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Essays on Trust in Teams

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Abstract

This thesis examines the role of trust at the team level. In a setting of a strategic online simulation game, three longitudinal studies investigate antecedent and consequences of the team's trust in the team and in the team's leadership. The first study provides an examination of the development of trust in the team over time and its dynamic relationship with the team's ability. The study shows that trust in the team develops over time and that this development follows a curvilinear relationship. That is, initially high growth rates become smaller over time. In addition, the relationship between team ability and trust in the team changes over time. While initially the relationship becomes stronger until reaching a peak, team ability contributes less to trust in the team after team members interacted for an extended period of time. The findings contribute to the understanding of trust development and the dynamic interplay between trustworthiness and trust. The second study examines how the virtualness of teams influences the relationships between the breadth of the communication channel repertoire of team leaders, trust in leadership, and team effectiveness. The study shows that a broad communication channel repertoire of the leadership is positively related to the team's trust in leadership, team performance, and performance growth. These relationships were stronger when teams had a higher degree of virtualness. In addition, trust in leadership mediated the relationship of communication repertoire with performance and performance growth. However, while trust in leadership was negatively related to the turnover rate, the hypothesized negative relationship between communication repertoire and turnover rate could not be confirmed. The study contributes to the trust literature and the literature on virtual teams by stressing the significance of using multiple communication channels in virtual teams for building trust and enhancing performance. The third study investigates how shared leadership is related to team performance. The study suggests that by increasing shared leadership, teams build trust in the team and, thereby, increase team performance. The

findings from a dynamic, longitudinal design confirm that positive change in shared leadership relates positively to positive change in trust in the team and positive change in performance. Further, positive change in trust in the team mediates the relationship between positive changes in shared leadership and team performance. The study contributes to the understanding of team dynamics and to the literature on shared leadership and trust. In sum, the findings of this dissertation emphasize the importance of establishing trust at the team level for improving team effectiveness.

Kurzfassung (German abstract)

Diese Dissertation untersucht die Rolle von Vertrauen im Kontext von Teams. In einem strategischen Online-Simulationsspiel werden in drei Langzeitstudien Vorläufer und Auswirkungen von Vertrauen von Teams in das Team und in die Führung des Teams erforscht. Die erste Studie liefert eine Untersuchung der Entwicklung von Vertrauen in das Team über die Zeit und dessen dynamische Beziehung mit der Fähigkeit des Teams. Die Studie zeigt, dass sich Vertrauen in das Team über die Zeit entwickelt und dass diese Entwicklung kurvenförmig verläuft. Das bedeutete, dass zu Beginn hohe Wachstumsraten über die Zeit schwächer werden. Des Weiteren ändert sich der Zusammenhang zwischen der Fähigkeit des Teams und dem Vertrauen in das Team. Anfangs wird der Zusammenhang stärker, bis ein Hochpunkt erreicht wird. Nachdem die Teammitglieder über einen längeren Zeitraum interagiert haben, trägt die Fähigkeit des Teams weniger zum Vertrauen in das Team bei. Die Ergebnisse leisten einen Beitrag zum Verständnis der Entwicklung von Vertrauen und der dynamischen Beziehung zwischen Vertrauenswürdigkeit und Vertrauen. Die zweite Studie untersucht, wie der Zusammenhang zwischen einem breiten Repertoire an Kommunikationskanälen der Teamführung mit dem Vertrauen in die Führung und mit der Leistungsfähigkeit des Teams vom Grad der Virtualität des Teams abhängt. Die Studie zeigt einen positiven Zusammenhang zwischen der Breite des Repertoires an Kommunikationskanälen der Führung mit dem Vertrauen des Teams in die Führung, der Teamleistung und dem Anstieg der Leistung. Dieser Zusammenhang ist stärker, je höher der Grad der Virtualität des Teams ist. Zusätzlich wird die Beziehung von Kommunikationsrepertoire mit Leistung und Leistungsanstieg vom Vertrauen in die Führung mediiert. Obwohl ein negativer Zusammenhang zwischen Vertrauen in die Führungskraft und Fluktuation der Teammitglieder besteht, kann der angenommene negative Zusammenhang zwischen breitem Kommunikationsrepertoire und Fluktuation der Teammitglieder nicht

bestätigt werden. Die Studie trägt zur Vertrauensforschung und zur Forschung über virtuelle Teams bei, indem sie die Wichtigkeit der Verwendung von unterschiedlichen Kommunikationskanälen für die Bildung von Vertrauen und die Steigerung von Leistung hervorhebt. Die dritte Studie untersucht, wie verteilte Führung mit Teamleistung zusammenhängt. Die Studie nimmt an, dass Teams durch eine Erhöhung der Verteilung von Führung Vertrauen aufbauen und dadurch die Leistung erhöhen. Die Ergebnisse aus einer dynamischen Langzeituntersuchung bestätigen, dass ein Anstieg der Verteilung von Führung einen positiven Zusammenhang mit dem Anstieg von Vertrauen und dem Anstieg der Leistung des Teams aufweist. Des Weiteren wird der Zusammenhang zwischen Anstieg in verteilter Führung und Leistung durch den Anstieg von Vertrauen mediiert. Die Studie trägt zum Verständnis der Dynamiken in Teams bei, sowie zur Forschung zu verteilter Führung und zu Vertrauen. Zusammengefasst betonen die Ergebnisse dieser Dissertation die Wichtigkeit Vertrauen in Teams aufzubauen, um die Leistung von Teams zu verbessern.

1 Introduction

"Trust is an important lubricant of a social system. It is extremely efficient; it saves people a lot of trouble to have a fair degree of reliance on other people's word."

(Arrow, 1974, p. 23)

1.1 Motivation and research question

Over decades, trust has been a central construct in research on organizations (Fulmer & Gelfand, 2012; Mayer, Davis, & Schoorman, 1995) and has been studied in diverse disciplines such as management, ethics, sociology, philosophy, psychology, political science, and economics (Colquitt, Scott, & LePine, 2007; Kramer & Lewicki, 2010; Schoorman, Mayer, & Davis, 2007). Researchers widely agree on the beneficial effects of trust enhancing positive attitudes, cooperation, and performance in organizational settings (Dirks & Ferrin, 2001; Kramer, 1999; McEvily, 2011).

Since the late 1950s, diverse conceptualizations of trust emerged (Colquitt et al., 2007; Kramer & Lewicki, 2010). Even though there exists no generally accepted definition of trust (Costa, 2003; Ferrin, Bligh, & Kohles, 2008), scholars widely agree on two components (Colquitt et al., 2007; Kramer & Lewicki, 2010; Rousseau, Sitkin, Burt, & Camerer, 1998). First, trust refers to positive expectations regarding the behavior of another party, and second, the willingness to be vulnerable to the other party (Mayer et al., 1995; Rousseau et al., 1998). This definition entails that trust is a relational phenomenon between two parties: one trusting party (trustor) and another party that is trusted (trustee) (Mayer et al., 1995). The involved parties can occur at the individual, team, or organizational level and the relationship can occur across different levels (Fulmer & Gelfand, 2012). Trust has been found to be beneficial for outcomes of trusted parties at the individual level (e.g., Colquitt et al., 2007; Dirks & Ferrin, 2002; Mayer & Davis, 1999), team level (e.g., de Jong & Dirks, 2012; de Jong & Elfring,

2010; Joshi, Lazarova, & Liao, 2009), and organizational level (e.g., Aryee, Budhwar, & Chen, 2002; Robinson, 1996) alike.

In recent years, trust at the team level and its relationship with team effectiveness have become particularly important (de Jong & Elfring, 2010). Increased globalized competition urges organizations to structure work rather around teams than individuals (Kozlowski & Bell, 2003). A team is defined as a “collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems (for example, business unit or the corporation), and who manage their relationships across organizational boundaries” (S. G. Cohen & Bailey, 1997, p. 241). Teams can quickly adapt to constantly changing requirements (Kozlowski & Ilgen, 2006). Team members can be assigned according to the knowledge, skills, and abilities needed (Hackman, 1987), especially since advances in information and communication technology allow for spatially and temporally distributed teams (Kozlowski & Ilgen, 2006; Mukherjee, Lahiri, & Billing, 2012; Picot, Reichwald, & Wigand, 2008). However, the division of labor requires organizational members to rely on others’ task achievements without the ability to monitor their behavior (McEvily, Perrone, & Zaheer, 2003). Team members work on interdependent tasks and are confronted with uncertainty about others’ behavior (Mayer et al., 1995; McEvily et al., 2003). In such situations, trust helps to reduce transaction costs (Dyer & Chu, 2003; Whitener, Brodt, Korsgaard, & Werner, 1998; Zaheer, McEvily, & Perrone, 1998) such as the need for monitoring (Langfred, 2004; Picot et al., 2008; Welppe, 2008). Trust helps to deal with the interdependencies among team members because they can rely on that others will behave in an agreed way (Zand, 1972). Besides the direct benefits on organizational outcomes, trust fosters conditions which help others interpret others’ behavior in a positive way (e.g., Dirks &

Ferrin, 2001; Simons & Peterson, 2000). Thereby, trust works as a lubricant in social systems (Arrow, 1974).

Even though research on trust at the team level has proliferated (de Jong & Elfring, 2010; Fulmer & Gelfand, 2012; Kramer & Lewicki, 2010) ample important gaps in research remain. This dissertation aims to point out and address three gaps in research on *trust at the team level* and provide evidence to fill out the blind spots by focusing on how trust in teams develops in general, how team leaders can enhance trust in virtual settings, and how trust helps to transform shared leadership into higher team performance.

First, research lacks on how and why trust in teams develops over time. Theories of trust assume that a current state of trust is a result of a process over time (e.g., Lewicki & Bunker, 1995; Mayer et al., 1995; Shapiro, Sheppard, & Cheraskin, 1992). Accordingly, trust evolves through repeated interactions among team members (Mayer et al., 1995; Rousseau et al., 1998). Team members utilize the outcomes from previous interactions to infer the other team members' trustworthiness (Mayer et al., 1995). In turn, the perceptions of trustworthiness help team members to infer how much they can trust the other team members (Colquitt et al., 2007; Mayer et al., 1995). Mayer et al. (1995) speculated that facets of trustworthiness affect trust differently at different points in time. However, research lacks examinations on the dynamic nature of trust (Lewicki, Tomlinson, & Gillespie, 2006). Most studies implicitly assume or theoretically hypothesize dynamic relationships, however fail to test the relationships properly by taking a cross-sectional ("snapshot") view of the relationships (Pitariu & Ployhart, 2010). Taking a longitudinal perspective may provide a more detailed view on the dynamic relationships between trustworthiness and trust and may integrate yet inconclusive results on how dimensions of trustworthiness contribute to trust over time.

Second, communication technology is imperative for leading and managing virtual teams (Mukherjee et al., 2012). While research predominantly contrasts communication channels (e.g., Williams, Caplan, & Xiong, 2007) or virtual against face-to-face teams (e.g., Wilson, Straus, & McEvily, 2006), research is needed on how to employ diverse communication channels to build trust and foster team effectiveness depending on the level of virtualness. Within teams, a particularly important referent of trust is the team leader (Dirks & Ferrin, 2002). Leaders occupy a central role for fostering team effectiveness (Kozlowski & Bell, 2003; Morgeson, DeRue, & Karam, 2010) and trust in the leader has been found to be positively related to psychological as well as work-related outcomes (cf. Dirks & Ferrin, 2002 for a meta-analytic review). However, leading teams becomes more difficult in virtual settings (Mukherjee et al., 2012; Zigurs, 2003), that is, when team members are temporally or spatially distributed (Bell & Kozlowski, 2002). Team leaders can either manage their teams by monitoring or trusting their behavior (Handy, 1995). In a virtual setting, however, monitoring becomes virtually impossible (Wilson et al., 2006) leaving trust as the preferred mechanisms. This raises the question how leaders of virtual teams can establish and maintain trust in them, since “Trust needs touch” (Handy, 1995). Leaders of virtual teams have to rely on technology-mediated communication to interact with the team (Griffith & Neale, 2001; Kirkman & Mathieu, 2005). However, electronic communication lacks social and physical cues (Jarvenpaa & Leidner, 1999; Kayworth & Leidner, 2002) that help team members to develop trust (Wilson et al., 2006). At the same time, researchers argue that the use of a broader range of electronic communication channels can balance the limitations of a single channel (Shachaf & Hara, 2007). Consequently, the use of a broad communication channel repertoire could help team leaders to mitigate the challenges of building trust in virtual settings. Being rather a continuum than a dichotomous characteristic with the two extremes face-to-face and fully technology mediated communication (Fiol & O'Connor, 2005; Griffith & Neale, 2001) the

teams' degree of virtuality is likely to influence the relationship between communication repertoire and trust in leadership. Research on how leaders should employ diverse communication channels with respect to the team's degree of virtualness is largely missing and could provide important implications for theory and practice.

Third, while research confirms that shared leadership is beneficial for team performance (Wang, Waldman, & Zhang, 2013), research on the mechanisms on how sharing leadership is related to superior performance is yet unexplored (Carson, Tesluk, & Marrone, 2007). As stated above, leadership is an important determinant for building trust and fostering team performance (Dirks & Ferrin, 2002; Kozlowski & Bell, 2003). Yet, research primarily focused on leader attributes (Kozlowski & Bell, 2003) of a *single person* leading the team (Avolio, Walumbwa, & Weber, 2009) who can be a member or be outside of the team (Morgeson et al., 2010). This, however, represents a rather romantic and heroic view of the leadership process (Yukl, 1989, 1999). Recently, research and practice recognized that leadership roles do not necessarily have to be centralized within one person (Hoch & Kozlowski, 2012; Pearce & Conger, 2003). This opens up a new perspective on leadership (Contractor, DeChurch, Carson, Carter, & Keegan, 2012): Leadership can be defined along the quality of leadership – as before – or, additionally, from the source of leadership, that is, leadership can be shared among team members (Carson et al., 2007). Sharing leadership responsibilities provides several advantages for teams. Scholars contend that leadership functions can be performed by the respective specialist in a team (Bligh, Pearce, & Kohles, 2006; Klein, Ziegert, Knight, & Xiao, 2006). Shared leadership is argued to be related to higher commitment, coordination, and greater information sharing – constructs related to trust – and therefore functioning as an intangible resource for the team (Carson et al., 2007; Mehra, Smith, Dixon, & Robertson, 2006). Even though several studies showed a positive relationship between shared leadership and team performance (cf. Wang et al., 2013 for a

meta-analysis) the mechanisms which transform shared leadership into superior team performance are yet unclear. Research suggests trust to be a mediating mechanism of the relationship between shared leadership and performance: Shared leadership has been found to be positively related to trust in the team (Bergman, Rentsch, Small, Davenport, & Bergman, 2012; Boies, Lvina, & Martens, 2010; Wang et al., 2013) and trust in team has been shown to be positively related to team performance (de Jong & Dirks, 2012; de Jong & Elfring, 2010). An examination of mechanisms triggered by shared leadership could advance our understanding of how and why shared leadership fosters team performance.

Trust has been shown to be a pivotal element in organizational contexts (Colquitt et al., 2007). This dissertation aims to advance research in the context of teams by addressing the above delineated gaps in research and contribute to trust research, as well as research on teams and leadership. First, research on the development on trust is lacking in general (Lewicki et al., 2006). The first study examines how trusting behavior – the most proximal behavioral consequence from trust in relationships (Colquitt et al., 2007; Mayer et al., 1995) – develops over time. In addition, it provides an examination of how the dynamic relationship between team ability and trusting behavior changes in the course of time. Second, communication has been shown to be an essential process for effective and efficient functioning of virtual teams (Kayworth & Leidner, 2002; Wakefield, Leidner, & Garrison, 2008). Furthermore, virtuality is not a binary attribute categorizing teams into co-located and virtual teams (Fiol & O'Connor, 2005; Griffith & Neale, 2001). Therefore, the second study investigates how the leader's communication repertoire – the variety of communication channels used – relates to team members' trust in their leadership and to team effectiveness depending on the team's degree of virtualness. Third, research on how shared leadership translates into superior team performance is lacking (Carson et al., 2007). The third study proposes that trust functions as a mediating mechanism between shared leadership and team

performance. Taking a longitudinal perspective, the study suggests that increases in sharing leadership are related to increases in team trust and, in turn, increases in team performance.

1.2 Theoretical foundations of organizational trust

The subdivision of work in organizational settings increases the interdependence and uncertainty among organizational units (McEvily et al., 2003). Organizational members have to rely on others to accomplish personal or organizational goals (Mayer et al., 1995) without certainty about the others' intentions nor the possibility to fully monitor them (McEvily et al., 2003). Trust can resolve that risk (Lewis & Weigert, 1985) and work as a mechanism which enables actors to work together more effectively (Mayer et al., 1995).

1.2.1 Trust defined

Many disciplines provided conceptualizations of trust (Colquitt et al., 2007; Kramer, 1999; McEvily, 2011). Still, scholars broadly agree on the two fundamental components of trust (Colquitt et al., 2007; Ferrin et al., 2008). Trust is based on (1) positive expectations towards another party and (2) the willingness to accept vulnerability (Kramer, 1999; Rousseau et al., 1998). First, positive expectations about another party specify the bases on which trust is built (Costa & Anderson, 2011). This also implies that trust is a relational phenomenon between a trustor and a trustee (Zand, 1972). Second, vulnerability of the trustor refers to a risky situation where something important is at stake for the trustor (Mayer et al., 1995). Risk creates opportunities for trust (Deutsch, 1958) and without risk there would be no need for trust (Lewis & Weigert, 1985). Willingness to be vulnerable refers to an intention to engage in trusting actions (Dietz & Den Hartog, 2006; Mayer et al., 1995). That is, confronted with a risky situation, trust can cause that the trustor engages in a trusting action (Rousseau et al., 1998).

This thesis builds on the definition of trust proposed by Mayer et al. (1995, p. 712) that is congruent with the aforementioned components. Accordingly, trust

“is 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, irrespective of the ability to monitor or control that other party.”

1.2.2 A framework of trust

In the psychological tradition, trust has been conceptualized as beliefs of trustworthiness, intention to trust, trusting action, or as propensity to trust (Colquitt et al., 2007; Dietz & Den Hartog, 2006; McEvily & Tortoriello, 2011). The first three concepts take a relational and attitudinal view on trust that may vary over time, whereas the latter is viewed as a stable part of personality (Kramer, 1999; McEvily et al., 2003; Rousseau et al., 1998). In a seminal theoretical contribution, Mayer et al. (1995) provided a framework which incorporates the above mentioned conceptualizations. Departing and based on the above definition of trust, they argue that trust manifests as an *intention to trust*. The framework assumes that a trustor makes an assessment of the characteristics of a trustee which is the basis for beliefs about the trustee’s trustworthiness. The trustor uses the trustworthiness beliefs to determine his/her intention to trust. In turn, a trustor’s intention to trust can manifest in a trusting action that goes beyond the willingness to be vulnerable; that is, to actually making him-/herself vulnerable to the trustee. The trustor finally uses the outcome of the trusting action to reassess the perceptions of trustworthiness of the trustee (Mayer et al., 1995; McEvily et al., 2003). In the framework, the trustor’s propensity to trust constitutes a further influence factor that affects the perceptions of trustworthiness and the intention to trust (Mayer et al., 1995).

1.2.3 Antecedents of trust

Research identified two important antecedents of trust: The perception of the trustee's trustworthiness and the trustor's propensity to trust. First, trustworthiness reflects the trustor's assessment of attributes of the trustee (Mayer et al., 1995). Perceptions of trustworthiness help the trustor to evaluate the expectations towards the trustor (Colquitt et al., 2007). Research identified three dimensions that are argued to cover the facets of trustworthiness (Davis, Schoorman, Mayer, & Tan, 2000): ability, integrity, and benevolence (Mayer et al., 1995). Ability refers to the trustee's skills and competences needed to perform a *particular* task for the trustor (Colquitt et al., 2007; Mayer et al., 1995). Integrity includes beliefs about the compatibility of the trustee's ethical principles with the trustor's principles (Mayer et al., 1995). This includes concepts such as fairness, justice, consistency, and reliability (Colquitt et al., 2007; Fulmer & Gelfand, 2012; Korsgaard, Schweiger, & Sapienza, 1995). Finally, benevolence describes beliefs about the extent to which the trustee wants to do something good for the trustor apart from self-centered profit motives (Mayer et al., 1995). Benevolence has been linked to loyalty, openness, caring, and supportiveness (Colquitt et al., 2007). The trustworthiness dimensions capture cognitive and emotional aspects of trust (Colquitt, LePine, Zapata, & Wild, 2011) that have been suggested in prior research (Lewis & Weigert, 1985; McAllister, 1995). Ability and integrity capture cognitive aspects of trustworthiness whereas benevolence entails emotional facets (Colquitt et al., 2011). Second, the propensity (or disposition) to trust is a stable characteristic of the trustor (as compared to trustworthiness which relates to an assessment of trustee) and refers to a general propensity to trust others (Kramer, 1999; Mayer et al., 1995). Trustors differ in their general expectancy that others will behave in an agreed way (Rotter, 1967). Importantly, the disposition to trust is an important source of trust before any information about the trustor is available (Mayer et al., 1995;

Rotter, 1967). Later on, the disposition to trust will influence how the trustor evaluates the trustworthiness of the trustee when they are interacting (Mayer et al., 1995).

1.2.4 Consequences of trust

The most proximal outcome of trust is risk taking in relationships which is a trusting behavior (Colquitt et al., 2007). The difference between trust and trusting behavior is that trust involves the *willingness/intention* to take a risk whereas trusting behavior is the manifestation of trust and *actually* involves engaging in a risky action (Mayer et al., 1995). In a trustful relationship, trusting behavior may for example involve delegation, relying on someone's information without double-checking, or sharing information (Colquitt et al., 2007). Trust is argued to release cognitive capacities that otherwise would be used for evaluating risky situations and monitoring others (McEvily et al., 2003). Since trust helps to act as if possible uncertainties would not exist (Lewis & Weigert, 1985) trust is argued to positively relate to performance-related outcomes (de Jong & Elfring, 2010). Trust has been associated with several desirable outcomes. Scholarly research provides ample evidence on the beneficial effects of trust in organizations (Kramer, 1999) which have been confirmed in meta-analytic analyses (e.g., Colquitt et al., 2007). On an aggregate level, McEvily (2011, p. 1267) summarized consequences of trust: Trust has “constructive effects for organizations and the individuals in them, including reduced transaction costs, increased pro-social behaviors, realization of positive attitudes, the effective exercise and acceptance of authority, and superior performance.”

1.2.5 Trust over time

Theories of trust explicitly or implicitly assume a development over time (e.g., Lewicki & Bunker, 1995; Mayer et al., 1995; Shapiro et al., 1992). Importantly, changes do not occur because of time but because of repeated interactions among trusting parties (Pitariu

& Ployhart, 2010). Initially, trusting parties will lack of information about each other and trust will be based on the respective trustee's propensity to trust (Mayer et al., 1995). Through repeated interactions trustors will learn about the trustees' ability, integrity, and benevolence and use this information to infer their intention to trust the trustee. However, the relationship between trustworthiness dimensions with trust may change over time (Pitariu & Ployhart, 2010). Scholars argue that trustors may obtain assessments of ability and integrity more quickly whereas it takes longer to assess a trustee's benevolence towards the trustor (Mayer et al., 1995). However, only few studies examined the development of trust over time which yielded yet inconsistent findings (e.g., Aubert & Kelsey, 2003; Serva, Fuller, & Mayer, 2005). Therefore, trust research needs more longitudinal research to capture the dynamics of the emergence of trust and its interplay with antecedents (e.g., trustworthiness) and consequences (e.g., performance) (Cronin, Weingart, & Todorova, 2011; de Jong & Elfring, 2010). Thus, the call for more longitudinal research on trust is still present (Pitariu & Ployhart, 2010).

1.2.6 Trust within teams

The definition of trust introduced above is not restricted to interpersonal trust. It applies to the team level or the organizational level, as well (Schoorman et al., 2007). Indeed, scholars examine trust relationships at the individual, team, and organizational level and within those levels the referent of trust can be specified at the individual, team, and organizational level (Fulmer & Gelfand, 2012).

At the team level, trust is conceptualized as a collectively shared construct by the team members (Costa & Anderson, 2011) whereas the referent of trust can be at the individual level (e.g., the team leader), the team level (e.g. the team referring to itself or to another team) or the organizational level (e.g. the organization in which the team is embedded) (Fulmer & Gelfand, 2012). Building on the defining components of trust, researchers defined team trust as members' generalized perceptions of these components regarding the team leader (e.g.,

Dirks, 2000) or the team members (e.g., de Jong & Elfring, 2010; Simons & Peterson, 2000). Following S. G. Cohen and Bailey (1997), the phrases “team” and “group” are used interchangeably in this thesis.

1.3 Measurement of trust

Research on trust mainly applies measures based on psychometric surveys and behavioral approaches relying on game-theoretic reasoning (McEvily, 2011). Further, but less frequently, scholars use archival data to obtain proxies for trust (e.g., Gulati, 1995).

Measuring trust with psychometric surveys aims to capture the trustor’s psychological state (McEvily, 2011). Therefore, scholars developed measures that capture the attitudinal, intentional, and behavioral aspects of trust (Dietz & Den Hartog, 2006; McEvily & Tortoriello, 2011). While measures on the intention to trust refer to the trustor’s intention to rely on the trustee or positive expectations of the trustee (Ferrin et al., 2008; McEvily & Tortoriello, 2011), attitudinal and behavioral measures have a formative and reflective focus respectively (Costa & Anderson, 2011). Attitudinal measures capture the trustor’s propensity to trust or the trustor’s perception of the trustee’s trustworthiness (Mayer & Davis, 1999) which help to form the trustor’s intention to trust the trustee (Mayer et al., 1995). Behavioral measures on the other hand account for the behavioral consequences of trusting intentions (Costa & Anderson, 2011) such as open communication, informal agreements, surveillance, and coordination (Currall & Judge, 1995). For obtaining team level assessments, the individual level data from team members may be aggregated to the team level by averaging, if ratings among team members show sufficient agreement (LeBreton & Senter, 2008).

Behavioral approaches to measuring trust build on game theoretic concepts (McEvily, 2011). Trust is typically operationalized as observable behavior in form of cooperation in an experiment: Cooperation represents trust, whereas the lack thereof denotes the absence of

trust. A commonly used game in experiments is the Investment Game (Berg, Dickhaut, & McCabe, 1995). Two players take part in an experiment, player A and player B. A is provided with a positive monetary amount x . Player A can keep x or invest any proportion of x in a B. If A decides to keep the money the game is over. If A decides to invest, B receives three times the invested amount. Subsequently, B may return any proportion of the received amount back to A, but there is no obligation to return any money (Berg et al., 1995). The transfer of money from one player to another represents the measure of trust. Under the assumption of rational choice and opportunistic behavior (Kramer, 1999), A foresees that B would act opportunistically and not return any money (Malhotra, 2004). In anticipation of B's behavior, A would not invest. However, participants tend to invest when being put in the above described situation which reflects the presence of trust (Berg et al., 1995).

Finally, some scholars suggest to utilize archival data as indicators of trust (Zucker, 1986). Similar to the behavioral approach, observable actions are used as indicators of trust (McEvily & Tortoriello, 2011). For example, Gulati (1995) used the number of previous alliances as a proxy for trust between firms. Gulati (1995) argues that through repeated interactions firms accumulate knowledge about each other and thereby build trust. Archival data is not restricted to the organizational level. If data is available researchers may infer proxies that indicate trustworthiness or trusting behavior from interactions among individuals or team members. Indeed, two of the subsequent studies in the following chapters make use of archival data to create proxies of ability and trusting behavior.

1.4 Methodological approach

1.4.1 Data source

This thesis builds on data from a large research project. Data were collected in a psychologically rich strategy simulation game called Travian (www.travian.com). Travian is a

massively multiplayer online game which is played in localized versions in over 50 countries worldwide. Virtual worlds such as Travian allow for large scale and longitudinal studies that make it especially suitable for research in social science (Bainbridge, 2007; Korsgaard, Picot, Wigand, Welpe, & Assmann, 2010). In specific, one game round in Travian lasts between 12 to 18 months with several thousands of participants. Participants may form teams which can persist until the end of the round. This allows researchers to track the development and the dynamics of teams over time. Teams compete in the race for completing a major landmark and thereby win the game which requires large amounts of resources. Teams collect resources either by producing resources and investing in the production capacity or raiding the storages of other teams. Consequently, teams have to protect their resources from other teams as well. Since it is virtually impossible to collect sufficient resources alone individuals pool their resources and group up in teams – the unit of analysis in this thesis.

1.4.2 Data collection

The dataset was collected from several instances of Travian game rounds from different countries around the world. The dataset consists of archival data and survey data. Archival data were collected from server log-files over the full length of the game instances. The log-files consist of static, status, and interaction data. Static data define constant parameters that influence the game dynamics such as production rates. Status data yield information on individuals or teams at a certain time such as the status of the infrastructure, team membership, or team size. Finally, interaction data provide information on relational actions between individuals or teams such as sending messages, resources, or troops. This data can be used to infer psychologically relevant indicators. For example, the infrastructure of an individual or team represents an indicator of performance since it gives an indication on an individual's or team's potential to produce resources and troops. Actually, the infrastructure provides the basis for the performance system in the game which is available to

every participant. A less obvious proxy can be found for trusting behavior. Team members may assign up to two other participants to take care of their account in their absence. Consistent with prior research, delegation of an important task constitutes a trusting behavior (Colquitt et al., 2007). Therefore delegation may be used as an indicator for trusting behavior. The archival data were supplemented by an online survey. Participants were invited to take part in online surveys. The surveys included measures on trust in team members, trust in leadership, and demographics on the participants (and other measures of the research project).

1.4.3 Analytic approach

All subsequently presented studies utilize longitudinal data. However, longitudinal data are likely to be non-independent (Bliese & Ployhart, 2002; P. Cohen, Cohen, West, & Aiken, 2002): First, observations from one team over time are likely to be more similar than observations across teams. Second, team observations that are collected temporarily closer are likely to be more similar than observations that are temporarily more distant. Finally, variation in observations may become systematically smaller or bigger over time. To produce unbiased regression estimates the statistical model has to account for the structure of the data. Bliese and Ployhart (2002) outlined a procedure to address these requirements using random coefficient modeling (RCM, also known as mixed models or hierarchical linear modeling). RCM accounts for differences between subjects – in this case teams. Temporal effects can be controlled by employing auto-regressive and heteroscedastic error structures (Pineiro & Bates, 2000). This approach allows for testing the hypothesized relationships that are summarized in the next section.

1.5 Structure and main results

The central theme of this dissertation is on team members' trust in either their team leader or their fellow team members. Chapters 2 to 4 present three studies examining

antecedents and consequences of trust in the context of teams (see Figure 1.1 for an overview). Chapter 2 focuses on how team ability foster trust in team members over time, whereas Chapters 3 and 4 examine the influence of team leadership behavior and leadership structure on trust in leadership, trust in team members, and team effectiveness. Finally, Chapter 5 provides a summary of the findings, a general discussion and suggestions for future research. The remainder of this section summarizes the following chapters.

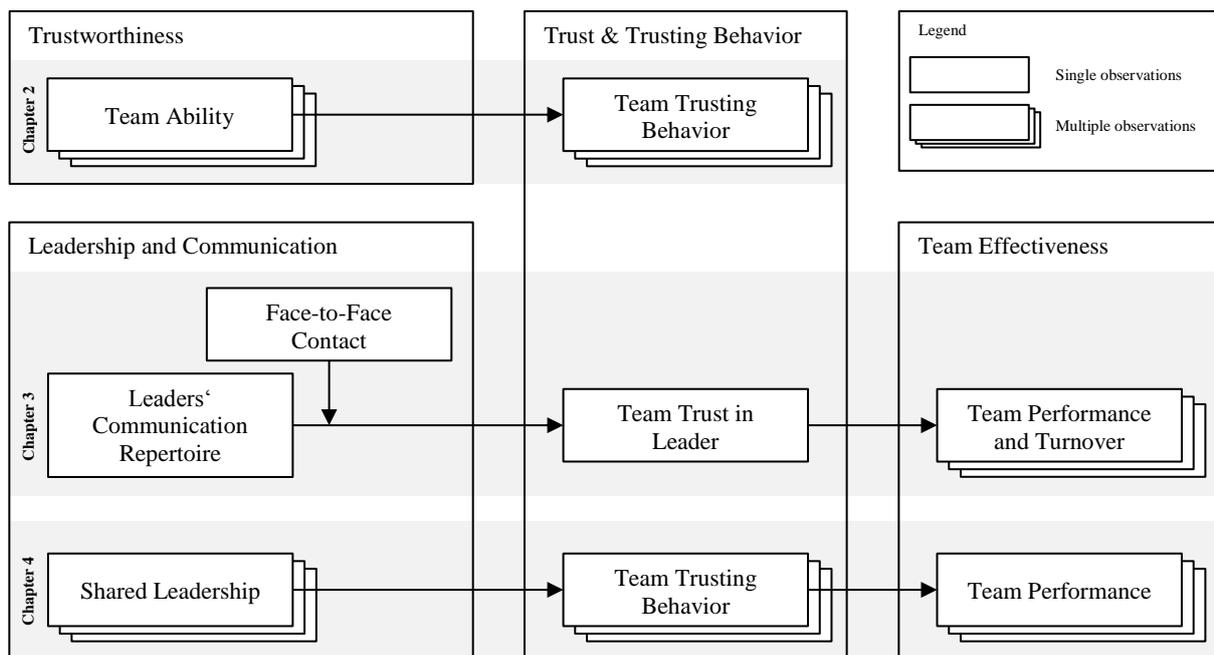


Figure 1.1. Study overview

Chapter 2 examines the development of trusting behavior and its relationship with team ability over time. While theory suggest that trust develops over time (e.g., Lewicki & Bunker, 1995; Mayer et al., 1995) empirical research is lacking (Lewicki et al., 2006). Further, the scarce longitudinal research on the relationship between trustworthiness and trust yields inconsistent patterns over time (cf. Aubert & Kelsey, 2003; Serva et al., 2005). This study examines the dynamics of trust development over time assuming a curvilinear growth of trust. That is, growth rates are initially high and will level off over time. In addition, this study tests the dynamic relationship between ability and trusting behavior over time.

Chapter 3 explores the team's trust in leadership in light of virtualness. The defining features of virtualness are the degree of face-to-face contact and the communication technology employed (Griffith & Neale, 2001; Kirkman & Mathieu, 2005). Research suggests that trust suffers in settings that use less information-rich or less synchronous communication channels (Hill, Bartol, Tesluk, & Langa, 2009; Rockmann & Northcraft, 2008; Wilson et al., 2006). However, scholars argue that a broader communication repertoire may offset the shortcomings of a single communication channel (Shachaf & Hara, 2007). Given the central role of leadership in fostering team effectiveness (e.g., Morgeson et al., 2010) and the beneficial effects of trust in leadership for team performance in co-located teams (e.g., Dirks & Ferrin, 2002) this study examines how the leaders' communication repertoire is related to trust in leadership, team performance, and turnover depending on the team's degree of face-to-face contact.

Chapter 4 examines how the dynamics of shared leadership relates to team trusting behavior and team performance. Since research suggests that shared leadership contributes to building trust (Wang et al., 2013) and trust has been found to be positively related to performance (Colquitt et al., 2007), team trust immediately suggests itself to be a mediating mechanism. Further, while research overall indicates a positive relationship between shared leadership and performance (Wang et al., 2013), studies find negative or no relationships between the constructs (e.g., Hmieleski, Cole, & Baron, 2012; O'Toole, Galbraith, & Lawler III, 2003). However, at a given time, an negative relationship may be attributable to a contraction of shared leadership and not to the overall level of shared leadership. A consideration of the development may provide a clearer picture. This study uses longitudinal data to examine the relationships among changes in shared leadership, team trusting behavior, and team performance using the actual trajectories of these variables over time.

Chapter 5 summarizes the findings of the previous chapters and discusses the main contributions for the literature on trust, leadership, and team dynamics for research and practices. Finally, the chapter concludes with implications for future research.

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2 The waxing and waning of trust: The dynamic role of ability in the development of trusting behavior

This study is joint work with Isabell M. Welp, M. Audrey Korsgaard, Arnold Picot, Matthias Spörrle, and Rolf T. Wigand. Earlier versions of this study were presented at the 74th Annual Meeting of the German Academic Association for Business Research and the 2011 Academy of Management Annual Meeting:

Drescher, M. A., Welp, I. M., Korsgaard, M. A., Picot, A., Spörrle, M., & Wigand, R. T. (2012, May 30-June 2). *The waxing and waning of trust: The dynamic role of ability in the development of trusting behavior*. Paper presented at the 74th Annual Meeting of the German Academic Association for Business Research, Bolzano, Italy.

Drescher, M. A., Welp, I. M., Korsgaard, M. A., Picot, A., Spörrle, M., & Wigand, R. T. (2011, August 12-16). *The waxing and waning of trust: The dynamic role of ability in the development of trusting behavior*. Paper presented at the 2011 Academy of Management Annual Meeting, San Antonio, Texas, USA.

Abstract

This research examines how group ability predicts group trusting behavior over time. We propose, first, a curvilinear trajectory for the development of trusting behavior, second, that changes in ability are positively related to changes of trusting behavior over time, and, finally, this relationship is curvilinear such that the relationship increases over time, and, subsequently, decreases after having reached a peak value. By unobtrusively observing 105 groups weekly over 24 weeks engaged in an online game we confirmed our hypotheses. Our results advance the understanding of the emergence of trust and provide insight into the dynamic nature of its antecedents.

Keywords: Group ability, group trust, longitudinal, change over time

3 How the use of multiple communication channels fosters trust and virtual team effectiveness

This study is joint work with M. Audrey Korsgaard, Isabell M. Welpe, and Arnold Picot.

Abstract

We propose that the leaders' use of multiple communication channels influences trust in leaders of virtual teams, which in turn affects team effectiveness. These relationships are assessed in two studies. Study 1 was a longitudinal assessment of team performance and team turnover in a simulation setting. The findings of Study 1 indicate that channel repertoire was positively related to trust in leadership, particularly when face-to-face contact was infrequent. Further, trust in leadership predicted team performance, team turnover, and the sustainability of team performance. In addition, trust mediated the relationship between channel repertoire and team performance. Data from Study 2 were collected from members of virtual teams in a multinational company and validated the core findings of Study 1 regarding channel repertoire, trust, and performance, and indicated that team coordination mediated the relationship between trust and performance. Implications for organizational theory and practice are discussed.

Keywords: Communication channel repertoire, trust, virtual team, leadership of virtual teams, team performance, team turnover, team effectiveness, online simulation

4 The dynamics of shared leadership: Building trust and enhancing performance

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Drescher, M. A., Welpe, I. M., Korsgaard, M. A., & Wigand, R. T. (2012). *How does shared leadership affect team performance? A mediational path over communication and trust*. Paper presented at the 2012 Academy of Management Annual Meeting, Boston, Massachusetts, USA.

Drescher, M. A., Straub, N., Welpe, I. M., Korsgaard, M. A., Picot, A., & Wigand, R. T. (2012, May 30-June 2). *The impact of shared leadership on communication, trust, and performance in virtual teams*. Paper presented at the 74th Annual Meeting of the German Academic Association for Business Research, Bolzano, Italy.

Abstract

In this study, we examine how the dynamics of shared leadership are related to group performance. We propose that, over time, the expansion of shared leadership within groups is related to growth in group trust. In turn, growth in group trust is related to performance improvement. Longitudinal data from 142 groups engaged in a strategic simulation game over a four month period provide support for positive changes in trust mediating the relationship between positive changes in shared leadership and positive changes in performance. Our findings contribute to the literature on shared leadership and group dynamics by demonstrating how the growth in shared leadership contributes to the emergence of trust and a positive performance trend over time.

Keywords: Shared leadership, trust, performance, groups, change over time

5 Conclusions

5.1 Summary of findings

This thesis focuses on the concept of trust in the context of teams. In specific, the development of trusting behavior and its dynamic relationship with the team's ability (chapter 2), the relationship of the leaders' communication use with the teams' trust in leadership and team effectiveness on varying degrees of virtualness (chapter 3), and the mediating role of trusting behavior in the relationship between shared leadership and team performance (chapter 4) were examined. The thesis contributes to literature on trust in teams, leadership, virtual teams, and team dynamics.

Chapter 2 examined how group trusting behavior develops over time and the dynamics of the relationship with team ability. Consistent with theory on trust development (e.g., Mayer, Davis, & Schoorman, 1995) the results showed that trusting behavior among team members increased over time. However, the increase was curvilinear: After a strong increase of trusting behavior in the initial phase of the team's existence, later on, the rate of increase leveled off and the degree of trusting behavior stabilized. Beyond the development of trust, the relationship between group ability and trusting behavior varied over time as well. While the relationship was weak initially, over time ability became a stronger predictor of trusting behavior. As teams continued to work the strength of the relationship leveled off. These findings contribute to the rare empirical studies on trust development (e.g., Aubert & Kelsey, 2003; Serva, Fuller, & Mayer, 2005; Wilson, Straus, & McEvily, 2006). The longitudinal approach allows for integrating and explaining yet inconsistent temporal finding between trustworthiness dimensions and trust (Aubert & Kelsey, 2003; Serva et al., 2005). In the course of interacting with others, team members learn about the others' trustworthiness. Depending on the level of development of the team, different antecedents of trust may be

more relevant. The findings suggest that in the initial phase of a team's existence team members should offer opportunities to let other team members learn about their ability. This may allow team members to quickly infer the other members' ability (Mayer et al., 1995) and foster trust at an early point in time.

Chapter 3 studied the team's trust in leadership with varying degrees of virtualness. Building on theories of team virtualness (Griffith & Neale, 2001; Kirkman & Mathieu, 2005) the study examines the relationship of leaders' communication repertoire with trust in leadership and team effectiveness whereby the latter is represented by team performance and turnover. The results show that trust in leadership is high when leaders employ a broad communication repertoire. This relationship is especially pronounced when team members have few face-to-face contact, that is, are more virtual. Consistent with research in co-located teams (Dirks & Ferrin, 2002), trust in leadership was positively related to team performance as well as team performance over time and negatively related to turnover. Finally, trust in leadership was examined as a mediator between communication repertoire and team effectiveness. While trust in leadership mediated the relationship between communication repertoire and performance (over time) the results did not support a mediational relationship with turnover. The study emphasizes the importance of trust in leadership in virtual teams by demonstrating its positive influence on team effectiveness. The study contributes to the literature on virtual teams (Griffith & Neale, 2001; Shachaf & Hara, 2007) by highlighting the importance of a broad communication repertoire of the leader. While most studies compare single communication channels, this study examines the joint relevance of communication channels of varying levels of richness and synchrony. Team leaders of virtual teams may facilitate multiple communication channels to relieve the detrimental characteristics of virtual work.

Chapter 4 focused on team trusting behavior as a mediator of the relationship between shared leadership and team performance. The study showed that increases in shared leadership over time were positively related to increases in team performance. This relationship was mediated by increases in trusting behavior. As the study utilizes a dynamic approach to examining shared leadership, it allows for explaining yet inconsistent findings in the relationship between shared leadership and performance. A given level of shared leadership may be the result of an increase or a decrease in shared leadership which could relate positively or negatively to performance. This study found increases in shared leadership to be positively related to increases in trust and performance which rules out alternative explanations. A static analysis would not have been able to detect the developmental process. The findings highlight the importance of trust when transforming shared leadership into superior performance. Sharing leadership provides signals for trustworthiness which foster trust and in turn foster performance.

5.2 Main contributions of the dissertation

This thesis highlights the importance of trust for effective team functioning. Thereby, two important referents of trust – the team itself and the team’s leadership – confirmed to contribute to the team’s effectiveness. First, the results showed that increases in trust in team members were positively related to subsequent increases in team performance irrespective of the initial level of trust. Second, the teams that trusted their leadership not only exhibited higher performance and lower turnover rates but also were able to uphold these positive outcomes over time. Teams with high trust in leadership showed higher performance growth rates and were able to keep turnover rates constantly low.

This research also emphasizes the central role of leadership in teams (Morgeson, DeRue, & Karam, 2010). Focusing on leaders in the process of building trust this research extends the literature on virtual teams and the growing body of research on shared leadership.

First, virtuality poses challenges to leadership in virtual teams (Zigurs, 2003). When face-to-face contact is scarce teams have to rely on communication technology to interact (e.g., Griffith & Neale, 2001). The findings show that leaders who employ a broad range of communication channels – differing in richness and synchrony – are trusted more by their team members, especially when face-to-face contact is low. The findings also suggest that by offering diverse communication channels leaders may offset challenges of virtual leadership, enhance trust in them, and materialize the positive effects that have been shown in co-located teams (Dirks & Ferrin, 2002). Second, research on shared leadership and performance lacks explanatory mechanisms on how shared leadership fosters performance (Carson, Tesluk, & Marrone, 2007). This thesis suggests that by enhancing trust in team members shared leadership positively influences team performance.

Contributing to the literature on team dynamics (Cronin, Weingart, & Todorova, 2011), all studies employ a longitudinal approach to theorizing and testing relationships. Since most theories implicitly or explicitly assume a development over time this approach allows for a rigor test of theory (Marks, Mathieu, & Zaccaro, 2001; Pitariu & Ployhart, 2010). Emergent phenomena need time to evolve and therefore relationships may vary or unfold over time as well. In the relationship between ability and trusting behavior the findings showed a curvilinear relationship that initially became stronger and leveled off later. Additionally, teams of trusted leaders were found to have stronger growth rates in performance over time. These findings provide a more precise test of the hypothesized relationships. Further, testing dynamic relationships may provide explanations for yet inconsistent results. The alternating extent of the relationship between ability and trusting behavior at different points in time (Aubert & Kelsey, 2003) may be attributable to different stages of the curvilinear relationship. As well, negative relationships between shared leadership and performance (e.g., Hmieleski, Cole, & Baron, 2012) may be due to a recent reduction on shared leadership. Longitudinal

theorizing and testing of relationships is likely to advance our understanding of team functioning.

5.3 General implications for organizations

Teams represent the central units for structuring and performing work in organizations (Kozlowski & Bell, 2003). Since team work involves working on interdependent tasks (Cohen & Bailey, 1997) team members face the uncertainty of other team members' intentions and competencies (McEvily, Perrone, & Zaheer, 2003). Trust provides an effective mechanism to overcome such uncertainties (Arrow, 1974; Mayer et al., 1995).

This thesis provides evidence for the positive relationship of trust at the team level with team outcomes. Teams not only exhibited higher performance and superior performance development over time when trust was high, but also showed lower turnover. The latter can result in significantly lower replacement costs (Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone, 2006). Therefore, organizations may benefit from establishing an environment that fosters trust. Especially, leaders assume a central role in providing conditions that foster team effectiveness (Morgeson et al., 2010). Previous research highlighted the importance of leadership in building trust (e.g., Korsgaard, Schweiger, & Sapienza, 1995; Whitener, Brodt, Korsgaard, & Werner, 1998). Accordingly, the findings of this thesis suggest that leadership can significantly contribute to building trust. It is worth noting that this task does not necessarily need to be performed by a single person and may be distributed among team members – which provides another driver of trust building as this thesis's results suggest.

The findings also provides suggestions for managing virtual teams. A defining feature of virtual teams is the use of electronic communication channels for coordinating work (Griffith & Neale, 2001; Kirkman & Mathieu, 2005). This characteristic offers great potential for composing teams with the knowledge, skills, and ability to fit the task irrespective of the

spatial location (Kozlowski & Bell, 2003). However, it poses challenges for building trust among team members since electronic communication channels are less efficient in transporting social cues that are important for establishing social bonds (Jarvenpaa & Leidner, 1999). The findings suggest that leaders of virtual teams should employ diverse communication channels in interacting with his/her team. Leaders that offer a broad communication channel repertoire may allow team members to use the channel that fits the situation best. Thereby, leaders may overcome the spatial distance and again get in touch with the team (Handy, 1995). Further, shared leadership suggests itself to be beneficial in virtual teams. An increase in shared leadership may increase the availability of leaders and increase the interactions among team members. In fact, research indicates that shared leadership benefits team performance irrespective whether the team works face-to-face or virtually (Hoch & Kozlowski, 2012).

5.4 Implications for future research

Departing from this thesis' findings and limitations several important routes for research depart. First, the positive relationship between trustworthiness and trust has been widely confirmed in cross-sectional settings (Colquitt, Scott, & LePine, 2007). However, research on the dynamic relationship of trustworthiness and trust is scarce. This thesis provides a first test of the dynamic relationship between ability and trust. While scholars speculate about the dynamic relationship between integrity and benevolence with trust (Mayer et al., 1995) research has yet to show whether they hold true. Further, theory suggests that each trustworthiness dimension contributes uniquely to the formation of trust (Colquitt et al., 2007). However, taking a more calculative or exchange-oriented view on early trust development (Lewicki & Bunker, 1995) one could argue ability to represent a boundary condition for establishing higher levels of trust. If someone is not capable of performing an important task, how could another person rely on the person in that matter? A simultaneous

consideration of the development of all trustworthiness dimensions may help understanding the dynamic interplay in determining trust.

This thesis highlights the importance of the leaders' communication behavior in virtual teams. When face-to-face contact was low teams profited from a broad communication repertoire of the leader. This conceptualization defines virtualness as varying degrees of face-to-face contact and the communication channel repertoire (Griffith & Neale, 2001). However, scholars suggest that research may benefit from subdividing the face-to-face contact dimension further. One way of defining face-to-face contact may be the degree of geographic dispersion. O'Leary and Cummings (2007) argue that geographic dispersion is a defining feature of virtual teams as well. Geographically dispersed teams may vary in spatial as well as temporal dispersion. This has important implications for the applicability of communication channels. While asynchronous channels are applicable irrespective of the type of dispersion, more synchronous channels are contingent on time zone overlaps. In the examined relationships, the temporal dispersion may be another dimension that qualifies different types of suitable communication repertoires for establishing trust and enhancing team performance.

Finally, this thesis took a functional approach to examining shared leadership. While this research built on a categorization of four broad leadership functions (Fleishman et al., 1991) research may benefit from a more detailed view on leadership. Building on Marks et al.'s (2001) model of action and transition phases, Morgeson et al. (2010) derived a more detailed perspective on leadership functions. Future research could benefit from examining leadership functions at a more fine-grain level and determine which leadership functions could or should be shared. On a related topic, this thesis' data on shared leadership indicated that teams tended to specifically share leadership functions. Leadership functions were rather assumed by a range of team members than being concentrated on a small set of members.

More research is needed on configurations of leadership functions and its relationship with trust and performance over time (Contractor, DeChurch, Carson, Carter, & Keegan, 2012).

In conclusion, this thesis examined antecedents and enabling conditions of trust at the team level and its relationship with team outcomes. Team leaders turned out to be important drivers of trust at the team level. In turn, high trust was related to desirable outcomes such as superior performance and lower turnover rates. Organizations are well advised establishing conditions that foster trust in teams (Fulmer & Gelfand, 2012) and provide an efficient “lubricant” for everyday teamwork.

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