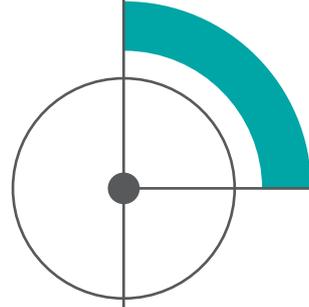


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ORGANISATIONAL CULTURE AND PERFORMANCE

An evidence review

Scientific summary
July 2022



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Organisational culture and performance: an evidence review

Scientific summary

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1 Introduction

Rationale for this review

For decades organisational culture has been claimed to be an important driver of organisational success. It is assumed that certain cultures are 'bad' or 'weak' and need to be changed, whereas others are more constructive and need to be strengthened. As pointed out by Scott et al (2003), the claim that organisational culture affects firm performance rests upon three underlying assumptions: (1) an organisation has an identifiable culture; (2) culture is related to performance; (3) a culture can be changed to positively impact performance. Although intuitively appealing and often accepted as fact – a recent survey showed that 78% of Fortune 1000 CEOs believe culture to be one of the top three factors affecting their firm's performance (Graham et al 2016) – academia has a somewhat uneasy relationship with this claim. In fact, many scholars question whether 'organisational culture' is a valid construct to start with, whereas others suggest that you can't measure – and thus can't manage or change – an organisation's culture. For this reason, this evidence review summarises what is known in the scientific literature about the link between organisational culture and performance.

Main question: What does the review answer?

What is known in the scientific literature about the link between organisational culture and performance?

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

- 1 What is meant by organisational culture (what is it)?
- 2 What is the assumed logic model (how is it supposed to enhance performance)?
- 3 How can organisational culture be measured?
- 4 What is known about the link between organisational culture and performance?
- 5 (a) What culture elements in particular are linked with performance (is there a difference in impact)?
- 5 (b) Is there a different impact on specific performance outcomes (for example operational efficiency, innovation, commercial performance, society's trust)?
- 6 What is known about the effectiveness of strategies to change organisational culture?

2 Methods

Search strategy: How was the research evidence sought?

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

- 1 scholarly journals, peer-reviewed

- 2 published in the period 1980 to 2019 for meta-analyses and the period 2000 to 2019 for primary studies
- 3 articles in English.

A search was conducted using combinations of different search terms, such as 'culture', 'performance', and 'workplace'. In addition, a search was conducted for studies that used the four most prominent quantitative approaches to assessing organisational culture: the Denison Organisational Culture Survey (DOCS), the Organisational Culture Assessment Instrument (OCAI), the Organisational Culture Inventory (OCI) and the Organisational Culture Profile (OCP).

We conducted 21 search queries and screened the titles and abstracts of more than 500 studies. An overview of all search terms and queries is provided in Appendix 1.

In addition, the MetaBUS database – an online repository of meta-analytic effect sizes and related information from the field of applied psychology – was searched for correlations between the constructs organisational culture and performance. This search yielded 60 studies.

Finally, the Cochrane Library and Medline were searched for systematic reviews. This search yielded two studies.

Selection process: How were the studies selected?

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

Study selection took place in two phases. First, the titles and abstracts of the studies identified were screened for their relevance to this review. In case of doubt or lack of information, the study was included. Duplicate publications were removed. This first phase yielded 14 secondary studies (meta-analyses) and 49 primary studies.

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

- 1 Type of studies: only quantitative, empirical studies. Qualitative research will also be drawn on for the logic model (what is culture and how is it assumed to work) but not for association or effect.
- 2 Measurement: only studies in which the link between culture/climate and organisational outcomes was measured.
- 3 Context: only studies related to workplace settings.
- 4 Level of trustworthiness: only studies that were graded level C or above (see below).

In addition, the following exclusion criteria were applied:

- 1 cross-cultural studies
- 2 studies on the effect of national cultures or the socio-cultural environment
- 3 studies on the effect of subcultures (for example team, group or professional culture).

This second phase yielded nine secondary studies and six primary studies. An overview of the selection process is provided in Appendix 2.

Critical appraisal: What is the quality of the studies included?

In almost any situation it is possible to find a scientific study to support or refute a theory or a claim, and sometimes to quite a large degree. It is therefore important to determine which studies are trustworthy (that is, valid and reliable) and which are not. The trustworthiness of a scientific study is first determined by its methodological appropriateness. For cause-and-effect claims (that is, if we do A, will it result in B?), a study has a high methodological appropriateness when it fulfils the three conditions required for causal inference: co-variation, time–order relationship, and elimination of plausible alternative causes (Shaughnessy and Zechmeister 2006). A study that uses a control group, random assignment and a before-and-after measurement is therefore regarded as the ‘gold standard’. Non-randomised studies and before–after studies come next in terms of appropriateness. Cross-sectional studies (surveys) and case studies are regarded as having the greatest chance of showing bias in the outcome and therefore sit lower down in the ranking in terms of appropriateness. Meta-analyses in which statistical analysis techniques are used to pool the results of controlled studies are therefore regarded as the most appropriate design.

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

| <i>Design</i> | <i>Level</i> |
|--|--------------|
| Systematic review or meta-analysis of randomised controlled studies | AA |
| Systematic review or meta-analysis of controlled and/or before–after studies | A |
| Randomised controlled study | |
| Systematic review or meta-analysis of cross-sectional studies | |

| | |
|---|---|
| Non-randomised controlled before–after study | B |
| Interrupted time series | |
| Controlled study without a pre-test or uncontrolled study with a pre-test | C |
| Cross-sectional study | D |

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

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

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

3 Main findings

Outcome of the critical appraisal

The overall quality of the studies included in this review is moderate to low. Most of the meta-analyses were based on cross-sectional studies, and where therefore qualified as level C. Only one meta-analysis was graded level B.

It should be noted that this review came across many studies that used a sample of ‘CEOs or senior managers estimated as having adequate knowledge of the organisational culture and performance within their companies’. In addition, many studies use self-report measures to assess the culture–performance link. This suggests that, in general, the methodological quality of studies on organisational culture and performance tends to be rather low.

Question 1: What is meant by organisational culture?

Finding 1: There is no consensus of what 'organisational culture' entails.

Organisational culture is an anthropological construct to analyse organisations as micro-societies: it sees the organisation as a group of people who share ideas, customs, and social behaviour. It is related to – but conceptually different from – organisational climate. Culture refers to a pattern of shared underlying norms and assumptions – rooted in history, collectively held, interconnected, and not easily changed – whereas climate refers to employees' perceptions of the organisation's policies, practices and procedures and the behaviours they observe getting rewarded (Scott et al 2003; Denison 1996).

Research on organisational culture dates back at least as far as the late 1970s. A search in ABI/INFORM on the term organisational (or 'corporate') culture in the abstract yields more than 5,300 results of peer-reviewed papers published in scholarly journals, spanning a period of five decades. Although references to organisational culture are found in both popular management books and the academic literature, there does not seem to be a sharp, accepted definition of the concept. In fact, despite the large number of academic publications, there is no clear consensus of what 'organisational culture' entails. As a result, there are many definitions of organisational culture available.¹ However, at the risk of oversimplifying, it could be argued that two dominant schools of thought can be identified.

1 Schein's Organisational Culture Model

One of the most widely used definitions of organisational culture is provided by Edgar Schein (1984, 2004, 2006), who describes it as follows:

Organisational culture is the pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (Schein 1984)

Schein's model originated in the 1980s and identifies three distinct levels in organisational cultures:

- underlying assumptions and beliefs (that may be conscious or unconscious)
- norms and values about appropriate attitudes and behaviours (that may be espoused or real)
- artefacts that may reflect these (for example, symbols and language).

¹ For example, already in 1984, Allaire and Firsirotu noted more than 160 different definitions.

2 Culture traits–strengths models

The second school of thought takes a different approach. Rather than defining what organisational culture is, culture traits–strengths models aim to identify separate culture traits (for example particular values, beliefs, criteria for success, norms, and shared behaviour) that represent a distinctive culture ‘profile’. The managerial implications of traits–strengths models are often clear and can be easily communicated: culture profiles that impede performance are ‘bad’ or ‘weak’ and need to be changed, whereas culture profiles that enhance performance are ‘strong’ and need to be fostered. As such it has become the dominant model among practitioners and consulting firms. As a result, a large number of ‘strong’ culture profiles are available, often accompanied by a specific assessment tool that claims to measure its underlying traits. Some of the most widely used models/tools are:

- DOCS – the Denison Organizational Culture Survey, based on the theory of Dan Denison, identifying ‘strong’ traits such as employee involvement, internal consistency and adaptability.
- OCAI – the Organizational Culture Assessment Instrument, based on Quin and Cameron’s Competing Values Framework, differentiating between a clan, adhocracy, hierarchy, or market culture.
- OCI – the Organizational Culture Inventory, based on the Life Styles Inventory developed by Lafferty, differentiating between a constructive, passive/defensive, or aggressive/defensive culture.

In addition to these two schools of thought, a wide range of definitions, theories, models and frameworks are available. As will be explained below, the lack of a clear, operational definition has serious methodological consequences for the assumed culture–performance link.

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

Finding 2: It is unclear how organisational culture enhances performance.

One of the earliest empirical studies that explicitly examined the effect of organisational culture is ‘On studying organizational cultures’ by Andrew Pettigrew, published in 1979. Since then, many popular management books, as well as academic conferences and special issues of scholarly journals, have emphasised the impact of organisational culture on organisational outcomes, claiming that organisations with a strong culture – demonstrating a well-integrated and effective set of specific values, beliefs, and behaviours – will perform at a higher level of productivity. In addition, it is argued that organisational culture creates competitive advantage by defining the boundaries of the organisation in terms of individual interactions and information-processing capabilities (Krefting and Frost 1985).

To provide a logic model for the culture–performance link, a clear definition and a coherent theoretical framework is needed. Unfortunately, as explained above, both are lacking. As a result, the logic model for the culture–performance link is not based on a single coherent theory, but rather a number of separate, loosely related hypotheses, often pertaining to a particular culture profile and specific performance outcome. For example, it is suggested that an ‘adhocracy culture’ enhances a company’s innovative performance by emphasising values such as growth, stimulation, variety, and autonomy (Cameron and Quinn 1999). It is hypothesised that these values encourage employees to take risks and utilise creativity to identify and respond to customer needs (Cameron et al 2006). A market culture, on the other hand, is assumed to boost profitability by focusing employees’ attention to activities that deliver lucrative financial results.

In addition to these hypotheses, a wide range of alternative explanations for the assumed culture–performance link are available.

Question 3: How can organisational culture be measured?

Finding 3: There is no consensus of how organisational culture can be measured. Although many culture assessment tools are available, most of the underlying research is inadequate to establish their reliability and validity. At best, some of these tools show some predictive validity but their construct validity is less clear.

There are many assessment tools and questionnaires available that claim to measure (elements of) organisational culture. Among scholars studying culture, however, there is a debate on the most appropriate method – qualitative versus quantitative – to assess culture. Proponents of Schein’s Organisational Culture Model argue that culture is characterised by implicit beliefs and unconscious assumptions, thus assessing it requires a qualitative approach involving open interviews and observations by a well-trained assessor, often over several weeks or even months. In contrast, advocates of the culture traits–strengths model argue that culture is something an organisation has, not something an organisation is. As such, they focus on the espoused values, beliefs, criteria for success, and organisational norms that guide employees’ behaviour, often using quantitative approaches (survey questionnaires).

Aside from the qualitative–quantitative debate, perhaps the biggest obstacle to developing an integrative theory of culture is that scholars have adopted vastly different construct definitions and measurement approaches (Chatman and O’Reilly 2016). A systematic review by Jung et al (2009) identified no fewer than 70 culture diagnostic instruments and concluded that the underlying research is *‘inadequate to establish the reliability and validity of the majority of instruments’*. Because managers believe culture to be important, it has fuelled a large and financially lucrative consulting practice that offers a wide range of diagnostic tools that claim to measure culture – notwithstanding the fact that its meaning remains ambiguous and the tools themselves are proprietary, so the psychometric qualities are often not available. In addition, researchers have developed a limited set of

questions that claim to measure culture and, in some cases, have simply relabelled their measures as 'culture'. A well-known example is the best-selling book *Corporate Culture and Performance* by Kotter and Heskett (2008). The authors surveyed 600 respondents from 200+ US companies to assess the 'culture strength' of these firms with only three questions:

- 1 Have managers of competing firms commonly spoken of this company's 'style' or way of doing things?
- 2 Has this firm both made its values known through a creed or credo and made serious attempts to encourage managers to follow them?
- 3 Has this firm been managed according to long-standing policies and practices other than those of the incumbent CEO?

Each respondent was asked to rate each of the 200+ firms on a scale ranging from (1) a very strong culture to (5) a very weak culture. Not surprisingly, several researchers have identified a number of limitations that seriously affect the reliability of the authors' findings (Chatman and O'Reilly 2016).

In a recent review by Chatman and O'Reilly (2016), the scientific underpinning and construct validity of the four most prominent quantitative approaches to assessing organisational culture (DOCS, OCAI, OCI, and OCP) are discussed. Although these instruments have often provided good predictive validity and have demonstrated test-retest reliability, there is no evidence of construct validity, meaning that it is unclear what exactly is being measured. Put differently, these tools have been shown to be correlated with some organisational outcomes and predict aspects of organisational behaviour, but we don't know what exactly they measure. As Chatman and O'Reilly point out, a possible reason that studies show correlations with organisational effectiveness is that some of these instruments (for example OCAI and DOCS) were originally designed to measure, not organisational culture, but organisational effectiveness.

Question 4: What is known about the link between organisational culture and performance?

Finding 4: The scientific evidence does not consistently show that organisational culture is linked to performance (level A).

Several well-conducted meta-analyses have demonstrated that the correlations between culture and performance outcomes are evenly split as either positive, close to zero, or non-significant (see, for example, Scott et al 2003; Taras et al 2010; Brand et al 2012; Hartnell et al 2011; Hunt et al 2012; Hartnell et al 2019). This finding is consistent with the outcome of controlled and/or longitudinal studies (for example Kline et al 2000; Jacobs et al 2013; Kim and Chang 2019). A possible explanation for this finding is that organisational culture is a multidimensional construct that can be measured in many different ways. It is therefore likely that some culture elements/traits may be relevant in some circumstances and irrelevant in others, resulting in mixed and inconsistent findings when the culture–

performance link is measured.

Finding 5: The association between organisational culture and performance is moderate to low (level A).

The overall correlation between (aspects of) organisational culture and performance outcomes in general reported by meta-analyses is moderate to low – varying from zero (Brand et al 2012) to 0.2 (Eisend et al 2016) and 0.4 (Hartnell et al 2019). This finding was confirmed by the MetaBUS database – an online repository of meta-analytic effect sizes from the field of applied psychology – the overall mean correlation found based on 60 studies is 0.16.

Finding 6: The association between organisational culture and performance is substantially lower when hard/objective outcome measures are used (level A).

Several meta-analyses and longitudinal studies report that when performance outcomes are measured objectively, the correlation with organisational culture is low (for example Hartnell et al 2019; Kline et al 2000). For example, a meta-analysis of 84 studies representing 880 correlations (Hartnell et al 2011) found that the association between culture profiles and hard/objective performance outcomes (for example increase in revenue and/or number of employees and profitability) are substantially lower than when subjective performance measures are used ($r=0.1$ versus $r=0.4$).

Finding 7: Organisational culture is a weak predictor for performance when compared with other factors (level C).

Several meta-analyses report that organisational culture is a rather weak performance indicator when compared with the direct effect of several other factors. For example, a meta-analysis based on 598 studies found that culture was the weakest predictor of performance with the direct effect of cultural values being close to zero ($\rho=0.03$), whereas other factors such as demographics, and personality traits showed stronger links, and general mental ability stood out as a remarkably good predictor ($\rho=0.54$) of performance (Taras et al 2010). This finding was confirmed in a recent meta-analysis including 149 studies, demonstrating that some culture dimensions do not have unique predictive utility when controlling for factors such as leadership and performance management (Hartnell et al 2019).

Question 5a: What culture elements in particular are linked with performance (is there a difference in impact)?

Question 5b: Is there a different impact on specific performance outcomes?

Finding 8: The strength of the association between organisational culture and performance varies depending on the culture profile and the type of performance that is measured (level A).

The correlation coefficients reported in both meta-analyses and controlled/longitudinal studies vary depending on the culture profile and the type of performance that is measured (for example, Kim and Chang 2019; Eisend et al 2016). For example, a recent meta-analysis based on 48 independent samples representing 26,196 organisations demonstrates that the correlation between a 'clan culture' and organisational-level innovation outcomes (for example the development and/or introduction of new and improved procedures, practices, or products) is moderate (0.43) whereas the correlation with financial performance is low (0.13) (Hartell et al 2019). However, this review did not find reliable and conclusive evidence that some culture elements have a consistent, larger impact on performance than others, nor did this review find reliable and conclusive evidence that specific outcomes are more sensitive to (aspects of) organisational culture.

Question 6: What is known about the effectiveness of strategies to change organisational culture?

Finding 9: It is not possible to draw any conclusions about the effectiveness of interventions to change organisational culture (level AA).

This REA did not find any studies in which the effectiveness of interventions to change an organisation's culture was assessed in a valid and reliable way. This finding is consistent with a Cochrane review published in 2011 in which no rigorous evidence was found to demonstrate the effect of strategies to change organisational culture on (healthcare) performance (Parmelli et al 2011).

4 Conclusion

Empirical research on the link between organisational culture and performance has been hampered by a number of conceptual and methodological challenges, including disagreements about defining and assessing culture. As a result, the studies included in this review are hard to compare and lack the methodological rigour necessary to demonstrate a causal link. As explained, to demonstrate a causal relationship between culture and performance, three conditions must be met. Most studies meet only one, that

is: demonstrating a correlation.

However, this does not mean that the findings of this REA are inconclusive. On the contrary, the findings are very clear: there is little evidence consistently linking organisational culture to performance, but if such a link should exist, it is very weak and too small to be practically meaningful. As such, organisations and practitioners should be careful spending time and money on company-wide culture change programmes as they are not likely to increase performance.

Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about the link between organisational culture and performance by using the systematic review method to search and critically appraise empirical studies. However, in order to be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases and a focus on empirical research published in the period 1980 to 2019 for meta-analyses and the period 2000 to 2019 for primary studies. In addition, the search for empirical studies was based only on combinations of different search terms, such as 'culture', 'performance', and 'workplace', and a search for studies that used the four most prominent quantitative approaches to assessing organisational culture. As a consequence, some relevant studies may have been missed.

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

that is, studies with a control group and/or a before-and-after measurement. For this reason, a large number of cross-sectional studies were excluded. As a consequence, new, promising findings that are relevant for practice may have been missed.

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

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Appendices

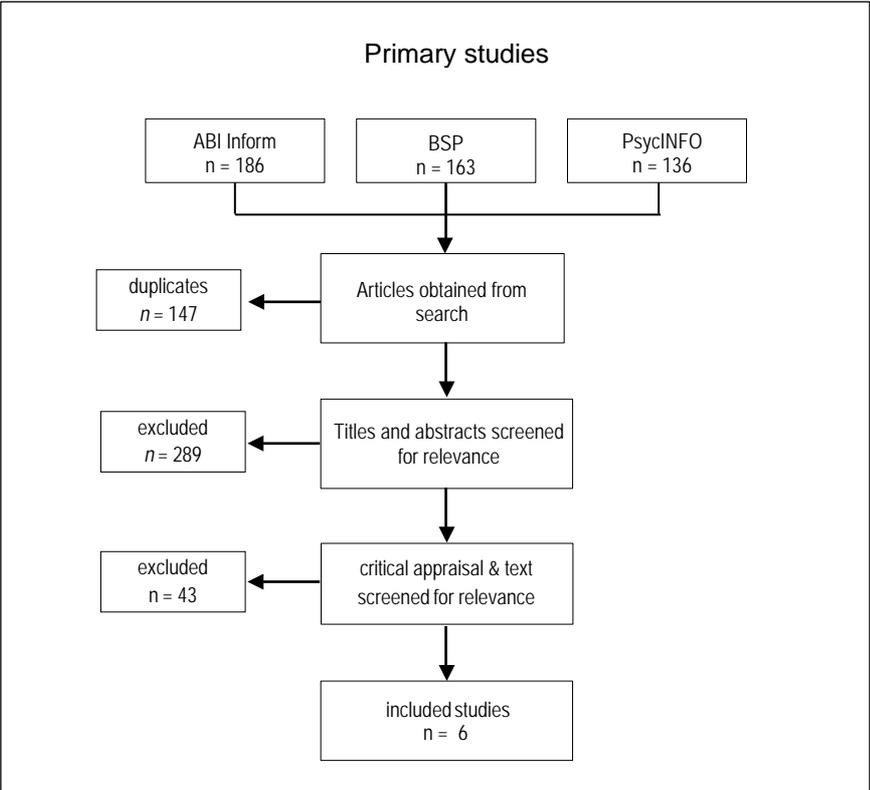
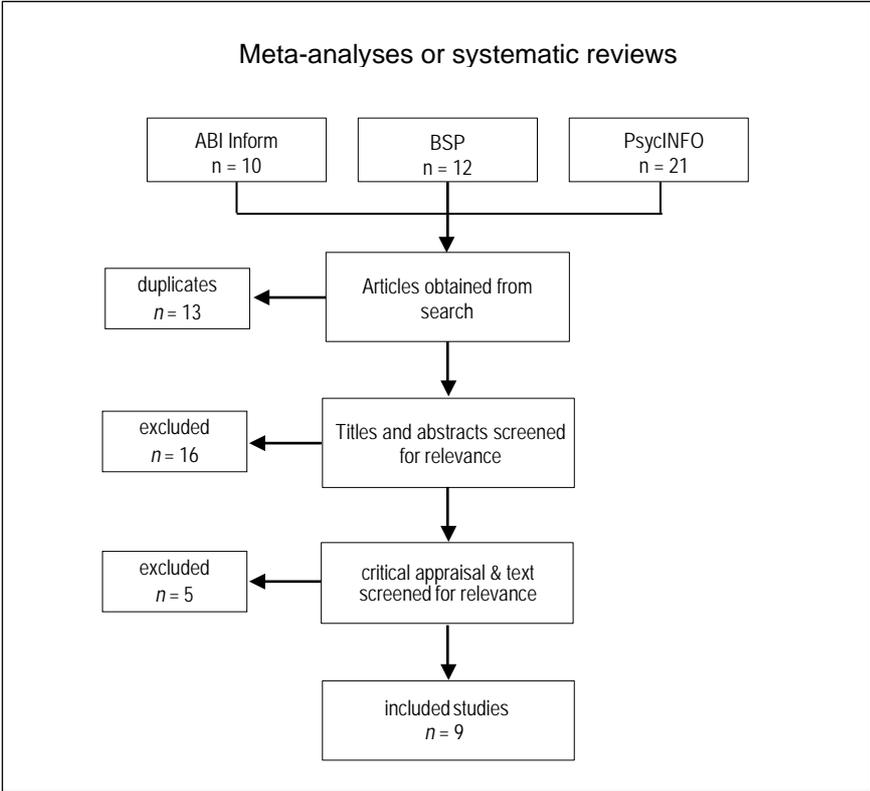
Appendix 1: Search terms and results

| ABI/Inform Global, Business Source Elite, PsycINFO peer-reviewed, scholarly journals, May 2019 | | | |
|---|-----------|-----------|-----------|
| Search terms | ABI | BSP | PSY |
| S1: ti(cultur*) AND ti(organi?tion*) | 361 | 2,926 | 4,559 |
| S2: ti(cultur*) AND ti(corporat*) | 698 | 880 | 589 |
| S3: ab('organi?ational culture') OR ab(corporate culture') | 5,915 | 4,613 | 2,762 |
| S4: S1 OR S2 OR S3 | 6,375 | 6,564 | 6,522 |
| S5: ti(perform*) OR ab(performance) | 214,692 | 330,493 | 361,335 |
| S6: S4 AND S5 | 1,468 | 1,299 | 900 |
| S7: ti(perform*) AND ti(culture) | 576 | 566 | 475 |
| S8: S6 OR S7 | 1,790 | 1,578 | 1,223 |
| S9: filter meta-analyses or systematic reviews | 10 | 12 | 21 |

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

| Search terms | ABI | BSP | PSY |
|---|------------|------------|------------|
| S11: S8 and filter longitudinal or controlled studies | 82 | 75 | 49 |
| S12: ti('competing values') OR ab('competing values') | 351 | 302 | 210 |
| S13: ti('organi?ational culture assessment') OR ti('organi?ational culture assessment') | 34 | 38 | 12 |
| S14: ti(OCAI) OR ab(OCAI) | 15 | 17 | 7 |
| S15: ti('organi?ational culture inventory') OR ab('organi?ational culture inventory') | 13 | 10 | 44 |
| S16: ti(OCI) OR ab(OCI) | 57 | 99 | 244 |
| S17: ti('organi?ational culture survey') OR ab('organi?ational culture survey') | 24 | 18 | 125 |
| S18: ti('organi?ational culture profile') OR ab('organi?ational culture profile') | 24 | 22 | 45 |
| S19: S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 Or S18 | 495 | 559 | 658 |
| S20: ti(perform*) OR ab(performance) | 214,692 | 330,493 | 361,335 |
| S21: S19 AND S120 | 186 | 163 | 136 |

Appendix 2: Study selection



Appendix 3: Critical appraisal

Meta-analyses

| Author and year | Design and sample size | Sector/population | Culture (type/definition) | Measurement tool | Performance (type) | Effect sizes | Limitations | Level |
|-----------------|--|---------------------------|--|------------------|--|--|--|-------|
| Brand, 2012 | systematic review of controlled and uncontrolled studies k = 57 | hospitals | not specified | not specified | financial, operational and clinical outcomes | no (valid and reliable) effect sizes found | no serious limitations | AA |
| Eisend, 2016 | meta-analysis k = 123 | not specified (mixed) | Quinn: market, clan, hierarchy and adhocracy culture | OCAI | new products | clan r = .31 adh r = .23 market r = .46 hier r = .104 moderated by low/high individualism, uncertainty avoidance, power distance, etc. | poor search strategy, design of studies included not specified | D |
| Harding, 2017 | systematic review of controlled and uncontrolled studies k = 51 | health care organisations | Research culture = research activities | not specified | organisational efficiency (not specified) | no difference (k = 1 controlled study) | small sample size | B |

| | | | | | | | | |
|----------------|---|--------------------------|---|------|---|--|--|---|
| Hartnell, 2011 | meta-analysis k = 84 | not specified (mixed) | Quinn: market, clan, hierarchy and adhocracy culture | OCAI | innovation (new products, services or processes), financial performance | <p>subj innovation clan $\rho = .41$; adh $\rho = .48$; market $\rho = .59$</p> <p>Obj profit clan $\rho = .00$; adh $\rho = .13$; market $\rho = .14$</p> <p>Obj growth clan $\rho = .05$; adh $\rho = .15$ market $\rho = .18$</p> <p>Note: Moderated by industry and national culture.</p> | design of studies included not specified | C |
| Hartnell, 2019 | meta-analysis k= 148 (N = 26,196 organisations and 556,945 informants) | not specified (mixed) | Quinn: market, clan, hierarchy and adhocracy culture | OCAI | task performance, organisational citizenship behaviours, organisational innovativeness, technical and administrative innovations, process innovations, financial performance | <p>innovation outcomes clan $\rho = .43$; adh $\rho = .43$ market $\rho = .41$; hierar $\rho = .27$</p> <p>operational outcomes clan $\rho = .25$; adh $\rho = .34$ market $\rho = .38$; hierar $\rho = .31$</p> <p>financial outcomes clan $\rho = .13$; adh $\rho = .14$ market $\rho = .23$; hierar $\rho = .22$</p> <p>NOTE: Results demonstrate that some culture dimensions do not have unique predictive utility when controlling for the competing values framework (CVF) other culture dimensions as well as leadership and HPWPs. For example, clan culture did not explain incremental variance in operational outcomes; hierarchy culture did not explain additional variance in customer outcomes; market culture did not explain significant variance in employee outcomes; and adhocracy and market cultures failed to explain additional variance in financial outcomes.</p> | design of studies included not specified | C |

| | | | | | | | | |
|------------------|-----------------------------|---------------------------|--------|---|---|--|---|---|
| Hunt, 2012 | systematic review k = 20 | not specified (mixed) | Schein | Mainly OCAI | mix of subjective & objective clinical and organisational performance measures | not reported In terms of outcomes, none of the studies reviewed found evidence of a relationship between culture and performance. It is clear that any relationship between culture and performance is highly unlikely to be simple: such relationships are more likely to be multiple, complex, contingent and dynamic. | design of studies included not specified | C |
| Radakovich, 2017 | meta-analysis k = 3 | not specified (mixed) | Schein | unclear | work quality, in-role performance, job performance, overall performance, work performance, innovative job performance | $r = .03$ (fully mediated by intrinsic motivation, $r = .49$) | design of studies included not specified no differentiation between climate and culture small sample | C |
| Scott, 2003 | meta-analysis k = 10 | health care organisations | Schein | mixed, OCAI, participative observation, self-constructed questionnaires | a wide range, including clinical and attitudinal outcomes | No ES reported Four of the ten studies reviewed in detail claimed to have uncovered supportive evidence for the hypothesis that culture and performance are linked. All the other studies failed to find a link, though none provided strong evidence against the hypothesis. | design of studies included not specified small sample Most of the studies measured culture only at the level of artefacts and behaviours, rather than assumptions | C |

| | | | | | | | | |
|---------------|--------------------------|--------------------------|-------------------------|--|---|---|--|---|
| Taras, 2010 | meta-analysis k = 598 | not specified (mixed) | Hofstede's 4 dimensions | Various versions of Hofstede's original Values Survey Module (VSM) | job performance | Culture was found to be the weakest predictor of performance, with the direct effect of cultural values being close to zero ($\rho=0.03$). Demographics and personality showed comparatively better results ($\rho=0.12$ and $\rho=0.09$ respectively) and general mental ability stood out as a remarkably good predictor ($\rho=0.54$) of performance. | design of studies included not specified | C |
| metaBUS, 2019 | meta-analysis k = 21 | not specified | Varies | OCI, OCAI, DOCS and self-construed measurements | Task, job, individual, team, group, financial, market, and innovative performance | $r = .16$ (95% CI = .08 – .24) | design of studies included not specified | C |

Excluded studies

| Author and year | Reason for exclusion |
|-------------------|---|
| Ng, 2009 | Concerns the moderating effect of culture on the satisfaction–performance relation, no zero-order correlations are reported |
| Parker, 2003 | Independent variable (IV) is psychological climate perceptions, organisational culture is mentioned but not measured |
| Slater, 2014 | Traditional literature review, no quantitative outcomes are reported |
| Whiterspoon, 2013 | Culture is defined as a set of sub-constructs, such as communication, participation, subjective norms, social trust, and organisational commitment, etc |
| Yaghoubi, 2017 | Culture is defined as goal-setting, team orientation, integration, performance emphasis, innovation orientation, members' participation, and reward orientation. In addition, no quantitative findings are presented. |

Single studies

| Author and year | Design and sample size | Sector/population | Culture (type/definition) | Measurement tool | Performance (type) | Effect size | Limitations | Level |
|-----------------|---|---|--|------------------|--|---|--|-------|
| Boyce, 2015 | longitudinal study (6 years, 4 measurement points for culture, 6 for outcomes) Sample: sales and service departments in 95 dealerships | franchise automobile dealerships in the USA | Culture was conceptualised as a shared phenomenon at the department level. | DOCS | New vehicle sale | In sales departments, culture at time 3 $r = .07$ In sales departments, culture at time 6 $r = .11$ | | B |
| Jacobs, 2013 | Cross-sectional study with repeated (3) measures | NHS hospitals | Competing Values Framework | OCAI | Unclear: 'Performance data comes from a variety of routinely collected sources and is held in a longitudinal database of NHS hospitals.' | Mixed: some small hospitals with a clan culture show a negative correlation with performance, some large hospitals with a developmental culture show a positive correlation. Overall, though, the changes over time across all performance measures are towards a more blended culture, with a single dominant culture becoming less prominent. | Cross-sectional study, the repeated measures don't affect the risk of bias | D |

| | | | | | | | | |
|-------------|--|--|---|---|--|--|--|---|
| Kim, 2019 | longitudinal study (4 years, 3 measurement points) Sample: employees from 411+ organisations | business corporations operating in Korea | Competing Values Framework | A 12-item instrument based on the OCAI | Self-report measure by managers of the company's: - HR performance - customer performance - process performance | HR performance: β between -.04 (Hierarchy culture) and .59 (Clan culture) Process performance: β between -.07 (Hierarchy culture) and .50 (Adhocracy culture) Customer performance: β between .002 (Hierarchy culture) and .50 (Adhocracy culture) | no serious limitations | B |
| Kline, 2000 | Time-lagged study (from 1 to 5 years between predictor and outcome measures) Sample: 100 companies | Fortune's 'America's most admired corporations' 1989, comprising the 10 largest from the Fortune 500 in each industry in the USA | Six cultural attributes valuable to strategic competitiveness (Hall 1993): perceptions of quality, perceptions of customer service, ability to manage change, ability to innovate, teamworking ability, and participative management style. | Content analysis of the annual reports of the companies. | Financial performance, measured as relative (to the industry median) return on shareholders' equity | $r = -.18$ $\beta = -.20$ | The sentences used to code the cultural attributes expressed something the company was aspiring to possess, not its current characteristics. | C |
| Nold, 2012 | matched samples controlled study Sample: 56 companies (28 listed in 'Great Places to Work' and 28 who weren't listed) | companies in the USA | A 'great place to work' culture is where employees trust the people they work for, have pride in what they do, and enjoy the people they work with. Note: not really a measure of culture | The Great Places to Work survey: 58 statements grouped into key dimensions of organisational culture: •credibility •respect •fairness •pride •camaraderie. | Firm value: •Price/earnings ratio •Tobin's q Operating performance measures and growth rate: •operating margins •operating income per employee •return on assets •average annual growth | Firm value: •price/earnings: Wilcoxon's Z = 0.66 •Tobin's q: Z = 0.30 Operating performance: •operating margins: Z = 1.96 •income/employee: Z = 2.48 •ROA: Z = 2.12 •growth: Z = 2.37 | Selecting the 'Great Places to Work' sample restricted the pool to companies listed on the stock exchange in the USA. | C |

| | | | | | | | | |
|---------------|--|--|--|--|---|-------------------|--|---|
| Ramella, 2017 | time-lagged study (1 year) Sample: 93 companies | Italian companies in the mechanical engineering and high-technology fields which had European patents granted to them. | Collaborative corporate culture: building co-operative relationships internally, through a 'strategic integration' approach that valorises human capital and organisational flexibility. | Custom-built questionnaire to measure the 'strategic integration index'. | Increase in the number of employees during the financial crisis (2010–2012) | Odds Ratio = 6.85 | Unclear who were the respondents for each company. | C |
|---------------|--|--|--|--|---|-------------------|--|---|

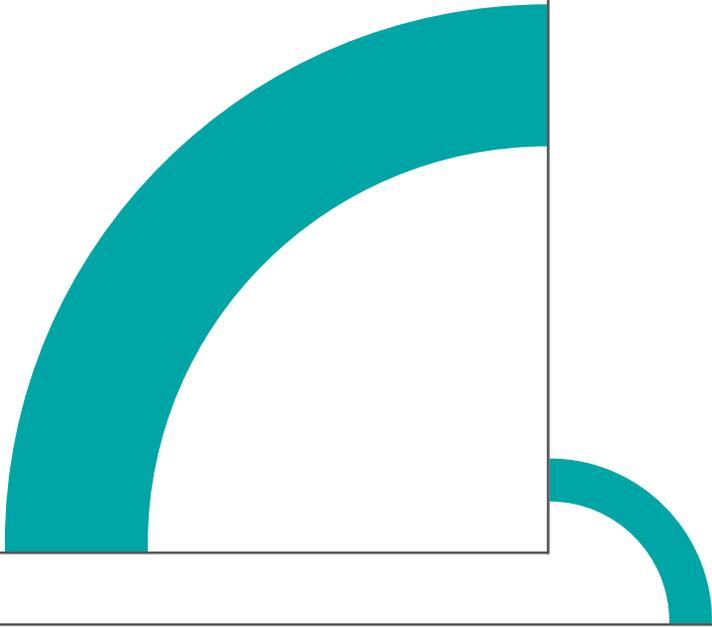
Excluded studies

| Author and year | Reason for exclusion |
|---------------------|--|
| Agbejule, 2011 | Cross-sectional study |
| Balthazard, 2006 | Cross-sectional study, large sample size but derived from the company that commercially exploits the OCI |
| Braunscheidel, 2010 | Cross-sectional study |
| Brouthers, 2012 | Not relevant – the study looks at national culture differences, not organisational culture |
| Buch, 2001 | Not relevant – doesn't provide a measure of effect size between culture and performance |
| Cadden, 2013 | Not relevant – doesn't provide a measure of effect size between culture and performance |
| Calciolari, 2018 | Cross-sectional study |
| Corbett, 2000 | Cross-sectional study |

| | |
|------------------|---|
| Davies, 2007 | Cross-sectional study |
| De Luca, 2018 | Cross-sectional study |
| Deshpande, 2004a | Reports on many single studies, but not enough data is available for any of them to identify an effect size |
| Deshpande, 2004b | Cross-sectional study, most measures are self-report |
| Deshpande, 2007 | Cross-sectional study |
| Gambi, 2015 | Cross-sectional study |
| Gillett, 2003 | Cross-sectional study |
| Goodman, 1999 | Cross-sectional study |
| Islam, 2019 | Expert panel |
| Kagaari, 2011 | Cross-sectional survey and mixed methods |
| Kairisia, 2017 | Cross-sectional study |
| Kalyar, 2013 | Cross-sectional study |

| | |
|--------------------|--|
| Klein, 1995 | Cross-sectional study |
| Kotrba, 2012 | Cross-sectional study, large sample size but only public traded companies with financial records listed in S&P's Compustat database were included. Overall R2s are rather low (.04 to .11) |
| Lee, 2004 | Cross-sectional study. Note: Type of industry accounted for 53.3% of the variance |
| Lewis, 1994 | Not relevant – doesn't provide a measure of effect size between culture and performance |
| Nazir, 2008 | Cross-sectional study (involving only three organisations). |
| O'Reily, 2014 | Cross-sectional study |
| Pobkeeree, 2015 | Not relevant – doesn't report data on the effect size between culture and performance |
| Polychroniou, 2017 | Cross-sectional study |
| Prajogo, 2011 | Cross-sectional study |
| Prentini, 2013 | Cross-sectional study |
| Ritchie, 2013 | Not relevant – concerns a study conducted as part of a classroom exercise designed to help undergraduate students participating in a business strategy simulation to understand better the relationship between culture and organisation performance |
| Skerlavaj, 2007 | Cross-sectional study |

| | |
|--------------------|---|
| Song, 2009 | Cross-sectional study |
| Ukawa, 2014 | Cross-sectional study |
| Van Beek, 2010 | Cross-sectional study |
| Valmohammadi, 2015 | No effect sizes reported |
| Van Dyck, 2005 | Cross-sectional study |
| Yarbrough, 2011 | Cross-sectional study |
| Yiing, 2008 | Cross-sectional study |
| Wali, 2011 | Not relevant – doesn't report data on the effect size between culture and performance |
| Zbieg, 2017 | Cross-sectional study |
| Zhang, 2008 | Cross-sectional study |

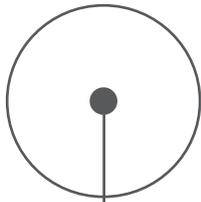


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