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ORGANISATIONAL CLIMATE

An evidence review

Scientific summary

July 2022

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Organisational climate: an evidence review

Scientific summary

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Acknowledgements

This report was written by Eric Barends, Denise Rousseau and Emilia Wietrak of the Center for Evidence-Based Management (CEBMa) and Jonny Gifford of the CIPD. Please cite this report as: Barends, E., Rousseau, D., Wietrak, E. and Gifford, J. (2022) *Organisational climate: an evidence review*. Scientific summary. London: Chartered Institute of Personnel and Development.

This report and the accompanying practice summary are available at: cipd.co.uk/evidence-culture-climate

CEBMa
center for
Evidence-Based Management

1 Introduction

Rationale for this review

For decades organisational culture has been claimed to be an important driver of organisational success.[1] However, a recent rapid evidence assessment conducted by the Center for Evidence Based Management (CEBMa) has indicated that the empirical research on the link between organisational culture and performance has been hampered by numerous conceptual and methodological challenges, and that there is little evidence consistently linking organisational culture to performance (see accompanying scientific summary). Scholars have questioned whether organisational culture is useful as a focus for practitioners as the links to organisational outcomes are poorly established and organisational climate is more tractable and connected to managerial practices and policies (Schneider et al 1980). As such, both scholars and management practitioners have shifted their focus to the related construct of 'organisational climate'. To get a better understanding of its outcomes, antecedents and evidence base, the Chartered Institute of Personnel and Development (CIPD) approached CEBMa to undertake a review of the research literature on organisational climate.

Main question: What will the review answer?

What is known in the scientific literature about organisational climate?

Sub-questions that form the basis of the review:

1. What is meant by organisational climate?
2. What climate dimensions are there and what is their evidence base?

   Following consultation with HR leaders and an initial search of the literature, we prioritised:
   - safety or risk climate
   - innovation climate
   - learning climate
   - ethical climate
   - inclusion climate
   - trust climate
   - empowerment climate
   - leadership climate.

3. What are the outcomes and antecedents of these climate dimensions?
4. How can these climate dimensions be assessed?

[1] Compare Schein (2010).

2 Methods

Search strategy: How were the studies obtained?

To answer the review questions, the following databases were used to identify empirical studies on organisational climate: ABI/INFORM Global from ProQuest, Business Source Premier from EBSCO, and PsycINFO from Ovid. In addition, previous REAs conducted by CEBMa were screened to find additional relevant empirical studies on specific climate dimensions. The following generic search filters were applied to all databases during the search:

1. scholarly journals, peer-reviewed
2. published between 2000 and 2021
3. articles in English.

We conducted 40 different search queries, which yielded 700+ papers. An overview of all search terms and queries is provided in Appendix 1.

Selection: How were the studies selected?

Study selection took place in two phases. First, the titles and abstracts of the 700+ 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. Second, studies were selected based on a screening of their full text according to the following inclusion criteria.

1. types of studies: focusing on quantitative, empirical studies
2. measurement: only studies in which relationships between a climate dimension and its outcomes or antecedents were quantitatively measured
3. context: focusing on studies related to workplace settings
4. quality: only meta-analyses and longitudinal studies that were graded level C or higher, or studies that assess the psychometrical properties of a climate dimension scale.

This second phase yielded a total number of **16 meta-analyses** and **117 primary studies**. An overview of the selection process is provided in Appendix 2.

Data extraction: What data were extracted?

Data extraction involves the collation of the results of the studies included. From each study we extracted and interpreted information relevant to the review question, such as year of publication, research design, sample size, population (for example, industry, type of employees), possible moderators or mediators, main findings, effect sizes, and limitations. An overview of all studies included is in Appendix 3.

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

Often, it is possible to find a scientific study to either support or refute a given theory or claim. Thus, it is important to determine which studies are trustworthy (that is, valid and reliable) and which are not. The trustworthiness of a scientific study is first determined by its methodological appropriateness. To determine the methodological appropriateness of the included study's research design, the classification system of Shadish et al (2002), and Petticrew and Roberts (2006) was used. 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. Finally, the effect sizes were identified. An effect (for example, a correlation, Cohen's d or odd ratio) 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 – was assessed. For a detailed explanation of how the quality of included studies was judged, see CEBMa Guideline for Rapid Evidence Assessments in Management and Organisations (Barends 2017).

In this review, we list effect sizes reported in meta-analyses on the outcomes and antecedents of organisational climate. When no systematic reviews or meta-analyses were available for a particular dimension of climate, we searched for single studies. In these cases, we limited our assessment to what components the constructs comprised and whether there was scientific literature in support of those constructs – we did not assess effect sizes.

In reviewing climate scales, we assessed which scales are most widely used and whether studies assessing their psychometric qualities are available. We did not critically appraise the psychometric qualities of the studies of climate scales.

Purpose	Example	Study Design				
		RCT	CBA	C / BA	Cross	Qual
Effect, impact	Does A have an effect/impact on B? What are the critical success factors for A? What are the factors that affect B?	A	B	C	D	na
Association	Is A related to B? Does A often occur with B? Do A and B co-vary?	A	A	A	A	na
Frequency	How often does A occur? How many people prefer A?	na	na	na	A	na
Difference	Is there a difference between A and B?	na	na	A	A	na
Attitude, opinion	What is people's attitude toward A? Are people satisfied with A? Do people agree with A?	na	na	na	A	C
Experience, perceptions, feelings, needs	What are people's experiences with A? What are people's feelings about A? What are people's perceptions about A?	na	na	na	B	A
Exploration, theory building	Why does A occur? Why is A different from B? In what context does A occur?	na	na	na	B	A

RCT = Randomized controlled trial; CBA = Non-randomized controlled before-after study; C = Controlled study; BA = Before-after study; Cross = cross-sectional study; Qual = Qualitative study; na = not appropriate

3 Main findings

Question 1: What is meant by organisational climate?

Finding 1: Although various definitions of 'organisational climate' exist, most converge on two key elements: shared employee perceptions and observable aspects of the work environment.

Before culture became a topic of interest to management researchers in the late 1970s, industrial-organisational psychologists were already focusing on the topic of 'organisational climate'. Kurt Lewin (1939) used social climate to talk about the psychological effect leaders have on followers. In 1968, Litwin and Stringer wrote a paper proposing that employee perceptions of properties of the work environment such as decision autonomy, organisational structure, supportive supervision, conflict, and concern for employee welfare could affect employee motivation and behaviour. The authors labelled this construct 'organisational climate'. Since then, numerous studies on the impact of climate on organisational outcomes have been published. Despite a wide range of publications, there seems to be strong consensus of what organisational climate entails.[2]

Although various definitions are available, organisational climate is typically defined as *'the shared perceptions of and the meaning attached to the policies, practices and procedures employees experience'*.[3] All of this relates to typical behaviour in an organisation: policies give the formal infrastructure, procedures give written statements that describe required behaviours, and practices describe actual behaviour. Climate is the shared experiences of these things – that is to say, it is not the formal requirements themselves that matter but, rather, how they are seen to 'hit the ground' in reality.

Historically, climate was a measure using a diverse array of dimensions under the broad umbrella of climate (consistent with the initial approach taken by Litwin and Stringer (1968)); more recently, climate researchers tend to agree that organisational climate is best conceptualised in terms of specific dimensions or themes relevant to organisational practices. This means that rather than focus on climate in general, researchers focus on a climate for X, as in *safety* climate or *inclusive* climate.[4]

Contrary to the concept of culture, climate concerns employees' *perceptions of observable aspects of the work environment* typically regarding a specific business problem or organisational goal, such as safety, trust, or innovation. In addition, scholars consider climate as a major contributing factor to organisational culture, aside from the role of national culture.[5]

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[2] Denison (1996); Chatman and O'Reilly (2016); Schneider et al (2013).
[3] Schneider et al (2013).
[4] Schneider et al (2013).
[5] Schneider et al (1996); Schneider et al (2013).

As we address the specific forms that climate can take, it is important to keep in mind a key feature of climate. An organisation's climate (or a team's or a department's) is considered 'strong' when two criteria are met: (1) there is agreement on a specific dimension of climate as perceived by members, and (2) the organisation is perceived to score at a high (rather than low) level on that dimension.

Question 2: What climate dimensions are there and what is their evidence base?
Question 3: What are the outcomes and antecedents of these climate dimensions?
Question 4: How can these climate dimensions be assessed?

Finding 2: Many climate dimensions have been identified; several are shown to be strong predictors of organisational outcomes.

Research has demonstrated that certain climate dimensions are strong predictors of related performance outcomes.[6] Based on a review of the literature, we identified the following climate dimensions as supported by numerous (50+) empirical studies and meta-analyses.

Safety climate

'Safety climate' refers to the shared perceptions of organisational members regarding workplace safety and whether it is prioritised.[7] High-risk industries such as aviation, nuclear energy, the offshore oil industry, and hospitals pay considerable attention to assessing safety concerns. Driven by the awareness that organisational, managerial, and human factors rather than technical failures are prime causes of accidents, these industries frequently evaluate the organisation's safety climate. Not surprisingly, safety climate is the most researched climate dimension, and several validated safety climate scales are available.[8]

Components

Safety climate refers to employee perceptions of their organisation's policies, procedures, and practices regarding workplace safety. As well as the perceived safety of behaviour, its sub-components include various factors that play an important role in this, including employees' views of: whether people are blamed or punished for mistakes in their organisation; whether their organisation learns from mistakes; whether colleagues support other teams when they have high workloads. Some scholars differentiate safety climate into *psychological safety climate*[9] (individual perceptions of the organisation's

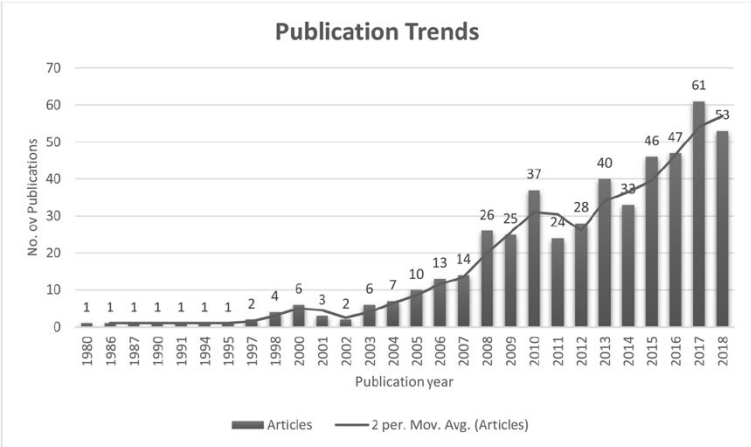
[6] Ehrhart et al (2014).
[7] Zohar (1980).
[8] For example, Alsalem et al (2018); Zohar (2000).
[9] The term 'psychological safety climate' here refers to the individual or psychological aspects of *safety climate*; it does not describe a climate of *psychological safety* as researched by Amy Edmondson (1999) and others.

policies, practices, and procedures regarding personal workplace safety) and *group safety climate* (group-level perceptions of the organisation's policies, practices, and procedures regarding group-level workplace safety).

Outcomes

A positive safety climate provides employees with cues that safe behaviours and outcomes are supported, expected, and rewarded in the workplace.[10] Indeed, numerous empirical studies have demonstrated that a positive safety climate leads to fewer workplace accidents. For example, meta-analyses have shown that safety climate, particularly at the group level, strongly predicts accidents, injuries, psychological wellbeing, safety motivation, safety compliance (for example, obeying safety regulations, following correct procedures), and safety participation (for example, helping co-workers resolve safety problems, making suggestions to improve safety).[11]

Figure 1: Publishing trends in safety climate research



(Bamel, 2020)

Antecedents

Research has demonstrated that management commitment, supervisory support, work pressure, job autonomy, job demands, reporting/speaking up, safety attitude and communication/feedback are antecedents or drivers of a strong safety climate and offer a robust prediction of safety outcomes across industries and countries.[12]

Measures

There are many scales available that measure safety climate at the individual and/or group level; most of them have good psychometric properties. Examples are the Organisational and Safety Climate Inventory (OSCII)[13] and the Nordic Safety Climate

[10] Jiang et al (2019).
[11] For example, Beus (2010); Christian et al (2009); Clarke (2010); Jiang et al (2019).
[12] Clarke (2013); Jiang et al (2019); Leitão and Greiner (2016); Schneider et al (2017); Christian et al (2009).
[13] OSCII (Silva 2004).

Questionnaire.[14]

Figure 2: Items of the OSCII (Silva et al 2004)

8. Staff feel like their mistakes are held against them	☐1	☐2	☐3	☐4	☐5
9. Mistakes have led to positive changes here	☐1	☐2	☐3	☐4	☐5
10. It is just by chance that more serious mistakes don't happen around here	☐1	☐2	☐3	☐4	☐5
11. When one area in this unit gets really busy, others help out	☐1	☐2	☐3	☐4	☐5
12. When an event is reported, it feels like the person is being written up, not the problem	☐1	☐2	☐3	☐4	☐5
13. After we make changes to improve patient safety, we evaluate their effectiveness	☐1	☐2	☐3	☐4	☐5
14. We work in "crisis mode" trying to do too much, too quickly	☐1	☐2	☐3	☐4	☐5
15. Patient safety is never sacrificed to get more work done	☐1	☐2	☐3	☐4	☐5
16. Staff worry that mistakes they make are kept in their personnel file	☐1	☐2	☐3	☐4	☐5

Innovation climate

Whether or not successful innovation occurs within an organisation is determined by a combination of personal qualities and work environment factors.[15] Psychological research has identified several personality traits related to the creativity of employees.[16] These traits, however, may be difficult to influence. For this reason, it is important that an organisation creates a work environment in which creativity and innovation are fostered (innovation climate).

Components

Innovation climate (also termed 'climate for innovation' or 'innovation-supportive climate') refers to the shared perceptions at the team (or organisational) level as to the extent to which team (or organisational) processes encourage and enable innovation.[17] It includes employees' perceptions of whether people in their organisation are open to change, support new ideas, desire new ideas, take time to develop ideas, and co-operate with others to develop and apply new ideas.

Outcomes

Several studies have found that a positive innovative climate enhances employees' innovative behaviours, as well as their adaptive performance – their ability to solve problems creatively, dealing with uncertain or unpredictable work situations, learning new

[14] NOSACQ-50 (Kines et al 2011).
[15] West and Richards (1999).
[16] See, for example, Xu et al (2019).
[17] Anderson and West (1996).

tasks, technologies and procedures, and handling work stress.[18] In addition, it was found that innovation climate also affects a team's knowledge-sharing, mutual support, communication, as well as individual team members' commitment, satisfaction, and general wellbeing.[19]

Antecedents

Longitudinal studies have indicated that when leaders establish high-quality interactions with their subordinates – offering them sufficient resources and a high level of confidence, support, and autonomy – these efforts contribute to the development of a strong innovative climate.[20] In addition, it was found that leadership style (authentic, transformational, servant) and a work environment that is open to change and constructive in response to errors positively affects an organisation's climate for innovation.[21] Finally, it was found that team process variables such as vision, internal communication, support for innovation, task orientation and cohesion displayed strong relationships with innovation.[22]

Measures

There are many scales that aim to measure innovative climate. Among the most widely used questionnaires are the Inventory of Organisational Innovativeness[23] and the Team Climate Inventory.[24] Another widely used scale is the shortened (14-item) version of the Team Climate Inventory (TCI) developed by Kivimäki and Elovainio (1999).

Figure 3: Items of the shortened version of the TCI (Kivimäki and Elovainio 1999)

3. Support for innovation
   - Team members provide practical support for new ideas and their application
   - In this team we take the time needed to develop new ideas
   - This team is always moving towards the development of new answers
   - The team is open and responsive to change
   - Assistance in developing new ideas is readily available
   - People in this team are always searching for fresh, new ways of looking at problems
   - People in the team cooperate in order to help develop and apply new ideas
   - Members of the team provide and share resources to help in the application of new ideas

Learning climate

In the scientific literature, employee learning is viewed as a key component in providing

[18] For example, Anderson and West (1996); Newman (2020); Stanczyk (2017).
[19] Newman (2020).
[20] For example, Tafvelin et al (2019); Tordera and González-Romá (2013); Tordera et al (2020).
[21] Newman (2020); Hülsheger et al (2009).
[22] Hülsheger et al (2009).
[23] IOI (Tang 1998).
[24] TCI (Anderson and West 1996).

organisations an advantage in competitive environments.[25] Over recent decades, studies of workplace learning have mainly focused on predictors of employee learning activities, defining typologies of workplace learning, and on studying the organisational outcomes of employee learning. Less attention has been paid to the organisational conditions that stimulate (or hamper) employee learning, such as the organisation's learning climate. As a result, only a limited number of (mainly cross-sectional) studies on organisational learning climate are available, indicating that the evidence base for this climate dimension is scarce in both quantity and quality.

Components

Learning climate is employees' perceptions of organisational policies and practices aimed at facilitating, rewarding and supporting employee learning behaviour.[26] Its components include whether employees perceive that they have training and resources that facilitate learning and make learning appealing, that learning is appreciated and rewarded in their organisation, and whether people are fearful of making mistakes (a negative influence).

Outcomes

Several authors suggest that a strong learning climate produces innovative ideas in employees, fosters an empowering work environment, and professionally facilitates employees to cope with work challenges.[27] Indeed, several cross-sectional studies have shown that learning climate is associated with employees' learning intentions, positive attitudes towards learning, and participation in learning activities.[28] In addition, several studies indicate that learning climate is an important predictor of innovative behaviour, turnover intentions, and work stress.[29]

Antecedents

This review did not find longitudinal studies on antecedents of learning climate in a workplace setting.

Measures

Widely used questionnaires that aim to measure learning climate are the Dimensions of the Learning Organisation Questionnaire (DLOQ) developed by Yang et al (2004), and the Learning Climate Scale (LCS) developed by Nikolova et al (2014).

Figure 4: Items of the Learning Climate Scale (Nikolova et al 2014)

Dimensions and items
Facilitation learning climate
My organization provides appealing educational facilities (resources)
My organization provides sufficient resources to develop my competences
In my organization, one receives the trainings he/she needs
Appreciation learning climate
In my organization, employees who continuously develop themselves professionally, are being rewarded
Employees get quickly promoted here, if they engage in continuous professional development
In my organization, employees who make effort to learn new things, earn appreciation and respect
Error avoidance learning climate
In my organization, one is afraid to admit mistakes
In my organization, employees do not dare to discuss mistakes
In my organization, employees are anxious to openly discuss work-related problems

Ethical climate

An organisation's ethical climate circumscribes employees' shared perceptions of the organisation's norms for moral conduct and thus creates conditions where certain behaviours are tolerated (or not). Academics distinguish different types of ethical climates. An *egoistic* ethical climate emphasises self-interest with little attention given to the consequences of actions. In contrast, a *benevolent* ethical climate emphasises concern for others. Finally, a *principled* ethical climate emphasises rules, laws, and codes.

Components

Examples of components of ethical climate are the extent to which employees perceive that: standards, rules and laws are regarded as important in their organisation; other stakeholders are considered important as well as an organisation's own interests; people's personal ethics are respected; people look after others' as well as their own interests; and short-term results are all that matter (a negative influence).

Outcomes

A meta-analysis of 136 studies demonstrated that these types of ethical climate are differentially related with unethical behaviours. For example, it was found that egoistic climates were positively associated with unethical choices, whereas benevolent and principled climates were negatively associated with unethical choices.[30] In addition, a meta-analysis of 44 studies demonstrated that egoistic climates are associated with increases in dysfunctional behaviour, whereas benevolent and principled ethical climates are associated with decreases in dysfunctional behaviour.[31]

Antecedents

A meta-analysis of 134 studies found that leadership behaviour is an important antecedent (driver) of ethical climate – leaders that are perceived by their subordinates as unethical are negatively associated with an organisation's ethical climate. In addition, it was found that both transactional and transformational leadership are positively associated with ethical climate, but that transactional leaders are important in ensuring compliance with rules and regulations, whereas transformational leaders are primarily associated with encouraging employee participation in ethical behaviours.[32]

Measures

A scale that is widely used to measure types of ethical climate in an organisation is the Ethical Climate Questionnaire (ECQ) developed by Victor and Cullen (1993). This questionnaire has been shown to have good psychometric properties and is available in several languages. Another questionnaire that has been shown to have good predictive validity for ethical and unethical behaviours is the Ethical Climax Index (ECI) developed by Arnaud (2010).

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[30] Kish-Gephart (2010).
[31] Martin (2006).
[32] Clarke (2013).

Figure 5: Items of the Ethical Climate Questionnaire (Victor 1993)

7. It is very important to follow strictly the company's rules and procedures here.
8. Work is considered sub-standard only when it hurts the company's interests.
9. Each person in this company decides for himself what is right and wrong.
10. In this company, people protect their own interest above other considerations.
11. The most important consideration in this company is each person's sense of right and wrong.
12. The most important concern is the good of all the people in the company.
13. The first consideration is whether a decision violates any law.
14. People are expected to comply with the law and professional standards over and above other considerations.
15. Everyone is expected to stick by company rules and procedures.
16. In this company, our major concern is always what is best for the other person.
17. People are concerned with the company's interests—to the exclusion of
18. Successful people in this company go by the book.
19. The most efficient way is always the right way, in this company.
20. In this company, people are expected to strictly follow legal or professional standards.

Inclusion climate

Inclusion refers to *'the individual's sense of being part of the organisational system in both the formal processes, such as access to information and decision-making channels, and the informal processes, such as "water cooler" and lunch meetings where information and decisions informally take place'*.[33]

Components

A 'climate' for inclusion refers to employees' shared perceptions of the organisation's policies, procedures and behaviour that lead to the acceptance of all employees.[34] Components can include whether employees feel that they are involved in decisions about their work or the organisation; that colleagues co-operate, share information and help each other; and that people feel isolated from their teams (negative influence).

Outcomes

The term 'inclusion' is often used in tandem with 'diversity', a term that is used to describe the composition of groups/teams or workforces. As such, it is considered to be a characteristic of groups that refers to (often demographic) differences among members. Management practitioners and scholars alike have long considered workforce diversity to have a positive impact on a wide range of organisational outcomes, such as organisational commitment, job satisfaction, and employee retention. However, empirical studies have found mixed results or even detrimental outcomes such as a lack of retention, decreased performance, task conflicts, miscommunication and decreased social integration.[35] This finding was confirmed by a recent meta-analysis of 30 studies demonstrating that workforce diversity is associated with both beneficial and detrimental

[33] Mor Barak (2011, p166).
[34] Nishii (2013).
[35] For example, Holmes et al (2021); McKay and Avery (2015).

effects on organisational outcomes, such as turnover, absenteeism, intention to leave, job stress, and mental health.[36]

Diversity management efforts, however, particularly those designed to create an organisational climate for inclusion, are consistently associated with positive organisational outcomes while concurrently reducing negative consequences. These findings suggest that it is important to develop organisational policies and practices that move beyond simply promoting workforce diversity and actively manage diversity to engender an inclusive climate.[37]

Antecedents

As mentioned above, the research literature indicates that diversity management efforts have a positive effect on the development of an inclusive climate.[38] Diversity management involves specific policies, programmes and (HR) practices to enhance the recruitment, inclusion, recognition, promotion, and retention of employees who are different from the majority of an organisation's workforce.

Measure

There are several measures of inclusion and diversity that have been used by researchers that can be used by organisations for assessing employee sentiments and behaviours related to inclusion and diversity. One of the most widely used measurement scales is the Climate for Inclusion – Exclusion Scale and the Diversity Climate Scale.[39]

Figure 6: Items of the Climate for Inclusion–Exclusion Scale (Mor Barak and Cherin 1998)

Inclusion in work-related decisions and processes

I have usually been involved in choosing my job assignments
I am able to influence decisions that affect my organization
I have a significant say in the way important work is performed by my work group
I have input into the process of how my work group gets routine work done
I am usually consulted before being asked to be a part of a work group or task team

Inclusion in work-related relationships

I feel that I have the cooperation of the people in my work group
I can ask anyone in my work group to assist me with my tasks
I feel isolated from my work group
My co-workers openly share work-related information with me

[36] Mor Barak et al (2016).
[37] For example, Ashikali and Groeneveld (2015); Mor Barak et al (2016); Bilmoria et al (2008); Jansen et al (2015); Li et al (2019).
[38] For example, Ashikali and Groeneveld (2015); Mor Barak et al (2016); Bilmoria et al (2008); Jansen et al (2015); Li et al (2019).
[39] Mor Barak and Cherin (1998).

Other climate dimensions

So far we have focused on the forms of organisational climate that have the strongest evidence base. There are also a number of less well-established forms in the scientific literature: either the constructs are not fully developed, the measures are not properly tested, or the evidence on outcomes and antecedents is thin. In this section, we start with the constructs that show some promise, even though they are still nascent compared with those described above. We then mention constructs of organisational climate for which the evidence base is weak.

Empowerment climate

Employee empowerment is a term that is frequently used in the popular management literature, and refers to giving employees the means, ability, and authority to be proactive or to do something. The scientific literature differentiates empowerment as either structural or psychological. Structural empowerment refers to the delegation of authority and responsibility to employees, whereas psychological empowerment refers to employees' perceptions that they have autonomy to decide how to do their jobs and that their beliefs and behaviour make a difference.[40] As such, psychological empowerment is often considered a climate dimension. Psychological empowerment climate is related but distinct from 'empowering leadership climate', with the former referring to psychological empowerment and the latter referring to structural empowerment. Despite being distinct constructs, empowering leadership is a likely antecedent to psychological empowerment climate.[41] This review, however, did not identify meta-analyses or controlled/longitudinal studies on the outcomes, antecedents, or measurement of empowerment climate.

Leadership climate

Leadership climate refers to the shared perceptions of employees towards their direct supervisor and/or the organisation's leadership. Most empirical studies on leadership climate, however, focus on a specific aspect of leadership climate, such as supportive leadership climate,[42] transformational leadership climate,[43] or shared leadership climate.[44] This review, however, did not identify meta-analyses or controlled/longitudinal studies on the outcomes, antecedents, or measurement of leadership climate in any form.

Risk climate

Risk climate refers to *'the shared perceptions among employees of the relative priority given to risk management, including perceptions of the risk-related practices and behaviors that are expected, valued, and supported'*.[45] Most authors consider risk climate as a sub-dimension of safety climate. However, a recent study found evidence for unique factors of risk climate that may provide senior leaders of financial institutions a better understanding of the company's risk climate and how it varies at the business unit level.

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[40] Thomas and Velthouse (1990).
[41] Zhang and Bartol (2010).
[42] Schyns et al (2009).
[43] Moon (2016).
[44] Gavin and Hofmann (2002).
[45] Erhart et al (2014).

However, because this is a new area of study, the evidence base for the outcomes, antecedents and measurement of risk climate is limited. A short questionnaire to measure risk climate was developed by Sheedy et al (2017).

Service climate

Service climate refers to *'employees' shared perceptions of the organisation's service quality-focused policies, procedures and behaviour they experience and the service quality emphasis they observe in behaviours that are rewarded, supported, and expected'*.[46] The first research on service climate was conducted in the 1970s and focused on the degree to which organisations create a warm and friendly atmosphere for their customers.[47] Later research found a strong link between employee experiences of service climate and customer experiences of service quality.[48] In particular, it was found that when an organisation creates a high-quality service climate, this influences employees' behaviour in their interactions with customers, which in turn positively affects the service quality experienced by customers.[49] An overview of the empirical research on service climate is provided by Bowen and Schneider (2014). A short questionnaire to measure service climate was developed by Schneider et al (1998).

Figure 7: Service climate survey items

Service Climate Survey Items.

- How would you rate the job knowledge and skills of employees in your business to deliver superior quality service?
- How would you rate efforts to measure and track the quality of service in your business?
- How would you rate the recognition and rewards employees receive for the delivery of superior service?
- How would you rate the overall quality of service provided by your business?
- How would you rate the leadership shown by management in your business in supporting the service quality effort?
- How would you rate the effectiveness of our communications efforts to both employees and customers?
- How would you rate the tools, technology, and other resources provided to employees to support the delivery of superior quality service?

Organisational and team climate

Many empirical studies, including longitudinal studies and meta-analyses, have examined 'organisational climate' or 'team climate'. In addition, several validated scales that aim to measure these two constructs are available (for example, the Organisational Climate Scale (CLIOR) developed by Peña-Suárez et al (2013), and the earlier mentioned Team Climate Inventory (TCI) developed by Kivimäki and Elovainio (1999)). However, as discussed above, contrary to the concept of culture, climate concerns employees' perceptions of observable aspects of the work environment *regarding a specific business problem or strategic goal*. In fact, a feature of the current research literature on climate is its targeted focus, stemming from arguments that it is meaningless to study (or measure) climate without a specific referent.[50] For this reason, most studies on organisational and team climate distinguish sub-dimensions, such as safety, trust, or innovation. The same applies for the measurement of organisational and team climate:

[46] Schneider et al (1998).
[47] Schneider (1973).
[48] Schneider (1980); Bowen and Schneider (2014).
[49] Schneider (2002); Carrasco et al (2012).
[50] Anderson and West (1996).

most scales have several subscales that assess a specific dimension or facet of an organisation's or team's climate. For example, the Team Climate Inventory distinguishes four climate factors – 'vision' (11 items), 'participative safety' (12 items), 'task orientation' (7 items) and 'support for innovation' (8 items) – and most organisational climate scales include climate dimensions such as safety, leadership, trust, supervisory support, involvement, and innovation.

Figure 8: Items of the Participative Safety (interaction and information sharing) subscale of the TCI

13. We share information generally in the team rather than keeping it to ourselves
14. We have a 'we are in it together' attitude
15. We all influence each other
16. People keep each other informed about work-related issues in the team
17. People feel understood and accepted by each other
18. Everyone's view is listened to even if it is in a minority
19. There are real attempts to share information throughout the team

For this reason, organisation and team climate are not considered a separate construct but an umbrella term that includes dimensions that are related to strategic goals or relevant organisational outcomes such as safety, innovation, or customer service.

Other, less developed climate dimensions

In addition to the climate dimensions listed above, many other climate dimensions are mentioned in both the popular and academic literature. Most of these climate dimensions, however, are based on a limited number of (often cross-sectional) studies and thus lack a robust evidence base. Examples are trust climate,[51] team incivility climate,[52] autonomy-supportive team climate,[53] organisational support climate,[54] organisational health climate,[55] implementation climate,[56] hospitality climate,[57] work psychosocial climate,[58] affective team climate,[59] agency climate,[60] motivational climate,[61] competitive work climate,[62] social climate,[63] human resource development climate,[64] interpersonal justice

[51] Li and Yan (2009).
[52] Paulin et al (2017).
[53] Liu (2011).
[54] Bashshur et al (2011).
[55] Zweber et al (2016).
[56] Ehrhart et al (2019).
[57] Datta (2020).
[58] Magnano et al (2020).
[59] Baeza et al (2009).
[60] Lawrence et al (2016).
[61] Reinboth and Duda (2006).
[62] Fousiani and Wisse (2022).
[63] Roy et al (2020).
[64] Muduli (2015).

climate,[65] organisational justice climate,[66] and risk-taking climate.[67]

4 Conclusion

The studies identified by this review demonstrate that organisational climate is a construct that is firmly grounded in the research literature. In turn, specific forms of climate such as safety, innovation, learning, ethical, and inclusion are strongly supported by a large number of empirical studies, with valid and reliable scales available to measure them.

We find that there is some overlap between dimensions of climate. For example, both safety climate and learning climate relate to attitudes towards and responses to mistakes, and safety climate and inclusion climate both relate to how well employees are supported by managers or colleagues.

This evidence review has centred on dimensions of organisational climate that have the strongest research base. Besides these, there were some areas of particular interest on which we found little research. For example, following consultation with senior HR leaders, we searched for research on trust climate and climates of respect or compassion and found that they were not well-developed constructs. Nonetheless, these and other potential dimensions may benefit from bespoke evidence reviews to scope out how they are discussed in the scientific literature from the perspectives of climate and/or culture.

Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about organisational climate by using the systematic review method to search and critically appraise empirical studies. 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 past 20 years. In 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.

A third limitation concerns the focus on meta-analyses and longitudinal studies. As a consequence, new, promising findings from cross-sectional studies may have been missed.

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

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[65] Stoverink (2014).
[66] Whitman et al (2012).
[67] García-Granero et al (2015).

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Appendices

Appendix 1: Search terms and results

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(risk) AND ti(climate) OR ab('risk climate)	623	479	181
S2: S1 AND filter MAs & SR, date limit > 2000	3	4	0
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	38	30	9
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure)	8	4	7

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(safety) AND ti(climate) OR ab('safety climate')	204	445	713
S2: S1 AND filter MAs & SR, date limit > 2000	7	14	16
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	24	42	45
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure)	17	22	13

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(trust) AND ti(climate) OR ab('trust* climate') OR ab('climate of trust')	123	106	118
S2: S1 AND filter MAs & SR, date limit > 2000	0	0	0
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	13	10	11
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure)	0	0	16

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(innovati*) AND ti(climate) OR ab('innovati* climate') OR ab('climate of innovation')	381	427	222
S2: S1 AND filter MAs & SR, date limit > 2000	2	1	2
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	26	35	9
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure)	4	2	33

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(empower*) AND ti(climate) OR ab('empower* climate') OR ab('climate of empowerment')	57	49	169
S2: S1 AND filter MAs & SR, date limit > 2000	0	0	0
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	0	1	0
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure)	0	0	0

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(leadership*) AND ti(climate) OR ab('leadership climate')	260	262	246
S2: S1 AND filter MAs & SR, date limit > 2000	0	0	0
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	11	23	0
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure)	0	0	0

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(learning*) AND ti(climate) OR ab('learning climate') OR ab('climate of learning') AND ab(work*) OR ab(organi?ation*) OR ab(corporat*) OR ab(employ*)	159	155	162
S2: S1 AND filter MAs & SR, date limit > 2000	0	0	0
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	14	13	7
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure*)	4	3	30

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(organi?ation*) AND ti(climate) OR ab('organi?ation* climate')	1,642	1,654	1,611
S2: S1 AND filter MAs & SR, date limit > 2000	18	25	26
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	59	51	53
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure*)	34	38	9

ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, April 2022			
Search terms	**ABI**	**BSP**	**PSY**
S1: ti(team) AND ti(climate) OR ab('team climate')	237	234	338
S2: S1 AND filter MAs & SR, date limit > 2000	0	0	0
S3: S1 AND filter controlled/longitudinal studies, date limit > 2000	21	18	32
S4: S1 AND ab(psychometric*) OR ti(scale) OR ti(questionnaire) OR ti(measure*)	13	13	10

Appendix 2: Study selection

Selection studies: organisational climate			
	ABI	**BSP**	**PSY**
Meta-analyses and/or systematic reviews	18	25	26
Combined, duplicates removed	43		
Titles and abstracts screened for relevance	**5**		
Controlled and/or longitudinal studies	59	51	53
Combined, duplicates removed	118		
Titles and abstracts screened for relevance	**19**		
Scales and/or measures	34	38	9
Combined, duplicates removed	52		
Titles and abstracts screened for relevance	**15**		

Selection studies: team climate			
	ABI	**BSP**	**PSY**
Meta-analyses and/or systematic reviews	0	0	0
Combined, duplicates removed	0		
Titles and abstracts screened for relevance	**0**		
Controlled and/or longitudinal studies	21	18	32
Combined, duplicates removed	50		
Titles and abstracts screened for relevance	**11**		
Scales and/or measures	13	13	10
Combined, duplicates removed	24		
Titles and abstracts screened for relevance	**6**		

Selection studies: risk climate			
	ABI	**BSP**	**PSY**
Meta-analyses and/or systematic reviews	3	4	0
Combined, duplicates removed	5		
Titles and abstracts screened for relevance	**0**		
Controlled and/or longitudinal studies	38	30	9
Combined, duplicates removed	62		
Titles and abstracts screened for relevance	**3**		
Scales and/or measures	8	4	7
Combined, duplicates removed	13		
Titles and abstracts screened for relevance	**2**		

Selection studies: safety climate			
	ABI	**BSP**	**PSY**
Meta-analyses and/or systematic reviews	7	14	16
Combined, duplicates removed	23		
Titles and abstracts screened for relevance	**9**		
Controlled and/or longitudinal studies	38	30	9
Combined, duplicates removed	62		
Titles and abstracts screened for relevance	**31**		
Scales and/or measures	17	22	13
Combined, duplicates removed	45		
Titles and abstracts screened for relevance	**2**		

Selection studies: innovation climate			
	ABI	**BSP**	**PSY**
Meta-analyses and/or systematic reviews	2	1	2
Combined, duplicates removed	2		
Titles and abstracts screened for relevance	**2**		
Controlled and/or longitudinal studies	26	35	9
Combined, duplicates removed	47		
Titles and abstracts screened for relevance	**9**		
Scales and/or measures	4	2	33
Combined, duplicates removed	35		
Titles and abstracts screened for relevance	**13**		

Selection studies: leadership climate			
	ABI	**BSP**	**PSY**
Meta-analyses and/or systematic reviews	0	0	0
Combined, duplicates removed	0		
Titles and abstracts screened for relevance	**0**		
Controlled and/or longitudinal studies	11	23	0
Combined, duplicates removed	21		
Titles and abstracts screened for relevance	**1**		
Scales and/or measures	0	0	0
Combined, duplicates removed	0		
Titles and abstracts screened for relevance	**0**		

Selection studies: trust climate			
	ABI	**BSP**	**PSY**
Meta-analyses and/or systematic reviews	0	0	0
Combined, duplicates removed	0		
Titles and abstracts screened for relevance	**0**		
Controlled and/or longitudinal studies	13	10	11
Combined, duplicates removed	17		
Titles and abstracts screened for relevance	**5**		
Scales and/or measures	0	0	16
Combined, duplicates removed	16		
Titles and abstracts screened for relevance	**0 (1)**		

Selection studies: learning climate			
	ABI	**BSP**	**PSY**
Meta-analyses and/or systematic reviews	0	0	0
Combined, duplicates removed	0		
Titles and abstracts screened for relevance	**0**		
Controlled and/or longitudinal studies	14	13	17
Combined, duplicates removed	17		
Titles and abstracts screened for relevance	**9**		
Scales and/or measures	4	3	30
Combined, duplicates removed	25		
Titles and abstracts screened for relevance	**7**		

Selection studies: empowerment climate

	ABI	BSP	PSY
Meta-analyses and/or systematic reviews	0	0	0
Combined, duplicates removed	0		
Titles and abstracts screened for relevance	**0**		
Controlled and/or longitudinal studies	0	1	0
Combined, duplicates removed	0		
Titles and abstracts screened for relevance			
Scales and/or measures	0	0	0
Combined, duplicates removed	0		
Titles and abstracts screened for relevance	**0**		

Appendix 3: Critical appraisal

Innovation climate: meta-analyses

Author and year	Design and sample size	Sector /Population	Main findings	Effect sizes	Limitations	Level
1. Bos-Nehles (2017)	Systematic review of cross-sectional studies k = 27	Employees from a wide range of professions	This SR focused on HRM practices that can have impact on employees' innovative work behaviour (IWB). According to the review, the practices positively linked to IWB are: - training and development (mediator: knowledge transfer) - autonomy (mediators: obligation to innovate; psychological contract) - feedback Other practices that are related to IWB (but the direction of the relationship is unclear – may be both positive and negative) are: - reward - job insecurity - task composition (mediator: LMX) - job demands	Not reported	Narrative synthesis, no pooled effect sizes.	C
2. Hulsheger (2019)	Meta-analysis of k = 104	Teams for a wide range of professions	Overall, team process variables were strongly linked to overall measures of innovation. Strongest corrected correlations emerged for vision (ρ = .49), external communication (ρ = .46), support for innovation (ρ = .47), and task orientation (ρ = .415). Furthermore, internal communication (ρ = .36) as well as cohesion (ρ = .31) displayed considerable relationships with innovation.	A large number of ESs are reported (see Table 1 and 2); the strongest correlations are reported in the previous column.	Not really about innovation 'climate'; focuses on 'innovation at work' in general. However, study is often referred to by innovation climate studies.	

3. Newman (2020)	Systematic review of cross-sectional studies k = 78	Employees from a wide range of professions, sectors, and industries	One of the aims of this review is to identify antecedents and outcomes of innovation climate. In the included studies, innovation climate was defined on either team or organisational level (that is, team innovation climate or organisational innovation climate). The authors identified the following antecedents and outcomes: **Antecedents:** - Leadership (that is, transformational, authentic, innovative leadership; structuring; LMX, fostering clarity) – antecedents of team innovation climate - Team characteristics (that is, complexity – complex task structures, motivation, reflexivity) – antecedents of team innovation climate. - Workforce characteristics (gender, tenure, occupation; experience, education, skills, demographics, stress) – antecedents of both team and organisational innovation climate. - Workplace characteristics (openness, autonomy, organisational support, HRM practices, transformational leadership) – antecedents of organisational innovation climate. **Outcomes:** - Team outcomes (project performance, decision-making, innovation – self and supervisor rated, useful outcomes + patents, product quality, project efficiency, customer satisfaction, team creativity, communication + mutual support) – outcomes of team and innovation climate. - Individual outcomes (job attributes – satisfaction, commitment, etc; physiological wellbeing, stress, passion for inventing, behaviour – creativity, knowledge-sharing, improvisation, etc; more authentic leadership behaviour) – outcomes of both team and organisational innovation climate. - Organisational outcomes (organisational innovativeness and performance, manager innovativeness, open innovation – inbound and outbound) – outcomes of organisational innovation climate.	Not reported	Narrative synthesis, no pooled effect sizes.	C

			Innovation climate was also found to moderate several processes on team and organisational level (for an overview, see Figure 3). Finally, the authors outline the **scales** frequently used to measure innovation climate: - Team Climate Inventory - The Climate for Innovation Scale			

Inclusion climate: from previous reviews

Author and year	Design and sample size	Sector/Population	Main findings	Effect sizes	Limitations	Level
2. Barak (2016)	**Design:** meta-analysis, design of included studies not reported **Sample** k = 30	Mixed, mainly from social service settings	1 Workforce diversity is associated with both beneficial and detrimental organisational outcomes. 2 Diversity management efforts that promote a climate of inclusion are consistently associated with positive outcomes. 3 Findings suggest that increasing diversity alone will not suffice as a human resource management strategy – it is important to develop organisational policies and practices that move beyond simply promoting diversity representation to creating policies that actively and effectively manage diversity and engender an inclusive work climate.	2. r = .42 (95%CI = .29, .54)	No critical appraisal of studies included The effect of 2 includes an outlier, without the outlier the ES is .26	C

6. Holmes (2021)	**Design:** Meta-analysis **Sample** 94 studies	working adults	1 Climate type moderates the relationships of diversity climate* with organisational outcomes such that measures of inclusion climate** exhibit more positive relationships with organisational outcomes than do measures of diversity climate. 2 Outcome type somewhat moderates the relationships of diversity climate with organisational outcomes such that diversity climate exhibits more positive relationships with attitudinal outcomes than with behavioural outcomes. 3 Demographic diversity moderates the relationships of diversity climate with organisational outcomes such that the relationships are more strongly positive in samples containing greater racioethnic diversity than in those containing less diversity. 4 Climate strength moderates the relationships of diversity climate with organisational outcomes such that the relationships are more positive when climates are stronger as opposed to weaker. *Diversity climate: employee perceptions of the extent that their employer is fair and inclusive of personnel irrespective of demographic group membership **Inclusion climate: how strongly employees feel that their unique backgrounds, knowledge, skills, and perspectives are integrated in a work environment ***Employee withdrawal refers to the extent to which employees intend to withdraw from their jobs (for example, turnover intentions) or actually withdraw from their current organisation (for example, voluntary turnover)	Diversity Climate – Employee withdrawal ρ = −.37 95% CI = [−.44: −.31] 2. small betas 3. β = .29	design of the included studies not reported	C

Organisational climate – meta-analyses

Author and year	Design and sample size	Sector /Population	Main findings	Effect sizes	Limitations	Level
4. Arora (2012)	Meta-analysis of cross-sectional studies H1: k = 89 N = 53,865 H2: k = 40 N = 66,318	Employees in organisations in the US	F1: Organisational commitment was positively related to favourable aggregate organisational climate (H1). F2: Organisational commitment was negatively related to unfavourable aggregate organisational climate (H2).	F1: r = .54; 95%CI [0.51; 0.52] F2: r = −.33; 95%CI [−0.56; −0.55]	The construct 'aggregate organisational climate' is not further specified, underlying dimensions were not measured	C
5. Bronkhorst (2015)	Systematic review of cross-sectional studies k = 21	Employees working in health care organisations	This review analysed the association of organisational climate (OC) and employee mental health outcomes. The concept of organisational climate included three dimensions: - Leadership and supervision (leadership style, type of supervision, degree of management support, leadership trust, and type of leadership hierarchy) - Group behaviours and relationships (characteristics of interpersonal interactions, group behaviours, co-worker trust, group supportiveness, and group cohesion) - Communication and participation (refers to the formal and informal mechanisms used to transfer information. The degree of participation or involvement in decision-making was also included) Perceptions of a good OC were associated with positive employee mental health outcomes such as lower levels of burnout, depression, and anxiety. Overall, the studies that tested a composite scale of OC showed a positive association OC and mental health outcomes. As for the specific dimensions, group relationships between co-workers, as well as aspects of leadership and supervision were related to mental health outcomes. Relationships between communication or participation and health outcomes were less clear. Table 1 includes examples of scales and subscales to measure OC in health care (nurse samples) – for example, NWI (Nurse Work Index), MPHPSS, TCI (team climate inventory).	Not reported (Some effect sizes for specific included studies reported in Table 1)	Narrative synthesis, no pooled effect sizes	C

6. Keyko (2016)	Systematic review of cross-sectional studies k = 18	Nurses (mainly from Canada and the US)	Eight studies examined the correlation of organisational climate and work engagement. The organisational climate factors included two categories: leadership and structural empowerment. - Authentic leadership and transformational leadership were both reported to influence work engagement directly or indirectly in three studies. - Two studies confirmed relationship (direct and indirect) of structural leadership and work engagement.	Not reported	Narrative synthesis, no pooled effect sizes.	C
7. Loh (2019)	Systematic review of cross-sectional and longitudinal studies k = 56	Samples mostly from English-speaking countries (the US, the UK, Australia); service or public sector (for example, health care, education, defence).	This review focused on investigating the relationship between different facets of organisational climate and different health-related variables. Climate dimensions included psychological safety climate, physical safety climate, service climate, supportive and affective climate, and team climate In general, the association between organisational climate and health was mostly supported in the 56 studies reviewed here, although these studies mainly focused on psychological health rather than physical health or illnesses. Overall, almost no differences were found among the different organisational climate constructs.	Not reported	Narrative synthesis, no pooled effect sizes.	B
8. Thompson (2011)	Systematic review k = 21	Employees working directly with people with intellectual disability	The aim of this article is to review the literature in relation to organisational climate in order to investigate whether there is a relationship between organisational variables and staff burnout. Overall, it was found that an organisational climate that has a better 'person–environment' fit promotes greater job satisfaction and reduced burnout.	Not reported	Narrative synthesis, no pooled effect sizes. Limited generalisability due to a specific sample. The construct 'organisational climate' is not further specified, underlying dimensions were not measured nor discussed.	C

Safety climate – meta-analyses

Author and year	Design and sample size	Sector /Population	Main findings	Effect sizes	Limitations	Level
9. Beus (2010)	Meta-analysis of cross-sectional studies Injury → psychological safety climate: k = 32 N = 16,011 Injury → organisational safety climate: k = 10 N = 251 Organisational safety climate → injury: k = 11 N = 458	Unclear	F1: Injury → safety climate relationships were stronger for organisational climates (**collective** perceptions about a coherent set of policies, procedures, and practices, F1a) than for psychological climates (**individuals'** perceptions about this set of policies, procedures, and practices, F1b). (H1 supported, but not clear if the difference was statistically significant). Comparisons of organisational and psychological safety climate → injury relationships could not be made due to the unavailability of psychological safety climate → injury studies. The MA also test hypotheses that are relevant in research, but less interesting for practitioners, related to safety climate measure content contamination and deficiency, and operationalisation of the concept of injury.	F1a: $\rho = -.29$ F1b: $\rho = -.16$	Analysis of impact (prediction) relies on correlational studies. The statistical significance of analysed differences was not analysed.	C
10. Clarke (2010)	Meta-analysis of cross-sectional studies k = 113 N = 94,669	Unclear (employees?)	F1: All dimensions of psychological climate – job (that is, job challenge and autonomy; F1a), role (that is, role stress and lack of harmony; F1b), work group (that is, group co-operation, friendliness and warmth; F1c), leader (that is, leadership facilitation and support; F1d), and organisational attributes (F1e) were related to perceived safety climate (H1).	F1a: $r = .33$ F1b: $r = .15$ F1c: $r = .42$ F1d: $r = .42$ F1e: $r = .58$	No serious limitation	C

			F2: Perceived safety climate was related with employee job satisfaction (F2a), organisational commitment (F2b), psychological wellbeing (F2c), safety behaviour (F2d), and accidents* (F2e) F3: Safety behaviour partially mediated the relationship between perceived safety climate and occupational accidents (that is, individual's behaviour is likely to reduce accident liability for that individual, for example, by following safety rules; H2b). F4: General health (that is, physical and psychological wellbeing) partially mediated the relationship between perceived safety climate and accidents (H3). F5: Work-related attitudes (organisational commitment and job satisfaction) acted as partial mediators in the relationship between perceived safety climate and safety behaviour (H4). * Variable 'accidents' could have been explained more clearly – is it the number of accidents?	F2a: r = .34 F2b: r = .49 F2c: r = .30 F2d: r = .31 F2e: r = .14		
11. Clarke (2013)	Meta-analysis of cross-sectional studies k = 103 N = 80,160	Unclear (employees?)	F1: Transformational leadership style was related to safety participation (F1a/H1a) and (b) safety compliance (F1b/H1b). F2: Transactional leadership style was related to safety participation (F2a/H2a) and safety compliance (F2b/H2b). F3: Safety compliance was NOT more strongly associated with active transactional leadership than with transformational leadership (H3 not supported, difference not significant). F4: Safety participation was NOT more strongly associated with transformational leadership than with transactional leadership (H4 not supported; difference not significant). F5: Transformational leadership was related to perceived safety climate (H5). F6: Transactional leadership was related to perceived safety climate (H6).	F1a: ρ = .44 F1b: ρ = .31 F2a: ρ = .36 F2b: ρ = .41 F5: ρ = .48 F6: ρ = .57	No serious limitation	C

			F7: Perceived safety climate partially mediated the effects of leadership style on safety behaviours, both for transformational (H7a) and for active transactional leadership (H7b).			
12. Christian (2009)	Meta-analysis of cross-sectional and longitudinal studies s = 90 k = 477	Employees from a wide range of industries	The aim of the study is to identify person- and situation-related antecedents of workplace safety. 1 Group safety climate is a stronger predictor of safety performance, safety compliance, safety participation, and accidents than psychological safety climate. 2 Several situation-related factors that contribute to safety climate outcomes were identified, of which 1) management commitment, 2) HRM practices, 3) supervisor support, and 4) work pressure had the largest impact.	1. safety performance, safety compliance, safety participation indiv: ρ = .49 group: ρ = .51 safety errors and injuries indiv: ρ = −.14 group: ρ = −.39 2. for an overview of all factors, levels, and outcomes, see Table 4 and 5. ES of the factors with the largest impact were all in the range of ρ =	no serious limitations	B
13. Jiang (2019)	Meta-analysis of cross-sectional studies k = 109 N = 81,213	Employees from a wide range of industries (chemical processing, construction, hospital/health care, hospitality/restaurant/accommodations, manufacturing, maritime, mining, nuclear, offshore, gas production, transportation)	The aim of this study is to examine the criterion-related validity of universal and industry-specific safety climate measures by conducting a meta-analytic comparison to determine if either universal or industry-specific measures of safety climate offer better predictions of safety-related outcomes. F1: Safety climate was positively related to safety behaviour (F1a/H1a), and negatively related to risk perceptions (F1b/H1b), accidents and injuries (F1c/H1c), and other adverse events (F1dH1d). F2: Industry-specific safety climate measures showed stronger relationships with safety behaviour (F2a/H2a) and risk perceptions (F2b/H2b) than universal safety climate measures. F3: Universal safety climate measures showed stronger relationships with other adverse events (F3a/H3b) compared with industry-specific safety climate measures, but not with accidents and injuries (H3a not supported). Identified universal safety climate measures are:	F1a: *r* = .49 F1b: *r* = −.40 F1c: *r* = −.14 F1d: *r* = −.17 F2a: β = .27 F2b: β = −.26 F3a: β = .34	No serious limitation	C

			- Safety climate scale (Neal et al 2000) - Nordic Safety Climate Questionnaire (NOSACQ-50; Kines et al 2011) Moreover, the authors identified several industry-specific safety climate measures (for example, in healthcare, aviation or trucking industry).			
14. Lee (2019)	Systematic review k = 19	Employees from different professions and industries (mostly from occupational settings in Denmark and the US)	The study aims at: 1 Examining different types of efforts to improve safety climate in varying occupational contexts. 2 Providing empirical evidence on the effectiveness of interventions and strategies in advancing safety climate. All studies were categorised as interventions focusing on improving organisational and managerial structure as well as the personnel subsystem; four of them also aimed at improving technological aspects of work, and five of them aimed at improving the physical work subsystem. Some examples of intervention strategies: incident reporting, safety training, leader-based on-site verbal safety communication, feedback session (for more details, see Table 3). In general, a vast majority of the studies (89.5%, n = 17) showed a statistically significant improvement in safety climate across their organisations post-intervention.	Not reported (Some effect sizes for specific included studies reported in Table 3)	Narrative synthesis, no pooled effect sizes.	AA/A
15. Leitao (2016)	Systematic review (15 out of 17 studies were cross-sectional) k = 17	Employees from industrial sector (for example, car manufacturing, construction, shipping, heavy manufacturing, chemical processing plant, off-shore oil & gas)	The study investigated the relationship between organisational safety climate and occupational accidents and injuries. Although 15 of the 17 included studies provided full or partial support for the association of safety culture with accidents/injuries at work, scientific evidence is still unclear on the causal relationship between these two variables. Some of the identified scales to measure safety climate: - Danish Safety Culture Questionnaire (|Nielsen and Mikkelsen 2007) - Zohar Safety Climate Survey (Zohar and Luria 2005), - Offshore Safety Questionnaire (Rundmo 1994; Flin et al 1996) - Deboddeller and Beland's questionnaire (1991) - the 16-item tool by Neal, Griffin and Hart (2000).	The effect sizes obtained in the included studies presented in Tables 1, 2, 3, 4	Narrative synthesis, no pooled effect sizes.	C

Ethical climate – meta-analyses

Author and year	Design and sample size	Sector /Population	Main findings	Effect sizes	Limitations	Level
2. Bedi et al (2015)	Meta-analysis, 134 independent samples, involving 54,920 employees	Workplace samples	Ethical leadership is associated with (increase in) ethical behaviour, and (decreases in) counterproductive work behaviours (level C). The study used social learning and social exchange theories to test the relationship between ethical leadership and follower work outcomes, predicting beneficial outcomes and less likelihood of turnover, interpersonal conflict and other counterproductive work behaviours. Most relevant to this evidence review, follower perceptions of ethical leadership were positively associated with follower ethical behaviour and negatively associated with self-rated CWBs and leader-rated CWBs.	Ethical behaviour $\rho = 0.61$ Perception of ethical climate $\rho = 0.52$ Self-efficacy $\rho = 0.53$ Job satisfaction $\rho = 0.56$ Normative commitment $\rho = 0.53$	No information about the design of studies included The quality of studies included was not assessed	C
4. Clarke (2013)	Meta-analysis of 35 empirical studies which included 9,897 participants within 39 independent samples.	Workplace samples	Active transactional leadership is associated with compliance with rules and regulations, whereas transformational leadership is associated with employee participation in safety (level B). Transformational leadership had a positive association with both perceived safety climate and safety participation, with perceived safety climate partially mediating the effect of leadership on safety participation. Active transactional leadership had a positive association with perceived safety climate, safety participation and safety compliance. The effect of leadership on safety compliance was partially mediated by perceived safety climate and the effect on safety participation fully mediated by perceived safety climate. The findings suggest that active transactional leadership is important in ensuring compliance with rules and regulations, whereas transformational leadership is primarily associated with encouraging employee participation in safety.	Overall effect of transformational leadership on > safety compliance (ρ =.31) safety participation (ρ =.44). Overall effect of active transactional leadership on safety compliance (ρ =.41) safety participation (ρ =.36)	Only one database searched, complemented by a manual search of review articles The quality of studies included was not assessed	B

7. Kish-Gephart (2010)	Meta-analysis of cross-sectional and controlled/ longitudinal studies k = 136 N = 43,914	Workplace and university student samples	The study explored why individuals behave unethically in the workplace and found that the reasons for behaving unethically in the workplace are complex – no single demographic variable makes a unique contribution to unethical intention. They identify that we need to consider individual ('bad apple'), moral issues ('bad case'), and organisational environment ('bad barrel') antecedents of unethical choice. 1. 'Bad apples', or individual factors. Unethical choice was found to be related to individual characteristics such as cognitive moral development, idealistic or relativistic moral philosophy, Machiavellian personality, locus of control, job satisfaction. There is little evidence that demographic factors (such as gender and age) have a noticeable impact on ethical outcomes, once other factors are controlled for. 2. 'Bad cases', or situational factors. Moral intensity characteristics such as concentration of effects, magnitude of consequences and social context were all related to unethical intention. In other words, specific facets of an ethical decision-making situation may influence the likelihood of unethical behaviour. 3. 'Bad barrels', or organisational context. Three types of ethical climate (egoistic, benevolent, and principled) were related with unethical choice: they found that egoistic climates were positively associated with unethical choice, whereas benevolent and principled climates were negatively associated with unethical choice. The relationship between ethical culture and unethical choice did not explain unique variance over and above the constructs of climate and ethical code enforcement.	Unethical behaviour related to: individual: Cognitive moral development (ρ =−.16) Machiavellianism (ρ =.27) Locus of control ρ =.13 Ethical climate ranges from ρ =.12 to −.46 Further effect sizes available in original source	Quality of the studies included not evaluated. Small sample sizes for some relationships. A large number of hypotheses/variables tested	A
8. Martin (2006)	Meta-analysis of 44 studies with 44 independent samples	Unclear	Different aspects of an ethical climate are associated with dysfunctional behaviour (level C): a) Instrumental ethical climates are associated with increases in dysfunctional behaviour b) Benevolent and caring ethical climates are associated with decreases in dysfunctional behaviour c) Ethical climates emphasising rules, laws and codes are associated with decreases in dysfunctional behaviour This meta-analysis finds that perceived ethical climate is a construct which influences organisational outcomes.	Dysfunctional behaviour correlates with aspects of ethical climate are: - Instrumental (.22) - Caring (−.14) - Independence (−.10) - Rules (−.17) - Law and Code (−.15)	- Only a small amount of studies investigated the negative outcomes of ethical climate using this particular scale. - Quality not assessed - Key features not described	C

			The authors define several types of ethical climate (instrumental, caring, independence, law and code, and rules) find they have different associations with various organisational outcomes, suggesting organisational climates have consequences for how people respond to their perceived ethical environments. This includes influencing employee organisational commitment, job satisfaction, psychological wellbeing, and dysfunctional behaviour. An interesting finding of the study demonstrates that externally based rules, such as professional or religious rules, when internalised, result in positive outcomes for the organisation. Conversely, the analysis illustrates that climates which result from individual and independent ethical decisions, or internal organisational rules, have weak associations with many outcomes. The authors conclude that further research is required to map what may be done to mitigate the adverse impacts of unethical behaviour, as perceptions of ethical climate are shown through the study to be powerful influencers of positive and negative organisational outcomes.			

Excluded studies

Author and year	Reason for exclusion
1. Bamel (2020)	The objective of this study is to examine the safety climate knowledge epistemology using bibliometric and systematic literature network analysis (focus on research trends, most productive authors, most influential research work).
2. Beus (2015)	This meta-analysis investigated the relationship personality (five-factor model dimensions) and workplace safety – difficult to draw actionable conclusions for practitioners. The results of the study substantiate the value of considering personality traits as key correlates of workplace safety. According to the findings, whereas agreeableness and conscientiousness were negatively associated with unsafe behaviours, extraversion and neuroticism were positively associated. Of these traits, agreeableness accounted for the largest proportion of explained variance in safety-related behaviour, while openness to experience was unrelated. At the facet level, sensation-seeking, altruism, anger, and impulsiveness were all meaningfully associated with safety-related behaviour, though sensation-seeking was the only facet that demonstrated a stronger relationship than its parent trait (that is, extraversion).
3. Newaz (2018)	The purpose of this study is to identify future directions in research on safety climate in construction, and to propose a five-factor model that can be used to diagnose and measure safety climate in construction safety research and practice. The five factors are: management commitment, safety system, supervisor's role, workers' involvement, and group safety climate.

Appendix 4: Organisational climate assessment tools

Innovation climate

(1) Shortened (14-item) version of the **Team Climate Inventory** (TCI) developed by Kivimäki and Elovainio (1999)

Vision

1 How clear are you about what your team objectives are?
2 How far are you in agreement with these objectives?
3 To what extent do you think your team's objectives can actually be achieved?
4 How worthwhile do you think these objectives are to the organization?

Participative safety – information sharing

5 People keep each other informed about work-related issues in the team.
6 There are real attempts to share information throughout the team.

Participative safety – safety and influence

7 People feel understood and accepted by each other.
8 We have a 'we are in it together' attitude.

Task orientation

9 Are team members prepared to question the basis of what the team is doing?
10 Does the team critically appraise potential weaknesses in what it is doing in order to achieve the best possible outcome?
11 Do members of the team build on each other's ideas in order to achieve the best possible outcome?

Support for innovation

12 People in this team are always searching for fresh, new ways of looking at problems.
13 In this team we take the time needed to develop new ideas.
14 People in the team cooperate in order to help develop and apply new ideas.

(2) **Inventory of Organisational Innovation** (IOI; Tang 1998)

Leadership

1 Our top managers are approachable and communicative. (Item 18)
2 Our supervisors often challenge us to be more innovative and resourceful. (Item 24)
3 Our top managers show great enthusiasm for innovation and work improvement. (Item 27)
4 Our top managers don't value employees' opinions much. (Item 42)

Support

1 My organization has active programs to upgrade employees' knowledge and skills. (Item 9)
2 There are many opportunities to exchange and generate ideas in my organization. (Item 10)
3 My organization recognizes and rewards innovative and enterprising employees. (Item 25)
4 My organization gives adequate resources to exploring and implementing innovative ideas. (Item 35)
5 In my organization innovative and enterprising employees are well paid. (Item 38)

6 My work schedule allows me time to think of creative solutions to problems. (Item 12)
7 Innovation is clearly a part of my organization's mission or basic beliefs. (Item 29)

Task
1 My work is intellectually stimulating and challenging. (Item 2)
2 There are many opportunities and freedom in my work to explore and try out new ideas. (Item 5)
3 I frequently encounter non-routine and challenging work in my organization. (Item 14)
4 The type of work we do requires very little imagination and creativity. (Item 16)
5 There is much knowledge to gain from the work I do for my organization. (Item 19)

Behaviour
1 I found my colleagues very helpful when I encounter difficulties with my work. (Item 11)
2 In my organization people show little interest in each other's work. (Item 13)
3 I find my colleagues very helpful in sharing knowledge and information. (Item 17)
4 In my organization very few people take the initiatives to raise new projects. (Item 30)

Integration
1 Teamwork is poor in my organization. (Item 7)
2 In my organization different departments work together harmoniously. (Item 15)
3 In my organization there is a strong sense of mutual trust. (Item 48)
4 My organization is unable to accumulate knowledge or learn and benefit from experience. (Item 34)

Raising Project
1 My organization actively collects ideas for improvements from employees. (Item 3)
2 In my organization employees are active in making suggestions about work improvement. (Item 6)
3 In my organization there are ways to support unplanned but worthwhile initiatives. (Item 39)
4 My organization evaluates project proposals with an open but pragmatic mind. (Item 47)
5 In the pursuit of innovation or new business, my organization tolerates mistakes. (Item 46)
6 If my new idea is not accepted, I can try it out elsewhere in the organization. (Item 26)

Doing Project
1 Projects and jobs are well organized and executed in my organization. (Item 22)
2 In my organization projects start with clear objectives, schedule and resource requirements. (Item 32)
3 Projects are monitored and reviewed regularly. (Item 40)
4 My organization learns about what was done right or wrong at the end of each project. (Item 36)
5 My organization has clearly defined achievement goals and strategic directions. (Item 33)

Knowledge and Skills
1 My colleagues and I are able to come up with creative ideas when we face tough problems. (Item 37)

2 My organization creates its own intellectual assets, e.g. special techniques, patents. (Item 43)
3 In my organization there are many employees with strong knowledge and skills. (Item 44)
4 I have colleagues who impress me with their innovative ideas, energy, and resourcefulness. (Item 23)
5 I have colleagues who help others to turn ideas into action and reality. (Item 45)

Information and Communication
1 In my organization the dissemination of information relevant to work is excellent. (Item 1)
2 Documentation, information and databases are well managed in my organization. (Item 20)
3 My organization's information system is a great aid to finding ideas and opportunities. (Item 28)
4 My organization captures information diligently from external sources, e.g. customers. (Item 41)

Summary Assessment Items
1 My organization is effective in innovating. (Item 49)
2 Overall, my organization is an effective organization. (Item 50)

Learning climate

(1) Dimensions of the **Learning Organization Questionnaire** (DLOQ – Individual Level)) developed by Yang et al (2004).

1 In my organization, people openly discuss mistakes in order to learn from them.
2 In my organization, people identify skills they need for future work tasks.
3 In my organization, people help each other learn.
4 In my organization, people can get money and other resources to support their learning.
5 In my organization, people are given time to support learning.
6 In my organization, people view problems in their work as an opportunity to learn.
7 In my organization, people give open and honest feedback to each other.
8 In my organization, people listen to others' views before speaking.
9 In my organization, people are encouraged to ask 'why' regardless of rank.
10 In my organization, whenever people state their view, they also ask what others think.

Ethical climate

(1) **Ethical Climate Questionnaire** (ECQ) developed by Victor and Cullen (1988). Dimensions: Ethical criteria – egoism (E), benevolence (B), principle (P); Locus of analysis – individual (I), local (L), cosmopolitan (C).

1 In this company, people are mostly out for themselves. (EI)
2 The major responsibility for people in this company is to consider efficiency first. (EC)
3 In this company, people are expected to follow their own personal and moral beliefs. (PI)
4 People are expected to do anything to further the company's interests. (EL)
5 In this company, people look out for each other's good. (BI)
6 There is no room for one's own personal morals or ethics in this company. (EI)
7 It is very important to follow strictly the company's rules and procedures here. (FL)
8 Work is considered sub-standard only when it hurts the company's interests. (EL)

9 Each person in this company decides for himself what is right and wrong. (PI)
10 In this company, people protect their own interest above other considerations. (EI)
11 The most important consideration in this company is each person's sense of right and wrong. (PI)
12 The most important concern is the good of all the people in the company. (BL)
13 The first consideration is whether a decision violates any law. (PC)
14 People are expected to comply with the law and professional standards over and above other considerations. (PC)
15 Everyone is expected to stick by company rules and procedures. (PL)
16 In this company, our major concern is always what is best for the other person. (BI)
17 People are concerned with the company's interests – to the exclusion of all else. (EL)
18 Successful people in this company go by the book. (PL)
19 The most efficient way is always the right way in this company. (EC)
20 In this company, people are expected to strictly follow legal or professional standards. (PC)
21 Our major consideration is what is best for everyone in the company. (BL)
22 In this company, people are guided by their own personal ethics. (FI)
23 Successful people in this company strictly obey the company policies. (PL)
24 In this company, the law or ethical code of their profession is the major consideration. (PC)
25 In this company, each person is expected, above all, to work efficiently. (EC)
26 It is expected that you will always do what is right for the customer and public. (BC)
27 People in this company view team spirit as important. (EL)
28 People in this company have a strong sense of responsibility to the outside community. (BC)
29 Decisions here are primarily viewed in terms of contribution to profit. (EL)
30 People in this company are actively concerned about the customer's, and the public's, interest. (BC)
31 People are very concerned about what is generally best for employees in the company. (BL)
32 What is best for each individual is a primary concern in this organization. (BI)
33 People in this company are very concerned about what is best for themselves. (EI)
34 The effect of decisions on the customer and the public are a primary concern in this company. (BC)
35 It is expected that each individual is cared for when making decisions here. (EI)
36 Efficient solutions to problems are always sought here. (EC)

(2) **Ethical Climate Index** (ECI) developed by Arnaud (2010).

Collective moral sensitivity – norms of moral awareness

1 People around here are aware of ethical issues.
2 People in my department recognize a moral dilemma right away.
3 If a rule or law is broken, people around here are quick to notice.
4 People in my department are very sensitive to ethical problems.
5 People around here do not pay attention to ethical issues.

Collective moral sensitivity – norms of empathetic concern

1 People in my department sympathize with someone who is having difficulties in their job.
2 For the most part, when people around here see that someone is treated unfairly, they feel pity for that person.
3 People around here feel bad for someone who is being taken advantage of.

4 Sometimes people in my department do not feel very sorry for others who are having problems.
5 Others' misfortunes do not usually disturb people in my department a great deal.
6 When people in my department see someone being treated unfairly, they sometimes don't feel much pity for them.
7 In my department people feel sorry for someone who is having problems.

Collective moral judgement – focus on self

1 People around here protect their own interest above other considerations.
2 People in my department are very concerned about what is best for them personally.
3 People around here are mostly out for themselves.
4 People in my department think of their own welfare first when faced with a difficult decision.
5 In my department people's primary concern is their own personal benefit.

Collective moral judgement – focus on others

1 In my department it is expected that you will always do what is right for society.
2 People around here have a strong sense of responsibility to society and humanity.
3 What is best for everyone in the department is the major consideration.
4 The most important concern is the good of all the people in the department.
5 People in my department are actively concerned about their peers' interests.

Collective moral motivation

1 In my department people are willing to break the rules in order to advance in the company.
2 Around here, power is more important than honesty.
3 In my department authority is considered more important than fairness.
4 Around here, achievement is valued more than commitment and loyalty.
5 In my department personal success is more important than helping others.
6 In my department people strive to obtain power and control even if it means compromising ethical values.
7 Around here, people are willing to tell a lie if it means advancing in the company.
8 In order to control scarce resources, people in my department are willing to compromise their ethical values somewhat.

Collective moral character

1 People around here are confident that they can do the right thing when faced with moral dilemmas.
2 People I work with would feel they had to help a peer even if that person were not a very helpful person.
3 People in my department feel it is better to assume responsibility for a mistake.
4 No matter how much people around here are provoked, they are always responsible for whatever they do.
5 Generally people in my department feel in control over the outcomes when making decisions that concern ethical issues.
6 When necessary, people in my department take charge and do what is morally right.

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Issued: July 2022 Reference: 8263 © CIPD 2022

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