Trust and performance in business teams: A meta-analysis

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Abstract

**Purpose** – The aim of this study is two-fold. First, the nature of the relationship between team trust and team performance in the business context is determined. Second, both team design (team size and team type) and methodological moderators (source of criterion measure and study date) of the relationship are assessed.

**Design/methodology/approach** – A random-effects meta-analysis was performed on published and unpublished empirical studies. Subgroup moderator analyses were conducted using Cochran’s $Q$. Continuous moderator analyses were conducted using meta-regression.

**Findings** – Data from 55 independent studies (3,671 teams) were pooled. Results indicated a large, positive relationship between team trust and team performance in real business teams. Further analyses indicated that the relationship was significantly moderated by business team type, team size, and source of criterion measure.

**Research limitations/implications** – Results indicate different team types, sizes, and performance criteria should not be treated as equivalent. Results are based on cross-sectional research and can only be generalized to business teams.

**Practical implications** – Managers should be attentive to trust issues in work teams as they may portend future performance problems or mirror other organizational issues that affect team performance. Team function and size predict how team trust is related to team performance.

**Originality/value** – The present study answers a call by Costa *et al.* (2018) for additional investigation of moderators of the trust-performance relationship in teams using a quantitative review of studies.

*Keywords:* team trust, team performance, meta-analysis, team size, team type, business teams, team function; criterion source
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Introduction

As organizations increasingly rely on teams, there has been a greater impetus to determine how team performance can be optimized. While traditional models of team functioning have focused on team processes (e.g., input-process-output model: McGrath, 1984), recent research (e.g., Carter et al., 2018; Shuffler et al., 2018) has shifted attention toward team emergent states—attitudes, values, and beliefs that arise out of team interactions and tend to vary with context (Marks et al. 2001). One emergent state that has intrigued both scholars and practitioners is team trust. Team trust has been conceptualized as “a shared psychological state among team members comprising willingness to accept vulnerability based on positive expectations of a specific other or others” (Fulmer and Gelfand, 2012: 1174).

In recent decades, a growing number of studies have examined the relationship between team trust and business team performance. Despite general optimism about the potential of team trust to enhance business team performance, results of empirical research have been highly inconsistent with correlations ranging from very weak to very strong. These inconsistencies may be a consequence of team design and methodological factors. In their meta-analyses, Breuer et al. (2016) and de Jong et al. (2016) found that various task (e.g., task interdependency) and process factors (e.g. virtuality) moderated the team trust-team performance relationship across different team contexts. Both meta-analyses aggregated data from studies conducted across an array of team contexts such as laboratory/simulated, business, academic, and athletic settings. Furthermore, the meta-analysis conducted by de Jong et al. (2016) treated teams, firms, districts, and schools as equivalent and regarded organization-wide performance measures and other types of outcomes, including innovativeness and satisfaction, as congruent to team performance.
Breuer et al. (2016), however, found that effect sizes differed depending on the nature of the criteria correlated with team trust. Hence, this calls into question the practice of treating distinct outcomes as equivalent or generalizing across wide-ranging units and team contexts. As a result of these amalgamations, previous meta-analyses may have introduced extraneous heterogeneity. The current meta-analysis aims to advance understanding of the nature of the team trust-team performance relationship in business teams and identify moderators of the relationship.

This paper extends the work of Breuer et al. (2016) and de Jong et al. (2016) in several notable ways. First, it aims to summarize a significantly narrower stream of literature that examines the relationship between team trust and team performance in real business teams. Thus, results of the current study are applicable to and have implications for workplace teams and their managers. Likewise, directions for future research that build on the current study are clear given the relatively narrow inclusion criteria. Second, given that organizations increasingly rely on teams to achieve their objectives across different functional areas (Mathieu et al., 2014), this paper examines whether team size and team type moderate the trust-performance relationship in business teams. It is expected that the strength of the relationship will vary based on team size and type of business team (decision-making, project, production). In addition, the current study examines whether methodological moderators including source of criterion measure (internal, external, objective) and study date help to explain variance in effect sizes across primary studies. These four potential moderators have not been examined by previous meta-analyses on the topic. Furthermore, the current study answers Costa and colleagues’ (2018) call for continued meta-analytic investigation of moderators of the trust-performance relationship in teams.
**Team trust-team performance relationship**

According to Mayer and colleagues’ (1995) organizational trust model, trust in an interdependent relationship leads to outcomes through risk-taking behavior. Specifically, a trusting party recognizes the benevolence, ability, and integrity of another party and subsequently is more likely to engage in a range of cooperative behaviors (e.g., delegating important tasks, supporting the process of change) with that party. These collective and compliant behaviors can help teams achieve their goals. Teams that are successful in developing trust among their members foster cooperation, which facilitates members’ accomplishment of the shared team task.

Marketing and management scholars have shown considerable interest in the topic of team trust (e.g., Akgün et al., 2005; Dayan and Di Benedetto, 2010; Muethel et al., 2012) and asserted that high team output (e.g., decision, product) quality is often a function of trust between team members. For instance, Dayan and Di Benedetto (2010: 699) argued that team trust is a critical driver of new product performance; they pointed out “as team members develop trust, they develop new products with fewer technical problems, find and solve product problem areas with which customers are dissatisfied, and develop products better.” As predicted, Dayan and Di Benedetto (2010) found that higher team trust was significantly related to higher new product success. More recent studies have also found large, positive correlations between team trust and team performance (e.g., Buvik and Tvedt, 2016; Chou et al., 2013; Lee et al., 2015). This suggests:

*Hypothesis 1: Team trust will be positively associated with team performance in the business context and the effect size describing the relationship will be large.*
Moderators of the team trust-team performance relationship

This study also examines whether team design and methodological factors moderate the relationship between team trust and team performance. Team design moderators include team size and team type. Methodological moderators include source of criterion measure and study date.

Team size. Team size has been examined in other meta-analyses dealing with teams (e.g., LePine et al., 2008; Stahl et al., 2010). Process loss theory (Steiner, 1972) suggests that larger teams are subject to greater process losses (e.g., breakdowns in communication, coordination challenges) than smaller teams. Because processes give rise to emergent states (e.g., beliefs about the benevolence and integrity of another party), smaller teams may require less time to develop trust than larger teams. Smaller teams also tend to be more effective than larger teams (Mueller, 2012). Therefore, it is likely:

Hypothesis 2: Team size will significantly moderate the team trust-team performance relationship such that the relationship will be stronger for smaller as compared to larger teams.

Team type. Team type refers to the functional purpose of the team. According to D’Innocenzo et al. (2016: 1974), team type “is one of the more commonly examined moderators of team-related effect sizes in meta-analyses.” Different types of teams have fundamentally different core tasks which may affect the nature of the interdependences needed for effective team performance. In their meta-analysis, DeChurch and Mesmer-Magnus (2010) argued that interdependencies in decision-making teams, which process information and make decisions or develop strategies, are largely informational in nature given their tasks require more cognitive than physical activities. Conversely, production teams which coordinate actions and perform
physical tasks such as manufacturing a product, have more behavioral than informational interdependencies. They indicate that project teams are both informationally- and behaviorally-interdependent and thus should fall between the other team types. This suggests, due to their informational interdependence, decision-making teams have greater relationship considerations given the critical role that building rapport and trust play in gaining buy-in and achieving consensus. Conversely, the greater behavioral demands of production teams may be characterized by higher levels of task-oriented than relationship-oriented exchanges which may hinder the development of strong social ties between team members. Thus, it follows:

*Hypothesis 3:* Team type will significantly moderate the team trust-team performance relationship such that the relationship will be strongest for decision-making teams and weakest for production teams.

**Source of criterion measure.** Team performance can be assessed by internal sources (team members themselves), external sources (non-team members), or objective sources (impartial measures such as sales profit). It is widely accepted that effect sizes are inflated when employees rate their own performance. Common source bias (see Podsakoff et al., 2003) may inflate the coefficient describing the team trust-team performance relationship when the source of criterion measure is internal. Conversely, objective sources of team performance generally do not lead to inflated performance scores. This suggests:

*Hypothesis 4:* Source of criterion measure will significantly moderate the team trust-team performance relationship such that the relationship will be strongest when an internal source is used and weakest when an objective source is used.

**Study date.** Another potential methodological moderator is study date. In the current meta-analysis, study date is used as a proxy for changes in social values, most notably an
increasing focus on trust in matters concerning organizations. The magnitude of the effect size for the focal relationship is expected to be larger over the publication years of the primary studies for several reasons. Since the turn of the 21st century, trust has become more salient in society due in part to several high-profile corporate scandals (e.g., Enron, Wells-Fargo) which spurred the passage of legislation, such as the Sarbanes-Oxley Act, to enhance trust and transparency in organizations (Hurley et al., 2013; Kramer and Lewicki, 2010). During this same period, the understanding of how to optimize trust and team performance has increased as a result of growing interest in both. For example, the number of research articles and books published on the topic of trust relevant to organizations has grown notably (see Figure 1). Thus, it is hypothesized:

**Hypothesis 5:** Study date will significantly moderate the team trust-team performance relationship such that the relationship will be stronger in more recent studies as compared to earlier studies.

Method

**Literature search**

Electronic searches of *Business Source Premier, PsycINFO, Google Scholar, and Dissertation Abstracts* databases, and major conferences (e.g., Academy of Management, Society for Industrial and Organizational Psychology, American Psychological Association) were conducted through January 2020. Several combinations of key terms were used including team trust, intrateam trust, collective trust, mutual trust, team performance, and/or team effectiveness. The reference sections of potentially relevant articles were also searched to locate
Inclusion criteria

Studies were eligible for inclusion if they reported a correlation coefficient for the relationship between trust and performance assessed at the team-level for business teams. Team performance was defined as the degree of task or goal achievement in terms of quality and/or quantity of output. In addition, only team performance measures were included; other criterion measures (e.g., team member satisfaction) were excluded from the current study. The inclusion criteria resulted in 56 studies; however, one of these studies (i.e., Potrafka, 2016) was identified as an outlier after inspecting the funnel plot. The corrected effect size for the study was near perfect in magnitude ($\rho = .96$) and had a very narrow confidence interval (.91 to .98). This outlier had an appreciable impact on heterogeneity—the $Q$ statistic increased by 21.3% (from 296.10 to 359.23). Also, though based on only 36 teams, inclusion of this one study would have increased the corrected mean effect size by 3.8% (from .479 to .497). Although including the study would lend further weight in support of Hypothesis 1, it was excluded given the aim of this study is to best represent the general team trust-team performance relationship and its heterogeneity.

Removal of this outlier yielded a final sample of 55 studies as noted in the Reference section.

Coding procedure

The authors created a coding manual to outline the protocol for extracting data for sample size, effect size (correlation), moderator variables, and reliability estimates for both the criterion and predictor variables. Cronbach alpha coefficients were the preferred reliability coefficient although composite reliability coefficients were used when alpha values were not reported.
Perfect reliability was assumed for objective team performance measures or when no criterion reliability was reported. Codes for team size were based on the average team size reported in studies; the median or the midpoint of a range of team sizes was used when the mean was not reported. Team type was coded as decision making (e.g., top management teams), production (e.g., manufacturing teams), or project (e.g., new product development teams) based on research on team type taxonomies (e.g., Devine et al., 1999; Sundstrom et al., 1990). Source of criterion measure was coded as internal (e.g., team member-rated team performance), external (e.g., customer-rated team performance), or objective (e.g., team income/profit). Study date was coded as the copyright date for published articles and book chapters; presentation year was used for unpublished works.

Both authors independently coded all the studies and then compared codes. Intercoder agreement was high (90.1%). Coding discrepancies, which typically resulted from differences in values reported in text and tables, were resolved through discussion.

Analyses

Comprehensive Meta-Analysis version 3.3 was used to perform quantitative analyses (Biostat, 2014). Study effects sizes were corrected for measurement error based on procedures outlined by Schmidt and Hunter (2014). Data was synthesized based on a random-effects model per recommendations by Kisamore and Brannick (2008). A 95% confidence interval was used to determine significance for the mean effect size. Heterogeneity was assessed utilizing the Cochran Q statistic. Categorical moderators including team type and source of criterion measure were assessed using subgroup analyses. Continuous moderators including team size and study date were assessed with meta-regression. Publication bias was assessed using Duval and Tweedie’s (2000) trim and fill procedure.
Results

The 55 independent studies (3,671 teams) included: 43 journal articles, 7 doctoral dissertations, 3 master’s theses, and 2 book chapters. Study dates ranged from 1996 to 2019. Sample sizes ranged from 15 teams to 162 teams ($M = 66.7$).

**Hypothesis 1**

Team trust was positively correlated with team performance ($\rho = .48; p < .001$). The 95% confidence interval ranged from .42 to .54; the random-effects variance component was .07. Based on work by Cohen (1992), the strength of the effect size was large given it was greater than .40 thus supporting Hypothesis 1. Therefore, higher levels of trust in business teams are generally associated with higher levels of team performance. Duval and Tweedie’s (2000) trim-and-fill analysis indicated no studies needed to be trimmed, thus the mean effect size ($\rho = .48$) did not need to be adjusted. These results imply that publication bias is unlikely.

The $Q$ statistic for heterogeneity was 293.04 and significant ($p < .001$), suggesting that the team trust-team performance relationship is likely to be affected by other factors. This result supported proceeding with testing for the hypothesized moderators.

**Hypothesis 2**

Six studies did not report enough information about team size to allow for coding. Average team size for the remaining 49 studies ranged from 2.09 to 20.95 team members. The mean team size (20.95) in Dekker’s (2008) study was determined to be an outlier as it was more than 3 standard deviations from the average of the team sizes coded. Thus, Dekker’s (2008) study was eliminated for this moderator analysis only. Raw mean team size for the remaining 48 studies was 7.07; weighted mean team size was 6.76. As predicted in Hypothesis 2, the meta-regression analysis yielded a coefficient of -.031 ($Z = -2.07, p = .039$); the 95% confidence
interval ranged from -.061 to -.002. Thus, team size significantly moderated the team trust-team performance relationship; the relationship was stronger in smaller teams.

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Insert Table 1 about here

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**Hypothesis 3**

As shown in Table 1, team type significantly moderated the relationship between team trust and team performance in business teams \( (Q = 8.26, p = .016) \). As predicted, the relationship was found to be strongest in decision-making teams \( (\rho = .52) \) and weakest in production teams \( (\rho = .25) \). The magnitude of relationship in project teams \( (\rho = .51) \) fell between the magnitudes for the other two team types.

**Hypothesis 4**

Hypothesis 4 predicted source of criterion would moderate the team trust-team performance relationship. Results supported Hypothesis 4. Source of criterion measure significantly moderated the relationship between trust and performance in business teams, \( (Q = 10.93, p = .004) \). As shown in Table 1, the relationship between team trust and team performance was strongest when team performance was measured internally \( (\rho = .56) \), followed by use of external ratings \( (\rho = .38) \); the relationship was weakest when objective performance measures were used \( (\rho = .27) \).

**Hypothesis 5**

Hypothesis 5 indicated the relationship between trust and performance would be stronger for more recent studies due to societal changes in the salience of trust. Based on the 55 included studies, meta-regression results yielded a coefficient of 0.014; the 95% confidence interval ranged from -.001 to -.029. The magnitude of effect sizes tended to increase over time, but not
significantly so. Hypothesis 5 was not supported; study date did not significantly moderate the team trust-team performance relationship ($Z = 1.83, p = .067$).

**Discussion**

This study examined the association between team trust and team performance in real business teams and tested possible moderators of this relationship. The main team trust-team performance relationship was positive and large in magnitude. Thus, business team leaders should understand that the shared perception of trust within a team may foster higher levels of team performance. These findings also illustrate the importance of examining business contexts separately from other team contexts (e.g., academic, athletic) as the two previous meta-analyses found that the main relationship was lower in magnitude ($\rho = .27$: Breuer *et al.*, 2016; $\rho = .30$: de Jong *et al.*, 2016) than the current study, likely as a result of aggregating effect sizes from disparate team contexts.

Practitioners should also be mindful of team design factors such as team size and type that moderate the relationship between team trust and team performance. The results for team size revealed that the strength of the relationship tends to be significantly stronger as team size decreases. Work by Troth *et al.* (2012) focused on how outcomes of emergent states are particularly relevant in small teams in which team members have more intimate personal connections. Furthermore, process loss theory (Steiner, 1972) maintains that larger teams have greater process issues which can negatively affect the development of trust or be detrimental to performance; breakdowns in communication and coordination may hamper team efforts to foster these.

The results also indicate that the relationship between team trust and team performance differs across types of business team. The positive relationship between team trust and team
performance was the strongest in decision making teams followed by project and production teams, respectively. This is likely because members in decision-making teams rely on information and ideas provided by other team members in order to commit to a strategy or decision. Production teams, however, create tangible objects and perform observable actions; they are less reliant on information exchange for performance. Thus, in some team types, quality of information and quantity of communication may be critical for team performance; these exchanges may also inherently foster trust.

Furthermore, the results for the methodological moderator of source of criterion measure indicate that when team performance measures are collected from internal sources, the relationship between trust and performance in those teams will generally be stronger than if either external ratings or objective sources are used. Thus, researchers are cautioned against treating data from different types of criterion sources as equivalent.

**Limitations and future directions**

There were several limitations in the present study. First, because cross-sectional data was used, the conclusions that could be drawn from this study are limited. Social exchange theory (Blau, 1964) suggests that trust evolves from shared experiences and is likely to grow stronger over time; therefore, it should be examined over time given its complexity (see Fry et al. 2017). Future research should examine the differences in the team trust-team performance relationship as a function of team tenure to determine whether there is a typical relationship trajectory as teams evolve over time. Meta-analytic work could then use different timepoints in the team’s life to explore both whether team tenure moderates the team trust-team performance relationship and whether performance improvements follow rising levels of team trust.
Second, the primary study coefficients used in this meta-analysis as well as the meta-regression methods used for continuous moderator analyses assumed linear relationships. Future research both at the primary and secondary levels are encouraged to explore the possibility of curvilinear relationships between team trust and team performance. For example, higher levels of team trust may correspond to higher levels of performance up to a point and then the relationship flattens or weakens. Similarly, with the study date moderator designed to reflect changes in social values, the salience of specific values in society may wax and wane as is evident in Figure 1. Thus, curvilinear moderation models may be able to explain heretofore unexplained heterogeneity across studies.

Third, the current study was based on team trust referents that focused on trust within the team. Future studies should assess other referents, such as a team’s trust in the organization or in the teams’ leader.

Fourth, the moderators examined were limited to the variables available for coding. Other variables (e.g., team performance incentives, organizational support, team diversity) may affect the correlation between team trust and team performance.

**Conclusion**

Results of the current study support the idea that team trust is a key emergent state that is strongly associated with business team performance. This study is the first to investigate team size, team type, source of criterion measure, and study date as possible moderators of the relationship between trust and performance in business teams. As team leaders become more aware of the value of team trust on team outcomes, organizations will increasingly find ways to facilitate team trust and with it, task and goal achievement.
**References**

(* indicates studies included in this meta-analysis)


Steiner, I. D. (1972), Group Processes and Group Productivity, Academic, New York, NY.


Table 1.

Summary of Categorical Moderator Analyses

<table>
<thead>
<tr>
<th>Moderator variables</th>
<th>$k$</th>
<th>$\rho$</th>
<th>95% CI</th>
<th>$Q$-value</th>
<th>$\tau^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Team type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Decision-making</td>
<td>9</td>
<td>0.518***</td>
<td>0.405 – 0.615</td>
<td>0.011</td>
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</tr>
<tr>
<td>Project</td>
<td>19</td>
<td>0.512***</td>
<td>0.430 – 0.585</td>
<td>0.054</td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>6</td>
<td>0.252**</td>
<td>0.064 – 0.423</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Test for level difference</td>
<td>34</td>
<td>0.446***</td>
<td>0.292 – 0.578</td>
<td>8.258*</td>
<td>0.043</td>
</tr>
<tr>
<td><strong>Source of criterion measure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal</td>
<td>25</td>
<td>0.558***</td>
<td>0.475 – 0.631</td>
<td>0.109</td>
<td></td>
</tr>
<tr>
<td>External</td>
<td>19</td>
<td>0.377***</td>
<td>0.257 – 0.485</td>
<td>0.017</td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>6</td>
<td>0.265*</td>
<td>0.033 – 0.470</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Test for level difference</td>
<td>50</td>
<td>0.421***</td>
<td>0.230 – 0.581</td>
<td>10.932**</td>
<td>0.070</td>
</tr>
</tbody>
</table>

*Note. $k =$ number of studies; $\rho =$ mean corrected correlation coefficient; CI = confidence interval; $Q =$ test of heterogeneity among levels; $\tau^2 =$ random-effects variance component. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$*
Figure 1. A graphical representation of scholar and mainstream interest in trust. Darker segments of the bars represent articles on “trust” indexed in PsycINFO. Data were retrieved through a title-based search using the term “trust” along with six classifications including social psychology, group and interpersonal processes, organizational behavior, cognitive processes, industrial and organizational psychology, and general psychology. Search results were further limited to peer-reviewed articles. Lighter segments of the bars represent books published on “trust,” “team trust,” and “group trust” in Dewey decimal system call numbers from 302 to 305 in the Books in Print database. Data were retrieved through a subject keyword search. Note: * represents an incomplete record given the search was completed in April 2020.