How Managers Can Build Trust in Strategic Alliances:
A Meta-Analysis on the Central Trust-Building Mechanisms

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Abstract
Trust is an important driver of superior alliance performance. Alliance managers are influential in this regard because trust requires active involvement, commitment and the dedicated support of the key actors involved in the strategic alliance. Despite the importance of trust for explaining alliance performance, little effort has been made to systematically investigate the mechanisms that managers can use to purposefully create trust in strategic alliances. We use Parkhe's (1998b) theoretical framework to derive nine hypotheses that distinguish between process-based, characteristic-based and institutional-based trust-building mechanisms. Our meta-analysis of 64 empirical studies shows that trust is strongly related to alliance performance. Process-based mechanisms are more important for building trust than characteristic- and institutional-based mechanisms. The effects of prior ties and asset specificity are not as strong as expected and the impact of safeguards on trust is not well understood. Overall, theoretical trust research has outpaced empirical research by far and promising opportunities for future empirical research exist.

Keywords: meta-analysis, strategic alliances, trust, alliance performance, alliance manager

JEL Classification: D23, L14, L22, M10

1 Introduction

Strategic alliances are established to create economic value for the partner firms (e.g., Anand and Khanna 2000; Dyer and Singh 1998; Khanna 1998; Lunnan and Haugland 2008; Zollo et al. 2002). Trust is considered to be an important driver of superior alliance performance (Zaheer and Harris 2006). Alliance managers are important in this regard because trust requires active involvement, commitment and the dedicated support of the key actors involved in the strategic alliance (Parkhe 1998a, 1998b; Zucker 1986). Although this knowledge is well established and the number of newly formed alliances all over the world is steadily increasing, we observe high failure rates of up to 70 percent (e.g., Bleeke and Ernst, 1991; Duysters et al. 1999; Park and Ungson 2001). In addition, "we do not necessarily know where it comes from, as relatively little scholarly attention has been devoted to understanding the antecedents of trust in interorganizational relationships" (Gulati and Sytch 2008, p. 166). Hence, the pressing question which alliance managers are facing and empirical research should help answer is how to purposively and intentionally establish trust and proactively foster its development in strategic alliances.

The issues of how to define what a strategic alliance is and how to distinguish it from other types of interorganizational relationships have been widely discussed in management research (Heide and John 1990; Mayer and Teece 2008). While it is indisputable that a joint venture represents a particular alliance type, distinguishing between contractual alliances and buyer-supplier relationships is far more difficult (Mayer and Teece 2008). In this study, we follow Dyer and Singh (1998) and use four characteristics to distinguish arm's-length arrangements and alliances: arm's-length market relationships include non-specific investment, minimal information exchange, low technological and functional interdependence of firms and minimal investment in governance mechanisms. The opposite is true for alliances. In addition, in contrast to arm's-length buyer-supplier relationships, alliances are characterized by a long-term perspective, higher commitment of partners, specific investment into assets and governance mechanisms, a higher degree of mutual integration and the exchange of strategic resources like information, routines, knowledge and capabilities.

In his frequently cited two-paper series on building trust, Parkhe (1998a, 1998b) develops a theoretical framework containing the central sources of trust in strategic alliances. This framework draws on Zucker (1986) who argues that trust does not develop automatically. Instead, management has an active role in the creation of trust. Parkhe (1998b) distinguishes between process-based, characteristic-based and institutional-based trust-building mechanisms and describes how these mechanisms are interrelated to trust and performance in strategic alliances. Drawing on his framework, we meta-analytically estimate whether trust is related to alliance performance and how trust-building mechanisms facilitate the emergence of trust.

We analyze 64 studies on trust in strategic alliances, comprising 66 samples and a total of 8,964 alliance relationships. To our knowledge, ours is the first study that derives empirically testable hypotheses from Parkhe's (1998b) theoretical framework. We contribute to research on and the practice of managing strategic alliances in two ways: first, although the study of trust has become an institutionalized field in management research[1] and there is wide-spread consensus that trust drives alliance performance, we shed new light on this relationship by probing more deeply its strength and critically assess the measurement of trust and alliance performance. Second, prior studies tend to provide singular and partly inconsistent findings based on different theories and methodologies. By means of a meta-analysis, we go beyond the analysis of singular relations and accumulate existing empirical results on how and to what extent process-based, characteristic-based and institutional-based mechanisms each

[1] The formation of FINT - First International Network of Research on Trust - and the infusion of trust as an important topic in influential research associations, such as AOM, EGOS or EURAM, are cases in point.

contribute to trust-building in strategic alliances across theoretical perspectives and empirical methodologies.
The remainder of this article is structured as follows: first, we present the theoretical foundations of trust in strategic alliances and outline nine hypotheses. Second, we describe the methods and analytical procedures chosen and report our results. Third, we discuss our findings and elaborate on opportunities for future research and managerial implications for the creation of trust in strategic alliances.

2 Theory and Hypotheses

2.1 The Importance of Building Trust in Alliances

According to Mayer et al. (1995, p. 712), trust is defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor". Trust has been studied from many different disciplinary perspectives (Bhattacharya et al. 1998). It presents itself as a highly context-specific concept which is abstract and elusive, fragile and ephemeral (Kramer and Lewicki 2010). From a transaction cost perspective, every collaborative arrangement faces the potential threat of opportunism, which makes participating firms vulnerable to the actions of their partner(s) (e.g., Young-Ybarra and Wiersema 1999; Zaheer et al. 1998). Trust can be considered a means to secure cooperation and inhibit opportunistic behavior (Ybarra and Turk 2009).
Nooteboom et al. point out that "[a]part from its own worth, trust pays" (1997, p. 311). Indeed, it reduces transaction, governance and agency costs, such as negotiation costs or the costs of interpartner conflict (Krishnan et al. 2006; Zaheer et al. 1998). This makes transactions more flexible, more agreeable and cheaper (Nooteboom et al. 1997). Conversely, too little trust can annul the benefits of collaboration and make synergies and savings harder or even impossible to reap (Parkhe 1998b).
Social exchange theorists focus on the social context of the relationship (e.g., Young-Ybarra and Wiersema 1999; Zaheer and Venkatraman 1995). Trust is viewed as the fundamental confidence in and the expectation of the counterpart's trustworthy behavior in an exchange relationship – even if, or precisely when, no formal safeguards against opportunism exist (Lee and Cavusgil 2006). Then, trust is a mechanism that reduces the fear of opportunism, which leads to the notion that "where opportunism might be rationally expected, trust prevails" (Ybarra and Turk 2009, p. 64). As it enables and promotes cooperative behavior, trust also encourages future exchange, makes partners want to resolve potential disagreements, and fosters the development of a stable, enduring and successful alliance (Lee and Cavusgil 2006).
To sum up, transaction cost economists understand trust as a mode of governance that reduces transaction costs by limiting opportunism (Ybarra and Turk 2009). Social exchange theorists conceptualize trust as a contextual factor that makes the coordination in alliances more efficient as the fear of opportunism is lowered, communication is enriched and the scope of the relationship is enlarged (Muthusamy et al. 2007; Young-Ybarra and Wiersema 1999). Although these theoretical perspectives offer different explanations, they agree upon the position that trust is conducive to alliance performance.

Hypothesis 1: Trust is positively related to the performance of strategic alliances.

2.2 How Managers Can Purposefully Build Trust in Strategic Alliances

According to Parkhe (1998a), trust is a central organizational principle that allows coping with the uncertainty regarding an unknown and complex future and an unpredictable partner's behavior in an erratic environment. As trust is of vital importance to the success of strategic alliances, the production of trust becomes a central task in post-formation alliance

management (Zucker 1986, p. 59). Rousseau et al. (1998) also emphasize the intentional aspect of trust. Managers as the key actors involved in strategic alliances can purposively build trust to enhance alliance performance. In a similar vein, Whitener et al. (1998, p. 514) claim "that managers' actions and behaviors provide the foundation for trust and that it is actually management's responsibility to take the first step and initiate trusting relationships". Hence, there must be observable and purposive actions and mechanisms that indicate whether and to what extent partner firms intend to engage in vulnerability-inducing collaboration (Robson et al. 2008).

Drawing on Parkhe (1998a, 1998b) and Zucker (1986), we specify three categories of trust-building mechanisms which are depicted in Figure 1. First, *process-based trust* emerges from the interorganizational exchange process itself from the past, the ongoing exchange or from the expected future interaction of the alliance partners. It refers to the partner firm's cooperative history, reputation effects, communication and the expected continuity of the relationship.

Second, *characteristic-based trust-building mechanisms* build on the idea that similarity in terms of societal and corporate cultures in the partners' attributes facilitates trust-building (Parkhe 1998b; Zucker 1986). This similarity should foster the establishment of trustworthy relationships.

Third, *institutional-based trust* originates from formal mechanisms (Zucker 1986), such as specific investment and safeguards (Parkhe 1998b). By investing in alliance-specific assets the partners show good faith and lock themselves into the relationship. Contractual safeguards and other legal agreements aim at penalizing non-cooperative behavior and making partner's behavior more predictable

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Insert Figure 1 about here

We describe the trust-building mechanisms in more detail in the sections below and derive testable hypotheses on the relationships between these mechanisms and trust.

2.3 Process-Based Trust-Building Mechanisms

The interaction between partners in the operation of the alliance is a major cause of cooperative and trustworthy behavior. This continuous interplay of action, interpretation and reaction creates and destroys trust within the relationship (Ring and Van de Ven 1994). Parkhe (1998b) transforms this dynamic perspective into an observation of the past, the present and the future of a relationship. He discusses joint cooperative history and reputation (past), formal and informal communication (present) and the expectation of relationship continuity (future) as the sources of process-based trust.

2.3.1 Cooperative History

According to Zucker (1986), repeated exchange leads to the development of "kinship ties" between the partners. These are informal mechanisms which are likely to produce trust. Firms that have already worked together in the past are more familiar with each other and more confident about each other's trustworthiness than firms that lack this experience (Gulati and Sytch 2008). Thus, they are more likely to trust each other (Kale et al. 2000). Through repeated ties, partners accumulate "partner-specific experience" (Lui and Ngo 2004). They know each other better and can predict and understand each other's behavior (Nielsen 2007; Parkhe 1998b), capabilities and needs (Rosenkopf et al. 2001). A history of past interaction and collaboration can create a unique path to trust (Jennings et al. 2000; Poppo et al. 2008; Ybarra and Turk 2009). Although economists view trust in the context of future gains or losses and sociologists focus on the common context, past history and a jointly developed

background (Zaheer and Harris 2006), both agree upon the idea that a joint cooperative history provides critical information on past cooperative behavior, offers the opportunity to establish relation-specific routines and reduces the perceived likelihood of opportunism (Parkhe 1993a).
Hence, prior relationships allow recurrent matching of the observed with the expected partner behaviors. In case of reinforced positive experiences, they provide an evolutionary path to trust (Parkhe 1998b).

Hypothesis 2: A joint cooperative history between partners is positively related to trust in strategic alliances.

2.3.2 Reputational Effects

Joint cooperative history provides valuable first-hand experience about the alliance partner. However, idiosyncratic and partner-specific knowledge is not always available. Companies that have not worked with each other before may find themselves in a "blind date"-situation. They lack reliable information about their potential partner's trustworthiness, for example in terms of integrity, credibility or reliability. In such a situation, initial trust might emerge from second-hand experience in terms of a partner's good reputation. Reputation is a cumulative track record of trustworthy behavior in the past (Parkhe 1998b; Zucker 1986). It can be transferred across firms, like a vicarious cooperative history that also generates trust in a similar manner (Ganesan 1994). When resorting to a partner's good reputation, companies expect future behavior to be consistent with what they know about reliable behavior in previous relationships and base their own commitment on this information (Anderson and Weitz 1992; Ganesan 1994; Nielsen 2007; Parkhe 1998b; Ybarra and Turk 2009). Thereby, reputation can serve as an assurance of continued trustworthiness (Parkhe 1998a).
A firm's reputation is one form of a hostage that assures predictable behavior through a self-enforcing mechanism. Prior to alliance formation, reputation has an important signaling effect when evaluating potential partners. In later stages, it can serve as a safeguard against ex post-opportunistic behavior. A good reputation takes time to build (Ybarra and Turk 2009). Once established, it is a valuable asset – too valuable to gamble with it and threaten it (Bensaou and Andersen 1999). Violating the implicit rules of credibility and reliability through opportunistic behavior would harm the company's good name, its reputation and its future business (Anderson and Weitz 1992; Bensaou and Andersen 1999; Lui et al. 2006; Parkhe 1998a). In this type of backward-looking trust development (Parkhe 1998b), companies that perceive their respective partner to have a good reputation for fairness and reliability are more likely to trust (Ganesan 1994).

Hypothesis 3: A partner company's reputation is positively related to trust in strategic alliances.

2.3.3 Communication

Bridging the past and the future of a relationship, partner interaction in the present has a strong influence on the development of trust. Communication is important for the coordination and organization of any ongoing interorganizational exchange (Anderson and Narus 1990). As such, effective communication is decisive for the success of strategic alliances (De Jong and Woolthuis 2008; Inkpen and Birkenshaw 1994; Mohr and Spekman 1994). Idiosyncratic relationships provide partner firms the opportunity to realize communication economies through the accumulation of a specialized language which contributes to trust in interorganizational relationships (Williamson 1979).

The sociological literature shows that frequent and high-quality communication contributes to trust through the exchange and alignment of information, values and objectives (Young-Ybarra and Wiersema 1999), to higher mutual commitment (Anderson and Narus 1990) and to confidence in relationship continuity and higher mutual understanding and cooperation between partners (Jennings et al. 2000).
Adopting a broader perspective, Parkhe (1998b, p. 419) argues that formal and informal communication channels provide managers the opportunity of "repeated reinforcement of positive experiences". Intense communication and face-to-face interaction in particular (Dyer and Chu 2000) solidify the positive perception of the trustworthiness of the partner (McAllister 1995; Young-Ybarra and Wiersema 1999). Especially in erratic and uncertain environments and when unexpected problems arise, accurate and timely communication is of significant importance to the preservation of trust between alliance partners (Aulakh et al. 1996; De Jong and Woolthuis 2008; Inkpen and Birkenshaw 1994; Morgan and Hunt 1994). Accordingly, trust between partners "thickens and thins as a function of their cumulative interaction" (Kramer 1999, p. 575) and "cannot increase without exchange of information between partners" (Thuy and Quang 2005, p. 394).

Hypothesis 4: Communication between partners is positively related to trust in strategic alliances.

2.3.4 Expected Continuity

Turning to the future, as opposed to companies playing the power game, "in the trust game, continuity is vital" (Parkhe 1998b, p. 431). With a short or limited time horizon in mind, companies would mainly be interested in their own short-term gains rather than working for the relationship in the long run (Jap and Anderson 2003). Akin to the prisoner's dilemma in game theory, whenever partners expect to continue working together for an indefinite time, they can mirror each other's behavior, i.e., reward trustworthy actions by playing cooperative or punish opportunistic behavior by playing defective in return (Parkhe 1993a). With this kind of reciprocity in a long-lasting collaboration, incentives for opportunistic behavior dwarf (Dyer and Chu 2000). Companies choose today's actions with tomorrow in mind. This describes the "*shadow of the future*" (Parkhe 1993a). It is a self-enforcing mechanism which is independent of cooperative history or reputational effects.
The more today's behavior is tied to (expected) future gains, i.e., the greater the shadow of the future, the higher the likelihood of cooperative behavior in the present is (Parkhe 1993a, 1998a, 1998b). The intention to collaborate with each other for a longer time signals trustworthiness and commitment (Dyer and Chu 2000; Jap and Anderson 2003). In such a situation, a firm can and will trust the other party more readily (Parkhe 1998a).

Hypothesis 5: Expected continuity is positively related to trust in strategic alliances.

2.4 Characteristic-Based Trust-Building Mechanisms

Similar characteristics of alliance partners can be a good indicator for a similar cultural background and similar expectations and beliefs (Zucker 1986). These pave the way for the development of trust. Cultural distance may negatively affect relationship stability and performance (Ng et al. 2007; Nielsen 2007). Research to date has frequently found cultural differences to be the reason for many problems and the resulting poor performance of international strategic alliances (Nielsen 2007). Parkhe (1998b) differentiates between societal (or national) and corporate (or organizational) culture.

2.4.1 Societal Culture

Zaheer and Zaheer (2006, p. 24) point out that "it is clear that national culture powerfully influences trust". Because it affects individual perceptions of trustworthiness (Zaheer and Harris 2006), the cultural context of an alliance influences the nature and level of interorganizational trust. Trust in cross-cultural alliances has been extensively studied (Aulakh et al. 1996; Dyer and Chu 2000; Fryxell et al. 2002). Cultural similarity is expected to breed trust (e.g., Parkhe 1993b).

Because culture shapes individuals and their values, people are more likely to trust each other when they share the same beliefs, customs, language, meanings and symbolism. Crossing national and cultural boundaries increases the challenges involved (Seppänen et al. 2007). According to Hofstede (1983), partnering firms from different cultural backgrounds – rooted and embedded in different management and value systems – are more prone to conflicts and misunderstandings, for example, due to misperceptions, misinterpretations and misevaluations of behavior and attitudes, which can severely harm interorganizational trust (Kwon 2008; Zaheer and Zaheer 2006). Cultural similarity is thus a factor which increases trust and drives the performance and longevity of a strategic alliance (Krishnan et al. 2006; Ng et al. 2007; Nielsen 2007).

Hypothesis 6: Similarity of alliance partners' societal cultures is positively related to trust in strategic alliances.

2.4.2 Corporate Culture

Like cultural similarity from a country-level perspective, similarity of corporate culture is a dimension of the multifaceted overall construct of cultural similarity or distance, respectively (Nielsen 2007). Similarity of corporate culture is an equally important factor when it comes to the creation of trust in strategic alliances (Lui et al. 2006). Dissimilarity with regard to cultural and processual issues can impede a fruitful collaboration (Kwon 2008).

A company's corporate culture is affected by its operating strategy, management styles (Parkhe, 1993b), organizational structure, decision-making routines (Kwon 2008), organizational values (Sarkar et al. 2001) and goals (Murray and Kotabe 2005). Similarity in these attributes increases mutual understanding through a shared frame of reference and reduces conflicts (Kwon 2008; Lui et al. 2006; Murray and Kotabe 2005). If the chemistry is right, relationship quality improves, such that firms can make the most of their organizational compatibilities (Kale et al. 2000; Sarkar et al. 2001). Shared values, needs and goals can develop and strengthen a relational bond between partners (Lui et al. 2006; Murray and Kotabe 2005).

Overall, sharing similar organizational characteristics helps partners create value through their alliance (Sarkar et al. 2001) by facilitating cooperation (Park et al. 2009) and promoting open and efficient knowledge sharing (Feller et al. 2009; Kale et al. 2000; Nielsen 2007). A sense of unity among the partners is established (Sarkar et al., 2001) and trust is built (Kwon 2008).

Hypothesis 7: Similarity of alliance partners' corporate cultures is positively related to trust in strategic alliances.

2.5 Institutional-Based Trust-Building Mechanisms

The mechanisms described so far imply that firms can use detailed information about their partner firms. However, if a firm lacks such information or if an alliance is characterized by fast-changing conditions, the establishment of trust will require formal mechanisms (Parkhe 1998b).

2.5.1 Alliance-Specific Investment

Idiosyncratic investment in an exchange relationship that is worth significantly less (or nothing) in its second-best use is commonly referred to as asset specificity, the "big locomotive" of transaction cost economics (Williamson 1985). Specific investment considerably reduces the alliance partners' flexibility to follow alternative routes of action and increases the risk associated with such decisions (Inkpen and Currall 1998; Murray and Kotabe 2005). Partner firms accept their own vulnerability and hope to promote interdependence between each other (Ybarra and Turk 2009) so that the expected future gains offset the probability of a loss. Such ex ante measures signal the partners' good faith and long-term commitment to a stable alliance (Williamson 1985).

Moreover, specific investment increases the efficiency of the collaboration. Members of an interorganizational collaboration are tied together and bonds are strengthened (Ybarra and Turk 2009). This, in turn, increases the reliability and behavioral predictability among the partners and fosters reciprocity and cooperation which may lead to a higher extent of trust (Parkhe 1993a; Ybarra and Turk 2009; Zaheer and Venkatraman 1995). Hence, specific investment is expected to be positively related to trust (Zaheer and Harris 2006; Zaheer and Venkatraman 1995).

Hypothesis 8: A partner company's alliance-specific investment is positively related to trust in strategic alliances.

2.5.2 Safeguards

Research to date has been particularly inconclusive regarding the relationship between trust and control (Das and Teng 1998; Inkpen and Currall 2004). There is an ongoing debate on whether control mechanisms substitute for or complement interorganizational trust (e.g., Cao and Lumineau 2015; Zaheer and Harris 2006). The substitutability perspective draws on the fundamental tenet of transaction cost economics that firms need to develop appropriate control mechanisms in order to inhibit opportunism and limit transaction costs (Gulati 1995; Lui and Ngo 2004; Nooteboom et al. 1997; Parkhe 1993a; Poppo and Zenger 2002). Scholars view trust and safeguards as competing concepts and put forward the view that they are feasible and effective alternatives to one another (Aulakh et al. 1996; Gulati 1995; Thuy and Quang 2005).

The opposing perspective emphasizes the complementarity of safeguards and trust. Both mechanisms develop and evolve hand in hand. Mutually agreed contracts serve as a basis for the development of trust (Poppo and Zenger 2002). In situations where partners are vulnerable to each other and opportunities for exploitation and opportunism may arise, control mechanisms help monitor trustworthy and trustful behavior (Mellewigt et al. 2007). This enables partners to establish a track record of trustworthy behavior (Das and Teng 1998) which reduces the risk of the collaboration (Bhattacharya et al. 1998). The transparency of the evaluation process is increased (Mellewigt et al., 2007). It further fosters mutual understanding and trust (Das and Teng, 2001).

Hypothesis 9: The use of safeguards is positively related to trust in strategic alliances.

3 Methods

3.1 Literature Search

In this meta-analysis, we systematically collected, summarized and integrated the results of the past 20 years of empirical research on the antecedents and performance implications of trust in strategic alliances. We used five stages to identify studies that had been published subsequent to Parkhe's (1998b) seminal article and that were relevant to the topic of our meta-

analysis. First, we conducted a computerized search in the Business Source Premier (EBSCOhost) database. For this search we developed a list of keywords in a review panel of four academics with experience in the field of alliance research.[2] Second, we consulted the reference sections of previous reviews on the topic (Robson et al. 2006; Zaheer and Harris 2006). Third, we examined the references of the articles identified in the previous two stages in order to identify studies that might have been overlooked. Fourth, in order to obtain unpublished studies and minimize the "file drawer"-problem (Rosenthal 1979), we conducted a keyword search in the working paper database of the Social Science Research Network (SSRN) and, as the fifth step, in the ProQuest Dissertations and Theses Database.

To be included in our meta-analysis a study had to meet several criteria. First, as a prerequisite to any meta-analytic calculation, the study had to be quantitative in nature. We did not include studies using experimental designs. Second, the object of research had to be alliance relationships. We restricted the sample to for-profit alliances and excluded other alliances (e.g., alliances between firms and universities), because these are characterized by idiosyncratic goals, different governance forms, and a different incentive contribution structure (Robson et al. 2008). Third, a study had to report one or more relationships between the following constructs: trust, performance, cooperative history, communication, reputational effects, expected continuity, similarity of societal culture, similarity of corporate culture, alliance-specific investment, and safeguards. Fourth, a study had to report sample sizes, correlation coefficients or an outcome statistic that allowed the estimation of a correlation coefficient (Lipsey and Wilson 2001).

Coding study characteristics like effect size, sample size, and reliabilities is not critical (Geyskens et al. 2006). However, as outlined in the introduction, the decision on whether a study actually deals with alliance relationships is less trivial. Based on the criteria proposed by Dyer and Singh (1998), the first and second authors independently coded all identified studies. Intercoder agreement was 96 percent. Disagreements were discussed to reach consensus. This process yielded a total of 64 studies, 66 independent samples, and a combined N of 8,964.[3]

3.2 Meta-Analytic Calculations

Geyskens et al. (2009) provide a guideline on how to conduct meta-analyses in management research. They reviewed 69 meta-analyses published in 14 management journals, critically assessed the methodology employed, and derived best practices. We organized our meta-analytic calculations around the sequence of critical decisions proposed by Geyskens et al. (2009).

Referring to *effect size metric*, our meta-analysis is based on the approach developed by Hunter and Schmidt (2004). It allows for the correction of statistical artifacts and provides an accurate estimation of the true effect sizes and their variances. We individually corrected the correlation coefficients (r) for the biasing influence of, first, sampling error, second, measurement error in the dependent variable, and third, measurement error in the independent variable. We weighted each effect size by the sample size (N) times and the squared total

[2] We used the following search terms to construct search strings: alliance*, joint ventur*, relational capabilit*, relational capital, relationship capital, social capital, social exchange*, tie strength*, and trust* (where the asterisk allows for any variations in the ending of the word). Examples are: [alliance* AND trust*], [joint venture* AND relational capability*], [alliance* AND social capital].

[3] The definition of strategic alliances provided in the introduction implies factors that promote trust from the outset of the relationship. Thus, on average, the level of trust prevailing in the alliances referred to by the studies included in our sample might be higher than in interorganizational relationships in general. This circumstance might lead to correlations that would still be higher, even if a sample of studies drawing on interorganizational relationships with more variation in trust was selected and compared to the findings of our meta-analysis. We thank an anonymous reviewer for bringing this point to our attention.

attenuation factor (A^2) of the respective study. This procedure gives less weight to studies with greater sampling error.
In order to ensure *independence among correlations*, we used the following procedures (Geyskens et al. 2006): first, using studies with multiple independent samples, we included correlations from every sample. Second, if a study reported multiple correlations for a single relationship, we calculated a single composite measure using the formulas provided by Hunter and Schmidt (2004). The reliabilities for the newly-formed composite measures were computed using the Mosier formula. Third, in the few cases where the calculation of a composite measure was not possible (for example, due to missing correlations between the different performance measures; Chen et al. 2009; Kauser and Shaw 2004), we averaged the available correlations and included this average in the meta-analytic calculations. Similarly, in cases in which no reliabilities were available, we added the average reliability of the same variable from all other studies (Harrison et al. 2006; Joshi and Roh 2009). Fourth, when multiple studies were based on the same or partially overlapping data, we included the study with the larger sample size.
We used the sample-adjusted meta-analytic deviancy statistic (SAMD) to identify potential *outliers* (Huffcutt and Arthur 1995).
Referring to *homogeneity analysis*, in order to examine whether the correlations were drawn from the same population we applied two tests: first, the 75% rule of thumb which indicates that it is warranted to look for potential moderators if less than 75 percent of the observed variance in correlations can be explained by statistical artifacts, and second, a chi-square test which assesses whether the observed variation is greater than that expected by chance (Hunter and Schmidt 2004).
As an *exploratory moderator analysis*, we analyzed whether the focal relations were moderated by different study characteristics. Because all study characteristics were categorical in scale, we divided our data set into subsamples based on the categories and determined whether the average corrected correlations (r_c) differed significantly between subsamples (Hunter and Schmidt 2004).
Finally, we addressed the issue of *publication bias* in two ways. First, we conducted an extensive search for unpublished studies and identified 14 unpublished studies. At 22 percent, these 14 unpublished studies account for a significant part of our sample, hence significantly reducing the probability of biased results. Second, we conducted Rosenthal's (1979) "file drawer" test and used the "trim and fill" method by Duval and Tweedie (2000). The calculation of these estimators provided no indication for any suppressed studies.

4 Results

Using the SAMD statistic we identified seven outliers in five relationships. We report both the results adjusted for outliers (see Table 1) and those without adjustment (see Appendix) (Geyskens et al. 2009). As a result, the final data set was reduced to 146 correlations from 61 studies with 63 independent samples and a total sample size of 8,439. All analyzed relations include at least three correlations from independent samples (Hunter and Schmidt 2004). Because many studies did not include all variables of interest, the number of studies contributing to each meta-analytic correlation is often much smaller than the total sample. As some of the relations are based on a rather small number of studies, the magnitudes of those relationships must be interpreted with caution.
The results of the 75% rule of thumb by Hunter and Schmidt (1990) and of the chi-square test reveal that heterogeneity is an issue when testing our hypotheses, but to a varying extent. The *Q* values calculated for the single observed relations differ considerably. Interpreted together with the percentage of variance accounted for by sampling error, this means that effect sizes may vary considerably across studies (except for the relationships between trust and

cooperative history and similarity of corporate culture, respectively, where the *Q* values are not significant). Potential moderators may exist to explain this heterogeneity.

Although homogeneity is preferable when testing hypotheses as it allows for generalization across studies, the degree of heterogeneity is an important indicator of whether meta-analytic testing can be regarded as meaningful (Geyskens et al. 2006). Cortina (2003) analyzed 1,647 meta-analyses and developed a cut-off value for an acceptable degree of standard deviation in an actual correlation ($s.d._\rho$). It ranges between .05 and .265. The $s.d._\rho$ of the significant relations in our analysis ranges between .00 and .219. Even though we think heterogeneity is not a severe problem in our analyses, we investigated variables which potentially moderate the relations.

Table 1 presents the results of our meta-analytic calculations. For the performance implication of trust and for each trust-building mechanism we report the number of samples (k), total sample size (N), the weighted uncorrected mean (r), the weighted corrected mean (r_c), the observed variance (σr^2) in the set of corrected correlation coefficients (r_cs), the estimated sampling error variance (σe^2) in the corrected correlation coefficients (r_cs), the percentage of variance that is attributable to sampling error, and the 95% confidence interval around the weighted corrected mean (r_c). We also report Hunter and Schmidt's (1990) chi-square test for heterogeneity (*Q*) and the fail-safe k calculated with Rosenthal's (1979) formula.

Insert Table 1 about here

Hypothesis 1 suggests that interorganizational trust is positively related to performance in alliance relationships. The average corrected correlation (r_c) was .54 (N = 6880, 95% CI = .48 – .60, fail-safe k = 4291). It supports H1. According to the conventional standards provided by Cohen (1988), the magnitude of this effect size is large. Our analysis shows that trust in alliance relationships is strongly associated with performance even if we consider the lower bound of the confidence interval. Furthermore, the fail-safe statistic indicates that at least 4,291 studies of similar size would have to be retrieved with a true corrected correlation of zero to widen the confidence interval enough for the relationship to become insignificant.

Regarding the trust-building mechanisms, our hypotheses (H2-H9) predicted a positive relationship between the pre-specified antecedents and trust. Cooperative history (r_c = .25, N = 1,507, 95% CI = .20 – .30, fail-safe k = 65), communication between alliance partners (r_c = .63, N = 2,941, 95% CI = .53 – .72, fail-safe k = 609), expected continuity (r_c = .45, N = 1,395, 95% CI = .37 – .53, fail-safe k = 66), similarity of corporate culture (r_c = .60, N = 721, 95% CI = .52 – .68, fail-safe k = 66) and alliance-specific investment (r_c = .16, N = 2,080, 95% CI = .09 – .24, fail-safe k = 27) have a significant positive effect on trust in strategic alliances. The strongest effects stem from communication, similarity of corporate culture and expectation of continuity. Cooperative history has a medium effect and the effect of alliance-specific investment is moderate or small. According to their fail-safe k, all relationships are resistant to unpublished null effects. These results lead us to accept the hypotheses H1 (performance), H2 (cooperative history), H4 (communication), H5 (expected continuity), H7 (similarity of corporate culture) and H8 (alliance-specific investment).

We find no support for three of our hypotheses, namely H3 (reputational effects), H6 (similarity of societal culture) and H9 (safeguards). The sample-weighted corrected means are .001 and .06. Only reputational effects achieve a larger (but still insignificant) effect size of .24.

We conducted exploratory moderator analyses by forming appropriate subgroups and computing separate meta-analyses for each. We calculated mean differences in effect sizes and used a Z-test statistic to test the null hypothesis that the true effect size is the same for both subgroups (Borenstein et al. 2009). We coded the studies based on the following

theoretical moderators and study characteristics: the subject of the alliance (marketing and distribution, manufacturing, R&D, and service alliances), the value chain localization (horizontal vs. vertical alliance), the type of governance (samples including only joint ventures vs. samples including a multitude of governance forms), the number of sources (single informant vs. multiple informants), the publication status (published vs. unpublished), and whether the relation in question has been subject to the theoretical formulation of a hypothesis (main effect vs. side effect). Despite the fact that a time-dependent analysis is impossible because of the cross-sectional character of our data, we additionally introduced alliance duration as a moderator. Building trust is time-consuming. It does not emerge in a linear fashion but is subject to an iterative process resulting in a rather curvilinear progression (Deeds and Rothaermel 2002). Based on an initial level of trust, which is an antecedent to each alliance formation, alliance managers must develop social networks and relationships. Formal and informal interaction mechanisms are hence implemented. They aim at fostering the development of trust from this initial level in order to achieve the desired trust-induced effectiveness and efficiency gains from the alliance (Inkpen 1998). Thus, there may be factors which are particularly important in the "honeymoon"-stage of the alliance and factors which are relevant in later stages (Deeds and Rothaermel, 2002).

Because we did not expect any of these study characteristics to moderate any of the focal relationships, we did not formulate separate hypotheses. Although we coded all relationships for these moderators, we restricted our moderator analyses to those relations based on at least three or more independent samples per subgroup in order to ensure stability of analysis (e.g., Geyskens et al. 2006). As a consequence, we could not analyze the influence of every single moderator on every existing relation. Our moderator analysis did not reveal any moderator for which the mean differences were significant. An exception is the relation between alliance-specific investment and trust, which was significantly moderated by the number of respondents. Effects were stronger in the case of studies which used multiple respondents than in studies which relied on single informants (r_c = .225 versus .104; $p < .05$). It is possible that these differences in the effects also depend on the type of respondent asked, because different key informants' perceptions of trust in alliances may vary due to the functions they have in the organization or the alliance, respectively.

Furthermore, we found 17 studies that provided information on the duration of the alliance which could be used as an indicator for the stage in the alliance management lifecycle. This procedure did not yield enough studies to provide moderator analyses for the hypotheses related to process-based trust-building mechanisms (H2-H5). We calculated the correlation between alliance duration and trust to get an impression of whether the generally assumed linear relationship between trust and alliance performance applies. Alliance duration is positively correlated to performance, the average corrected mean (r_c) is .124 (N= 2726, 95% CI = .08-0.19, fail-safe k = 36). Based on this preliminary finding and using different cut-off values, we separated the 17 studies into two subgroups, distinguishing between alliances in their "honeymoon"-stage and "established" alliances. A cut-off value of four years (Fichman and Levinthal 1991; Gulati and Sytch 2008; Levinthal and Fichman 1988) leads to subgroups with six and eleven studies, respectively. Although the re-calculation for these subgroups supports the positive correlation between alliance duration and trust ("honeymooners": r_c = .135, N= 929, 95% CI = .06-0.21, fail safe k= 523; "established" alliances: r_c = .133, N = 1797, 95% CI = .06-0.21, fail safe k = 1401), no significant difference between them was observed. Based on the cut-off values of three and two years, respectively, the results slightly changed but did not yield significant differences between the subgroups.

In line with our theoretical considerations, we were interested in the potentially moderating effect of different types of trust on current relations. Independently of each other, the first and second author categorized the trust scales used in the studies of the sample into the categories

ability-based, benevolence-based and integrity-based (Mayer et al. 1995). Initial inter-rater agreement was about 89 percent. We reached consensus about the remainder through discussion. This coding procedure left us with six studies focusing on ability-based trust, ten could be classified as having a measure of benevolence-based trust, 30 scales focusing on integrity-based trust, and 29 scales could not be classified. A comparison of the subgroup results by trust type showed no significant differences.

5 Discussion

Drawing on the results of empirical research on the antecedents and performance implications of trust in strategic alliances, first, our findings strongly indicate that trust plays an important role for alliance performance. Second, the three pre-specified types of trust-building mechanisms are effective, albeit to different degrees.

The relationship between trust and performance merits further attention. The significant and strong interrelation unmistakably shows that trust indeed matters for alliance performance and that its development is essential in day-to-day business (Ireland et al. 2002). In order to find out more about the heterogeneity of the effect sizes (as indicated by the *Q* value in Table 1), we examined the performance measurement in the underlying studies in further detail. We classified the performance measures into subjective and objective indicators. Surprisingly, most studies relied on subjective measures. A comparison of the correlations of the five truly objective performance measures (r = .373) with the correlations based on subjective scales (r = .552) showed no statistically significant differences.

Our findings reflect previous insights by Lunnan and Haugland (2008), in that the subjective measures differ with regard to *what kind* of performance indicators the respondents were asked to evaluate. Therefore, we coded for "satisfaction with hard factors" (sales growth, profits, costs, profitability, return on equity/assets/investment, market share, technological advance, product quality, customer service, marketing,) and "satisfaction with soft factors" (relational harmony, partners carrying out commitments and responsibilities, alliance stability, improvement of management skills, learning effectiveness, knowledge transfer/development, fulfillment of expectations, goal accomplishment). Based on this coding, we specified two categories of studies. Their comparison showed no statistically significant differences in coefficients (r = .464 and r = .634 respectively). However, our inspection of performance scales illustrates that, since Geringer and Hébert's (1991) seminal work, it has become common practice in alliance management research to rely on subjective measures of alliance performance (Kauser and Shaw 2004).

We find medium-sized and strong significant effects for three of the four process-based trust-building mechanisms, namely cooperative history, communication and expected continuity. The relationship of reputational effects and trust is medium-sized but not significant. In line with Gulati (1995), we found a positive and significant interrelation between cooperative history and trust. The magnitude of the effect size, however, is not as large as it might be expected. According to Gulati and Sytch (2008), caution is necessary when using prior ties as an antecedent of trust. Future research could differentiate between successful and unsuccessful prior relationships rather than measuring cooperative history in general. Sometimes firms have no choice but to collaborate with a certain partner. In such alliances, trust neither inevitably evolves nor does it have to develop as a precondition for further collaboration.

Interorganizational communication is likely to enhance trust. Thorough and regular communication processes help support and maintain the coordination of the relationship. Active alliance management is required to ensure a high level of trust in the relationship, for example, based on a dedicated function or department within the company (Dyer and Chu 2000).

The relationship between reputation and trust yields the first non-effect (.24) which was close to statistical significance. The most obvious explanation for this weak result is the fact that only three studies exhibited this relationship, which is the minimum for meta-analyses. This observation suggests that more research is required. Another explanation may be that reputation works better in theory than in practice, because there are too many requirements to be fulfilled in order to rely on it and exploit its trust-building properties (Bensaou and Andersen (1999).

We find support for the trust-building effect of expected continuity. Being tied together indefinitely, partners could employ "tit for tat"-strategies as an answer to opportunistic behavior. Mutual interest in preventing this from happening increases the probability of trustworthy behavior on both sides. Process-based trust-building mechanisms turn out to be most effective. This finding emphasizes the importance of interaction and the fact that building trust is not a one-off task but one that the collaborating parties need to work on continuously.

Our results only support one of the two hypotheses concerning characteristic-based trust-building mechanisms. Where the similarity of societal cultures exhibits almost no effect, similarity of corporate cultures significantly and strongly affects trust in strategic alliances. A plausible explanation for the non-significant effect of similarity of societal culture on trust could be the frequently underestimated complexity of the construct "culture". Another interpretation could be related to the effectiveness of cultural training which is frequently used by companies with foreign business partners with whom they are planning to cooperate especially in the long run (Deshpande and Viswesvaran 1992; Parkhe 1998b). A third explanation could be that companies explicitly choose business partners from countries that are culturally similar in order to mitigate the problems that might result from cultural incompatibility.[4] Finally, the issue of whether or not similarity itself directly promotes trust in strategic alliances or whether it is more likely that it moderates the relationships between process-based and institutional-based mechanisms and the development of trust may be discussed. Some process-based mechanisms may be more or less likely to promote trust depending on the culture in which a company is embedded. Futures studies including cross-country comparisons could be revealing in this regard.

Digging deeper into the similarity of corporate cultures, we find that organizational fit has a significantly positive influence on the generation of trust in an interorganizational relationship (.60). In line with our hypothesis, compatible resources and capabilities, management styles (Kale et al. 2000), norms and values, goals and philosophies (Chen et al. 2009) strongly promote the development of interorganizational trust through mutual understanding and the right chemistry.

We find mixed results for the effects for institutional-based trust-building mechanisms. As hypothesized, alliance-specific investment was found to be related to trust in strategic alliances, though not as strongly as expected. Through alliance-specific investment, especially at the outset of an alliance, companies do not only signal their trustworthiness and establish an initial level of trust but also make themselves vulnerable to the partner (Ybarra and Turk 2009). In some alliances, however, investment is not necessarily linked to trust development but just one of the main reasons for their mere existence. New biotechnology ventures that

[4] In order to shed more light on this non-finding, we dug deeper into the measurement of similarity of societal culture in the underlying studies in an exploratory way and normalized the scales of the studies that examine cultural similarity or cultural distance, respectively. The overall sample-weighted average of the normalized means for cultural similarity was 0.7258. It shows that about three quarters of the analyzed alliances were from similar or the same societal cultures, as opposed to only the remaining quarter of alliances with partners from different and distant cultures. This indicates a selection bias in the underlying studies. The result suggests that companies willing to form an alliance mainly choose partners with a similar cultural background.

ally with large pharmaceutical companies and barter money for technology are a case in point (Rothaermel and Deeds 2004). Such alliances are frequently seen as a "marriage of convenience": large companies are often short of innovative ideas, whereas new ventures lack the financial resources for their pursuance.

Another important insight that might explain the rather weak association between alliance-specific investment and trust emerged from a closer investigation of the utilized scales in the underlying studies. Researchers have adopted different perspectives: eight studies employ a unilateral perspective, the other seven studies aim at measuring the bilateral investment of partners. This distinction might be critical, as Williamson (1985) has indicated that reciprocal investment is an alternative to vertical integration. Aware of the fact that restricting measurement to one side of the relationship does not necessarily mean measuring unilateral investment only, we compared the eight studies with a single-sided focus to those measuring bilateral investment. Although the difference was not significant, the considerably smaller coefficients for studies with a single-sided focus ($r = .108$ compared to $r = .228$) give at least some indication that distinguishing between unilateral and bilateral investment might be meaningful. Bilateral investment indicates that partners are mutually committed, which reduces the likelihood of opportunism and increases trust (Zaheer and Venkatraman 1994).

A non-significant effect was found regarding the link between safeguards and trust. It suggests that, in line with the discussion about substitutes or complements, this interplay might be more complex and complicated. Das and Teng (1998) provide a possible reconciliation of the competing viewpoints, suggesting that the effect of safeguards on trust depends on the type of safeguard considered. The substitutability view applies to formal controls, such as procedures or regulations, whereas the complementarity view pertains to social controls, such as values or norms. Das and Teng (2001) suggest a third view which assumes that trust and safeguards as parallel concepts are not significantly interrelated at all. In a similar vein, Aulakh et al. (1996) hypothesize different effects for output control, process control and social control. In order to test this idea, we coded for these types of safeguards ex post. However, either the studies did not provide enough information on scales and measurement, or the categories could not be separated and assigned accurately. Hence, this empirical differentiation turned out to be impossible. In a second attempt, we coded the different safeguards into "contracts" and "governance mechanisms" (such as formalized rules and all other forms of output, process, formal, social, strategic and operational control). Again, differences between the influences of these subgroups on trust were not significant. However, the effect of the nine studies examining contracts was close to statistical significance. Statistical robustness aside, the direction of the two sub-effects paints an interesting picture: contractual mechanisms have a negative influence on trust (- .136), whereas other governance mechanisms exhibit a positive link (.150). This observation suggests that writing down detailed rules may be seen as a signal of suspicion. It may ultimately inhibit and undermine trust rather than fostering it (Das and Teng 1998; Das and Teng 2001; Mellewigt et al. 2007; Poppo and Zenger 2002). An alternative perspective suggests that choosing a detailed contract to govern the collaborative relationship leaves little room for the development and formation of trust (Rus and Iglic 2005).

6 Implications for Future Research and Alliance Management

Based on the discussion of our findings, Table 2 shows the current state of research and our recommendations for future studies, which are illustrated by some exemplary works.

Insert Table 2 about here

Turning to issues related to the *"What?"* of measuring, first, our findings reveal that the measurement of alliance performance is still an issue of debate. The range of performance measures indicates that a general, unified attitude towards alliance performance does not yet exist (Lunnan and Haugland 2008). It also suggests that different measures may reflect different parties' perspectives on what these actors consider as a successful alliance. Consequently, a recommendation for future research is to consider multiple viewpoints on and dimensions of alliance performance.

Second, our findings show that trust is a concept that is still far from being fully understood. Although theory differentiates between various types of trust and levels of analysis (e.g., Mayer et al. 1995; McAllister 1995), most studies draw on a broad and general definition of trust. Even studies explicitly focusing on interorganizational trust use approaches which measure trust on the interpersonal level (Seppänen et al. 2007). Future empirical research should provide more fine-grained and contextualized definitions of trust and specify different levels of analysis.

Turning to issues related to the *"How?"* of measuring, our meta-analysis reveals several shortcomings in previous research. First, many if not most studies rely on one-sided inquiry methods with single key informants (e.g., Carson et al. 2006; Poppo et al. 2008). In order to capture the dyadic nature of strategic alliances (Gulati 1998) and the different perspectives on trust and alliance performance, future research could implement two-sided measurement approaches including multiple respondents (e.g., Wong et al. 2005). Those approaches bear the chance to shed light on both concurrent and incongruent perceptions of trust and performance.

Second, our analysis also shows that many studies use questionnaires for collecting data on both the dependent and the independent variables, although this bears the risk of common method bias (Rindfleisch et al. 2008). A remedy in future research could be to integrate several data sources, for instance, by using archival data for measuring alliance performance and surveys for capturing perceptions of trust.

Third, theoretically, it is likely that some of the pre-specified trust-building mechanisms are more important in early stages of the alliance management lifecycle, while others are pertinent in later stages. Our exploratory moderator analysis including alliance duration did not yield any significant differences between "honeymooners" and "established" alliances. A reason for this non-finding may be that our current knowledge on trust in strategic alliances mainly results from evidence on successful alliances, although information on failure rates and unmet performance expectations is wide-spread. To reduce the risk of survivor bias, we recommend asking key informants to evaluate both the most and the least successful alliance at the time of the survey. Generally, alliance failure represents a promising field for future research. Studies on alliance failure could provide critical insights on why alliances fail. They could shed light on the role of trust in general and on what the loss of confidence and trust means in this regard. This point is illustrated by extant research on conflict and conflict resolution in strategic alliances. For instance, Kale et al. (2000) demonstrate that the harmonization of conflict is necessary for a relationship to last and critical to alliance performance. In addition, joint and integrative conflict management practices increase trust.

Finally, trust is a dynamic concept that evolves over time. Similarly, the mechanisms used by managers to build trust in alliances can be altered during the alliance management lifecycle. Nonetheless, most studies rely on cross-sectional data, although this procedure is critical with regard to endogeneity problems (Rindfleisch et al. 2008). In order to capture the dynamics of trust and clarify the direction of causality, researchers should consider longitudinal designs that allow for a more fine-grained investigation of the micro- and meso-processes that foster or destroy trust in strategic alliances.

Our meta-analysis faces limitations that also provide opportunities for future research. For instance, the set of variables included in our study is not exhaustive. In this context, the case of particularly small samples for an estimated effect requires further consideration, because meta-analytic estimates of means and standard deviations may be subject to second-order sampling error (Hunter and Schmidt 1990). As can be inferred from the fail-safe k, the results based on a small number of studies are not as robust as others. With regard to the small sample sizes, our results should serve to concentrate researchers' attention and effort on the less well-understood relations in this model instead of replicating results that are established and well-known. Moreover, there may be confounds, i.e., extraneous variables that correlate with both the independent and the dependent variable, which bias our meta-analytic calculations and conclusions. Related to this is the possibility of additional moderators being present in the relationships. An average, sample-weighted value of about 32% for the percentage of error variance shows that there is space for moderators that we have not detected yet. In this regard, we follow previous recommendations and encourage future researchers to describe their research settings in more detail (e.g., Joshi and Roh 2009; Rousseau and Fried 2001) and choose various, possibly unusual industrial and cultural contexts for their studies (e.g., Seppänen et al. 2007).

As process-based trust-building mechanisms turn out to be by far the most effective drivers of interorganizational trust, our findings highlight the role of alliance managers as important actors in the collaborative process. Trust neither appears from nowhere nor does it evolve automatically nor does it come overnight. Instead, it requires active involvement, commitment and the dedicated support of the key persons responsible in the relationship. During the course of an alliance, managers can engage in several kinds of trust-building activities and directly influence certain levers and mechanisms such as communication or alliance-specific investment. They actively influence the level of trust, the "behavioral lubricant" (Parkhe 1993b, p. 307) in any collaborative relationship, which, in turn, has a significant effect on alliance performance. What both researchers and practitioners can learn from the results of this meta-analysis is the observation that managers actually do matter – because they can help reach alliance objectives by creating trust among alliance partners.

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Figures and Tables

Figure 1. Trust-Building Mechanisms in Strategic Alliances

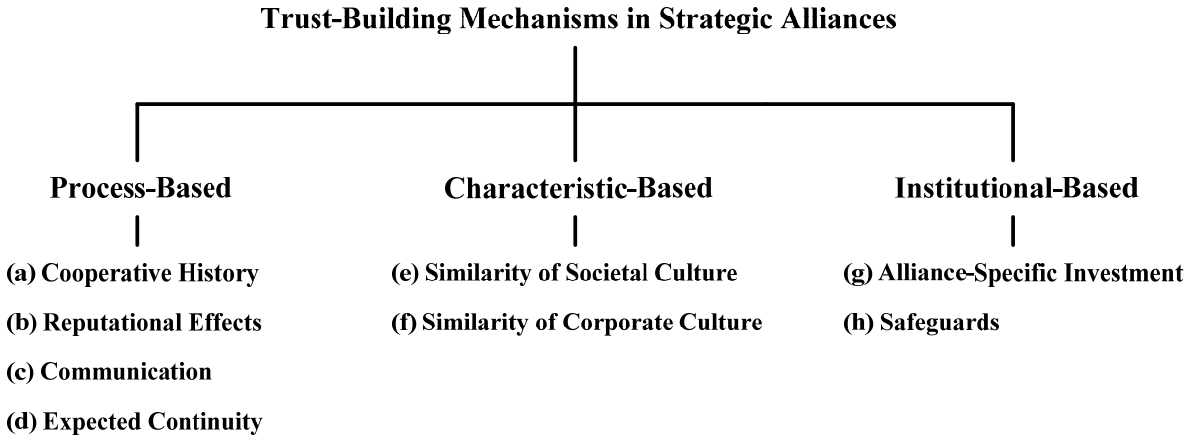

Table 1. Meta-Analytic Results of the Antecedents to and the Performance Implications of Trust in Strategic Alliances

	Hypothesis	k	Total N	Sample-weighted mean r	Sample-weighted corrected mean r_c	σr^2	σe^2	Percentage of error variance	*Q*	95% CI		Fail-safe k
Performance Implication												
H1: Performance	+	53	6880	.46	.54 ***	.05	.01	14%	351 ***	.48	.60	4291
Process-Based Trust-Building Mechanisms												
H2: Cooperative History	+	10	1507	.22	.25 ***	.01	.01	114%	11	.20	.30	65
H3: Reputational Effects	+	3	304	.18	.24	.06	.02	25%	13 **	-.04	.53	
H4: Communication	+	20	2941	.51	.63 ***	.04	.01	13%	180 ***	.53	.72	609
H5: Expected Continuity	+	6	1395	.39	.45 ***	.01	.00	38%	17 **	.37	.53	66
Characteristic-Based Trust-Building Mechanisms												
H6: Similarity of Societal Culture	+	12	1546	.06	.06	.02	.01	44%	27 **	-.02	.15	
H7: Similarity of Corporate Culture	+	6	721	.52	.60 ***	.01	.01	54%	9	.52	.68	66
Institutional-Based Trust-Building Mechanisms												
H8: Alliance-Specific Investment	+	14	2080	.13	.16 ***	.02	.01	50%	27 **	.09	.24	27
H9: Safeguards	+	13	1994	.00	.00	.05	.01	23%	56 ***	-.12	.12	

Notes: k = number of samples in which relationship was estimated; Total N = cumulative N for all k studies; Sample-weighted mean r = mean of uncorrected correlations weighted by sample size (N); Corrected mean rc = mean of correlations individually corrected for measurement error; σr^2 = the observed variance in the set of r's; σe^2 = the observed variance in error terms of r's; Percentage of error variance = the percentage of variance that is attributable to error and statistical artefacts; *Q* = Hunter and Schmidt's chi-square test for heterogeneity; 95% CI = confidence interval around the mean correlation; Fail-safe k = number of unpublished null effects the relationships is resistant to (Rosenthal, 1979); * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 2. Critical Issues and Recommendations for Future Research

Critical Issues	Current State of Research	Our Recommendations for Future Research	Good Examples
		Issues Related to the "What?" of Measuring	
Measurement of Alliance Performance	No consensus on measurement (financial indicators, duration/survival, satisfaction). Measurement only on one level of analysis.	Select performance measure(s) according to motivation and goals of alliance. Consider multiple viewpoints and dimensions.	Reuer et al. (2010)
Definition and Measurement of Trust	Researchers mostly employ a broad and general definition of trust.	Adapt definition to respective reseach context. Specify trustor and trustee (who trusts whom?)	Becerra et al. (2008); De Jong and Klein Woolthuis (2008); Dyer and Chu (2000); Hyvönen (1993); Muthusamy et al. (2007); Rindfleisch (2000)
	Theory differentiates between different types of trust, empirical research does not follow suit.	Account for different trust types in the empirical research as well.	Becerra et al. (2008); Cullen et al. (2000); Fryxell et al. (2002); Lui and Ngo (2004); Muthusamy et al. (2007)
	Theory on interorganizational trust, but measurement on interpersonal level only.	Distinguish between interorganizational and interpersonal level and measure it accurately.	Fang et al. (2008); Lui and Ngo (2004); Zaheer et al. (1998)
		Issues Related to the "How?" of Measuring	
Single Respondent Bias	Mainly one-sided inquiry methods with a single key informant.	Collect data on two sides, use multiple respondents.	Anderson and Narus (1990); Cullen et al. (2000); Feller et al. (2009); Luo (2006); Muthusamy et al. (2007); Ng et al. (2007); Sodhi and Son (2009); Rodriguez and Wilson (2002); Parkhe (1993); Young-Ybarra and Wiersema (1999)
Common Method Bias	Studies survey dependent and independent variables using the same questionnaire.	Use multiply data sources, e.g. combine surveys with archival data.	Luo (2006)
Survivor Bias	Studies only survey existing alliances and not past ones that might have been unsuccessful.	Evaluate both the most and the least successful alliance at the time.	Monczka et al. (1998)
Endogeneity	Cross-sectional data cannot depict the development of trust over time and open the way to endogeneity concerns (esp. safeguards, alliance-specific investments and performance).	Collect longitudinal data in order to embrace the dynamics of trust and to shed light on the direction of causality.	Jap and Anderson (2003); Ybarra and Turk (2009)

Appendix.
Meta-Analytic Results of the Antecedents to and the Performance Implications of Trust in Strategic Alliances without Corrections for Outliers and Publication Bias

	Hypothesis	k	Total N	Sample-weighted mean r	Sample-weighted corrected mean r_c	σr^2	σe^2	Percentage of error variance	*Q*	95% CI		Fail-safe k
Performance Implication												
H1: Performance	+	55	7016	.45	.53 ***	.06	.01	13%	393 ***	.47	.59	4289
Process-Based Trust-Building Mechanisms												
H2: Cooperative History	+	11	1562	.20	.23 ***	.01	.01	72%	18	.17	.30	64
H3: Reputational Effects	+	3	304	.18	.24	.06	.02	25%	13 **	-.04	.53	
H4: Communication	+	21	3394	.46	.55 ***	.07	.01	8%	245 ***	.44	.66	681
H5: Expected Continuity	+	9	1769	.38	.44 ***	.03	.01	15%	58 ***	.32	.56	89
Characteristic-Based Trust-Building Mechanisms												
H6: Similarity of Societal Culture	+	14	1747	.05	.06	.05	.01	20%	70 ***	-.05	.18	30
H7: Similarity of Corporate Culture	+	8	1053	.53	.62 ***	.05	.01	10%	70 ***	.46	.78	111
Institutional-Based Trust-Building Mechanisms												
H8: Alliance-Specific Investment	+	15	2122	.14	.18 ***	.03	.01	39%	37 ***	.09	.26	46
H9: Safeguards	+	16	2240	-.02	-.02	.11	.01	12%	139 ***	-.19	.14	

Notes: k = number of samples in which relationship was estimated; Total N = cumulative N for all k studies; Sample-weighted mean r = mean of uncorrected correlations weighted by sample size (N); Corrected mean rc = mean of correlations individually corrected for measurement error; σr^2 = the observed variance in the set of r's; σe^2 = the observed variance in error terms of r's; Percentage of error variance = the percentage of variance that is attributable to error and statistical artefacts; *Q* = Hunter and Schmidt's chi-square test for heterogeneity; 95% CI = confidence interval around the mean correlation; Fail-safe k = number of unpublished null effects the relationships is resistant to (Rosenthal, 1979); * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.