C. J., Queen, B. A., & Dow, A. W. (2019). Perceived influence of power distance, psychological safety, and team cohesion on team effectiveness. *Journal of Interprofessional Care*, 1-7.

Ashauer, S. A., & Macan, T. (2013). How Can Leaders Foster Team Learning? Effects of Leader-Assigned Mastery and Performance Goals and Psychological Safety. *The Journal of Psychology, 147*(6), 541.

Basit, A. A. (2017). Trust in Supervisor and Job Engagement: Mediating Effects of Psychological Safety and Felt Obligation. *The Journal of Psychology, 151*(8), 701-721.

Cai, Z., Huang, Q., Liu, H., & Wang, X. (2018). Improving the agility of employees through enterprise social media: The mediating role of psychological conditions. *International Journal of Information Management, 38*(1), 52-63.

Carmeli, A., Sheaffer, Z., Binyamin, G., Reiter-Palmon, R., & Shimoni, T. (2014). Transformational leadership and creative problem-solving: The mediating role of psychological safety and reflexivity. *The Journal of Creative Behavior, 48*(2), 115-135.

Castro, D. R., Anseel, F., Kluger, A. N., Lloyd, K. J., & Turjeman-Levi, Y. (2018). Mere listening effect on creativity and the mediating role of psychological safety. *Psychology of Aesthetics, Creativity, and the Arts, 12*(4), 489-502.

Chamberlin, M., Newton, D. W., & Lepine, J. A. (2017). A Meta-Analysis of Voice and Its Promotive and Prohibitive Forms: Identification of Key Associations, Distinctions, and Future Research Directions. *Personnel Psychology, 70*(1), 11-71.

Chi-Cheng, H., & Ping-Kuo, C. (2018). Exploring the antecedents and consequences of the transactive memory system: an empirical analysis. *Journal of Knowledge Management, 22*(1), 92-118.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Da Silva, N., & Oldham, G. R. (2012). Adopting employees' ideas: Moderators of the idea generation–idea implementation link. *Creativity Research Journal, 24*(2-3), 134-145.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*(2), 350-383.

Edmondson, A. C., & Lei, Z. (2014). Psychological safety: The history, renaissance, and future of an interpersonal construct. *Annual Review of Organizational Psychology and Organizational Behavior, 1,* 23-43.

Elsaied, M. M. (2019). Supportive leadership, proactive personality and employee voice behaviour: The mediating role of psychological safety. *American Journal of Business (Emerald Group Publishing Limited), 34*(1), 2-18.

Erkutlu, H., & Chafra, J. (2015). The mediating roles of psychological safety and employee voice on the relationship between conflict management styles and organisational identification. *American Journal of Business, 30*(1), 72-91.

Erkutlu, H., & Chafra, J. (2016). Benevolent leadership and psychological well-being: The moderating effects of psychological safety and psychological contract breach. *Leadership & Organization Development Journal, 37*(3), 369-386.

Erkutlu, H., & Chafra, J. (2019). Leader psychopathy and organizational deviance. *International Journal of Workplace Health Management, 12*(4), 197-213.

Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., & Vracheva, V. (2017). Psychological Safety: A Meta-Analytic Review and Extension. *Personnel Psychology, 70*(1), 113-165.

Gonçalves, L., & Brandão, F. (2017). The relation between leader's humility and team creativity: The mediating effect of psychological safety and psychological capital. *International Journal of Organizational Analysis, 25*(4), 687-702.

Guchait, P., Tews, M. J., & Simons, T. (2014). The Influence of Transactive Memory Systems and Psychological Safety on Effectiveness of Service Management Teams in a Restaurant Setting. *Journal of Human Resources in Hospitality & Tourism, 13*(3), 234.

Guchait, P., Madera, J., & Dawson, M. (2016). Learning in the service environment: the influence of diversity climate. *Journal of Service Theory and Practice, 26*(4), 448-470.

Guchait, P., Lee, C., Wang, C.-Y., & Abbott, J. L. (2016). Impact of error management practices on service recovery performance and helping behaviours in the hospitality industry: The mediating effects of psychological safety and learning behaviours. *Journal of Human Resources in Hospitality & Tourism, 15*(1), 1.

Harvey, J.-F., Johnson, K. J., Roloff, K. S., & Edmondson, A. C. (2019). From orientation to behaviour: The interplay between learning orientation, open-mindedness, and psychological safety in team learning. *Human Relations, 72*(11), 1726-1751.

Hood, A. C., Bachrach, D. G., Zivnuska, S., & Bendoly, E. (2016). Mediating effects of psychological safety in the relationship between team affectivity and transactive memory systems. *Journal of Organizational Behavior, 37*(3), 416-435.

Huyghebaert, T., Gillet, N., Fadi-Joseph, L., Dubois-Fleury, A., & Fouquereau, E. (2018). Psychological Safety Climate as a Human Resource Development Target: Effects on Workers Functioning Through Need Satisfaction and Thwarting. *Advances in Developing Human Resources, 20*(2), 169-181.

Ifzal, A., & Waheed Ali, U. (2019). The impact of ethical leadership style on job satisfaction. *Leadership & Organization Development Journal, 40*(5), 534-547.

Jha, S. (2019). Team psychological safety and team performance. *International Journal of Organizational Analysis, 27*(4), 903-924.

Kim, B.-J., Park, S., & Kim, T.-H. (2019). The effect of transformational leadership on team creativity: sequential mediating effect of employee's psychological safety and creativity. *Asian Journal of Technology Innovation, 27*(1), 90-107.

Kim, N. Y. (2019). Linking individuation and organisational identification: Mediation through psychological safety. *The Journal of Social Psychology.*

Koopmann, J., Lanaj, K., Wang, M., Zhou, L., & Shi, J. (2016). Nonlinear effects of team tenure on team psychological safety climate and climate strength: Implications for average team member performance. *Journal of Applied Psychology, 101*(7).

Lee, Y.-H., Yang, C.-C., & Chen, T.-T. (2016). Barriers to incident-reporting behavior among nursing staff: A study based on the theory of planned behavior. *Journal of Management and Organization, 22*(1), 1-18.

Liu, W., Zhang, P., Liao, J., Hao, P., & Mao, J. (2016). Abusive supervision and employee creativity: The mediating role of psychological safety and organizational identification. *Management Decision, 54*(1), 130-147.

Liu, Y., Fuller, B., Hester, K., Bennett, R. J., & Dickerson, M. S. (2018). Linking authentic leadership to subordinate behaviors. *Leadership & Organization Development Journal, 39*(2), 218-233.

Malhotra, M. K., Ahire, S., & Shang, G. (2017). Mitigating the Impact of Functional Dominance in Cross-Functional Process Improvement Teams. *Decision Sciences, 48*(1), 39.

Mura, M., Lettieri, E., Radaelli, G., & Spiller, N. (2016). Behavioral operations in healthcare: a knowledge sharing perspective. *International Journal of Operations & Production Management, 36*(10), 1222-1246.

Malik, M. S., & Nawaz, M. K. (2018). The Role of Ethical Leadership in Whistleblowing Intention among Bank Employees: Mediating Role of Psychological Safety. *Review of Integrative Business and Economics Research, 7*, 238-252.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*(3), 709-734.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: an introduction to assessing study quality. *Systematic reviews in the social sciences: A practical guide,* 125-163.

Rao, J. U., & Mukhopadhyay, S. (2018). Empowering leadership and constructive voice behavior: a moderated mediated model. *International Journal of Organizational Analysis, 26*(2), 226-241.

Schaubroeck, J., Lam, S. S. K., & Peng, A. C. (2011). Cognition-based and affect-based trust as mediators of leader behavior influences on team performance. *Journal of Applied Psychology, 96*(4), 863.

Scheepers, R. A., van den Goor, M., Arah, O. A., Heineman, M. J., & Lombarts, K. M. J. M. H. (2018). Physicians' Perceptions of Psychological Safety and Peer Performance Feedback. *The Journal of Continuing Education in the Health Professions, 38*(4), 250-254.

Schein, E.H., Bennis, W. (1965). *Personal and Organizational Change Through Group Methods.* NewYork: Wiley.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Shumski, J., Thomas, J., Olien, J. L., Allen, J. A., Rogelberg, S. G., & Kello, J. E. (2018). Faking It for the Higher-Ups: Status and Surface Acting in Workplace Meetings. *Group & Organization Management, 43*(1), 72-100.

Unler, E., & Caliskan, S. (2019). Individual and managerial predictors of the different forms of employee voice. *The Journal of Management Development, 38*(7), 582-603.

Walters, K. N., & Diab, D. L. (2016). Humble Leadership: Implications for Psychological Safety and Follower Engagement. *Journal of Leadership Studies, 10*(2), 7-18.

Yanchus, N. J., Periard, D., Moore, S. C., Carle, A. C., & Osatuke, K. (2015). Predictors of Job Satisfaction and Turnover Intention in VHA Mental Health Employees: A Comparison Between Psychiatrists, Psychologists, Social Workers, and Mental Health Nurses. Human Services Organizations. *Management, Leadership & Governance, 39*(3), 219.





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EFFECT OF EMPLOYEE RECOGNITION AND NON-FINANCIAL REWARDS ON WORKPLACE PERFORMANCE

a summary of scientific literature

August 2019

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our journey of positive change

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Background

Novartis, a global pharmaceutical company with more than 125,000 employees, is involved in several projects to enhance organisational effectiveness and performance. Part of this effort is to replace existing performance appraisal practices with a performance management system based on three hypotheses:

1. When associates know that their contribution matters, performance will increase.
2. When associates receive frequent and quality feedback, performance will increase.
3. When associates are recognised and rewarded for their contributions, performance will increase.

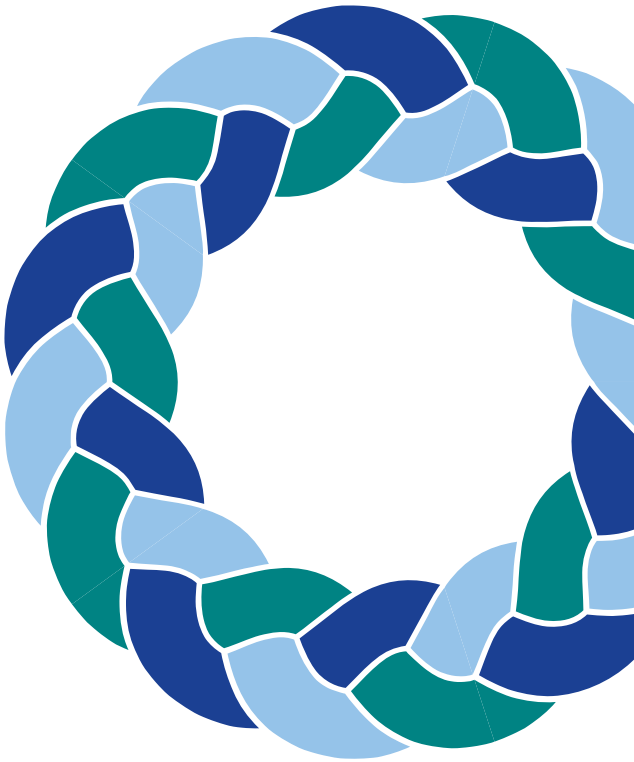
Although these three hypotheses appear to make sense from a managerial perspective, it is yet unclear whether they are supported by scientific evidence. For this reason, Novartis approached the Center for Evidence Based Management (CEBMa) to undertake a Rapid Evidence Assessment (REA) to understand what is known in the scientific literature about these hypotheses. Previous REAs have addressed hypotheses 1 and 2; this review presents an overview of the scientific evidence regarding hypothesis 3, the link of recognition and rewards with workplace performance.

What is a Rapid Evidence Assessment (REA)?

Evidence reviews come in many forms. One of the best-known is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: Clear criteria for inclusion is often lacking and studies are selected based on the researcher's individual preferences. As a result, conventional literature reviews are prone to severe bias.

This is why 'rapid evidence assessments' (REAs) are used. This type of review uses a specific research methodology to identify the most relevant studies on a specific topic as comprehensively as possible, and select appropriate studies based on explicit criteria. In addition, the methodological quality of the studies included is assessed by two independent reviewers on the basis of explicit criteria. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and, as a result, the likelihood of bias is considerably smaller.



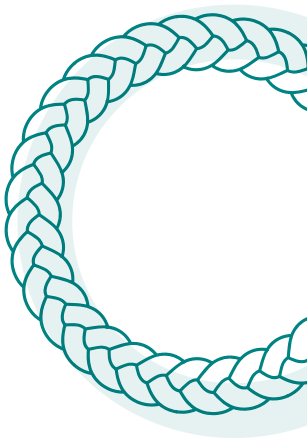


Main question: What does this REA answer?

What is known in the research literature about the effect of employee recognition and non-financial rewards on performance?

Other issues raised, which form the basis of our conclusion to the three questions above, are:

1. **What is meant by recognition and rewards (what is it)?**
2. **What is the assumed logic model (how is it supposed to enhance performance)?**
3. **How can recognition be measured?**
4. **What is the overall effect of recognition and rewards on employees' performance?**
5. **What is known about the (positive or negative) effect of possible moderators and/or mediators?**



Search strategy: How was the research evidence sought?

The following three databases were used to identify studies: ABI/INFORM Global, Business Source Premier and PsycINFO. The following generic search filters were applied to all databases during the search:

1. **Scholarly journals, peer-reviewed.**
2. **Published in the period 2000 to 2019.**
3. **Articles in English.**

A search was conducted using combinations of different search terms, such as 'recognition', 'appreciation', 'rewards' and 'performance'. In addition, the references listed in the studies retrieved were screened in order to identify additional articles for possible inclusion in the REA.

We conducted 15 different search queries and screened the titles and abstracts of more than 900 studies. An overview of all search terms and queries is provided in Appendix I.

Selection process: How were the studies selected?

Two reviewers worked independently to identify which studies should be included. Where the reviewers disagreed on selection, a third reviewer assessed whether the study was appropriate for inclusion with no prior knowledge of the initial reviewers' assessments. The decision of the third reviewer was final.

Study selection took place in two phases. First, the titles and abstracts of the studies identified were screened for their relevance to this review. In case of doubt or lack of information, the study was included. Duplicate publications were removed. This first phase yielded 19 secondary studies (meta-analyses) and 32 primary studies.

Secondly, studies were selected based on the full text of the article according to the following inclusion criteria:

1. **Type of studies:** Only quantitative, empirical studies.
2. **Measurement:** Only studies in which the link between recognition and/or rewards and performance outcomes was measured.
3. **Context:** Only studies on recognition and rewards related to workplace settings.

In addition, the following exclusion criteria were applied:

- Recognition and/or rewards from clients or customers.
- Financial incentives and/or financial rewards.

This second phase yielded 8 secondary studies and 27 primary studies. An overview of the selection process is provided in Appendix II.

Critical appraisal: How were the quality of the included studies judged?

It is possible to find a scientific study to support or refute any theory or a claim. Thus, it is important to determine which studies are trustworthy (i.e. valid and reliable). The trustworthiness of a scientific study is first determined by its methodological appropriateness. For cause-and-effect claims (i.e. if we do A, will it result in B?), a study has a high methodological appropriateness when it fulfils the three conditions required for causal inference: co-variation, time-order relationship, and elimination of plausible alternative causes (Shaughnessy & Zechmeister, 2006).

A study that uses a control group, random assignment and a before-and-after measurement is therefore regarded as the 'gold standard'. Non-randomised studies and before-after studies come next in terms of appropriateness. Cross-sectional studies (surveys) and case studies are regarded as having the greatest chance of showing bias in the outcome and therefore fall lower in terms of appropriateness. Meta-analyses in which statistical techniques are used to pool the results of controlled studies are therefore regarded as the most appropriate design.

To determine the methodological appropriateness of the included studies' research design, we used the classification system of Shadish, Cook and Campbell (2002), and Petticrew and Roberts (2006). The following four levels of appropriateness were used for the classification:

Design	Level
Systematic review or meta-analysis of randomised controlled studies	AA
Systematic review or meta-analysis of controlled before-after studies	A
Randomised controlled study	
Systematic review or meta-analysis of non-controlled and/or before-after studies	B
Non randomised controlled before-after study	
Interrupted time series	
Systematic review or meta-analysis of cross-sectional studies	C
Controlled study without a pretest or uncontrolled study with a pretest	
Cross-sectional study	D

It should be noted, however, that the level of methodological appropriateness as explained above is only relevant in assessing the validity of a cause-and-effect relationship that might exist between a predictor/driver (rewards & recognition) and its outcomes (workplace performance), which is the purpose of this review.

In addition, a study's trustworthiness is determined by its methodological quality (its strengths and weaknesses). For instance, was the sample size large enough and were reliable measurement methods used? To determine methodological quality, all the studies included were systematically assessed on explicit quality criteria. Based on a tally of the number of weaknesses, the trustworthiness was downgraded and the final level determined as follows: a downgrade of one level if two weaknesses were identified; a downgrade of two levels if four weaknesses were identified, etc. Since no study is perfect, one weakness is allowed without downgrading trustworthiness.

Finally, effect sizes were identified. An effect (e.g. a correlation, Cohen's d or omega) can be statistically significant but may not necessarily of practical relevance: Even a trivial effect can be significant if the sample size is big enough. For this reason, each study's effect size – a standard measure of the magnitude of the effect – was assessed. To determine the magnitude of an effect, we applied Cohen's rules of thumb (Cohen, 1988). According to Cohen a 'small' effect is an effect only visible through careful examination. A 'medium' effect is 'visible to the naked eye of the careful observer'. Finally, a 'large' effect is one that anybody can easily see because it is substantial.

Outcome of the critical appraisal

The overall quality of the studies included was high. Most of the secondary studies were based on controlled studies and were therefore graded level A or higher. Of the 27 primary studies, 5 qualified as randomised controlled studies and were therefore graded level A. The remaining studies concerned quasi-experimental studies (2), longitudinal designs (2) and cross-sectional studies (18). An overview of all the studies included and their year of publication, research design, sample size, population, main findings, effect sizes and limitations is provided in Appendix III (secondary studies) and Appendix IV (primary studies).

Main findings

1. What is meant by recognition and rewards?

Recognition is generally defined as the assignment of personal non-monetary rewards for individual efforts and work accomplishment to recognise and reinforce the desired behaviours displayed by an employee (Brun & Dugas, 2008). Many organisations recognise employees based on their performance (Frey 2007). For example, organisations can recognise outstanding performers through compliments, gratitude, private notes or emails, public awards, or publication of their achievements in company newsletters. These recognitions are sometimes symbolic and come with no corresponding financial rewards (Wang, 2017).

Rewards and recognition are usually regarded as synonyms. Behavioural psychologists, however, make an important distinction between the two terms: rewards are tangible, transactional, conditional and expected, whereas recognition is intangible, relational, unconditional and unexpected. Because the difference between the two is not always clear and often ignored in both academia and practice, this review focusses on both recognition and non-monetary rewards, although it is recognised that they have slightly different meanings.

2. What is the assumed logic model? (How is it supposed to work?)

Studies in the social sciences draw on social comparison theory to predict that employee recognition increases performance. Social comparison theory (Festinger, 1954) states that people tend to compare themselves with others in order to make judgments regarding their performance. They are concerned not only about their performance in an absolute sense, but also about how they measure up in relation to relevant peers.

The theory argues that people engage in social comparison to enhance their own self-esteem. Comparing favorably to others increases self-esteem and produces positive affect while comparing unfavorably lowers self-esteem and produces negative affect. Thus, receiving (private or public) recognition provides a positive signal about one's competence relative to others, which enhances self-esteem and induces positive affect (Wang, 2017). As a result, employees are motivated to attain a high level of performance to increase their chance of receiving recognition.

3. How can recognition be measured?

There are several measurement tools available that measure whether employees feel recognised by their manager and/or the organisation. One of the most widely used is the five-item scale developed by Migneault, Rousseau, and Boudrias (2009). Respondents are asked to indicate how frequently (1 = 'never' to 5 = 'always') their manager displayed the listed behaviours: 'My manager shows appreciation for my contributions', 'My manager acknowledges my performance', 'My manager appreciates my efforts', 'My manager congratulates me for my achievements' and 'My manager takes an interest in what I'm doing'.

4. What is the overall effect of recognition and rewards on performance?

Finding 1: There is strong evidence that employee recognition and non-financial rewards have a moderate to large effect on workplace performance (Level A)

There is wide consensus among both scholars and practitioners that employee recognition and non-financial rewards, in general, can have a large, positive impact on performance outcomes. There is indeed strong evidence from randomised controlled studies that employee recognition and rewards are an effective way to enhance (or maintain) performance. In the past 30 years several meta-analyses (e.g. Cameron, 2001) and high quality studies (e.g. Li, 2016; Wang, 2017) have consistently shown moderate to large effect sizes, even when the recognition was merely a thank-you card (Bradler, 2016) or smiley button (Kosfeld, 2017). In addition, employees rewarded with verbal praise or positive feedback show substantially greater intrinsic motivation than financially rewarded or non-rewarded employees. In addition, they also show more interest and enjoyment than non-rewarded employees (Deci, 1999; Cameron, 2001; Kunz, 2012).

Finding 2: Recognition and rewards can have a negative impact on performance when offered for simply doing a task (Level A)

A large number of controlled studies have consistently shown that employee recognition and non-financial rewards can have a negative effect on performance when offered to employees for engaging in a task without consideration of any standard of performance (Cameron, 1994; Cameron, 2001).

Finding 3: Employee recognition contributes to employee retention, commitment, and work engagement, but the effects are small (Level D)

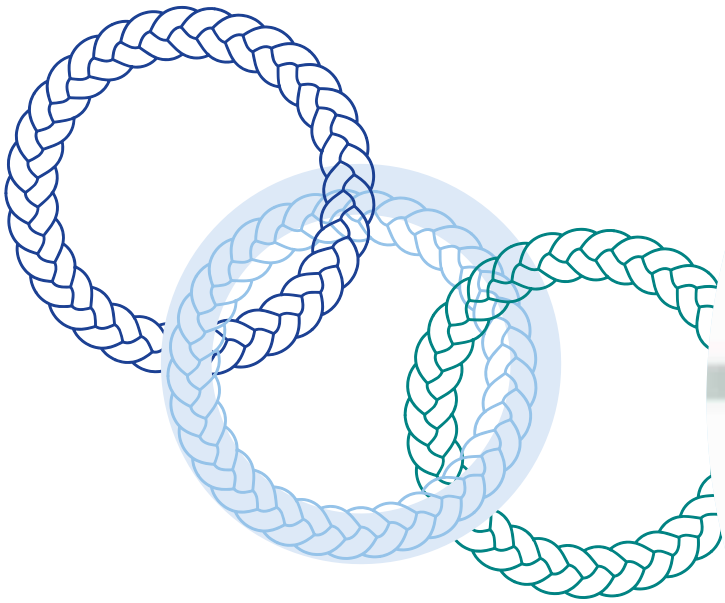
Several cross-sectional studies find that employee recognition may contribute to retention. Controlling for other factors (e.g. job stress) it was found that there is a small but positive relationship between (perceived) recognition from management and employees' intention to stay (Abualrub, 2008; Austen, 2016). Similar small but positive associations were found for (normative) commitment and work engagement (Gosh, 2016).

Finding 4: Employee recognition has a large positive impact on employee attendance (Level A)

A randomised controlled study demonstrated that an attendance-recognition program that included personal attention and recognition from senior managers substantially decreased absenteeism rates among employees (Markham, 2002).

Finding 5: Employee recognition produces strong positive spillover effects on other employees (Level A)

A recent randomised controlled study demonstrated that a single team member's recognition may produce strong positive spillover effects on other team members' performance, as well as overall team performance, especially when the award recipient is located in a central position in a team (Li, 2016).



[1]Remarkably, in this study employees who did not receive a thank-you card were mainly responsible for the performance increase. See also Finding 5.

Finding 6: There is some evidence that employee recognition can foster envy and resentment (Level D)

A cross-sectional study from the US found that, in some situations, formal (public) recognition for performance may foster envy and resentment among colleagues, which may create social discomfort (e.g. feeling embarrassed) on the part of high performers and potentially erode their intrinsic motivation (Henagan, 2010). The effect sizes found, however, were rather small.

5. What is known about the (positive or negative) effect of moderators?

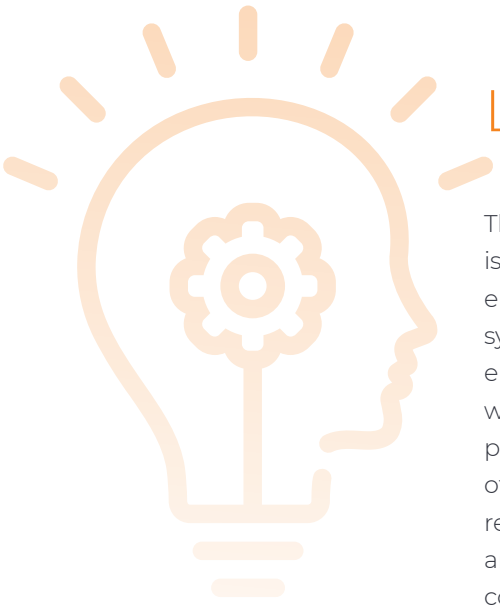
Finding 7: The effect of employee recognition is strongly dependent on perceived work meaningfulness (Level A)

A recent randomised controlled study found that, if perceived meaningfulness is low, employee recognition has a large impact on performance. However, if perceived meaningfulness is high, recognition has a limited effect (Kosfeld, 2017).



Conclusion

Based on the evidence found, we conclude that employee recognition and non-financial rewards tend to have large positive effects on work performance.



Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about the effects of employee recognition on work performance by using the systematic review method to search and critically appraise empirical studies. However, in order to be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases and a focus on empirical research published in the period 1990 to 2019 for meta-analyses and the period 2010 to 2019 for primary studies. As a consequence, some relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included, which did not incorporate a comprehensive review of the psychometric properties of the tests, scales and questionnaires used. In addition, it should be noted that some of the studies included used (subjective) performance ratings as an outcome measure, not objective performance indicators.

A third limitation concerns the fact that the evidence of some findings is based on only one study. Although most of these studies were well controlled or even randomised, no single study can be considered to be strong evidence – it is merely indicative.

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.

References

AbuAlRub, R. F., & Al-Zaru, I. M. (2008). Job stress, recognition, job performance and intention to stay at work among Jordanian hospital nurses. *Journal of Nursing Management, 16*(3).

Austen, S., Jefferson, T., Ong, R., Sharp, R., Lewin, G., & Adams, V. (2016). Recognition: applications in aged care work. *Cambridge Journal of Economics, 40*(4).

Bradler, C., Dur, R., Neckermann, S., & Non, A. (2016). Employee Recognition and Performance: A Field Experiment. *Management Science, 62*(11), 3085-3099.

Brun, J.-P., & Dugas, N. (2008). An analysis of employee recognition: Perspectives on human resources practices. *The International Journal of Human Resource Management, 19*(4), 716.

Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward, and intrinsic motivation: A meta-analysis. *Review of Educational Research, 64*(3), 363-423.

Cameron, J., Banko, K. M., & Pierce, W. D. (2001). Pervasive negative effects of rewards on intrinsic motivation: The myth continues. *The Behaviour Analyst, 24*(1), 1-44.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Deci, E. L., & Koestner, R. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic. *Psychological Bulletin, 125*(6), 627.

Festinger, L. (1954). A theory of social comparison processes. *Human relations, 7*(2), 117-140.

Ghosh, P., Rai, A., Chauhan, R., Baranwal, G., & Srivastava, D. (2016). Rewards and recognition to engage private bank employees. *Management Research Review, 39*(12), 1738-1751.

Henagan, S. (2010). The Perils of Workplace Recognition: Antecedents to Discomfort Associated with Being the Target of Upward Comparisons. *Basic & Applied Social Psychology, 32*(1), 57-68.

Kosfeld, M., Neckermann, S., & Yang, X. (2017). The effects of financial and recognition incentives across work contexts: the role of meaning. *Economic Inquiry, 55*(1), 237-247.

Kunz, J., & Linder, S. (2012). Organisational Control and Work Effort - Another Look at the Interplay of Rewards and Motivation. *European Accounting Review, 21*(3), 591-621.

Li, N., Zheng, X., Harris, T. B., Liu, X., & Kirkman, B. L. (2016). Recognizing "me" benefits "we" Investigating the positive spillover effects of formal individual recognition in teams. *Journal of Applied Psychology, 101*(7).

Markham, S. E., Scott, K. D., & McKee, G. H. (2002). Recognizing good attendance: a longitudinal, quasi-experimental field study. *Personnel Psychology, 55*(3), 639-660.

Migneault, P., Rousseau, V., & Boudrias, J.-S. (2009). The influence of work climate components on individual's empowerment. *European Review of Applied Psychology, 59*, 239–252.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: an introduction to assessing study quality. *Systematic reviews in the social sciences: A practical guide,* 125-163.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Wang, L. W. (2017). Recognizing the Best: The Productive and Counterproductive Effects of Relative Performance Recognition. *Contemporary Accounting Research, 34*(2), 966-990.

Appendix I

Search terms & hits

ABI/Inform Global, Business Source Elite, PsycINFO
peer reviewed, scholarly journals, July 2019

Search terms	ABI	BSP	PSY
S1: ti(recogni*)	4,859	8,191	21,175
S2: ti(work*) OR ti(employe*)	77,882	92,102	100,824
S3: ab(work*) OR ab(employe*)	389,421	492,775	539,939
S4: S1 AND S3	930	1,303	2,393
S5: ti(appreciat*)	967	1,316	1,920
S6: S5 AND S3	210	262	321
S7: S4 OR S6	1,140	1,565	2,712
S8: S7 AND filter meta-analyses, limit > 1980	1	2	8
S9: S7 AND filter high quality studies, limit > 2000	232	359	76
S10: S6 AND S2 (NOT S9) AND filter low quality studies, limit > 2000	82	78	120
S11: ab("non monetary") OR ab("non financial")	3,595	4,304	677
S12: ab(reward*)	15,455	16,013	52,704
S13: ab(employe*) OR ab(work*)	398,541	493,029	777,376
S13: S11 AND S12 AND S13, filter studies, limit > 2000	48	51	37
S14: S8 OR S9 OR S10 OR S13	363	490	241

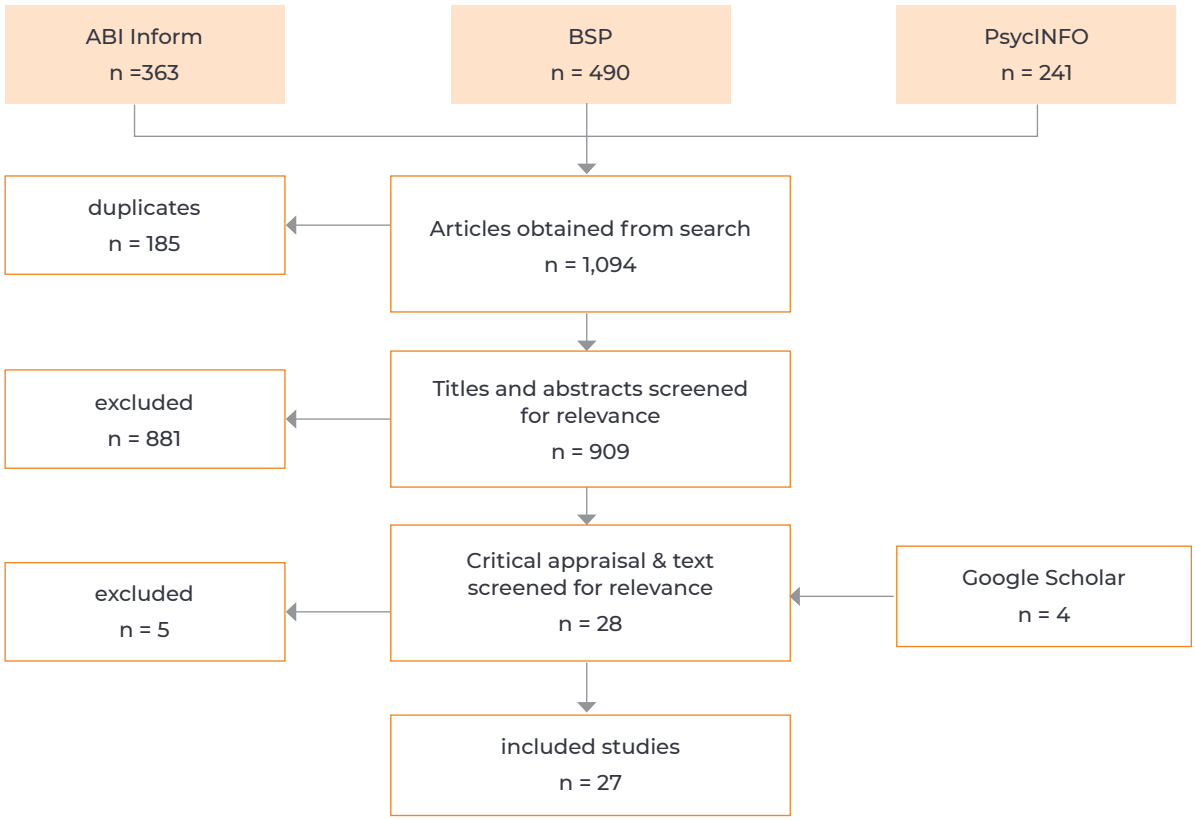
ABI/Inform Global, Business Source Elite, PsycINFO
peer reviewed, scholarly journals, July 2019

Search terms	ABI	BSP	PSY
S15: ti(reward*) OR ti(incentive*)	9,296	10,996	15,406
S16: filter meta-analyses, limit > 1980	28	29	102

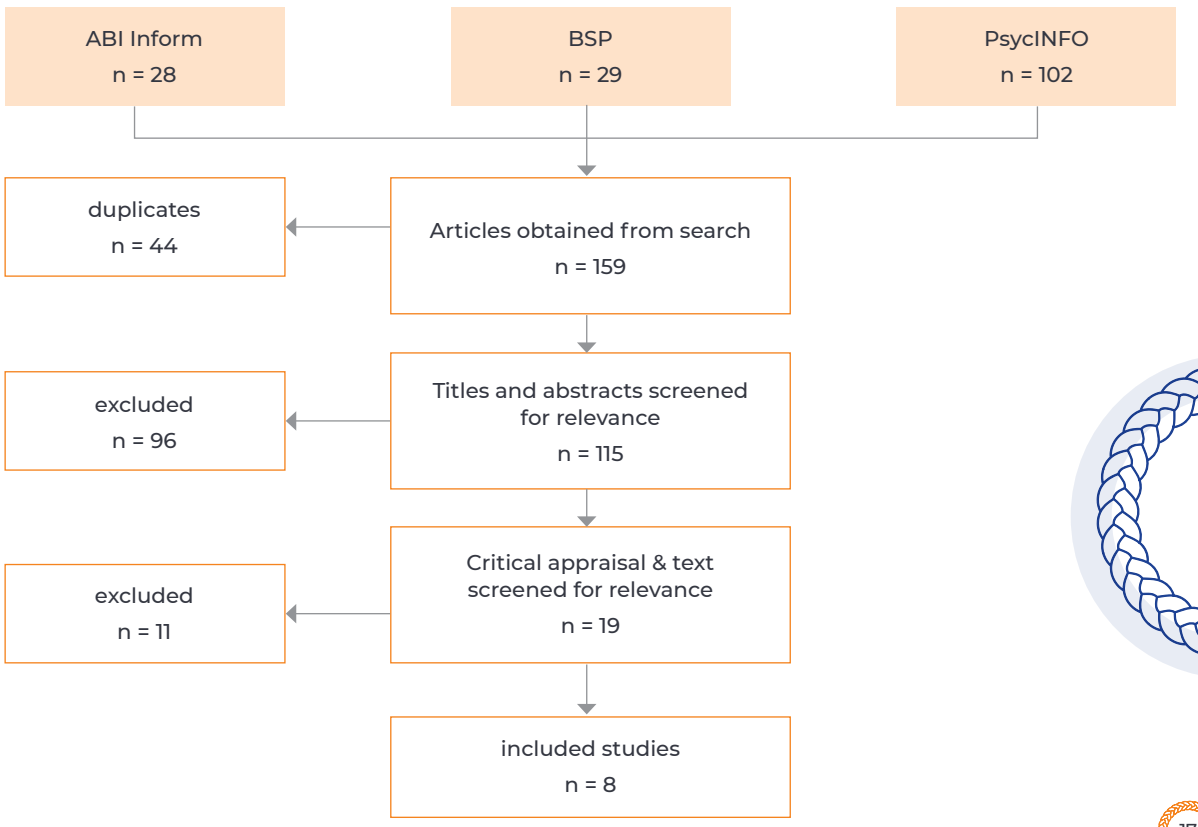
Appendix II

Selection of studies

Study selection – recognition & non-monetary rewards



Study selection – MAs/SRs incentives & rewards



Appendix III

Overview of included meta-analyses

1st Author & year	Design included studies & sample size	Sector / Population	Main findings	Effect sizes	Limitations	Level
Cameron, 1994	meta-analysis of experimental studies (between-group and within-subject design) k = 96	not reported	Overall: Results indicate that rewards don't decrease intrinsic motivation. Type of reward: Subjects rewarded with verbal praise or positive feedback show significantly greater intrinsic motivation than nonrewarded subjects. They also show more interest and enjoyment than nonrewarded persons. Those who receive a tangible reward show significantly less intrinsic motivation than nonrewarded persons. The only negative effect appears when expected tangible rewards are given to individuals simply for doing a task. Thus: Verbal praise and positive feedback enhance people's intrinsic interest. Rewards can have a negative impact on intrinsic motivation when they are offered to people for engaging in a task without consideration of any standard of performance (eg receiving a tangible reward simply for doing an activity). Note: Intrinsic motivation was measured 1) free time on task, 2) attitude, performance during the free- time period; and 3) willingness to volunteer for future studies without reward.	Overall, effect sizes for the three measures are ns or very small. Verbal rewards – free time on task: =.42; attitude = .39 tangible rewards – free time on task = –.22 attitude: .05	Limited search strategy No critical appraisal of studies included	AA
Cameron, 2001	meta-analysis of experimental, controlled and non-controlled studies k = 145	mixed	In general, rewards are not harmful to motivation to perform a task. 1. Rewards (tangible & verbal) given for low-interest tasks enhance intrinsic motivation. 2a. On high-interest tasks, verbal rewards produce positive effects on intrinsic motivation and self-reported task interest. 2b. Negative effects are found when the rewards are tangible, expected (offered beforehand), and loosely tied to level of performance.	1: d = .28 2a: d = .31 2b: d = -.17, -.18, and -.35	No critical appraisal of studies included	AA

Cerasoli, 2014	meta-analysis, design of included studies not reported k = 183	mixed	1. Intrinsic motivation is a medium to strong predictor of performance. 2. The correlation between intrinsic motivation and performance is stronger for quality performance than for quantity performance. 3. The correlation between intrinsic motivation and performance, when incentivised, was stronger for indirectly performance-salient incentives than it is for directly performance-salient incentives. 4. 4a. Intrinsic motivation is a better predictor for (a) quality of performance, whereas. (4b) financial incentives are a better predictor for (b) quantity of performance. Note: external incentive = any prize, credit, or financial compensation surrounding task performance.	1: ρ= .26 2: quality perf ρ = .35 quantity perf ρ = .26 3. indirect ρ = .45 direct ρ = .30 4a. ß=.35 vs .06 4b. ß=.33 vs .24	No critical appraisal of studies included	C
Deci, 1999	meta-analysis of controlled studies k = 128	mixed	1. Engagement-contingent, completion-contingent, and performance-contingent rewards undermine intrinsic motivation, as did all rewards, all tangible rewards, and all expected rewards. 2. Engagement-contingent and completion-contingent rewards undermine self-reported interest, as did all tangible rewards and all expected rewards. 3. Positive feedback (= verbal rewards) enhanced both free-choice behaviour and self-reported interest 1. Note: concerns only studies in which the task was defined as interesting!	1: d = -.40, -.36, and -.28 2: d = -.15 and -.17 3: d = .33 and .31	Limited search strategy No critical appraisal of studies included	AA
Garbers, 2014	meta-analysis, lab experiments were included k = 146	mixed	1. The overall effect size of individual incentives on performance was positive, but (1b) larger for qualitative than for quantitative performance measures, and (1c) smaller for les complex tasks. 2. The overall effect size of team-based incentives on performance was positive, and (2b) with equitably distributed rewards resulting in higher performance than equally distributed rewards. 3. The effect of team-based rewards on performance decreases with the amount of team members.	1a: g = .32 1b: g = .39 1c: g = .19 2a: g = .45 2b: g = .45	No critical appraisal of studies included Concerns financial incentives	AA

Jackson, 2012	meta-analysis of meta-analytic studies? k or n = 554?	not reported	1. Leader reward behaviour is positively related to higher task performance and organisational citizenship behaviour, and fewer intentions to turnover. 2. These relationships are mediated by employees' perceptions of fairness and work morale.	1: r = .28, .21 and -.32	Research methodology somewhat unclear Limited search strategy No critical appraisal of studies included	D
Jenkins, 1998	meta-analysis, lab experiments and controlled studies included k = 39	not reported	Financial incentives were not related to performance quality but had a medium correlation with performance quantity.	ρ = .34	Search strategy somewhat unclear No critical appraisal of studies included	A
Podsakow, 2006	meta-analysis of cross-sectional and longitudinal studies k = 78		1. Contingent reward behaviour had a stronger relationship with employee effort than non-contingent reward behaviour 2. Contingent reward behaviour had a stronger relationship with individual task performance than non-contingent reward behaviour. 3. Contingent reward behaviour had a stronger relationship with group performance than non-contingent reward behaviour. 4. Contingent reward behaviour was a strong predictor of employees' cynicism about organisational change. 5. These relationships are mediated by employees' perceptions of justice and role ambiguity.	1. ρ = .65 vs .09 2. ρ = .28 vs .11 3. ρ = .24 vs -.05 4. ß=.44	No critical appraisal of studies included	B

Overview of excluded studies

Cameron, 1996	Not a meta-analysis (comment on comment by Lepper et al and Ryan & Deci).
Deci, 2001	Not a meta-analysis (comment on Cameron et al).
Eisenberger, 1996	Traditional literature review.
Eisenberger, 1999	Not a meta-analysis (critique on Deci et al).
Lepper, 1996	Not a meta-analysis (comment on Cameron et al).
Lepper, 1999	Not a meta-analysis (comment on Deci et al).
Luthans, 1999	Traditional literature review.
Pierce, 2002	Summary of Cameron 2001.
Ryan, 1996	Not a meta-analysis (comment on Cameron et al).
Wiersema, 1992	Focuses on the advantages and disadvantages of different operationalisations of the intrinsic motivation construct.

Appendix IV

Overview Controlled and Longitudinal Studies

Author & year	Design & sample size	Sector / Population	Main findings	Effect size	Limitations	Level
Abualrub & Al-Zaru, 2008	Cross-sectional survey. N=206	Jordanian nurses in 4 government hospitals	The main value of the study is evidence that recognition can contribute to employee retention. Controlling for other factors (demographic details, job stress and self-rated job performance) there is a positive relationship between recognition for outstanding performance and employees' intention to stay (the effect size isn't reported but the 't' value in the regression model increases). Simple (bivariate) correlations showed that self-rated job performance (role effectiveness for patient care) had weak positive relationships with the amount of recognition employees received for both meeting job requirements and going beyond the job. However, because the study is cross-sectional, it does not consider recognition independently of employees' level of performance – this association is thus a very untrustworthy guide to the performance effect of recognition. There was no relationship between performance and employees' recognition for other non-job professional achievements (e.g. earning a degree). Employees' job stress had slightly stronger but nonetheless weak negative correlations with all three types of recognition that employees received. Retention (intention to stay) had similarly sized correlations with recognition with outstanding performance and other achievements but not with recognition for competence.	Job performance simple correlations with recognition for: competence (r=.14, p<.05); outstanding performance (r=.16, p<.05); other achievements (r=.02, **p>.05).** Job stress correlations with recognition for: competence (r=-.21, p<.001); outstanding performance (r=-.21, p<.001); other achievements (r=-.18, p<.001). Retention (intention to stay) correlations with recognition for: outstanding performance (r=.21, p<.01); other achievements (r=.23, p<.01); competence (r=.11, p>.05).	Direction of causality between recognition and performance is very unclear in a cross-sectional study. Convenience sample (self-selection) from which a 57.5% response; also, the overall population size is not given but n=206 may be small in relation to the number of nurses across 4 hospitals (e.g. N>1,000). Performance was self-rated.	D (55%)

Austen et al, 2016	Cross-sectional survey and semi-structured interviews. N=3,945	Female employees aged 45+ working in aged care (nurses and community care workers) based in 19 Australian organisations (population n=6,867)	Controlling for a range of other factors, the paper presents evidence that intention to leave care work is related to perceived recognition in the community, perceived recognition from higher-level managers, and pay satisfaction (as an indicator of perceived social contribution). Also theoretically interesting: relates especially to Adam Smith, who in The Theory of Moral Sentiments (1759) identified recognition as fundamental for welfare and motivation; and also to Karl Marx, who drew on Hegel to argue that recognition was needed for social justice, as misrecognition (treating workers as objects) led to alienation from work (lack of meaning); and to others, including Honneth (1996, 2010) Brennan and Pettit (2004). The authors 'argue that recognition is a distinctive motivation that cannot be reduced to a form or part of self-interest; that recognition does not simply reflect a desire for the approval of others but also a desire to be "what ought to be approved of".' (p.1037). Care work is argued to be relatively 'invisible' work, seen by some as 'demeaning' and 'paid like peasants', and thus generally misrecognised as a profession. Recognition is inherently linked to pay.	Small effect sizes: regression coefficients between intention to leave and high (vs low) for recognition in community coeff.=-.299, p<.05; and for recognition in organisation coeff.=.227, p<.1. ITL relationship with whether pay recognizes value of contribution n.s. for high vs low recognition but for medium (vs low) recognition, coeff.=-.247, p<.01.	Self-selected cross-sectional sample.	D (60%)
Bhatnagar, 2014	Cross-sectional survey. N=312 (from random selection of n=400)	Indian knowledge workers (R&D engineers & experts) in 5 organisations (IT, electronics & software development, & pharmaceutical)	Reward and recognition helps explain the impact of supervisor support on innovation and turnover intention. From abstract: 'psychological contract and rewards and recognition were strong mediators between perceived supervisor support, innovation and TI'.	Small relationship between reward & recognition and TI: beta=.149	Recognition not considered separately from reward	D (60%)

Bradler et al, 2016	Randomised controlled study. N=363	Workers hired for the experiment in Germany (mainly students)	Recognition of performance improves subsequent performance. 'When public recognition is more exclusive, such that the best 3 out of 8 employees in a work group receive a thank-you card, the estimated effect is even bigger and amounts to a 7.3% (or 0.38 standard deviations) performance increase. Remarkably, employees who do not receive a thank-you card are mainly responsible for this performance increase.' Unexpected recognition after 2 hours' work 'consisted of a thank-you card, personally signed by the head of the research institute … workers could deduce that no further thank-you cards would be provided in the remainder of the working period'. This was independent of payment, a flat rate of €25. Treatment 1 = all received recognition; treat 2 = recognition to best 3 performers; treat 3 = recognition to best performer only (in 2 and 3 it is explained that all workers valued but explicit recognition can only be given to the best performers due to time constraints).	Subsequent performance increases: treat 1 = 5.2% (d=0.27); treat 2 = 7.3% (d=0.38); treat 3 = 5.6% (d=.29). In treat 2, the increase for workers who don't receive the recognition is 10% (d=.52) whereas for the recipients of the card it was only 3.3% (d=0.17).	Limitations of specific controlled environment: performance was in a discrete data-entry task lasting 3 hours; employees worked in groups of 8 and had reasonable autonomy (free to take breaks, paid in advance, internet access, supervisor absent).	A (90%)
Chiang, 2008	Cross-sectional survey. N=284	Workers in 7 hotels in Hong Kong (mainly Chinese, managers and non-managers)	Descriptive survey of employee attitudes. Workers regard financial and non-financial recognition as important for increasing their task and extra-task performance. Basic salary increase and individual bonus/tips were considered the most important financial rewards (more than team bonuses). Promotion opportunities were seen as the most important non-financial rewards, followed by recognition and job interest. Different incentives were seen to be more relevant for different performance outcomes: 'For example, basic salary increase and individual bonus/ incentives were perceived as effective for achieving a wide range of performance dimensions. By contrast, the effectiveness of team-based incentives was limited to teamwork and extra work effort whereas promotion was associated more with performance dimensions, such as innovation and creativity, problem solving, honesty, and the ability to act independently.' Financial recognition is seen to have a greater impact than non-financial.	n/a	Response rate 36%. Subjective assessments of impact of recognition (respondents rated forms of recognition 'according to their perceived effectiveness for achieving' task and extra-task performance.	D (55%)

Feys, 2013	Hypothetical randomised controlled study (vignette experiment, post-test only); N=246	Administrative employees in a large Belgian health care organisation (population n=403)	Relationship quality moderates the relation between 'other-oriented' recognition and (H1a) positive affect, (H1b) negative affect, and (H2) interpersonal counterproductive behaviour, but not with (H3) interpersonal citizenship behaviour.	Results presented as interaction effects. Interaction between recognition and relationship quality: R=.69, F(5,234)=41.89, p<.001)	Hypothetical vignette situations lack external validity (show imagined not actual impact on behaviour). Post-test measures only (baseline effort not reported). Self-selected sample (response rate 61%), although random assignment to the 4 conditions.	B (80%)

Gosh et al, 2016	Cross-sectional survey (n=176)	employees in 84 private banks in India	Rewards and recognition have a positive relationship with normative commitment and with work engagement, and the former relationship is partially mediated by work engagement.	Reward & recognition with normative commitment: B=0.2658,SE=0.052, t=5.0462, p<0.001	Direction of causality between recognition and commitment / engagement is very unclear in a cross-sectional study; the latter could lead to recognition (see similar comment on Abualrub & Al-Zaru 2008). Response rate was 70% but unclear if the sample was randomly selected and if sample was large enough (i.e. sample was representative of the population).	D (55%)

Grolleau et al, 2015	Matched cross-sectional surveys of employees and firms (n for firms=5309)	French firms	Controlling for firm characteristics, the study shows a positive association between whether or not employees feel their work is 'fairly recognised' and objective firm level productivity. However, this relationship holds in large firms only, not small firms. Also, 'the results suggest that work recognition matters, but wages seem to be the factor that is the most relevant with regard to labor productivity'. Wages have a large effect, recognition a small effect. The study does not show causation but, as it draws on a large dataset of French firms, is a good guide to the association between recognition (very broadly defined) and firm performance.	OLS coefficients for recognition with labour productivity: -.03, p>.1 (small firms <250 employees); .11, p<.01 (large firms 250+ employees). Compared to unrecognised low wage (all firms): unrecognised high wage coeff=.31, p<.01; recognised low wage coeff=.05, p<.05; recognised high wage coeff=.45, p<.01	Analysis uses combined data from three surveys; it is unclear whether the combined survey datasets are de-duplicated. Direction of causality between recognition and performance is very unclear in a cross-sectional study (see comment on Abualrub & Al-Zaru 2008).	D (60%)
Henegan, 2010	Cross-sectional survey of employees, n=505	Real-estate agents in four US firms	Provides evidence that formal recognition for performance can 'foster envy and resentment' that creates social discomfort in the 'outperformers' and potentially erodes motivational benefits; and that this is influenced by 3 factors. The study focuses on 'comparison target discomfort' (CTD), specifically whether employees publicly recognised for their previous year's performance (n=217) feel social discomfort 1 to 2 months after firm awards ceremonies. The study shows that outperformers feel more discomfort if they have more 'empathic concern' for negative outcomes of the recognition on their colleagues (ß=.21, p<.05) and if there is a 'competitive psychological climate' in the organisation (ß=.24, p<.05); and gives weaker evidence for a relationship with whether lower performing colleagues feel 'external' forms of 'upward comparison threat' – e.g. feel inferior, intimidated, or vengeful (ß=.18, p<.1). No significant relationships found between CTD and outperformers' interpersonal sensitivity ('fear of causing harm to others and, in turn, being rejected or criticised') or the level of 'internal upward comparison threat' felt by lower performers (e.g. feeling embarrassed, sad, disappointed).	See main findings	56% response rates for outperformers, 54% for their colleagues. Also worth noting that the exclusivity of recognition varied between the four firms: respectively, 15.7%, 22.1%, 66.5% and 37% of employees were recipients of awards. Influence of this variance not analysed.	D (60%)

Ho, 2009	Cross-sectional survey, n=25	Employees in a purchasing and sales division in an electronic components firm.	Focuses on 'expertise recognition', being whether colleagues know each another's expertise so that they 'can allocate and retrieve information from one another'; i.e. recognising colleagues' expertise to ultimately help one's own performance. This is about the 'ability to obtain resources (e.g. information, knowledge, help, and cooperation) from others' and is qualitatively different from recognition for performance as a motivational management intervention. Study shows that employees' work performance (supervisors independent ratings) was moderately associated with the extent to which they were aware of their colleagues' expertise. This expertise recognition was also moderately associated with employees' job resourcefulness; and the relationship between expertise recognition and performance was fully moderated by job resourcefulness. Network recognition ('ability to recognise the friendship network in the division') did not play a moderating role.	Expertise recognition associated with work performance (ß=.43, p<.05); and job resourcefulness associated with expertise recognition (ß=.49, p<.05).	Small sample	D (60%)
Kosfeld et al 2014, 2017	Randomised controlled study, n=413	Students in China undertaking a paid one-off job	Field experiment assessing 'the impact of meaning on work performance in relation to and in combination with monetary incentives and worker recognition'. Subjects randomised to high-meaning condition (informed that the job made an important contribution to an important research project) or low-meaning condition (administrator suggested that the exercise did not make sense and the data may not be used). Within these two groups, also randomised to: control group (fixed wage); monetary-incentive condition (fixed wage plus piece rate); or recognition condition (told that the highest performer would be 'awarded a smiley button at the end of the work session' in front of others). 'Increasing the meaning of a task significantly raises performance in the absence of incentives. The estimated effect size is 14 percent… Monetary incentives increase performance both when meaning is low and when meaning is high. The estimated effect size ranges between 7 and 9 percent… The effect of worker recognition strongly depends on meaning. If meaning is low, recognition increases performance by about 19 percent. If meaning is high, however, recognition has no observable effect.' (p.17-18). Note: similar study and overlapping team as Bradler et al 2016.	Performance increases: 14% from meaning; 7% to 9% from monetary incentive; 19% from recognition (all significant).	Limited relevance of experimental condition: students employed for a one-off two-hour data entry job that was 'quite exhausting and monotonous' so intrinsic motivation assumed to be low.	A (90%)

Kunz & Linder, 2012	Hypothetical randomised controlled study (vignette experiment, post-test only), n=92	Graduate students in business administration at a Scandinavian business school 'told that they should imagine themselves as working in a project-oriented setting, such as an advertising or marketing project'	Method: statements about participants' imagined jobs were combined to give various very positive, very negative and neutral vignettes. Vignette statements on affiliative rewards were added to this: 1) 'Your superiors, colleagues, and co-workers strongly reward good performance on a job through strengthening personal ties with you and honoring your performance'; and 2) 'In your company it is generally accepted to keep your performance level within a moderate range. Performance has only a weak influence on friendships and social membership.' Study gives evidence that non-financial recognition enhances enjoyment-based motivation, and acts independently of behavioural norms and financial reward: that is, non-monetary affiliative rewards interact positively with the relationship between enjoyment-based motivation and effort (H2a), do not interact with norm-based motivation and effort (H2b) and may leave the influence of extrinsic motivation unaffected (H2c). Study also shows that 'monetary rewards positively moderate the effect of extrinsic motivation on work effort' but 'crowd out' (negatively moderate) norm-based motivation.	Mixed-effects regression for 'willingness to exert work effort' controlling for motivation: affiliative rewards est.=.13(t), z=1.82; monetary rewards est. =.57 **, z=6.87 Affiliative rewards x enjoyment-based motivation est.=.09(t), z=1.69; Affiliative rewards x norm-based motivation est.=.02, z=0.38; Affiliative rewards x extrinsic motivation est.=.02, z=0.52.	Hypothetical vignette situations lack external validity (show imagined not actual impact on behaviour). Post-test measures only (baseline effort not reported).	B (80%)
Lee, 2018	Cross-sectional study, n=569	'adults currently working in a setting that allows for interaction or communication with colleagues'	Primary focus is knowledge sharing behaviours. Financial rewards and non-financial rewards (e.g. getting a sense of satisfaction, a rewarding feeling, fulfilment, or friendship) are not positively related to knowledge giving (H3, H5). However, both financial and non-financial rewards are positively related to knowledge asking (H4, H6). Additionally, study suggests the relationships that financial rewards has with knowledge giving and knowledge asking do not significantly differ across career stages. However, there is some evidence that career stage moderates the relationship between non-financial rewards and knowledge giving (but not asking), with the relationship being more positive for those in the latter 'disengagement stage' of their career than for earlier 'exploration', 'establishment', and 'maintenance' stages.	Regression results for knowledge giving: financial rewards ß=.02, t(563)=.43, p=.67; non-financial rewards ß=.06, t(563)=1.28, p=.20. Knowledge asking: financial rewards ß=.12, t(563)=2.61, p<.01; non-financial rewards ß=.16, t(563)=3.54, p<.01	Snowballed convenience sample not representative of a specific population. Very broad con-ceptualisation of recognition.	D (55%)

Li et al, 2016	Randomised controlled studies: Study 1: n=96 Study 2: n=160 Study 3: n=571	Study 1 & 2: psychology graduates at a Chinese university. Study 3: employees in 52 teams in a Chinese electric transmission and distribution equipment firm	Argues that 'a single team member's recognition will produce positive spillover effects on other team members' performance, as well as overall team performance, via social influence processes, especially when the award recipient is located in a central position in a team'. Study 1 involved random allocation to 4-member teams for 90-minute tasks (making and stacking origami cubes). In experimental group, top performer was acknowledged and applauded in front of team peers part-way through. In study 2 some details were changed to further isolate the treatment effect. Study 3 randomised a firm's existing employee of 'the month' award. Recognition had a positive impact on colleagues' performance as assessed by team leaders and a large effect on subsequent team performance (ß=.86). Additionally, 'this effect was stronger when the recipient had more interactions with other team members (i.e., higher network centrality)'.	Study 1: mean performance increase for recognition group =9.86 vs. mean increase for no recognition group =1.13; ANOVA F(1, 82)=83.18, p<.001. Study 2 results similar. Study 3: Recognition impact on colleague performance: F(1,381)=78.19, p<.001; On subsequent team performance: ß=.86, p=.01. Network centrality on performance: F(1, 209)=31.83, p<.001.	Studies 1 & 2 used an artificial lab environment; this rectified by study 3.	A (90%)
Luthans, 2000	Cross-sectional survey, n=254	all levels of employees in a large, non-profit institution	Examines the value of recognition to employees. Results indicate they 'value highly personalised recognition for a job well done as a critical dimension of their reward system… 243 of the 254 respondents (96%) indicated an increased need for recognition was necessary'.	n/a	Opinion-based survey limited to descriptive results	D (60%)
Markham et al, 2002	Randomised controlled study (quasi-experimental field study), n=4	Employees in 4 US cut-and-sew garment factories (n=1,100)	Focuses on impact of recognition on employee attendance. The four factories were comparable and in the same firm but largely operationally independent. One plant was randomly selected for a one-year personal attendance recognition program that included personal attention (gold star at end of the quarter), annual public celebration & recognition from senior managers, mementos (necklace for women, penknife for men) and communication of target attendance behaviour. Control site 1: employees received two-monthly information feedback on absence. Control site 2: survey only, no treatment. Control site 3: no intervention. The personal recognition treatment plant showed large decreases in absence 'ranging from 29% to 52% for each quarter's baseline assessment', and significant decreases when the control groups showed no decrease.	See main findings	Small number of cases, although matched and comparable. Complications with changing conditions in control site 3 involving redundancies.	A (90%)

Markova & Ford, 2011	Cross-sectional study (n=288)	research and development employees and their supervisors in 30 Fortune 500 companies	Non-monetary rewards were more strongly associated with intrinsic motivation (longer work time) than group or individual monetary rewards. Also, significant positive relationship between work hours and performance.	Non-monetary reward and working hours ß=.21, t=3.04, p<.01; by contrast individual and group monetary rewards & work hours = n.s. Work hours and performance ß=.23, t=3.2, p<0:001		D (60%)
Masri & Suliman, 2019	Cross-sectional survey, n=117	Full-time employees at Qatari research institutions	Employee recognition (measured as Reward, Promotion, and Coworkers-Relations) was found to have a strong association with self-rated proxies for performance (measured as work skills, understanding work duties, quality of work and work enthusiasm).	ß=.615, p<.01	Not clear that sample is large enough and representative of population. Response rate =65% of selected sample (n=180). Measures imprecise.	D (55%)
Merino & Privado, 2015	Cross-sectional survey, n=1,831	A representative sample of 3,000 working adults in Spain	Positive psychological functioning moderates and is argued to mediate, the association between recognition and subjective well-being in employees.	SEM coefficients: Supervisor recognition & PPF =.20, p<.03; Co-worker recognition & PPF =.39, p<.03; PFF & wellbeing = .59, p<.03; Supervisor recognition & wellbeing =.07, p>.03; Co-worker recognition & wellbeing =-.03, p>.03.	Direction of causality between recognition and performance is very unclear in a cross-sectional study (yet authors argue that causal relationship and mediation shown). Unclear how 1,831 selected from the wider sample.	D (60%)

Montani et al 2017	Cross-sectional study, n=130	Employee-supervisor dyads in 9 French Canadian organisations (automotive, home-products manufacturing and logistics)	Shows that meaningfulness of work partly moderates the association between the recognition employees perceive and their supervisor-rated behavioural involvement (conscientiousness, efforts to improve work, collaboration, personal initiative for efficiency, and organisational involvement). From abstract: 'manager recognition promotes behavioural involvement both directly and indirectly through the intervening role of meaningfulness'; 'coworker recognition strengthens the benefits of manager recognition to meaningfulness and subsequent behavioural involvement'.	Direct relationship between manager recognition and employee behavioural involvement B=.47, p<.05; manager recognition & meaningfulness B=.35, p<.01; meaningfulness & behavioural involvement B=.47, p<.05. Indirect effect of recognition on involvement =B.16, 95% CI = .03, .24	Response rate 69% (non-managers), 61% (supervisors)	D (60%)
Seitovirta et al 2018	Cross-sectional study, n=402	Registered nurses in Finland	Survey of reward preferences. Subjects placed slightly greater value on non-financial reward – including 'appreciation and feedback from work community, worktime arrangements, work content, and opportunity to develop, influence and participate' – than financial rewards.	n/a	Worker preferences only, no measured associations with outcomes.	D (55%)
Stocker et al 2010	Cross-sectional study, n=228	Male career officers and career non-commissioned officers of the Swiss Armed Forces	From abstract: 'Appreciation at work correlated positively with job satisfaction and negatively with feelings of resentment. Moreover, appreciation at work explained incremental variance over and above job control, social support, and interactional justice.' Also finds that appreciation buffers the negative effect of working hours on job satisfaction; and that appreciation moderates the effect of illegitimate tasks on well-being (job satisfaction and resentment). Appreciation by supervisors and co-workers included 'compliments, understanding, trust, sympathy, attention, interest, and gratitude', e.g. of measures: "My colleagues ask for my advice," "When I perform a task well, other interesting tasks are assigned to me," "When talking with my supervisor I can voice my opinion," or "My colleagues notice when I show extra effort."	Hierarchical multivariate regression results: appreciation & job satisfaction ß=.30, p<.001; Appreciation & resentment ß=-.18, p<.05		D (60%)

Stocker 2018	Non-controlled before-after study, n=208	Employees from 7 companies (transportation and storage, financial and insurance activities, landscape service activities, information and communication, and retail)	Provides evidence that appreciation at work buffers work stress from interruptions: i.e. suggests that interruptions contribute to stress if supervisors don't show appreciation, but not if appreciation is shown. Investigates the negative influence of work interruptions ('intrusions by a secondary, unplanned, and unexpected task') and the positive influence of supervisor appreciation on employee well-being (job satisfaction, self-efficacy, job-related depressive mood, and sleep problems) approx. 1 year later. Finds no overall significant associations in these two relationships (p>.05) but finds that appreciation by supervisors moderated the effects of interruptions on employee outcomes. Mean time lag between T1 and T2 was 13.8 months (SD=5.8).	SEM coefficients for T1 interaction (interruptions x appreciation) with: T2 job satisfaction =.16, p<.01; T2 occupational self-efficacy =.24, p<.01; T2 job-related depressive mood =-.16, p<.05; T2 sleep problems =-.14, p<.05	Selection criteria unclear / possible convenience sample; sample size in relation to population not specified.	C (60%)
Von Bonsdorff 2011	Cross-sectional study, n=628	Nurses in 2 public hospitals in Finland	Preferences for rewards and recognition vary across four age groups: 20–29, 30–39, 40–49 and 50–59 year olds. Preferences for financial rewards strongest for oldest group and weakest for youngest group. Preferences for non-financial rewards unrelated to age.	Age related differences for: financial rewards X_2(chi-sq.)=15.70, p<.001; non-financial rewards X_2=4.68, p>.1	Response rate 48%	D (60%)
Wang 2017	Randomised controlled trial, n=76	Undergraduate students in business and accountancy	Shows that a non-financial private and public performance recognition program led to increases in both productive and counterproductive work efforts. Moreover, it shows that these effects are moderated by the Dark Triad (DT) personality traits (Machiavellianism, narcissism, and psychopathy). That is, recognition is a greater motivator for workers with strong DT traits and is more likely to lead to counterproductive work behaviour (CWB) for workers with weak DT traits. Increased counterproductive behaviour is theorised to be due to competitiveness between workers increasing suspicion and the tendency to undermine peers' performance – this is argued to be natural behaviour for high-DT workers who are 'innately antagonistic', whereas recognition can trigger this behaviour for low-DT workers. In sum, study suggests that recognition schemes are beneficial for DT workers but counterproductive for non-DT workers. Method: Base pay plus piece-rate pay given for a challenging letter-search task which individuals completed independently. Participants were randomly assigned to teams of 3 and teams assigned to one of three experimental conditions – No Recognition, Private Recognition, and Public Recognition. Participants told before task started whether (non-financial) recognition would take place for highest performer; and explained that they can take away in advance up to 10 points from their team members' totals without affecting their own total (counter-productive behaviour).	Recognition increases performance overall t=1.65, p=0.05; Recognition increases CWB overall z=2.45, p<0.01. Performance low DT rec vs high DT rec d = .52 Performance high DT non-rec vs high DT rec d = .75 Recognition x Dark Triad interaction effect on performance t=1.54, p=0.06; Recognition x Dark Triad interaction effect on CWB z=1.59, p=0.06	Limited relevance of lab-type environment. Small sample size.	A (90%)

White, 2016	Non-controlled before-after study, n=35	Division management team in a Fortune 500 company, US.	Assesses the impact of an Appreciation at Work training for managers on their ability to communicate appreciation effectively, measured by a composite Appreciation Index at baseline and 5 months after training. Scores improve for measures including on whether co-workers show appreciation (+.80 on a 5-point Likert scale), participants' own ability to show appreciation (+.79), their supervisor makes them feel appreciated (+.73). Training covers importance of work appreciation, reasons employees don't feel valued, the differences between appreciation and recognition, conditions for feeling appreciated, useful language to use to show appreciation and challenges in doing so.	n/a	Score increases not statistically tested for effect and significance. Scores self-rated by training participants, introducing likelihood of bias. Outcome measures included behaviour of training participants, their colleagues and their bosses; assumed causal mechanisms for the latter two outcomes is unclear. Intervention was not independent of other changes. Percentage of dropouts not reported.	C (55%)
White, 2018	Cross-sectional survey, n=89,579	Individuals who had completed the Motivating By Appreciation Inventory	From abstract: 'Employees in a long-distance work relationship chose quality time (''hanging out'' with coworkers, working together on a project, someone taking time to listen to them) as their preferred means to be shown appreciation more frequently (35 per cent) than workers on site (25 per cent). Words of affirmation (oral or written praise) remain high for both groups, but the long-distance group did not value it as much (long-distance: 38 per cent, general: 48 per cent).'	Effect sizes unclear. Statistical tests given only for grouped relationships: remote working and preference for quality time, words of affirmation and acts of service X_2 (chi-sq.)=186.2, p<0.01	Limited statistical analysis. Not a random sample representative of a clear population.	D (60%)

Excluded studies

Author & year	Reason for exclusion
Godkin et al, 2010	Cross-sectional survey of 'employees of a municipal government from across all the civilian departments' in the US (n=494). The paper is seriously undertheorised; detail of statistical analysis is described without sufficient explanation of theory. The hypotheses 'that type of recognition is positively related to preference for rewards, source of recognition, and attitude towards recognition' make little sense.
Khan et al, 2011	Poor quality study. Cross-sectional survey investigating relationships between non-financial recognition and employee performance, retention and long-term effectiveness. N (employee respondents) is alternately given as 100 and 40; and measures are not adequately described. In addition, direction of causality between recognition and performance is very unclear in a cross-sectional study (see comment on Abualrub & Al-Zaru 2008); despite this the study makes strong assertions about causality.
Kosfeld et al, 2017	Not appraised separately as reports on the same study as Kosfeld et al 2014.
Peluso et al, 2017	Discusses recognition only as an inherent aspect of pay (i.e. pay described and 'reward and recognition'), not as a verbal / written acknowledgement of performance. Non-monetary forms of reward considered include training and development and a positive work environment, but not recognition. [Cross-sectional study, n=1092, of workers in 12 multinational and domestic organisations in Italy (manufacturing, utility, consultancy & entertainment). Study looks at associations between total reward systems, which combine monetary and non-monetary rewards and employee outcomes (job satisfaction, affective commitment, and innovative behaviour).]
Schlechter et al, 2017	Study does not focus clearly on recognition for employee performance. Main focus is non-financial rewards, including work-life balance, learning, and career advancement; recognition was only loosely defined ('e.g. certificates of recognition') and was not isolated but grouped with other quite distinct factors – teambuilding, social relationships, health and wellbeing programmes. [Research method of 'full-factorial experimental design' not clearly described; n=180 (mainly South African) prospective workers; snowballed convenience sample. Study looks at influence of non-financial rewards on perceived attractiveness of a job offering and the moderating influence of demographic characteristics in this relationship.]

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EXECUTIVE SUMMARY

Rapid Evidence Assessment (REA)



EFFECT OF EMPLOYEE RECOGNITION AND NON-FINANCIAL REWARDS ON WORKPLACE PERFORMANCE

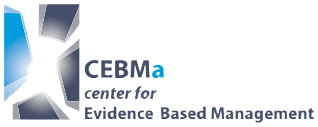
a summary of scientific literature

August 2019

Culture Review **Implementation**

our journey of positive change

ACT Government



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What is a Rapid Evidence Assessment (REA)?



Rapid Evidence Assessments (REAs) use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and as a result, the likelihood of bias is considerably smaller.

Background

Novartis, a global pharmaceutical company commissioned the Center for Evidence Based Management (CEBMa) to undertake a Rapid Evidence Assessment (REA) to understand what is known in scientific literature about the link of recognition and rewards with worker performance, specifically:

1. When associates are recognised and rewarded for their contributions, performance will increase.

What this REA assesses

This REA assesses research literature about the effect of employee recognition and non-financial rewards on performance. In answering this hypothesis, the REA also considers the following questions:

1. **What is meant by recognition and rewards (what is it)?**
2. **What is the assumed logic model – how is it supposed to work?**
3. **What is the overall effect of recognition and rewards on employees' performance?**
4. **What is known about the (positive or negative) effect of possible moderators and/or mediators?**

Main findings



1. What is meant by recognition and rewards – what is it?

Recognition is generally defined as the assignment of personal non-monetary rewards for individual efforts and work accomplishment to recognise and reinforce the desired behaviours displayed by an employee (Brun & Dugas, 2008). Organisations can recognise outstanding employees through compliments, gratitude, private notes or emails, public awards, or publication of their achievements in company newsletters. Such recognition is sometimes symbolic and comes with no corresponding financial rewards (Wang, 2017).

Behavioural psychologists make an important distinction between 'recognition' and 'rewards'. Recognition is intangible, relational, unconditional and unexpected, whilst 'rewards' are tangible, transactional, conditional and expected. This REA focuses on both recognition and non-monetary rewards, because the difference between the two terms is not clear or often ignored in academia and practice.

2. What is the assumed logic model – how is it supposed to work?

Studies in the social sciences draw on social comparison theory to predict that employee recognition increases performance. Social comparison theory (Festinger, 1954) states that people tend to compare themselves with others in order to make judgements regarding their performance. They are concerned with not only their own performance, but also how they compare to their peers. The theory also notes that people engage in social comparison to enhance their own self-esteem. Comparing favourably to others increases self-esteem and produces positive affect, while comparing unfavourably lowers self-esteem and produces negative affect. In 2017, Wang noted that when people receive private or public recognition it provides a positive signal about their competence relative to others, which enhances self-esteem and induces a positive effect. In receiving this positive recognition, employees are motivated to attain a high level of performance to increase their chance of receiving recognition.

3. What is the overall effect of recognition and rewards on employees' performance?

Several findings were discovered in answering this question:

- **There is strong evidence that employee recognition and non-financial rewards have a moderate to large effect on workplace performance.** Over the past 30 years several meta -analyses (Cameron, 2001) and high quality studies (Li, 2016; Wang, 2017) consistently showed moderate to large effect sizes, even when the recognition was merely a thank-you card (Bradler, 2016), or smiley button (Kosfeld, 2017). In addition, employees rewarded with verbal praise or positive feedback show substantially greater intrinsic motivation than financially rewarded or non-rewarded employees. And, they also show more interest and enjoyment than non-rewarded employees (Deci, 1999; Cameron, 2001; Kunz, 2012).
- **Recognition and rewards can have a negative impact on performance when offered for simply doing a task.** Several controlled studies consistently revealed that employee recognition and non-financial rewards can have a negative impact on performance when offered to people without consideration of any standard of performance (Cameron, 1994 and 2001).
- **Employee recognition contributes to employee retention, commitment and work engagement, but the effects are small.** Several cross-sectional studies found that employee recognition may contribute to retention. In controlling other factors (i.e. job stress) it was found that there is a small, but positive relationship between perceived recognition from management and employees' intention to stay (Abualrub, 2008; Austen, 2016).
- **Employee recognition has a large positive impact on employee attendance.** A randomised controlled study demonstrated that an attendance-recognition program that included personal attention and recognition from senior managers substantially decreased absenteeism rates among employees (Markham, 2002).
- **Employee recognition produces strong positive spill-over effects on other employees.** A recent randomised controlled study showed that a team member's recognition may produce strong positive spill-over effects on other team members' individual and group performance, particularly when the award recipient is located in a central position in a team (Le, 2016).
- **There is some evidence that employee recognition can foster envy and resentment.** A cross-sectional study in the US found that in some situations, public recognition for a high performing member may foster envy and resentment among colleagues, which may create social discomfort (e.g.embarrassment) on the part of the award recipient and potentially may erode their intrinsic motivation (Henagan, 2010). The effect sizes, however, were small.

4. What is known about the (positive or negative) effect of possible moderators and/or mediators?

A randomised controlled study showed that recognition has a larger impact on employees when their perceived meaningfulness of work is low than when it is high (Kosfeld, 2017).

Conclusion

Based on the evidence, employee recognition and other non-financial rewards tend to have large positive effects on work performance.

More information

You can access more information in the *Rapid Evidence Assessment (REA) – The Effect of Employee Recognition and Non-financial Rewards on Workplace Performance – a summary of research literature, August 2019 (Novartis).*

References

AbuAlRub, R. F., & Al-Zaru, I. M. (2008). Job stress, recognition, job performance and intention to stay at work among Jordanian hospital nurses. *Journal of Nursing Management, 16*(3).

Austen, S., Jefferson, T., Ong, R., Sharp, R., Lewin, G., & Adams, V. (2016). Recognition: applications in aged care work. *Cambridge Journal of Economics, 40*(4).

Bradler, C., Dur, R., Neckermann, S., & Non, A. (2016). Employee Recognition and Performance: A Field Experiment. *Management Science, 62*(11), 3085-3099.

Brun, J.-P., & Dugas, N. (2008). An analysis of employee recognition: Perspectives on human resources practices. *The International Journal of Human Resource Management, 19*(4), 716.

Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward, and intrinsic motivation: A meta-analysis. *Review of Educational Research, 64*(3), 363-423.

Cameron, J., Banko, K. M., & Pierce, W. D. (2001). Pervasive negative effects of rewards on intrinsic motivation: The myth continues. *The Behaviour Analyst, 24*(1), 1-44.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences (2nd ed.)*. Hillsdale, NJ: Lawrence Earlbaum Associates.

Deci, E. L., & Koestner, R. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic. *Psychological Bulletin, 125*(6), 627.

Festinger, L. (1954). A theory of social comparison processes. *Human relations, 7*(2), 117-140.

Ghosh, P., Rai, A., Chauhan, R., Baranwal, G., & Srivastava, D. (2016). Rewards and recognition to engage private bank employees. *Management Research Review, 39*(12), 1738-1751.

Henagan, S. (2010). The Perils of Workplace Recognition: Antecedents to Discomfort Associated with Being the Target of Upward Comparisons. *Basic & Applied Social Psychology, 32*(1), 57-68.

Kosfeld, M., Neckermann, S., & Yang, X. (2017). The effects of financial and recognition incentives across work contexts: the role of meaning. *Economic Inquiry, 55*(1), 237-247.

Kunz, J., & Linder, S. (2012). Organisational Control and Work Effort - Another Look at the Interplay of Rewards and Motivation. *European Accounting Review, 21*(3), 591-621.

Li, N., Zheng, X., Harris, T. B., Liu, X., & Kirkman, B. L. (2016). Recognizing "me" benefits "we" Investigating the positive spillover effects of formal individual recognition in teams. *Journal of Applied Psychology, 101*(7).

Markham, S. E., Scott, K. D., & McKee, G. H. (2002). Recognizing good attendance: a longitudinal, quasi-experimental field study. *Personnel Psychology, 55*(3), 639-660.

Migneault, P., Rousseau, V., & Boudrias, J.-S. (2009). The influence of work climate components on individual's empowerment. *European Review of Applied Psychology, 59*, 239–252.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: an introduction to assessing study quality. *Systematic reviews in the social sciences: A practical guide,* 125-163.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Wang, L. W. (2017). Recognizing the Best: The Productive and Counterproductive Effects of Relative Performance Recognition. *Contemporary Accounting Research, 34*(2), 966-990.

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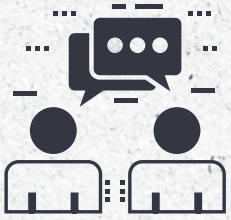
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Rapid Evidence Assessment (REA)



ANTECEDENTS* OF WORKPLACE INCIVILITY

a summary of scientific literature

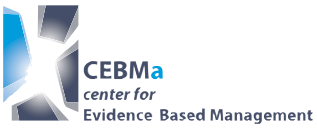
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Culture Review **Implementation**

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***For the purposes of this REA 'antecedents' refers to the 'drivers' that may cause workplace incivility.**



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Background

Whereas it was initially assumed that workplace incivility concerns only a small subset of employees, in the past 20 years it has become clear that it negatively affects a large percentage of workers (Hodgins, 2014). In fact, it is estimated that three and four per cent of workers experience serious bullying, between nine and 15 per cent of workers experience occasional bullying and at least 10-20 per cent experience negative social behaviour at work (Zapf, 2011). The British Workplace Behaviour Survey found that one-third of a nationally representative sample experiences some form of workplace incivility (Fevre, 2012).

Similarly, over one-third of Australian workers report being sworn or yelled at while at work, and almost one quarter reported having been humiliated in front of others (Dollard, 2012). These numbers suggest that workplace incivility is remarkably common. For this reason, ACT Government on behalf o the ACT public health system, approached the Center for Evidence Based Management (CEBMa) to undertake a Rapid Evidence Assessment (REA) to understand what is known in the scientific literature about the impact and antecedents of workplace incivility in teams and organisations. This review presents an overview of the findings.

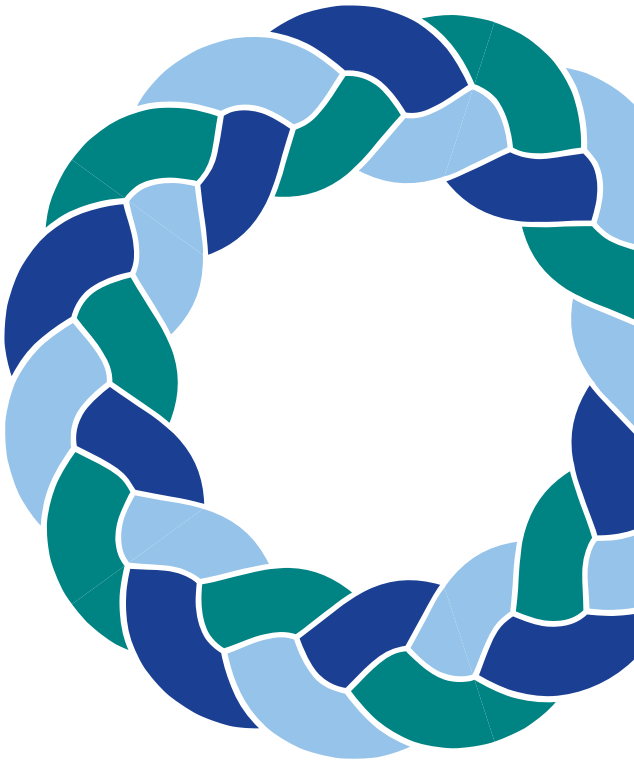


What is a Rapid Evidence Assessment (REA)?

Evidence reviews come in many forms. One of the best-known types is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: Clear criteria for inclusion is often lacking and studies are selected based on the researcher's personal preferences. As a result, conventional literature reviews are prone to severe bias. This is why 'rapid evidence assessments' (REAs) are used.

REAs use a specific research methodology to identify the most relevant studies on a given topic as comprehensively as possible, and to select appropriate studies based on explicit criteria. In addition, the methodological quality of the studies included is assessed by two independent reviewers on the basis of explicit criteria. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and, as a result, the likelihood of bias is considerably smaller.





Main question: What does this REA answer?

What is known in the scientific literature about the antecedents of workplace incivility in teams and organisations?

Other issues raised, which will form the basis of our conclusion regarding the main question above, are:

1. **What is workplace incivility?**
2. **How can workplace incivility be measured?**
3. **What is the impact of workplace incivility on organisational outcomes?**
4. **What are the antecedents of workplace incivility?**

Search strategy: How was the research evidence sought?

Four databases were used to identify studies: ABI/INFORM Global, Business Source Premier, PsycINFO, and Medline. The following generic search filters were applied during the search:

1. **Scholarly journals, peer-reviewed.**
2. **Published in the period 2000 to 2019.**
3. **Articles in English.**

A search was conducted using combinations of various search terms, including 'workplace incivility', 'workplace aggression', workplace bullying' and 'abusive supervision'. We conducted six different search queries and screened the titles and abstracts of 80 studies. An overview of all search terms and queries is provided in Appendix I.

Selection process: How were the studies selected?

Study selection took place in two phases. First, titles and abstracts of the 80 studies identified were screened for relevance. In case of doubt or lack of information, the study was included. Duplicate publications were removed. This first phase yielded 35 studies. Second, studies were selected based on the full text of the article using these inclusion criteria:

1. **Type of studies:** Only quantitative, empirical studies.
2. **Measurement:** Only studies in which relationships among workplace incivility, antecedents and outcomes were quantitatively measured
3. **Context:** Only studies related to workplace settings.

In addition, the following exclusion criteria were applied:

- Studies in non-western countries in which the perception of workplace incivility and its effect on organisational outcomes may differ from western countries due to cultural differences.
- Studies on occupational aggression (e.g. from clients, patients, or passengers).
- Studies on online bullying.

This second phase yielded a total number of 32 studies. An overview of the selection process is provided in Appendix II.

Critical appraisal: What is the quality of the studies included?

The overall quality of the included studies was mixed. Of the 32 studies included, 15 studies had a cross-sectional design and were therefore graded Level D. Only eight studies were classified as Level B or higher, but six concerned a meta-analysis or systematic review. Several studies had serious methodological weaknesses which affected their level of trustworthiness. An overview of all studies included and their year of publication, research design, sample size, population, main findings, effect sizes and limitations is provided in Appendix III.

Main findings

1. What is workplace incivility?

The research literature examining workplace incivility noted that many terms are being used, such as bullying, social undermining, mobbing, workplace aggression, emotional abuse, interpersonal conflict, abusive supervision, anti-social behaviour, counterproductive work behaviours, interpersonal deviance, retaliation, and workplace aggression.

While some of these terms represent well established constructs with key distinguishing features, there is also considerable definitional, conceptual, and measurement overlap (Hershcovic, 2011). Some authors, however, argue that the phenomenon of workplace incivility "appears under many different labels . . . but each label refers to the same overall construct" (Bowling, 2006). Indeed, a meta-analyses of 53 studies showed that the correlations with organisational outcomes differ from an academic perspective, but that the effect sizes tend to fall within the same range from a practical perspective[1] (Herscovic, 2011).

Although the overall impact of these constructs on organisational outcomes are similar, it should be noted that all constructs mentioned above can be conceptually differentiated from each other, in particular in terms of intensity, persistence, intent, and frequency. Moreover, each construct possesses important distinctions that likely represent critical experiential differences to the victim. Below an overview is provided of the most widely researched construct (adapted from Herscovic, 2011).

Workplace incivility	Low intensity deviant acts, such as rude and discourteous verbal and nonverbal behaviours enacted towards another organisational member with ambiguous intent to harm. Often used as a general term that includes bullying, social undermining, and related terms.
Social Undermining	Behaviour intended to hinder, over time, the ability to establish and maintain positive interpersonal relationships, work-related success, and favourable reputation.
Bullying	Situations where a person repeatedly and over a period of time is exposed to negative acts (i.e. constant abuse, harassment, offensive remarks or teasing, ridicule or social exclusion) on the part of co-workers, supervisors or sub-ordinates.
Abusive Supervision	The sustained display of hostile verbal and non-verbal behaviours, excluding physical contact.
Interpersonal Conflict	An organisational stressor involving disagreements between employees.

As mentioned, the constructs listed above can be conceptually differentiated from each other, for the sake of readability however, in this review we will use the general term 'workplace incivility' - unless the findings pertain to a particular construct.

[1]In fact, overlapping confidence intervals suggests that there is no practical difference between the constructs.

2. How can workplace incivility be assessed?

The most common workplace incivility measures used by the studies included in this review were the Interpersonal Conflict at Work Scale (ICWS; Spector 1998), the Negative Acts Questionnaire-Revised (NAQ-R; Einarsen, 2009), and the Abusive Supervision Scale (Tepper, 2000).

3. What is the impact of workplace incivility on organisational outcomes?

The negative impact of workplace incivility on individual employees, teams and organisations is indisputable. Indeed, this review identified a large number of studies confirming that workplace incivility is related to an array of attitudinal, behavioural, and health-related outcomes, such as:

- anxiety, depression, burnout, frustration, negative emotions, physical symptoms (Bowling, 2006; Demir, 2014; Escartin, 2016; Hershcovis 2010; Hodgins, 2014; Reio, 2009; Verkuil, 2015)
- reduced self-esteem, life satisfaction, job satisfaction, job performance, organisational commitment, perceived organisational justice (Bowling, 2006; Demir, 2014; Fiset, 2019; Hershcovis 2010)
- increased absenteeism, presenteeism, turnover, early retirement, and other economic costs (Bowling, 2006; Escartin, 2016; Hoel, 2011; McTernan, 2013)

Results from a systematic review of 66 samples show that workplace incivility that involves supervisors has the strongest impact on attitudinal and behavioural outcomes. However, there was no relevant difference between supervisor and co-worker incivility for health-related outcomes. (Herscovic, 2010)

It should be noted that workplace incivility does not only directly affect victims, but its consequences also extends to the team level, affecting employees who observe or become aware of others being mistreated (Escartin, 2016). Indeed, several studies indicate the presence of a contagion effect where uncivil behaviour of peers and supervisors is related to negative behaviours from employees through trickle-down (superiors) and trickle sideways (peers) effects (Aubé, 2014; Mawritz, 2012).

In addition, it was found that being the target of aggression increases the likelihood of engaging in aggression (Glomb, 2010). This finding was confirmed by a recent meta-analysis of 70 studies, indicating that abusive supervision, in turn, may lead to ‘employee deviance’, the latter being defined as 'a broad range of behaviours that violate significant organisational norms and in so doing threaten the well-being of an organisation, its members, or both' (Park, 2019). This deviant behaviour may be focused on the supervisor, co-workers, or the organisation as a whole, depending on who the employee considers to be the responsible party.

4. What are antecedents of workplace incivility?

In addition to studies examining the consequences of workplace incivility, this review identified several studies of the antecedents or predictors. Table 1 provides an overview of these antecedents. The effect sizes indicate that the following factors are strong predictors of workplace incivility in teams and/or organisations:

Leadership related antecedents

Leadership style

A substantial part of managers' and leaders' job concerns 'influencing employees to understand and agree about what needs to be done and how it can be done effectively, and facilitating employees to accomplish the shared objectives' (Yukl, 2002). As such, leadership style is the way in which this process of influencing and facilitating is carried out. Leadership style does not only refer to the style of a single leader, manager, or supervisor, but can also pertain to the overall leadership style of an organisation.

The findings of this review indicate that leaders perceived by their sub-ordinates as authoritarian, autocratic, unethical, or having a laissez-fair type of leadership style are more likely to display abusive behaviour or induce workplace incivility (Chadwick, 2017; Hoel, 2010; Zhang, 2016). Conversely, leaders perceived as constructive, ethical, fair, supportive or having a participative style of leadership, are less likely to display abusive supervision and tend to have an inhibitory influence on workplace incivility (Hauge, 2011; Salin, 2015; Zhang, 2016).

Lack of people management skills

A recent systematic review of 62 studies in the context of Australian healthcare organisations indicate that lack of effective management skills may be a significant factor contributing to workplace bullying, authoritarian management, and failure to address workplace incivility when it occurs (Chadwick, 2017). A possible explanation for this finding is that in some organisations managers are promoted due mainly to their clinical/task skills and competencies, even when they lack the relational and interpersonal skills required at more senior levels.



Stressors and negative affective states

Supervisors' interactions with higher organisational levels influence their affective state and behaviour towards their sub-ordinates (Zhang, 2016), suggesting a 'trickle down' effect. Indeed, it was found that stressors such as negative experiences with higher management, conflicts with colleague's, or lack of organisational justice, produce a negative affective state, which in turn may lead to mistreatment of sub-ordinates. On the contrary, supervisors with more positive affective state will less likely display abusive behaviours due to their relatively less need to cope with such stressors. This finding was confirmed by a recent study indicating that intense negative emotional reactions and frustration triggers managers, leaders, and supervisors to exhibit abusive behaviours in the workplace (Eissa, 2017). The same study found that role overload is an important source of supervisors' negative emotions. Conversely, supervisors that felt 'in control' will less likely display abusive behaviours (Courtrigh, 2016).

Demographic characteristics and personality traits

Several studies included in this review found no evidence that demographic characteristics of supervisors (e.g. gender, age, organisational tenure, ethnicity) are related to workplace incivility. The same counts for personality traits, such as neuroticism, conscientiousness or agreeableness, although some studies suggest they may function as a moderator (e.g. Eissa, 2017).

Employee related antecedents

Stressors and negative affect states



It is widely assumed that stressors in the workplace lead to an increased likelihood that employees will engage in workplace incivility. Indeed, several meta-analyses have demonstrated that high job demands, job stress, role/work overload, and even a poor physical work environment may lead to bullying, aggressive behaviour, harassment, and other types of workplace incivility (Hershcovis, 2007; Bowling, 2006). In fact, a recent study found that employees reporting higher levels of job demands reported an almost four times higher risk of bullying than those with low job demands (Salin, 2015).

As explained above, such stressors in general tend to produce negative affective states, which in turn have shown to increase the likelihood of interpersonal incivility and workplace aggression (Bowling, 2006; Reio, 2009; Van den Brande, 2016; Zhang, 2016).

Co-worker conflict and conflict management style



A co-worker conflict can be defined as a process that begins when an employee perceives differences and opposition between him/herself and a co-worker about interests and resources, beliefs, values, or practices that matter to him/her (De Dreu, 2008). Several studies have demonstrated that co-worker conflicts is a strong predictor of interpersonal aggression (Agotnes, 2018; Baillien, 2016; Hauge, 2007; Hershcovis, 2007). These findings suggest that workplace interpersonal aggression, such as bullying, should be viewed as the end state of a highly escalated and poorly managed conflict. The research literature on conflict behaviour distinguishes five conflict management styles: The five-part typology of conflict management styles: (1) integrating (collaborating); (2) dominating (competing or forcing); (3) accommodating (obliging); (4) avoiding; and (5) compromising.

A cross-sectional study found that a collaborative or sometimes referred to as an integrative conflict management style, involving a problem-solving orientation and a willingness to explore and work with the other person to find options that will be mutually acceptable, is the most constructive of the five conflict management styles (Trudel, 2011). A dominating style of conflict management, reflecting a win–lose orientation with an attempt to accomplish one's own objectives without account of the other person's needs, was found to be the less constructive of the five styles. In fact, whereas an integrative style functioned as an antidote for workplace incivility, a dominant style of managing conflicts turned out to be a strong predictor. It was found that employees who lack social skills in order to resolve organisational conflicts are more likely to be victims of workplace bullying (Moayed, 2006).

Job/role characteristics

Job and/or role characteristics are the most widely examined antecedents of workplace incivility. A large number of studies have repeatedly found that role ambiguity and role conflict are strong antecedents of workplace harassment and bullying (Bowling, 2006; Hauge, 2011-2; Reknes, 2014). Role ambiguity refers to uncertainty about which actions to take in order to fulfil the expectations of one's work role, while role conflict arises when the different expectations and demands of one's work role are incompatible (Beehr, 1995). In fact, it was found that role ambiguity and role conflict together predicted more than 20 percent of the variance in workplace harassment (Bowling, 2006).

Another important antecedent of workplace incivility is what is referred to as work constraints: situational constraints - such as lack of resources – that interfere with employees' task performance and prevent them from doing their job in an efficient and qualitative way, which will lead to frustration and ultimately aggression. Meta-analyses suggest that work constraints may be even stronger antecedents of workplace incivility than role ambiguity and role conflict (Bowling, 2006; Hershcovis, 2007). Not surprisingly, job autonomy was found to have a moderating effect on workplace incivility (Baillien, 2011; Bowling, 2006).



Demographic characteristics and personality traits

The studies included in this review found only limited evidence that personality traits are antecedents of workplace incivility (Nielsen, 2015). Some evidence was found, however, that 'trait anger' (the predisposition to respond to situations with hostility) may be linked with workplace aggression. A possible explanation for this finding is that people high in trait anger are more likely to be easily provoked because of their tendency to perceive situations as frustrating (Hershcovic, 2011). The same counts for demographic characteristics (e.g. age, level of education, organisational tenure, ethnicity), with the exception of gender.

A systematic review in the realm of healthcare found that female junior doctors experience more bullying behaviours compared to male junior doctors (Samsudin, 2018). The authors suggest that a possible explanation for this finding is that 'men and women perceive workplace bullying in different ways, with men being more likely to perceive bullying as a particular management style, and women being more likely to perceive certain behaviours as threatening. Others argue that women who deviate from traditional roles may submit them to negative evaluations and increase the risk of experiencing bullying'.

Organisational antecedents

Organisational (in)justice

This review did not find compelling evidence for organisational antecedents of workplace incivility, with the exception of organisational justice, in particular 'procedural' and 'distributive' justice (Zhang, 2019). Procedural justice concerns the perceived fairness of the procedures used to arrive at a certain decision. A meta-analysis found that procedural injustice may be a trigger that leads to an unfair outcome, and as such adversely affects employees (Hershcovis, 2007). For example, if an employee is reprimanded or punished for failing to comply with what is perceived as an unreasonable demand or arbitrary standards, it is likely to be judged as procedural injustice or even an abuse of power.

As a result, the employee may 'retaliate' by engaging in aggression against the organisation or the supervisor (Hoel, 2010). Distributive justice, on the other hand, concerns the perceived unfairness of outcomes. It was found that employees who feel that the outcome (distribution) is unfair are likely to blame the source of the decision and therefore may 'retaliate' by engaging in supervisor- and organisation-targeted aggression (Glomb, 2010; Hershcovis, 2007).

Hierarchical structures

Workplace incivility is more likely to occur in organisations with hierarchical management structures, high work pressure, and few policies. In addition, a recent systematic review of 62 studies in the context of Australian healthcare organisations found that interpersonal hierarchical bullying was more prevalent with professions with high power disparity where there are social norms regarding a 'pecking order' (Chadwick, 2017).

Table 1-Antecedents of Workplace Incivility

Antecedent	Type of Incivility	Effect size	Level	Studies
Conflict mgt style: integrative Conflict mgt style: dominating	Workplace incivility	ß = - .27 ß = .20	D	Trudel, 2011
Conflict mgt style: integrative	Target of workplace incivility	ß		
Conflict mgt style: dominating		ß = .11		
Co-worker conflict	Bullying	OR = 1.5	C	Agotnes, 2018;
	Interpersonal aggression	r = .50	C	Hershcovis, 2007
	Organisational aggression	r = .41		
Job autonomy	Being a target of bullying	r = -.20; -.25	C C	Baillien, 2011; Bowling, 2006
Job demands (high)	Bullying	OR = 3.7	D	Salin, 2015
Job dissatisfaction	Organisational aggression	r = .37	C	Hershcovis, 2007
Job stress	Aggressive behaviours	r = .36	D	Glomb, 2010
Lack of social skills	Bullying	OR = 1.5/2	B	Moayed, 2006
Leadership, authoritarian	Abusive supervision	r = .49	B	Zhang, 2016
Leadership, autocratic	Bullying	r = .39	D	Hoel, 2010
Leadership, constructive		OR = -0.5	D	Salin, 2015
Leadership, eth/ unethical	Abusive supervision	r = -.57/.58	B	Zhang, 2016
Leadership, fair/supportive	Workplace bullying	r = -.57; ß = - .46	D	Hauge, 2011
Leadership, laissez-faire	Bullying	r = .31	D	Hoel, 2010, Agotnes, 2018
Leadership, participative		r = -.26		
Leadership, supportive	Abusive supervision	r = -.53	B	Zhang, 2016
Leadership, transformational		r = -.45		
Negative affect - employee	Workplace harassment	r = .25	C	Bowling, 2006
	Organisational incivility	r = .34	D	Reio, 2009, Demir, 2012
	Interpersonal incivility	r = .28		
	Abusive supervision	r = .32	B	Zhang, 2016
Non contingent punishment	Bullying	r = .46	D	Hoel, 2010
Organisational injustice	Aggressive behaviours	r = .25; .36	D C	Glomb, 2010; Zhang, 2019
	Organisational aggression	r = .18	C	Hershcovis, 2007
Performance based pay	Bullying	OR = -0.6	D	Salin, 2015
Role ambiguity	Workplace harassment	r = .44	C	Bowling, 2006
	Bullying	r = .29; OR = 1.6	C C	Hauge, 2011-2; Reknes, 2014
Role conflict	Workplace harassment	r = .44	C	Bowling, 2006
	Bullying	r = .49; OR = 1.9	C	Hauge, 2011-2; Reknes, 2014
Role overload	Workplace harassment	r = .28	C	Bowling, 2006
	Bullying	r = .37	C	Hauge, 2011-2
Supervisors' emotional intel.	Abusive supervision	r = -.43	B	Zhang, 2016
Supervisor frustration	Abusive supervision	r = .52	D	Eissa, 2017
Supervisors' neg. experiences	Abusive supervision	r = .28 - .43	B D	Zhang, 2016; Courtright, 2016
Trait anger (employees)	Aggressive behaviours	r = .56; r = .43	D C	Glomb, 2010; Hershcovis, 2007
Victim of aggression	Aggressive behaviours	r = .70	D	Glomb, 2010
Work constraints	Workplace harassment	r = .53	C	Bowling, 2006
	Organisational aggression	r = .36	c	Hershcovis, 2007
Work environment (poor)	Bullying	OR = 1.6	D	Salin, 2015
Workload	Being a target of bullying	r = .11	C	Baillien, 2011
Workplace dom. by opp sex	Bullying	OR = 1.3	D	Salin, 2015
Workplace relationships	Uncivil behaviour	r = -12 / r =-.28	D	Reio, 2009

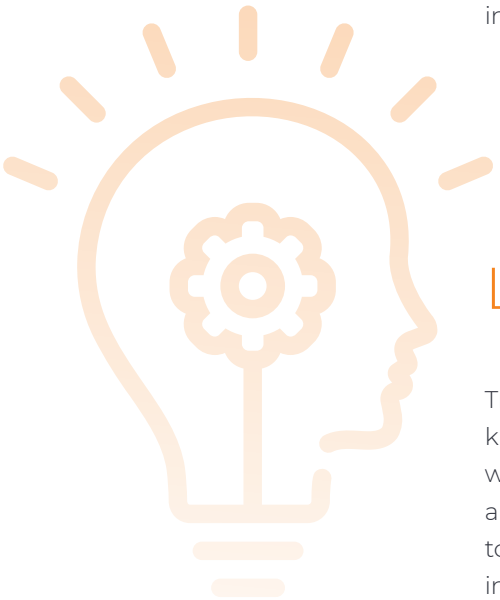
5. What interventions effectively address workplace incivility?

In the past decades, only a limited number of studies on the effectiveness of interventions designed to reduce workplace incivility have been published. As a result, the literature has only recently expanded to a point that allows for synthesis of findings across these studies. Below an overview is provided of the main findings from systematic reviews of high quality (controlled before-after) studies.

1. The development, implementation, and evaluation of a program addressing workplace incivility should be consistent. This consistency could be achieved through implementation of a single method program (Stagg, 2010).
2. Involving employees in the design and implementation of the intervention, drawing on their experiences, gives them a sense of agency and ownership, which is more likely to be successful than when employees are passive recipients of an intervention (Hodgins, 2014).
3. Multi-component, organisational level interventions - focusing on individual behaviours in a group context, and including actions to ensure visible management commitment - appear to be more effective than single level interventions (Hodgins, 2014).
4. The combination of (1) education about workplace incivility, (2) training related to effective responses to workplace incivility, and (3) an opportunity to practice those responses in a safe environment appears to be an effective approach to assisting employees in managing workplace incivility (Armstrong, 2018; Escartin, 2016; Stagg, 2010). It is recommended to use the program designed by Griffin (2004, 2014) as a template.

Conclusion

The studies identified through this review clearly demonstrate that workplace incivility constructs such as bullying, aggression, and abusive supervision have a profound, negative impact on a wide range of organisational outcomes. In addition, the findings from this review indicate that workplace incivility is symptomatic of broader issues within organisations. In fact, workplace incivility may be more about leadership and organisational issues as well as interpersonal relationships within organisations.



Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about the antecedents of workplace incivility and their subsequent impact on teams and organisations by using the systematic review method to search and critically appraise empirical studies. However, in order to be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases and a focus on empirical research published in the period 2000 to 2019. As a consequence, relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included, which did not incorporate a comprehensive review of the psychometric properties of their tests, scales and questionnaires.

Finally, some of the antecedents listed in Table 1 are based on cross-sectional research, which makes the nature or direction of the effect uncertain. This means that conclusions about cause and effect cannot be drawn.

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.

References

Ågotnes, K. W., Einarsen, S. V., Hetland, J., & Skogstad, A. (2018). The moderating effect of laissez-faire leadership on the relationship between co-worker conflicts and new cases of workplace bullying: A true prospective design. *Human Resource Management Journal, 28*(4), 555-568.

Armstrong, N. (2018). Management of Nursing Workplace Incivility in the Health Care Settings: A Systematic Review. *Workplace Health & Safety, 66*(8), 403-410.

Aubé, C., & Rousseau, V. (2014). Counterproductive behaviours. *Team Performance Management; 20* (5/6): 202–220.

Baillien, E., De Cuyper, N., & De Witte, H. (2011). Job autonomy and workload as antecedents of workplace bullying: A two-wave test of Karasek's Job Demand Control Model for targets and perpetrators. *Journal of Occupational & Organisational Psychology, 84*(1), 191-208.

Beehr, T. A. (1995). *Psychological stress in the workplace*. London: Routledge.

Bowling, N. A., & Beehr, T. A. (2006). Workplace harassment from the victim's perspective: a theoretical model and meta-analysis. *Journal of Applied Psychology, 91*(5), 998.

Chadwick, S., & Travaglia, J. (2017). Workplace bullying in the Australian health context: a systematic review. *Journal of Health Organisation and Management, 31*(3), 286-301.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Courtright, S. H., Gardner, R. G., Smith, T. A., McCormick, B. W., & Colbert, A. E. (2016). My family made me do it: A cross-domain, self-regulatory perspective on antecedents to abusive supervision. *Academy of Management Journal, 59*(5), 1630-1652.

De Dreu, C. K. (2008). The virtue and vice of workplace conflict: Food for (pessimistic) thought. *Journal of Organisational Behaviour: The International Journal of Industrial, Occupational and Organisational Psychology and Behaviour, 29*(1), 5-18.

Demir, D., Rodwell, J., & Flower, R. L. (2014). Antecedents and consequences of workplace aggression in the allied health context. *Social Work in Health Care, 53*(3), 250-267.

Dollard, M., Bailey, T., McLinton, S., Richards, P., McTernan, W., Taylor., A. and Bond, S. (2012), The *Australian Workplace Barometer: Report on Psychosocial Safety Climate and Worker Health in Australia,* Safe Work Australia, Canberra.

Escartín, J. (2016). Insights into workplace bullying: Psychosocial drivers and effective interventions. *Psychology Research and Behaviour Management, 9*.

Einarsen, K., Salin, D., Einarsen, S. V., Skogstad, A., & Mykletun, R. J. (2019). Antecedents of ethical infrastructures against workplace bullying. *Personnel Review, 48*(3), 672-690.

Eissa, G., & Lester, S. W. (2017). Supervisor role overload and frustration as antecedents of abusive supervision: The moderating role of supervisor personality. *Journal of Organisational Behaviour, 38*(3), 307-326.

Fiset, J., Robinson, M. A., & Saffie-Robertson, M. C. (2019). Masking wrongs through brilliance: the moderating effect of vision on the relationship between abusive supervision and employee outcomes. *European Journal of Work and Organisational Psychology, 28*(6), 756-768.

Fevre, R., Lewis, D., Robinson, A. and Jones, T. (2012), *Trouble at Work,* Bloomsbury Academic, London.

Glomb, T. M. (2010). Predicting workplace aggression: Reciprocal aggression, organisational, and individual antecedents. *International Journal of Organisation Theory and Behaviour, 13*(2), 249-291.

Griffin, M. (2004). Teaching cognitive rehearsal as a shield for lateral violence: An intervention for newly licensed nurses. *The Journal of Continuing Education in Nursing, 35*(6), 257-263.

Griffin, M., & Clark, C. M. (2014). Revisiting cognitive rehearsal as an intervention against incivility and lateral violence in nursing: 10 years later. *The Journal of Continuing Education in Nursing, 45*(12), 535-542.

Hauge, L. J., Einarsen, S., Knardahl, S., Lau, B., Notelaers, G., & Skogstad, A. (2011). Leadership and role stressors as departmental level predictors of workplace bullying. I*nternational Journal of Stress Management, 18*(4), 305-323.

Hauge, L. J., Skogstad, A., & Einarsen, S. (2011). Role stressors and exposure to workplace bullying: Causes or consequences of what and why? *European Journal of Work and Organisational Psychology, 20*(5), 610.

Hershcovis, M. S., Turner, N., Barling, J., Arnold, K. A., & et al. (2007). Predicting Workplace Aggression: A Meta-Analysis. J*ournal of Applied Psychology, 92*(1), 228.

Hershcovis, M. S., & Barling, J. (2010). Towards a multi-foci approach to workplace aggression: A meta-analytic review of outcomes from different perpetrator. J*ournal of Organisational Behaviour, 31*(1), 24.

Hershcovis, M. S. (2011). "Incivility, social undermining, bullying…oh my!": A call to reconcile constructs within workplace aggression research. *Journal of Organisational Behaviour, 32*(3), 499.

Hodgins, M., MacCurtain, S., & Mannix-McNamara, P. (2014). Workplace bullying and incivility: a systematic review of interventions. *International Journal of Workplace Health Management, 7*(1), 54-72.

Hoel, H., Glasø, L., Hetland, J., Cooper, C. L., & Einarsen, S. (2010). Leadership Styles as Predictors of Self-reported and Observed Workplace Bullying. *British Journal of Management, 21*(2), 453-468.

Hoel H, Sheehan MJ, Cooper CL, Einarsen S. Organisational effects of workplace bullying. In: Einarsen S, Hoel H, Zapf D, Cooper CL, editors. *Workplace Bullying: Developments in Theory, Research and Practice. London & New York: Taylor & Francis; 2011*:129–148.

Mawritz, M. B., Mayer, D. M., Hoobler, J. M., Wayne, S. J., & Marinova, S. V. (2012). A trickle-down model of abusive supervision. *Personnel Psychology, 65*(2), 325-357.

McTernan WP, Dollard MF, LaMontagne AD. Depression in the workplace: an economic cost analysis of depression-related productivity loss attributable to job strain and bullying. *Work Stress. 2013;27*(4):321–338.

Moayed, F. A., Daraiseh, N., Shell, R., & Salem, S. (2006). Workplace bullying: a systematic review of risk factors and outcomes. *Theoretical Issues in Ergonomics Science, 7*(3), 311-327.

Nielsen, M. B., & Knardahl, S. (2015). Is workplace bullying related to the personality traits of victims? A two-year prospective study. *Work & Stress, 29*(2), 128-149.

Park, H., Hoobler, J. M., Wu, J., Liden, R. C., Hu, J., & Wilson, M. S. (2019). Abusive Supervision and Employee Deviance: A Multifoci Justice Perspective. *Journal of Business Ethics, 158*(4), 1113-1131.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: an introduction to assessing study quality. *Systematic reviews in the social sciences: A practical guide, 125-163.*

Reio Jr, T. G., & Ghosh, R. (2009). Antecedents and outcomes of workplace incivility: Implications for human resource development research and practice. *Human Resource Development Quarterly, 20*(3), 237-264.

Reknes, I., Einarsen, S., Knardahl, S., & Lau, B. (2014). The prospective relationship between role stressors and new cases of self-reported workplace bullying. *Scandinavian Journal of Psychology, 55*(1), 45-52.

Salin, D. (2015). Risk factors of workplace bullying for men and women: The role of the psychosocial and physical work environment. *Scandinavian Journal of Psychology, 56*(1), 69-77.

Samsudin, E. Z., Isahak, M., & Rampal, S. (2018). The prevalence, risk factors and outcomes of workplace bullying among junior doctors: a systematic review. *European Journal of Work and Organisational Psychology, 27*(6), 700.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference. Houghton, Mifflin and Company.*

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: interpersonal conflict at work scale, organisational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of occupational health psychology, 3*(4), 356.

Stagg, S. & Sheridan, D. (2010). Effectiveness of Bullying and Violence Prevention Programs: A Systematic Review. *AAOHN Journal, 58*(10), 419-424.

Tepper, B. J. (2000). Consequences of abusive supervision. *Academy of Management Journal, 43,* 178–190.

Trudel, J., & Reio, T. G., Jr. (2011). Managing workplace incivility: The role of conflict management styles—Antecedent or antidote? *Human Resource Development Quarterly, 22*(4), 395-423.

Van den Brande, W., Baillien, E., De Witte, H., Elst, T. V., & Godderis, L. (2016). The role of work stressors, coping strategies and coping resources in the process of workplace bullying: A systematic review and development of a comprehensive model. *Aggression and Violent Behaviour, 29,* 61-71.

Verkuil B, Atasayi S, Molendijk ML. Workplace bullying and mental health: a meta-analysis on cross-sectional and longitudinal data. *PLoS One. 2015;10*(8).

Yukl, G. A. (2006). Leadership in organisations. Upper Saddle River, NJ: *Pearson–Prentice Hall.*

Zapf, D., Escartin, J., Einarsen, S., Hoel, H. and Vartia, M. (2011), "Empirical findings on prevalence and risk groups of bullying in the workplace", in Einarsen, S. Hoel, H. Zapf, D. and Cooper, C.L. (Eds), *Bullying and Harassment in the Workplace, Taylor and Francis, London,* pp. 75-106.

Zhang, Y., & Liao, Z. (2015). Consequences of abusive supervision: A meta-analytic review. Asia Pacific *Journal of Management, 32*(4), 959-987.

Zhang, Y., & Bednall, T. (2016). Antecedents of Abusive Supervision: a Meta-analytic Review. *Journal of Business Ethics, 139*(3), 455-471.

Zhang, Y., Liu, X., Xu, S., Liu-Qin, Y., & Bednall, T. C. (2019). Why Abusive Supervision Impacts Employee OCB and CWB: A Meta-Analytic Review of Competing Mediating Mechanisms. *Journal of Management, 45*(6), 2474-2497.

Appendix I

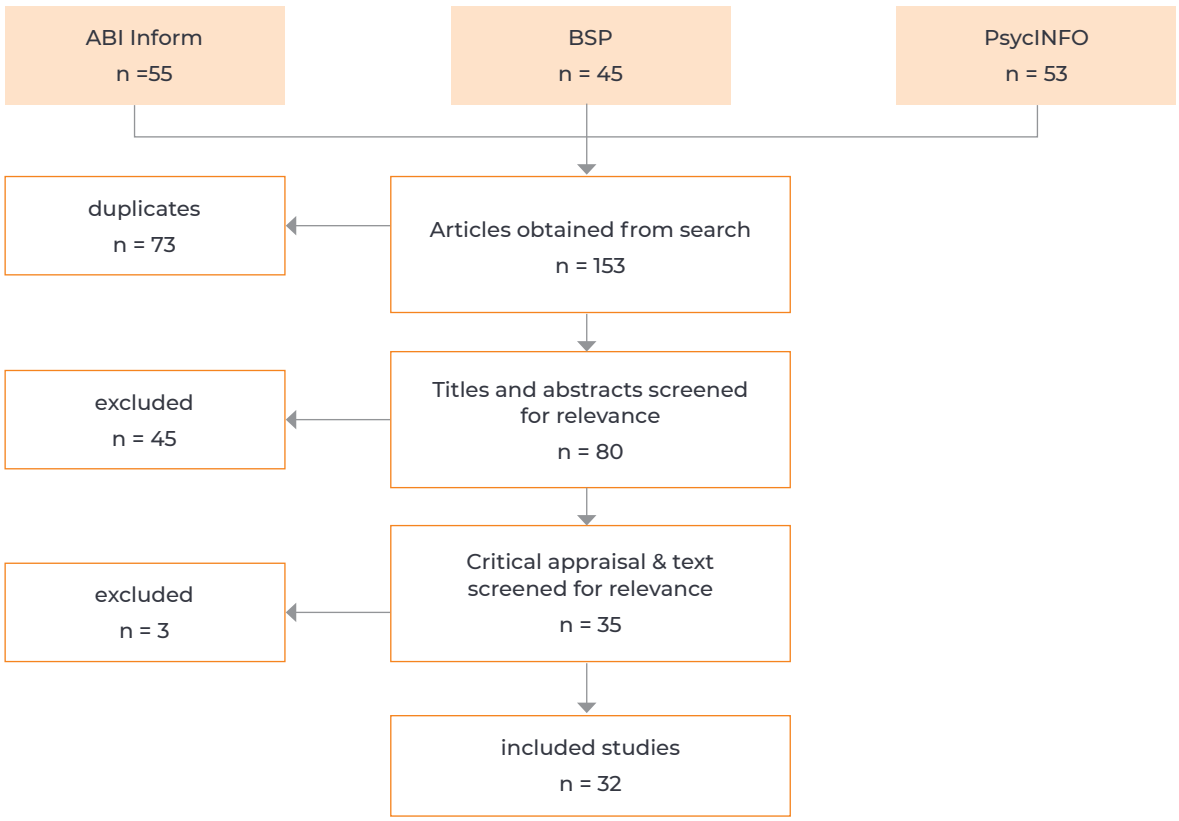
Search results REA Workplace Incivility

ABI/Inform Global, Business Source Elite, PsycINFO
peer reviewed, scholarly journals, Jan 2020

Search terms	ABI	BSP	PSY
S1: ti("workplace incivility") OR ab("workplace incivility")	123	72	121
S2: ti("workplace aggression") OR ab("workplace aggression")	93	58	127
S3: ti("workplace mistreatment") OR ab("workplace mistreatment")	28	9	19
S4: ti("workplace bullying") OR ab("workplace bullying")	403	279	516
S5: ti("abusive supervision") OR ab("abusive supervision")	293	210	265
S6: S1 OR S2 OR S3 OR S4 OR S5	911	627	1045
S7: S6 AND filter meta-analyses or systematic reviews	22	18	19
S8: S6 AND ti(antecedent* OR predictor* OR "risk factor*")	33	27	34

Appendix II

Selection of studies



Appendix III

Data extraction table - Workplace Incivility

Author & year	Design & sample size	Sector / Population	Main findings	Effect sizes	Limitations	Level
Agotnes, 2018	Longitudinal study (uncontrolled study with a pretest) n = 1772	Norwegian employees	F1: Co-worker conflict at Time 1 predicts new incidents of self-reported workplace bullying at Time 2 (H1). F2: Laissez-faire leadership at Time 2 moderates the relationship between co-worker conflict at Time 1 and subsequent new cases of self-reported victims of workplace bullying at Time 2. Respondents who are involved in a co-worker conflict at Time 1 have a higher probability of becoming a new victim of workplace bullying at Time 2 if they report high levels of laissez-faire leadership enacted by their immediate supervisor at Time 2 (H2).	F1: [OR] 1.40 F2: [OR] 1.29	No serious limitation	C
Armstrong, 2018	systematic review of mostly quasi-experimental studies k = 10	nurses	Study reviewing the research related to interventions in assisting nursing staff working in health care settings in managing incivility. Despite the limitations of the research, it appears that the use of a particular set of interventions is helpful in assisting nurses in managing workplace incivility. The combination of education about workplace incivility, training related to effective responses to workplace incivility, and an opportunity to practice those effective responses in a safe environment appears to be an evidence-based approach to assisting nurses in managing workplace incivility.	not reported	magnitude of the effect unclear	A

Baillien, 2011	Longitudinal study (uncontrolled study with a pretest) n = 320	Employees of two large organisations with headquarters in Belgium (textile industry and financial services). White collar employees: 52%, managers: 38%.	F1: There is a positive association between Time 1 workload and being a target of workplace bullying at Time 2 (H1a). F2: A relation between Time 1 workload and being a perpetrator of workplace bullying at Time 2 WAS NOT FOUND (H1b). F3: There is a negative association between Time 1 job autonomy and being a target of workplace bullying at Time 2 (H2a). F4: A association between Time 1 job autonomy and being a perpetrator of workplace bullying at Time 2 WAS NOT FOUND (H2b). F5: A significant Time 1 workload–job autonomy interaction in relation to being a target of workplace bullying at Time 2 (the relationship between workload and being a target of workplace bullying particularly strong under the condition of lower compared with higher job autonomy) WAS NOT FOUND (H3a). F6: There is a significant interaction between Time 1 workload and job autonomy in relation to being a perpetrator of workplace bullying at Time 2; the relationship between workload and being a perpetrator of workplace bullying is particularly strong under the condition of lower compared with higher job autonomy (Hypothesis 3b).	F1: r = .11 F3: r = -.20 F6: ß = -.09	No serious limitation	C

Bowling, 2006	meta-analysis k = 90	various	**Antecedents** Workplace harassment tends to occur in work environments where other stressors are present. Specifically, some other stressors, such as 1) role conflict, 2) role ambiguity, 3) role overload, and 4) work constraints, were all associated with workplace harassment. A negative relationship was found for 5) autonomy. Victim's negative effect (6) appears to play some role in workplace harassment. In contrast, victim's positive affect was only weakly related to harassment. Note: Role ambiguity and role conflict together predicted 21% of the variance in workplace harassment. **Impact** Workplace harassment was associated with victims' well-being. Specifically, harassment was positively associated with 8) generic strains, 9) anxiety, 10) depression, 11) burnout, 12) frustration, 13) negative emotions at work, and 14) physical symptoms. In addition, it was negatively associated with 15) positive emotions at work, 16) self-esteem, 17) life satisfaction, 18) job satisfaction, and 19) organisational commitment. Furthermore, harassment was negatively associated with 20) perceptions of organisational justice. In contrast, workplace harassment was associated with some individual performance outcomes but not with others. In particular, harassment was positively associated with 21) counterproductive work behaviours and 22) turnover intentions, but it was weakly related to 23) job performance, 24) organisational citizenship behaviours, and 25) absenteeism.	1. ρ = .44 2. ρ = .30 3. ρ = .28 4. ρ = .53 5. ρ = -.25 6. ρ = .25 7. ρ = < .1 8. ρ = .35 9. ρ = .31 10. ρ = .34 11. ρ = .39 12. ρ = .40 13. ρ = .46 14. ρ = .31 15. ρ = -.25 16. ρ = -.21 17. ρ = -.21 18. ρ = -.39 19. ρ = -.36 20. ρ = -.35 21. ρ = -.37 22. ρ = -.35 23. ρ = -.08 24. ρ = -.03 25. ρ = -.06	Limited search (only PsycINFO) Study design and quality not assessed	C

Chadwick, 2017	systematic review, design of included studies unclear k = 62	healthcare, Australia	Study reviews a range of International and Australian literature regarding workplace bullying behaviours in a health context from a management perspective. Overall finding: Workplace bullying is symptomatic of broader issues within organisations. Workplace bullying behaviours may be more about leadership and organisational issues as well as interpersonal relationships within organisations. **Contributing factors to workplace bullying:** 1) Lack of management leadership a. Leadership at all levels of the organisation (ie. Board, CEO, or Executive) needs to be motivated and engaged to prevent workplace bullying using a proactive and systemic approach as opposed to a reactive approach. b. Lack of effective management skills is viewed as a significant factor contributing to workplace bullying in addition to unrealistic expectations, authoritarian management, personality and even failure to address workplace bullying when it occurs. c. Managers in some organisations are promoted due mainly to their demonstrated task skills and competencies and some lack the relational and interpersonal skills required at more senior levels. Others are promoted or in positions which are outside their skill set and both of these can lead to a culture of bullying behaviours. d. Management culture may 'normalise' workplace bullying if behaviours have been ignored or tolerated by senior management for periods of time. This can lead to those engaging in workplace bullying to believe their behaviour is acceptable if there are no perceived consequences. e. Supportive work environments contribute to coping strategies for individuals and may act as a buffer from the negative and damaging effects of bullying. 2) Hierarchical structures a. Hierarchical workplace bullying is defined as occurring by virtue of an individual's structural location within the workplace and the wider world of work. Interpersonal hierarchical bullying is more prevalent in professions where power disparity is significant. b. Workplace bullying can be seen in organisations where hierarchical systems and structures are the norm and where the organisation is resistant to change c. The hierarchical structure of organisations is seen to create an imbalance of power and can lead to the misuse of this power amongst managers. Individuals within these professions can be seen as 'inheriting' power and prestige due to their occupations.	not reported	merely descriptive review magnitude of the effects unclear some constructs and findings lack clarity	C

d. Factors such as competiveness, autocratic managers, hierarchal organisations and environments with poor communication practices without formal policies encourage workplace bullying behaviours.

e. Organisations with hierarchical management structures, high pressure and few policies are more likely to experience greater levels of workplace bullying.

f. Leadership styles can also contribute to workplace bullying and there is a link between strong management practices and bullying (Sheehan and Griffiths 2011). An autocratic manager may engage in workplace bullying simply by exerting their authority over others, making unreasonable demands or excluding workers in decision making processes which are within their authority. Controlling managers may not realise some of the behaviours they are demonstrating are bullying behaviours. Some managers will attempt to explain their behaviour as 'reasonable management practices' or even 'blame' the worker for being 'too sensitive'.

3) Lack of workplace support.

4) Informal power.

5) Social environment.
- The social environments of organisations (department, teams) such as expectations, norms and beliefs may contribute to workplace bullying.
- Conflict within group norms is considered to be a significant cause of workplace bullying.

Factors that effectively address workplace bullying:

A range of skills have been identified to deal effectively with workplace bullying behaviours and their contributing factors. These key skills include communication, empathy, emotional intelligence, conflict resolution, interpersonal relationships, personal mastery, leadership, negotiation, stress management, team building and problem solving.

Courtright, 2016	Study 1: Cross-lagged study n = 714 (134 supervisors and 580 sub-ordinates) Study 2: Cross-lagged study n = 92	Study 1: Supervisors (mid-level managers in a variety of functions) and sub-ordinates at a Fortune 500 financial services organ-isation (North America). Study 2: Supervisors from 22 differ-ent industries (e.g., health care, finan-cial services, construction, manufactur-ing), most (73%) were classified as mid-level or senior-level managers.	F1: Supervisor FWC (family-work conflict) is positively associated with abusive supervision (H1a). F2: Ego depletion mediates the positive relationship between supervisor FWC and abusive supervision (H1b). F3: Gender moderates the positive relationship between supervisor FWC and abusive supervision such that the relationship is stronger for female supervisors (H2a). F4: Gender DOES NOT moderate the indirect positive effects of supervisor FWC on abusive supervision through ego depletion (H2b). F5: Situation control moderates the positive relationship between supervisor FWC and abusive supervision such that the relationship is stronger for supervisors with higher situation control (H3a). F6: Situation control moderates the indirect positive effects of FWC on abusive supervision through ego depletion such that the ego depletion–abusive supervision path is stronger for supervisors with higher situation control (H3b).	Unclear, unstandardised coefficients are reported	No serious limitation	D
Demir, 2012	Cross-sectional study n = 207	Nurses and midwives working across wards within a large Australian hospital	**Antecedents of workplace aggression:** F1: Bullying was linked to (a) high negative affectivity (NA), as well as (b) low supervisor support and (c) coworker support. F2: Internal emotional abuse was associated with (a) low levels of these support variables, as well as (b) high outside work support and (c) low job control. F3: External threat of assault was related to (a) high job demands and (b) NA. **Consequences of workplace aggression:** F4: Bullying (a) and verbal sexual harassment (b) were linked to increased psychological distress levels. F5: Bullying (a) and internal emotional abuse (b) were related to lowered organisational commitment. F6: Changes in job satisfaction were not found for any of the workplace aggression types.	Unclear	Low response rate (26.9%)	D

Demir, 2014	Cross-sectional study n = 134	Allied health professionals working for an Australian health care organisation	Relationship between the DCS variables (i.e., demand, control, and social support) and workplace aggression: F1: Low levels of co-worker support were associated with bullying. F2: Low job control (a), high negative affect (b), and high job demands (c) were associated with external emotional abuse. F3: Low co-worker support (a) and high outside work support (b) were associated with internal emotional abuse. F4: No significant results for external threat of assault. Relationships between workplace aggression and consequences (i.e., job satisfaction, psychological distress, and organisational commitment): **Organisational commitment** F5: Those who reported bullying also reported being less committed to the organisation. An interaction between age and bullying: participants aged 49 and below who reported bullying reported less commitment to the organisation compared to those aged 49 and below who reported no bullying, and those aged 50 and above who reported bullying (a). No interaction was found for gender and bullying (b, main effect of bullying on oc). F6: Those who reported external emotional abuse reported less commitment to the organisation. F7: There were no significant main or interaction effects regarding external threat of assault or internal emotional abuse. **Job satisfaction** F8: Those reporting emotional abuse reported less job satisfaction. F9: No main nor interaction effects for bullying, external threat of assault, or internal emotional abuse. **Distress** F10: Those who reported bullying also reported greater distress. F11: Those reporting internal emotional abuse reported a greater level of distress. F12: There were no significant main or interaction effects regarding external threat of assault or internal emotional abuse.	F1-F4: Unclear, unstandardised coefficients are reported F5: a: $\eta^2 = .06$ b: $\eta^2 = .04$ F6: $\eta^2 = .04$ F8: $\eta^2 = .06$ (including age) $\eta^2 = .04$ (including gender) F10: $\eta^2 = .04$ F11: $\eta^2 = .05$ (including age) $\eta^2 = .04$ (including gender)	No serious limitation	D

Einarsen, 2019	Cross-sectional study n = 216	Human resource managers or the main health and safety representatives in 216 Norwegian municipalities	F1: The level of high-quality HRM practices predict having a well-developed ethical infrastructure, here defined as having policies against workplace bullying, training against workplace bullying, recurrent communication, as well as having a strong conflict management climate (CMC); however it does not predict having sanctions. F2: Organisational size predict only having policies against workplace bullying, and training against workplace bullying. F3: Financial resources did not predict any of the elements within the ethical infrastructure.	F1: Policies: ß = 0.16 Training: ß = 0.22 Recurrent communication: ß = 0.45 CMC: ß = 0.59 F2 Policies: ß = .18 Training: ß = 0.17	The results for each municipality were obtain from only one respondent	D
Eissa, 2017	Cross-sectional study n = 190 employee–supervisor dyads	Employees and their immediate supervisors in organisations located in the Midwestern United States; various industries including human services, education, health care, finance, public safety, and information technology.	F1: Supervisor role overload is positively associated with supervisor frustration in the workplace (H1). F2: Supervisor frustration is positively associated with subordinate ratings of abusive supervision (H2). F3: Supervisor frustration mediates the relationship between supervisor role overload and subordinate ratings of abusive supervision (H3). F4: Supervisor neuroticism moderates the relationship between supervisor role overload and frustration, such that the relationship is stronger when neuroticism levels are higher (H4). F5: Supervisor agreeableness moderates the relationship between supervisor frustration and subordinate ratings of abusive supervision, such that the relationship will be weaker when agreeableness levels are higher (H5a). Such moderating effect was not found for conscientiousness (H5b). F6: Supervisor neuroticism, conscientiousness, and agreeableness moderate the indirect effect of supervisor role overload on subordinate ratings of abusive supervision (via supervisor frustration); the mediated relationship is stronger when (a) neuroticism is high as opposed to low and will be weaker when (b) conscientiousness and (c) agreeableness are high as opposed to low (H6).	F1: r = .52 F2: r = .45 F3-F6: Unclear, unstandardised coefficients are reported.	No serious limitation	D

Escartin, 2016	systematic review of 7 quasi-experimental longitudinal studies and 1 RCT k = 8	various	Study on effectiveness of workplace bullying interventions The majority of outcomes evidenced some level of change, mostly positive, suggesting that workplace bullying interventions are more likely to affect knowledge, attitudes, and self-perceptions, but actual bullying behaviours showed much more mixed results. In general, growing effectiveness was stated as the level of intervention increased from primary to tertiary prevention. Recommendations: » It is advisable to have facilitators (internal or external) who are respected and trusted by employees. » The managers, the leaders, and the organisation itself have to be perceived as committed and involved in such antibullying interventions (eg, zero-tolerance policies with clear procedures), and a positive climate has to be developed. The following 'best practices' were identified: a) Informal intervention first whenever possible, workplace bullying information resources available through the organisation, continuous feedback between the different hierarchical positions, zero tolerance against bullying programs (also included in the contract for newcomers), continuous opportunities for networking and internal communication, and strategies to improve assertive communication. b) Mentoring, coaching, and mediation; creation of a formal committee to handle future bullying cases; clarity on the antibullying policies regarding what it is and what is not; and processes to detect, manage, and prevent bullying situations. Note: Primary interventions focus on preventing occurrence of bullying in the workplace through contextual changes or employees training and educational workshops. Secondary interventions aim to reduce the extent and duration of any incident of bullying and to provide employees with the necessary skills and/or coping resources to deal with bullying should it occur. Finally, tertiary prevention programs focus on reducing negative consequences after bullying has occurred, through victims' support and assistance.	not reported	merely descriptive review findings are reported in very general and broad terms	A

Fiset, 2019	Study 1: RCT n = 179 Study 2: RCT n = 294	Study 1 & Study 2 Adults recruited via Amazon Mechanical Turk	F1: In Study 1, scores on ONLY ONE OUT OF three performance outcomes – practicality (H1) – was lower in the high abusive supervision condition, versus the low abusive supervision condition. Such effect was not found for quantity of performance (H1a, main effect not significant), and creativity of ideas (H1c, opposite direction). In Study 2, scores on all three performance outcomes was lower in the high abusive supervision condition, versus the low abusive supervision condition. F2: Participants report less affective commitment in the high abusive supervision condition, as compared to the low abusive supervision condition (H2) F3: Vision moderates the effects of abusive supervision on performance quantity (H3a) and creativity of ideas (H3c, confirmed only in Study 1), such that the effects of abusive supervision will be less negative when vision is high than when vision is low. Such effect was not found for practicality of ideas (H3b). F4: Vision DOES NOT moderate the effects of abusive supervision on affective commitment (H4).	Unclear, unstandardised coefficients are reported.	No serious limitation	A
Glomb, 2010	Cross-sectional study n = 366	Employees from a large, machinery manufacturing corporation; employees from a sporting equipment manufacturing company; employees from a large Midwestern University;	F1: Organisational injustice (distributive, procedural, and interpersonal forms) is positively related to employee reports of engaging in aggressive behaviours (H1). F2: Organisation, job, and work group stress is positively related to employee reports of engaging in aggressive behaviours (H2). F3: Type A behaviour pattern* is positively related to employee reports of engaging in aggressive behaviours (H3). F4: Trait anger is positively related to employee reports of engaging in aggressive behaviours (H4a). F5: Reactions to anger is positively related to employee reports of engaging in aggressive behaviours (H4b). F6: Being the target of aggression is positively related to engaging in aggression (H5). * Type A behaviour pattern - an action-emotion complex that can be observed in any person who is aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time, and if required to do so, against the opposing efforts of other things or persons. The major components of the Type A behaviour pattern are extremes of aggressiveness, easily aroused hostility, time urgency, and competitive achievement striving.	F1 Procedural: r = .25 Distributive: r = .18 Interpersonal: r = .20 F2 Organisational: r = .36 Job: r = .36 Work group: r = .31 F3 r = .28 F4 r = .56 F5 Anger suppressed: r = .36 Anger expressed: r = .59 F6 r = .70 [NOTE: some of these effects don't persist in a regression model]	No serious limitation	D

Hauge, 2011	Cross-sectional study n = 10,652 k = 685 departments	Norwegian employees from public and private organisations, representing health institutions, educational institutions, public administration, and manufacturing companies, among others	Shared perceptions of the environmental factors (fair and supportive leadership and role conflict) predicted the incidence of workplace bullying within departments. Such effect was not found for role ambiguity; however role ambiguity and workplace bullying are positively associated.	Fair and supportive leadership: r = -.57 ß = - .46 Role conflict: r = .49 ß = .29 Role ambiguity: r = .24 ß = .07 ns	No serious limitation	D
Hauge, 2011-2	Longitudinal study n = 1207	Norwegian employees	F1: Individual role stress (role ambiguity, role conflict, and role overload) is NOT an antecedent condition of exposure to workplace bullying. F2: Individual role stress (role ambiguity, role conflict, and role overload) is a consequence of exposure to workplace bullying. NOTE: This finding is refuted by Reknes, 2014.	Unclear	No serious limitation	C
Hershcovis, 2007	meta-analysis k = 57	various	Study examines whether the strength of predictor–aggression relationships depends on the targets (interpersonal vs organisation) of the aggression. 1. Trait anger a) and interpersonal conflict b) were the strongest predictors of interpersonal aggression. 2. The strongest predictors of organisational aggression were a) interpersonal conflict, b) situational constraints, and c) job dissatisfaction. 3. Other predictors such as a) distributive and b) procedural justice showed only small correlations. Note: Situational constraints = workplace stressors that interfere with an individual's task performance or goals at work (e.g., availability of resources).	1a. r = .43 (.29, .57) 1b. r = .50 (.37, .62) 2a. r = .41 (.21, .61) 2b. r = .36 (.31, .40) 2c. r = .37 (.28, .46) 3a. r = .12 (.12, .17) 3b. r = .18 (.07, .35)	design and quality of the studies not reported	C

Herscovis, 2010	Meta-analysis k = 66	various	Supervisor aggression (SUA) has the strongest adverse effects across the attitudinal and behavioural outcomes. Co-worker aggression (COA) had stronger effects than outsider aggression on the attitudinal and behavioural outcomes, whereas there was no significant difference between supervisor and co-worker aggression for the majority of the health-related outcomes.	SUA versus COA (P) Job satisfaction -.38 vs -.25 Aff commitment -.28 vs -.20 Intent to turnover .30 vs .23 Psychological distress .28 vs .21 Emotion exhaustion .35 vs .31 (ns) Depression .26 vs .24 (ns) Physical wellbeing -20 vs -.24 (ns) Performance -17 vs -.09	limited search design of the studies included unclear quality of the studies included not assessed	D
Hodgins, 2014	systematic review, includes (4) controlled before-after studies k = 31	various	Study addresses the question 'what interventions designed to reduce workplace bullying or incivility are effective and what can be learnt from evaluated interventions for future practice?' Results indicate that multi-component, organisational level interventions appear to have a positive effect on levels of incivility, and should be considered as a basis for developing interventions to address workplace bullying. For a description of the effective interventions > see paper, page 67. Note: multicomponent = is delivered at a number of levels; it focuses on individual behaviours, in a group context, and includes actions to ensure visible management commitment.	not reported	no serious limitations	B

Hoel, 2010	Cross-sectional study n = 5288	Employees from 70 organisations within the private, public and voluntary sectors across Great Britain	F1: Self-reported bullying is positively associated with autocratic leadership (H1). F2: Self-reported bullying is negatively associated with participative leadership (H2). F3: Witnessed or observed bullying is positively associated with autocratic leadership (H3). F4: Witnessed or observing bullying is negatively associated with participatory leadership (H4). F5: Self-reported bullying is positively associated with a leadership style applying non-contingent punishment (NCP) leadership (H5). F6: Witnessed or observed bullying is positively associated with a leadership style applying non-contingent punishment (NCP) leadership (H6). F7: Self-reported bullying is positively associated with a laissez-faire style of leadership (H7). F8: Witnessed or observed bullying is positively associated with a laissez-faire style of leadership (H8).	F1: r = .39 F2: r = - .26 F3: r = .41 F4: r = - .28 F5: r = .46 F6: r = .39 F7: r = .31 F8: r = .30	No serious limitation	D
Lam, 2017	Study 1 Time-lagged design n = 219 supervisor–subordinate dyads (44 supervisors) Study 2 Time-lagged design 416 supervisor–subordinate dyads (50 supervisors)	Study 1 Manufacturing workers (sub-ordinates) and their direct supervisors in a large telecommunications company in southern China. Study 2 Customer service providers (sub-ordinates) and their direct supervisors in a call center of a state-owned telecommunication services company in southeastern China.	F1: Perceived subordinate performance DOES NOT moderate the positive relationship between supervisors' emotional exhaustion and abusive supervision (H1). F2: There is a three-way interactive relationship between supervisors' emotional exhaustion, perceived subordinate performance, and self-monitoring, on the one hand, and abusive supervision, on the other. The positive relationship between supervisors' emotional exhaustion and abusive supervision is strongest when both supervisors' perceptions of a subordinate's performance and supervisors' self-monitoring are relatively low (H2).	Unclear	No serious limitation	D

Moayed, 2006	systematic review of case-control and cohort studies k = 7	various	Study investigates the association between workplace factors and bullying. Results showed (small) associations between organisational problems and workplace bullying and between a victim's personality and workplace bullying. 1. People with high level of unassertiveness and avoiding style are 1.26 times more likely to be victims. 2. Victims are 1.16 times more likely to believe that org. problems were the reason for bullying than others. 3. Individuals who lack social skills in order to resolve organisational conflicts are (1.5 to 2 times) more likely to be victims of workplace bullying.	small (OR's from 1.3 to 2)	most findings based on only 1 study	B
Nielsen, 2015	Time-lagged designed n = 3066	Norwegian employees (at full- or part-time positions) from 91 organisations, which represent a wide variety of job types, among others: insurance companies, health institutions and public organisations.	F1: Low levels of extraversion (being introverted) are NOT prospectively related to victimisation from workplace bullying (H1a). F2: Victimisation from workplace bullying is NOT prospectively related to lower levels of extraversion (becoming more introverted) (H1b). F3: Low levels of agreeableness are NOT prospectively related to victimisation from workplace bullying (H2a). F4: Victimisation from workplace bullying is prospectively related to lower levels of agreeableness (H2b). F5: High levels of conscientiousness are NOT prospectively related to victimisation from workplace bullying (H3a). F6: Victimisation from workplace bullying is prospectively related to lower levels of conscientiousness (H3b). F7: High levels of neuroticism are prospectively related to victimisation from workplace bullying (H4a). F8: Victimisation from workplace bullying is NOT prospectively related to higher levels of neuroticism (H4b). F9: Levels of openness are not related to subsequent victimisation from workplace bullying (H5a). F10: Victimisation from workplace bullying is prospectively related to lower levels of openness over time (H5b).	Unclear	No serious limitation	D

Notelaers, 2019	Cross-sectional study n = 5727	19 Belgian organisations	Employees reporting a higher degree of imbalance between efforts and rewards (i.e. who are under-rewarded in comparison to their efforts) have a higher likelihood to be a target of bullying.	Unclear (only unstandardised coefficients are reported)	No serious limitation	D
Park, 2017	meta-analysis k = 79	various	Study examines the influence of unethical leader behaviours in the form of abusive supervision on sub-ordinates' retaliatory responses. H1. Abusive supervision is negatively related to (a) supervisory-focused justice and (b) organisationally focused justice. H3. Abusive supervision is positively related to subordinate deviance toward (a) the supervisor and (b) the organisation. Note: The results indicate that the percentages of employees who engage in deviance toward a supervisor are 77 and 23%, if half of the population experienced abusive supervision and the other half did not. 71% of sub-ordinates who have abusive supervisors would display organisational deviance, and 29% of those who do not have abusive supervisors would engage in organisational deviance. H4. Supervisory-focused justice partially mediates the relationship between abusive supervision and deviance toward supervisor. H5. Supervisory-focused justice partially mediates the relationship between abusive supervision and deviance toward supervisor. H6. The negative relationship between abusive supervision and (a) supervisory-focused justice is stronger in a) lower power distance cultures as compared to b) higher power distance cultures. Practical implication: The negative implications of abusive supervision appear to be more significant for justice perceptions in reference to the supervisor and deviance toward the supervisor, compared to justice perceptions in reference to the organisation and deviance toward the organisation. Thus, leaders should be aware that the costs of abusive supervision are more strongly quid pro quo. Therefore, organisations should impose leadership development programs, coaching, and the like designed to stem abusive supervision. Note: supervisory focussed justice = when employees conclude that the source of their perceived injustice is the supervisor; organisationally focused justice = when employees attribute the cause of abusive supervision to their organisation, because they perceive that the organisation has fostered the context for the supervisor to behave in this way.	H1a: r = − .54 95% CI = − .61, − .47 H1b: r = − .36, 95% CI = − .41, − .31 H3a: r= .54 95% CI = .47, .60 H3b: r = .41 95% CI = .37, .46 H6a: r = −.60 H6b: r = −.43	design of the studies unclear no appraisal of study quality	C

Reio, 2009	Cross-sectional study n = 402	Workers in retail, manufacturing, school service, government, non-profit service, college or university, hospital or medical, for-profit service, self-employed, and other; US	F1: After controlling for the demographic variables, workplace adaptation (ESTABLISHING RELATIONSHIPS, ACCULTURATION) and affect (NEGATIVE) predict interpersonal and/OR organisational uncivil behaviour significantly (H1). [OBSERVATION: such effect was not found for job knowledge (adaptation) and positive affect]. F2: After controlling for the antecedent variables, organisational incivility predict physical health and job satisfaction (H2).	F1 interpersonal: Establishing relationships: ß = - .13 Negative affect: ß = .24 Organisational: Acculturation: ß = - .15 Negative affect: ß = .27 F2 Organisational: Physical health: ß = - .23 Job satisfaction: ß = - .17	No serious limitation	D
Reknes, 2014	Longitudinal study n = 2,835	Employees from 20 Norwegian organisations in the private and public sectors	F1: Role ambiguity at T1 predicts new incidents of self-reported workplace bullying at T2 (H1). F2: Role conflict at T1 predicts new incidents of self-reported workplace bullying at T2 (H2). F3: Workplace bullying at T1 predicts increased levels of role ambiguities at T2 (H3). F4: Workplace bullying at T1 predicts increased levels of role conflicts at T2 (H4).	F1: OR = 1.58, CI = 1.18–2.13 F2: OR = 1.92, CI = 1.43–2.57 F3: ß = 0.04, F4: ß = 0.04	No serious limitation	C

Salin, 2015	Cross-sectional study n = 4,392	Finnish employees	F1: Constructive leadership is associated with lower levels of bullying [H1: A poor quality of leadership is associated with a higher risk of workplace bullying]. F2: High job demands are associated with higher levels of bullying (H2). F3: Performance-based pay is associated with a LOWER risk of bullying (H3). F4: A poor physical work environment is associated with a higher risk of bullying (H4). F5: Working in work tasks dominated by the opposite sex is associated with a higher risk of bullying (H5).	F1: OR = 0.545, CI = 0.424–0.700 F2: OR = 3.702, CI = 2.439–5.617 F3: OR = 0.552, CI = 0.360–0.845 F4: OR = 1.641, CI = 1.285–2.097 F5: OR = 1.253, CI = 1.022–1535	No serious limitation	D
Samsudin, 2018	systematic review of cross-sectional studies k = 18	young doctors	Study investigating whether there are organisational factors that are associated with an increased risk of exposure to workplace bullying among junior doctors. Associations between age, height, ethnicity and subspecialty, and bullying were observed but the effect sizes reported were low and mixed. Several studies observed more female junior doctors experience bullying behaviours compared to male junior doctors, which is in keeping with the current literature According to some authors, the reason behind this is that men and women perceive workplace bullying in different ways, with men being more likely to perceive bullying as a particular management style, and women being more likely to perceive certain behaviours as threatening. Others argue that women who deviate from traditional roles may submit them to negative evaluations and increase the risk of experiencing bullying.	low	merely descriptive review	C

Stagg, 2010	systematic review, includes RCTs k = 18	staff nurses	Study aims to identify best practices for preventing and managing workplace bullying among staff nurses. 1. Bullying and violence prevention program standards do not exist, leading to numerous programs that are difficult to compare and that produce negligible outcomes. 2. The development, implementation, and evaluation of a workplace bullying program must be consistent. This consistency could be achieved through implementation of a single method program with successful results in decreasing bullying behaviours. 3. Although no clear answer to eliminating the workplace bullying phenomenon surfaced, the literature suggests the best strategy for managing bullies involves cognitive rehearsal of responses to common workplace bullying behaviours. This approach provides staff nurses with basic bullying information and a safe environment to learn and practice responses toward bullying behaviours through cooperative group work, building confidence in workplace bullying management for both experienced and new staff nurses (see Griffin, 2004). 4. Although no 'best practice' was identified, it is recommended to prepare staff nurses to manage workplace bullying by developing and providing a training program tailored specifically to their organisation, using the program designed by Griffin (2004) as a template. The aims of the 3-hour workplace bullying management program are to (a) present the theoretical foundation for understanding the origins and expression of workplace bullying in nursing; (b) recognize the vulnerability of nurses; and (c) provide training on the application of cognitively rehearsed responses to the most common bullying behaviours observed in nursing.	not reported	no serious limitations	AA
Tepper, 2011	Cross-sectional study n = 183 independent supervisor-subordinate dyads	Seven health care organisations, including hospitals, long-term care facilities, and outpatient facilities, located in the southeastern United States	F1: A supervisor's perceptions of relationship conflict DOES NOT mediate the relationship between the supervisor's perceived deep-level dissimilarity with a subordinate and abusive supervision directed toward that subordinate (H1). F2: A supervisor's perceptions of a subordinate's performance partially mediate the relationship between the supervisor's perceived deep-level dissimilarity with the subordinate and abusive supervision directed toward that subordinate (H2). F3: Relationship conflict is a distal partial mediator and supervisor evaluation of subordinate performance is a proximal partial mediator of the relationship between perceived deep-level dissimilarity and abusive supervision (H3). F4: Supervisor perceptions of subordinate performance moderate the indirect effect of perceived deep-level dissimilarity on abusive supervision (through relationship conflict); the mediated effect is stronger when a supervisor perceives a subordinate as having lower performance (H4).	Unclear	No serious limitation	D

Trudel, 2011	Cross-sectional study n = 289	Employees of three private Midwestern (US) companies: a company providing healthcare and two manufacturing companies	F1: Conflict management styles relates to the instigation of workplace incivility (H1). More specifically: a. Those with an integrating conflict style will be less likely to instigate workplace incivility. b. Those with a dominating conflict style will be more likely to instigate workplace incivility. Compromising (c), avoiding (d) and accommodating (e) conflict style were not found to predict instigate workplace incivility. However, compromising conflict style was associated to workplace incivility as instigator. F2: Conflict management styles is related to being targets of workplace incivility (H2); specifically: a. Those with an integrating conflict management style will be less likely to be targets of workplace incivility. b. Those with a dominating conflict management style will be more likely to be targets of workplace incivility. Compromising (c), avoiding (d) and accommodating (e) conflict style were not found to predict being targets of workplace incivility. However, compromising conflict style was associated to workplace incivility as target. F3: Workplace incivility as target and instigator relate positively (H3).	F1 a: ß = - .27 b: ß = .20 c: r = - .24 F2 a: ß = - .29 b: ß = .11 c: r = - .20 F3: r = .56	No serious limitation	D
Van den Brande, 2016	systematic review of mostly cross-sectional and some longitudinal studies k = 42	various	Examines the role of work stressors, coping strategies and coping resources in the process of workplace bullying: 1. Role conflict, workload, role ambiguity, job insecurity and cognitive demands were found to be the most relevant stressors with respect to workplace bullying, based on their total weight of relevance. 2. Reappraisal coping, confrontive coping, practical coping, direct coping, active coping, social support (i.e. problem-focused coping strategies) and selfcare (i.e. emotion-focused coping strategy) decrease (i.e. buffer-effect) the relationship between work stressors and workplace bullying, while wishful thinking, emotional coping, avoidance, recreation, social support and suppression (i.e. emotion-focused coping) increase this relationship. 3. Locus of control, self-efficacy, optimism (as opposed to pessimism), co-workers support, supervisor support, low task complexity, participation in decision-making, autonomy and continuance commitment as coping resources that may influence coping strategies. Specifically, we might expect that coping resources are positively associated with problem focused coping strategies, and negatively associated with emotion focused coping strategies.	only the effect sizes from individual studies are reported (no pooled ES are provided)	quality of the included studies was not assessed uses vote counting	B/C

Zhang, 2016	meta-analysis, includes some longitudinal studies k = 74 n = 30,063	various	Study examines antecedents of abusive supervision: H1a. Abusive supervision is positively related to stressors that produce a negative affective state (a. supervisors' negative experiences, b. supervisors' negative affect, c. supervisor stress, and d. lack of interactional and procedural justice). H1b. Abusive supervision is positively related to destructive leadership (a. authoritarian leadership style and b. unethical leadership) but negatively related to constructive leadership (c. ethical leadership, d. supportive leadership and e. transformational leadership). H1c. Abusive supervision is related to a) emotional intelligence, but not to b) supervisors' power and c) Machiavellianism. H2. Abusive supervision will be positively related to a negative a) organisational climate (aggressive norm), but negatively related to a b) positive organisation climate (organisational sanctions against aggression). H3. Abusive supervision is related to sub-ordinates' traits (a. stability, b. cynical attribution, c. negative affectivity, d. power distance, e. supervisor directed attribution, f. traditionalism, g. political skill, h. narcissism, i. neuroticism, j. conscientiousness, k. extraversion and l. agreeableness). H4. Demographic characteristics of supervisors and sub-ordinates (a. supervisors' age, b. sub-ordinates' age, c. sub-ordinates' organisational tenure, d. working time with supervisors and e. gender dissimilarity between sub-ordinates and supervisors) are related to abusive supervision.	H1a-a. r = .28 H1a-b. r = .33 H1a-c. r = .16 H1a-d. r = -.43 H1a-e. r = -21 H1b-a. r = .49 H1b-b. r = .58 H1b-c. r = -.57 H1b-d. r = -.53 H1b-e. r = -.45 H1c-a. r = -.43 H1c-b. r = ns H1c-c. r = ns H2a. r = .38 H2b. r = -.32 H3a. r = -.08 H3b. r = .13 H3c. r = .32 H3d. r = .26 H3e. r = .39 H3f. r = -.14 H3g. r = .21 H3h. r = .32 H3i. r = .10 H3j. r = -.06 H3k. r = -.01 H3l. r = -.16 H4a. r = ns H4b. r = -.04 H4c. r = ns H4d. r = ns H4e. r = ns	large number of associations tested design of the included studies unclear quality of the included studies not assessed	B

Zhang, 2019	meta-analysis k = 427 n = 336,236	various	Study examines the mediators between abusive supervision and its consequences. H1a. Organisational justice mediates the negative relationship between abusive supervision and employee OCB. H1b: Organisational justice mediates the positive relationship between abusive supervision and employee CWB. H2a: Work stress mediates the negative relationship between abusive supervision and employee OCB. H2b: Work stress mediates the positive relationship between abusive supervision and employee CWB. H3a: Relative to work stress, organisational justice better explains why abusive supervision influences employee OCB. H3b: Relative to organisational justice, work stress better explains why abusive supervision influences employee CWB. H4a: Masculinity/femininity moderates the negative relationship between abusive supervision and employee OCB such that the relationship is stronger in masculine cultures. H4b: Masculinity/femininity moderates the positive relationship between abusive supervision and employee CWB such that the relationship is stronger in masculine cultures.	only unstandardised coefficients are reported Zero order correlations: AS = Abusive Superv. DJ= Distributive Justice PJ = Procedural Justice IJ = Interactive Justice WS = Work stress AS – OCB: r = -.17 CI 95% = -24, -09 AS – CWB: r = -.37 CI 95% = .30, .42 AS – DJ: r = -.31 CI 95% = -.40, -.33 AS – PJ: r = -.34 CI 95% = -.44, -.33 AS – IJ: r = -.51 CI 95% = -60, -.42 AS – WS: r = .37 CI 95% = .19, .53	design and quality of included studies not reported	C

Excluded studies

Author & year	Reason for exclusion
Arab, 2013	Only the abstract is available in English, the rest of the text is in Persian.
Dhanani, 2009	Traditional literature review, focusses on vicarious mistreatment rather than mistreatment as such.
Waldman, 2018	Neurological study, findings are not relevant (especially F2-F4) as it's hard to translate the findings into applicable recommendations.





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Any enquiries in relation to the content of this REA should be directed to CEBMa through their website: www.cebma.org

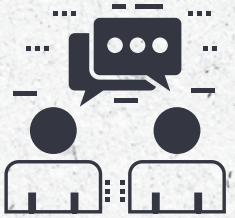






EXECUTIVE SUMMARY

Rapid Evidence Assessment (REA)



ANTECEDENTS* OF WORKPLACE INCIVILITY

a summary of scientific literature

January 2020

Culture Review **Implementation**

our journey of positive change

ACT Government

***For the purposes of this REA 'antecedents' refers to the 'drivers' that may cause workplace incivility.**

This REA was produced by the Center for Evidence Based Management (CEBMa). The ACT Government acknowledges and thanks the CEBMa for allowing ACT Health to reproduce and redesign the content of their REA.

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Acknowledgement of Country

ACT Health Directorate acknowledges the Traditional Custodians of the land, the Ngunnawal people. The Directorate respects their continuing culture and connections to the land and the unique contributions they make to the life of this area. It also acknowledges and welcomes Aboriginal and Torres Strait Islander peoples who are part of the community we serve.

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What is a Rapid Evidence Assessment (REA)?



Rapid Evidence Assessments (REAs) use a specific research methodology to comprehensively identify the most relevant studies on a given topic, and select appropriate studies based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and as a result, the likelihood of bias is considerably smaller.

Background

Over the past 20 years it has become clear that workplace incivility negatively affects a large percentage of workers (Hodgins, 2014). It is estimated that three to four percent of workers experience serious bullying, between nine and 15 percent of workers experience occasional bullying, and at least 10 to 20 percent experience negative social behaviour at work (Zapf, 2011). The British Workplace Behaviour Survey found that one-third of a nationally representative sample, experiences some form of workplace incivility (Fevre, 2012). Similarly, in Australia over one-third of workers report being sworn or yelled at while at work, and almost one quarter reporting having been humiliated in front of others (Dollard, 2012). All of these numbers show that workplace incivility is common. In late 2019 the ACT Government through the ACT public health system, in partnership with the ANU Research School of Management, approached the Center for Evidence-Based Management, recognised as a world authority, to conduct a REA of the most trustworthy scientific research on workplace incivility to determine the impact and antecedents of workplace incivility in teams and organisations.

What this REA assesses

This REA answers the following questions:

1. **What is workplace incivility?**
2. **What is the impact of workplace incivility on organisational outcomes?**
3. **What are the antecedents of workplace incivility?**
4. **What interventions effectively address workplace incivility?**

Main findings

1. What is workplace incivility?

The research literature revealed many terms used to define workplace incivility, with some authors arguing that it 'appears under many different labels, with each label referring to the same overall construct (Bowling, 2006).

The term 'workplace incivility' encompasses a range of inappropriate and unprofessional work behaviours that vary in intent, frequency and severity. It includes:

- **Low intensity deviant acts**, such as rude verbal and non-verbal behaviours taken towards another employee with ambiguous intent to harm.
- **Social undermining** – behaviour that is enacted over time to hinder a person's ability to establish and maintain interpersonal relationships, achieve work successes and negatively impacts their professional reputation.
- **Bullying** – repeated instances of a person being subjected to negative acts, including constant abuse, harassment, offensive remarks or teasing, ridicule or social exclusion, conducted by co-workers or supervisors.
- **Abusive supervision** – sustained display of hostile verbal and non-verbal behaviours, excluding physical contact, by a supervisor or manager to their staff member.
- **Interpersonal conflict** – an organisational stressor involving disagreements between employees.

2. What is the impact of workplace incivility on organisational outcomes?

This REA reveals that workplace incivility is related to many attitudinal, behavioural, and health-related outcomes, such as reduced self-esteem, life and job dissatisfaction, reduced work performance and organisational commitment, anxiety, depression, burn-out, negative emotions, increased employee turnover, and a range of physical symptoms.

Results from a systematic review of 66 samples shows that workplace incivility that involves supervisors has the strongest impact on attitudinal and behavioural outcomes, whereas there was no relevant difference between supervisor and co-worker incivility for health-related outcomes (Hershcovis, 2010)

Workplace incivility does not only directly affect victims, but its consequences also extends to the team level, affecting employees who observe or become aware of others being mistreated (Escartin, 2016). Several studies indicate the presence of a contagion effect where uncivil behaviour of peers and supervisors is related to negative behaviours from employees through trickle-down (superiors) and trickle sideways (peers) effects (Aube, 2014; Mawritz, 2012). In addition, it was

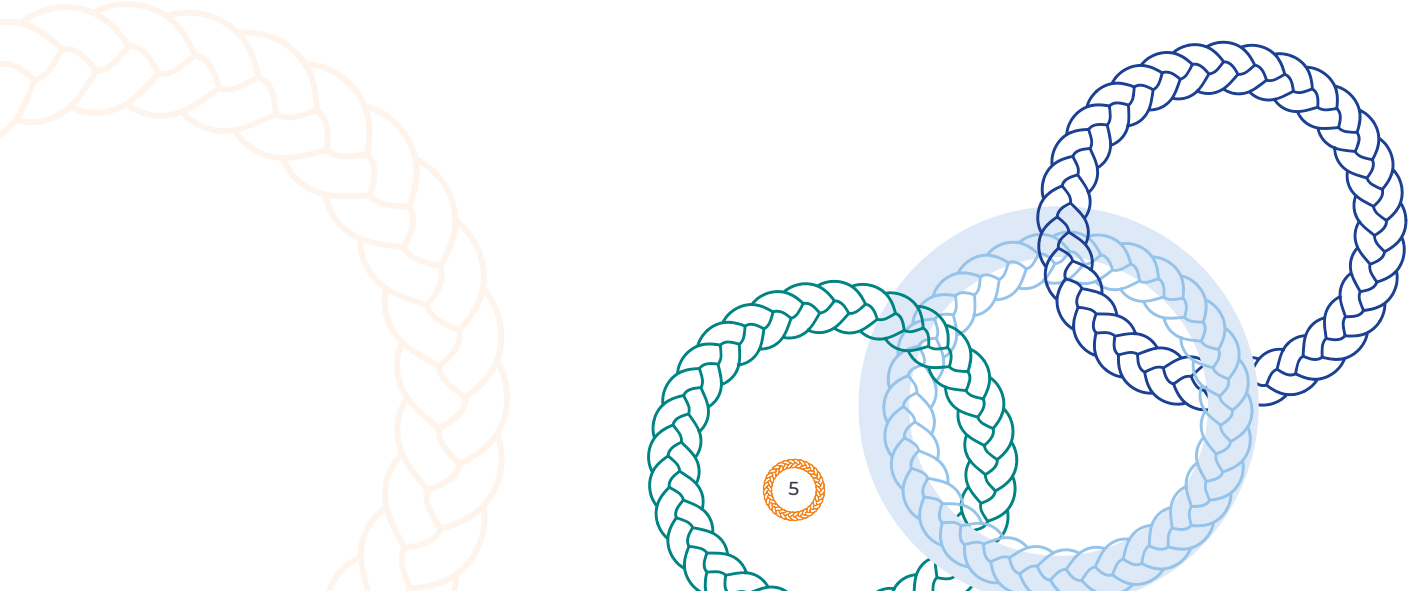
found that being the target of aggression increases the likelihood of engaging in aggression (Glomb, 2010). A recent meta-analysis of 70 studies indicated that abusive supervision, in turn, may lead to 'employee deviance', defined as a 'broad range of behaviours that violate significant organisational norms and in so doing threaten the well-being of an organisation, its members or both' (Park, 2019). This deviant behaviour may be focused on the supervisor, co-workers, or the organisation as a whole, depending on who the employee considers to the responsible party.

3. What are the antecedents of workplace incivility?

Following are the most important antecedents to focus upon as they are based on effect sizes and can contribute to workplace incivility in teams and organisations:

Leadership related antecedents

- **Leadership style** – leaders perceived by their employees as authoritarian, autocratic, unethical, or having a laissez-fair type of leadership style are more likely to display abusive behaviour and also induce workplace incivility in others (Chadwick, 2017; Hoel, 2010; Zhang, 2016). Conversely, leaders perceived as constructive, ethical, fair, supportive or having a participatory style of leadership, are less likely to display abusive supervision and tend to have an inhibitory influence on workplace incivility (Hauge, 2011; Salin, 2015; Zhang, 2016).
- **Lack of people management skills** – A recent systematic review of 62 studies in the context of Australian healthcare organisations indicate that a lack of effective management skills is a significant factor contributing to workplace bullying, authoritarian management, and failure to address workplace incivility when it occurs (Chadwick, 2017). A possible explanation for this finding is that in some organisation's managers are promoted due mainly to their clinical and technical skills and competencies, even when they lack the relational and interpersonal skills required at more senior levels.
- **Stressors and negative affective states** – supervisors' interactions with higher organisational levels influence their affective state and their behaviour towards their teams (Zhang, 2016), suggesting a 'trickle down' effect. It was found that stressors such as negative experiences with higher management, conflicts with colleague's, or lack of organisational justice, produce a negative affective state, which in turn leads to mistreatment of team members. On the contrary, supervisors with more positive affective state will less likely display abusive behaviours towards their teams. For example, a study by Eissa and Lester (2017) indicated that negative emotional reactions such as frustration are more likely to increase abusive behaviour from leaders, managers, and supervisors. The same study found that role overload is an important source of supervisor's negative emotions. Conversely, supervisors that felt 'in control' will less likely display abusive behaviours (Courtrigh, 2016).



Employee related antecedents



- **Stressors and negative affective states** – high job demands, such as job stress, role or work overload and a poor physical work environment may lead to bullying, aggressive behaviour, harassment and other forms of workplace incivility (Bowling, 2006; Hershcovis, 2007). A study by Salin in 2015 revealed that employees with higher levels of job demands reported an almost four times higher risk of bullying than those with low job demands. Such stressors tend to produce negative affective states, which in turn have shown to increase the likelihood of interpersonal incivility and workplace aggression (Bowling, 2006; Reio, 2009, Van den Brande, 2016; Zhang, 2016).
- **Co-worker conflict and conflict management style** – several studies have revealed that co-worker conflicts is a strong predictor of interpersonal aggression (Agotnes, 2018; Baillien, 2016; Huage, 2007; Hershcovis, 2007). These findings suggest that workplace interpersonal aggression, such as bullying, should be viewed as the end state of a highly escalated and poorly managed conflict. The research literature on conflict behaviour notes the following conflict management styles: integrating (collaborating); dominating (competing or forcing); accommodating (obliging); avoiding; compromising. A cross-sectional study found that an integrating style of conflict management, involving problem solving and a willingness to explore and work with the other person to find options that will be mutually acceptable, is the most constructive of the five conflict management styles (Trudel, 2011). A dominating style was found to be the less constructive of the five styles. It was also found that employees who lack social skills in order to resolve organisational conflicts are more likely to be victims of workplace bullying (Moayed, 2006).
- **Job/role characteristics** – these are the most widely researched antecedents of workplace incivility. A large numbers of studies have found that role ambiguity and role conflict are strong antecedents of workplace harassment and bullying (Bowling, 2006; Hauge, 2011-2; Reknes, 2014). Role ambiguity refers to uncertainly about which actions to take in order to fulfil the expectations of one's work role, while role conflict arises when the different expectations and demands of one's work role are incompatible (Beehr, 1995). In fact, it was found that role ambiguity and role conflict together predicted more than 20 percent of the variance in workplace harassment (Bowling, 2006). Another antecedent of workplace incivility is work constraints: situational constraints, such as lack of resources, that interfere with employees' task performance and prevent them from doing their job effectively, leading to frustration and ultimately aggression. Meta-analyses suggest that work constraints may be even stronger antecedents of workplace incivility than role ambiguity and role conflict (Bowling, 2006; Hershcovis, 2007). Not surprisingly, job autonomy was found to have a moderating effect on workplace incivility (Baillien, 2011; Bowling, 2006).
- **Demographic characteristics and personality traits** – there was limited evidence that personality traits are antecedents of workplace incivility (Nielsen, 2015). However, some evidence was found that 'trait anger' (the predisposition to respond to situations with hostility) may be linked with workplace aggression. A possible

explanation may be that people high in trait anger are more likely to be easily provoked because of their tendency to perceive situations as frustrating (Hershcovis, 2011). This also applies to age, level of education, time in an organisation and ethnicity, except for gender. A systematic review in the realm of healthcare found that female junior doctors experience more bullying behaviours compared to male junior doctors (Samsudin, 2018). The authors suggest that a possible explanation is that 'men and women perceive workplace bullying differently, with men being more likely to perceive it as a particular management style, with women perceiving certain behaviours as threatening. Others argue that women who deviate from traditional roles may submit them to negative evaluations and increase the risk of experiencing bullying'.

Organisational antecedents

» **Organisational (in)justice** Research suggests that perceptions of fairness and justice in organisations can impact work incivility, particularly workplace aggression. When procedures and processes for decisions made are perceived as unfair (procedural injustice) employees can 'retaliate' by engaging in aggression against the organisation or the supervisor (Hoel, 2010). Similarly, employees who feel that the outcome (distribution) of a decision is unfair are likely to blame the source of the decision and therefore may 'retaliate' by engaging in supervisor- and organisation-targeted aggression (Glomb, 2010; Hershcovis, 2007). Research suggests that perceptions of fairness and justice in organisations can impact work incivility, particularly workplace aggression. When procedures and processes for decisions made are perceived as unfair (procedural injustice) employees can 'retaliate' by engaging in aggression against the organisation or the supervisor (Hoel, 2010). Similarly, employees who feel that the outcome (distribution) of a decision is unfair are likely to blame the source of the decision and therefore may 'retaliate' by engaging in supervisor- and organisation-targeted aggression (Glomb, 2010; Hershcovis, 2007).

» **Hierarchical structures** -workplace incivility tends to occur in organisations with hierarchical management structures, high work pressure, and few policies. A recent systematic review of 62 studies in the context of Australian healthcare organisations found that interpersonal hierarchical bullying was more prevalent with professions with high power disparity (Chadwick, 2017).



4. What interventions effectively address workplace incivility?

Only a limited number of studies on the effectiveness of interventions designed to reduce workplace incivility have been published. Below is an overview of the main findings from systematic reviews of high quality (controlled before and after) studies:

- The development, implementation, and evaluation of a program addressing workplace incivility should be consistent. This consistency could be achieved through implementation of a single method program across the organisation (Stagg, 2010).
- Involving employees in the design and implementation of the intervention, drawing on their experiences, gives them a sense of agency and ownership, which is more likely to be successful than when employees are passive recipients of an intervention (Hodgins, 2014).
- Multi-component, organisational level interventions – focusing on individual behaviours, in a group context, and including actions to ensure visible management commitment – appear to be more effective than single level interventions (Hodgins, 2014).
- A combination of the three following elements is recommended by Armstrong (2018), Escartin (2016), and Stagg (2010): education about workplace incivility; training related to effective responses to workplace incivility; and finally, an opportunity to practice those responses in a safe environment appears to be an effective approach to assisting employees in managing workplace incivility.

Conclusion

The studies reviewed in this REA clearly demonstrate that workplace incivility constructs such as bullying, aggression, and abusive supervision have a profound, negative impact on a wide range of organisational outcomes. In addition, the findings from this REA indicate that workplace incivility is symptomatic of broader issues within organisations. In fact, workplace incivility may be more about leadership and organisational issues as well as interpersonal relationships within organisations.

More information

You can access more information in the *Rapid Evidence Assessment (REA) Antecedents of Workplace Incivility, a summary of scientific literature, January 2020.*

References

Ågotnes, K. W., Einarsen, S. V., Hetland, J., & Skogstad, A. (2018). The moderating effect of laissez-faire leadership on the relationship between co-worker conflicts and new cases of workplace bullying: A true prospective design. *Human Resource Management Journal, 28*(4), 555-568.

Armstrong, N. (2018). Management of Nursing Workplace Incivility in the Health Care Settings: A Systematic Review. *Workplace Health & Safety, 66*(8), 403-410.

Aubé, C., & Rousseau, V. (2014). Counterproductive behaviours. *Team Performance Management; 20* (5/6): 202–220.

Baillien, E., De Cuyper, N., & De Witte, H. (2011). Job autonomy and workload as antecedents of workplace bullying: A two-wave test of Karasek's Job Demand Control Model for targets and perpetrators. *Journal of Occupational & Organisational Psychology, 84*(1), 191-208.

Beehr, T. A. (1995). *Psychological stress in the workplace.* London: Routledge.

Bowling, N. A., & Beehr, T. A. (2006). Workplace harassment from the victim's perspective: a theoretical model and meta-analysis. *Journal of Applied Psychology, 91*(5), 998.

Chadwick, S., & Travaglia, J. (2017). Workplace bullying in the Australian health context: a systematic review. *Journal of Health Organisation and Management, 31*(3), 286-301.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences (2nd ed.).* Hillsdale, NJ: Lawrence Earlbaum Associates.

Courtright, S. H., Gardner, R. G., Smith, T. A., McCormick, B. W., & Colbert, A. E. (2016). My family made me do it: A cross-domain, self-regulatory perspective on antecedents to abusive supervision. *Academy of Management Journal, 59*(5), 1630-1652.

De Dreu, C. K. (2008). The virtue and vice of workplace conflict: Food for (pessimistic) thought. *Journal of Organisational Behaviour: The International Journal of Industrial, Occupational and Organisational Psychology and Behaviour, 29*(1), 5-18.

Demir, D., Rodwell, J., & Flower, R. L. (2014). Antecedents and consequences of workplace aggression in the allied health context. *Social Work in Health Care, 53*(3), 250-267.

Dollard, M., Bailey, T., McLinton, S., Richards, P., McTernan, W., Taylor., A. and Bond, S. (2012), The *Australian Workplace Barometer: Report on Psychosocial Safety Climate and Worker Health in Australia,* Safe Work Australia, Canberra.

Escartín, J. (2016). Insights into workplace bullying: Psychosocial drivers and effective interventions. *Psychology Research and Behaviour Management, 9.*

Einarsen, K., Salin, D., Einarsen, S. V., Skogstad, A., & Mykletun, R. J. (2019). Antecedents of ethical infrastructures against workplace bullying. *Personnel Review, 48*(3), 672-690.

Eissa, G., & Lester, S. W. (2017). Supervisor role overload and frustration as antecedents of abusive supervision: The moderating role of supervisor personality. *Journal of Organisational Behaviour, 38*(3), 307-326.

Fiset, J., Robinson, M. A., & Saffie-Robertson, M. C. (2019). Masking wrongs through brilliance: the moderating effect of vision on the relationship between abusive supervision and employee outcomes. *European Journal of Work and Organisational Psychology, 28*(6), 756-768.

Fevre, R., Lewis, D., Robinson, A. and Jones, T. (2012), *Trouble at Work,* Bloomsbury Academic, London.

Glomb, T. M. (2010). Predicting workplace aggression: Reciprocal aggression, organisational, and individual antecedents. *International Journal of Organisation Theory and Behaviour, 13*(2), 249-291.

Griffin, M. (2004). Teaching cognitive rehearsal as a shield for lateral violence: An intervention for newly licensed nurses. *The Journal of Continuing Education in Nursing, 35*(6), 257-263.

Griffin, M., & Clark, C. M. (2014). Revisiting cognitive rehearsal as an intervention against incivility and lateral violence in nursing: 10 years later. *The Journal of Continuing Education in Nursing, 45*(12), 535-542.

Hauge, L. J., Einarsen, S., Knardahl, S., Lau, B., Notelaers, G., & Skogstad, A. (2011). Leadership and role stressors as departmental level predictors of workplace bullying. I*nternational Journal of Stress Management, 18*(4), 305-323.

Hauge, L. J., Skogstad, A., & Einarsen, S. (2011). Role stressors and exposure to workplace bullying: Causes or consequences of what and why? *European Journal of Work and Organisational Psychology, 20*(5), 610.

Hershcovis, M. S., Turner, N., Barling, J., Arnold, K. A., & et al. (2007). Predicting Workplace Aggression: A Meta-Analysis. J*ournal of Applied Psychology, 92*(1), 228.

Hershcovis, M. S., & Barling, J. (2010). Towards a multi-foci approach to workplace aggression: A meta-analytic review of outcomes from different perpetrator. J*ournal of Organisational Behaviour, 31*(1), 24.

Hershcovis, M. S. (2011). "Incivility, social undermining, bullying…oh my!": A call to reconcile constructs within workplace aggression research. *Journal of Organisational Behaviour, 32*(3), 499.

Hodgins, M., MacCurtain, S., & Mannix-McNamara, P. (2014). Workplace bullying and incivility: a systematic review of interventions. *International Journal of Workplace Health Management, 7*(1), 54-72.

Hoel, H., Glasø, L., Hetland, J., Cooper, C. L., & Einarsen, S. (2010). Leadership Styles as Predictors of Self-reported and Observed Workplace Bullying. *British Journal of Management, 21*(2), 453-468.

Hoel H, Sheehan MJ, Cooper CL, Einarsen S. Organisational effects of workplace bullying. In: Einarsen S, Hoel H, Zapf D, Cooper CL, editors. *Workplace Bullying: Developments in Theory, Research and Practice. London & New York: Taylor & Francis; 2011*:129–148.

Mawritz, M. B., Mayer, D. M., Hoobler, J. M., Wayne, S. J., & Marinova, S. V. (2012). A trickle-down model of abusive supervision. *Personnel Psychology, 65*(2), 325-357.

McTernan WP, Dollard MF, LaMontagne AD. Depression in the workplace: an economic cost analysis of depression-related productivity loss attributable to job strain and bullying. *Work Stress. 2013;27*(4):321–338.

Moayed, F. A., Daraiseh, N., Shell, R., & Salem, S. (2006). Workplace bullying: a systematic review of risk factors and outcomes. *Theoretical Issues in Ergonomics Science, 7*(3), 311-327.

Nielsen, M. B., & Knardahl, S. (2015). Is workplace bullying related to the personality traits of victims? A two-year prospective study. *Work & Stress, 29*(2), 128-149.

Park, H., Hoobler, J. M., Wu, J., Liden, R. C., Hu, J., & Wilson, M. S. (2019). Abusive Supervision and Employee Deviance: A Multifoci Justice Perspective. *Journal of Business Ethics, 158*(4), 1113-1131.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: an introduction to assessing study quality. *Systematic reviews in the social sciences: A practical guide, 125-163.*

Reio Jr, T. G., & Ghosh, R. (2009). Antecedents and outcomes of workplace incivility: Implications for human resource development research and practice. *Human Resource Development Quarterly, 20*(3), 237-264.

Reknes, I., Einarsen, S., Knardahl, S., & Lau, B. (2014). The prospective relationship between role stressors and new cases of self-reported workplace bullying. *Scandinavian Journal of Psychology, 55*(1), 45-52.

Salin, D. (2015). Risk factors of workplace bullying for men and women: The role of the psychosocial and physical work environment. *Scandinavian Journal of Psychology, 56*(1), 69-77.

Samsudin, E. Z., Isahak, M., & Rampal, S. (2018). The prevalence, risk factors and outcomes of workplace bullying among junior doctors: a systematic review. *European Journal of Work and Organisational Psychology, 27*(6), 700.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference. Houghton, Mifflin and Company.*

Shaughnessy, J. J., & Zechmeister, E. B. (1985). *Research methods in psychology.* Alfred A. Knopf.

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: interpersonal conflict at work scale, organisational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of occupational health psychology, 3*(4), 356.

Stagg, S. & Sheridan, D. (2010). Effectiveness of Bullying and Violence Prevention Programs: A Systematic Review. *AAOHN Journal, 58*(10), 419-424.

Tepper, B. J. (2000). Consequences of abusive supervision. *Academy of Management Journal, 43,* 178–190.

Trudel, J., & Reio, T. G., Jr. (2011). Managing workplace incivility: The role of conflict management styles—Antecedent or antidote? *Human Resource Development Quarterly, 22*(4), 395-423.

Van den Brande, W., Baillien, E., De Witte, H., Elst, T. V., & Godderis, L. (2016). The role of work stressors, coping strategies and coping resources in the process of workplace bullying: A systematic review and development of a comprehensive model. *Aggression and Violent Behaviour, 29,* 61-71.

Verkuil B, Atasayi S, Molendijk ML. Workplace bullying and mental health: a meta-analysis on cross-sectional and longitudinal data. *PLoS One. 2015;10*(8).

Yukl, G. A. (2006). Leadership in organisations. Upper Saddle River, NJ: *Pearson–Prentice Hall.*

Zapf, D., Escartin, J., Einarsen, S., Hoel, H. and Vartia, M. (2011), "Empirical findings on prevalence and risk groups of bullying in the workplace", in Einarsen, S. Hoel, H. Zapf, D. and Cooper, C.L. (Eds), *Bullying and Harassment in the Workplace, Taylor and Francis, London,* pp. 75-106.

Zhang, Y., & Liao, Z. (2015). Consequences of abusive supervision: A meta-analytic review. Asia Pacific *Journal of Management, 32*(4), 959-987.

Zhang, Y., & Bednall, T. (2016). Antecedents of Abusive Supervision: a Meta-analytic Review. *Journal of Business Ethics, 139*(3), 455-471.

Zhang, Y., Liu, X., Xu, S., Liu-Qin, Y., & Bednall, T. C. (2019). Why Abusive Supervision Impacts Employee OCB and CWB: A Meta-Analytic Review of Competing Mediating Mechanisms. *Journal of Management, 45*(6), 2474-2497.





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