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The relationship between Transformational Leadership and LMX: The Moderating role of Team Virtuality and Task Interdependence.

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**The relationship between Transformational Leadership  
and LMX: The moderating role of Team Virtuality and  
Task Interdependence**

Supervisor: Sut I Wong

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## **Abstract**

Despite widespread increase in virtual teamwork, there still remains relatively little research on how leaders build relationship with their virtual team members and what factors that might influence this. Therefore, this study examined the joint moderating roles of the degree of team virtuality and the level of received task interdependence on the relationship between transformational leadership and leader-member exchange (LMX). In order to explore this relationship, the study used data collected from two-stage online surveys from two companies operating in virtual teams. Using regression analysis, the data collected from the total of 79 participants, showed that the relationship between transformational leadership and LMX turned negative if team virtuality and team task interdependence were high. This indicates that transformational leadership is more effective in building LMX in low team virtuality conditions. An elaborative discussion of our findings, together with practical implications and directions for future research are discussed.

Key words: Virtual teams, transformational leadership behavior, LMX and task interdependence

## 1.0 Introduction

A wide range of research has demonstrated the great influence leadership has on numerous organizational outcomes, such as team effectiveness and performance, follower engagement, job satisfaction, innovative thinking and motivation (Zaccaro, Rittman & Marks, 2001; Babcock-Roberson & Strickland, 2010; Lok & Crawford, 2004; Zhang & Bartol, 2010). Additionally, leadership style and behavior has shown to have implications for the dyadic relationship between leaders and followers, also known as leader-member exchange theory (LMX), which in turn plays an important role for achieving organizational outcomes (Gerstner & Day, 1997; Martin, Guillaume, Thomas, Lee & Epitropaki, 2016). However, advancements in information systems and technology have changed the way we work and provide resilient new organizational forms that would not have been feasible a decade ago (Bell & Kozlowski, 2002). This new way of working tend to make other demands of leaders, as they often have to manage teams and individual employees who work across distance, time zones, cultures and professional disciplines (Holton, 2001). Consequently, this creates a new context for leadership, team work and how leaders build relationships with their followers (Avolio, Kahai, Dum Dum & Sivasubramanian, 2001).

In today's organizations virtual teams are becoming more prevalent, and are commonly defined as “*teams whose members use technology to varying degrees in working across locational, temporal and relational boundaries to accomplish an interdependent task*” (Martins, Gilson & Maynard, 2004; 808). One of the main features of virtual teams is according to Driskell, Radtke and Salas (2003), interdependent group members that works together towards a common goal while they are spatially separated. This can be referred to as task interdependence, which explains how team members need to share information, knowledge or materials in order to achieve the desired outcomes (Rico, Bachrach, Sánchez-Manzanares & Collins, 2011). The virtual setting have implications for task interdependence as work must be interactive to complete a set of task (Stewart & Barrick, 2000). In turn, this may have implications for leadership and how leader build relationships

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with their follower due to new ways of collaborating (Kozlowski, Gully, Nason & Smith, 1999).

In general, findings suggest that virtual teams call for a more active rather than passive form of leadership style (Purvanova & Bono, 2009). Thus, while there are many approaches to the study of leadership, transformational leadership has been one of the main approaches related with virtual teams (e.g., Bell & Kozlowski, 2002; Hambley et al., 2007; Huang et al., 2010; Purvanova & Bono, 2009). Transformational leadership is usually associated with leaders that influence their followers by articulating strongly held beliefs and values, generating intellectual stimulation and inspiring them to rise above their immediate self-interest. Additionally, transformational leadership rests on the assertion that certain leader behaviors can arouse followers to a higher level of thinking (Huang et al., 2010). Research has also revealed that transformational leaders contribute to fulfilling the psychological contract implicit in their social exchange relationships with followers (Gerstner & Day, 1997; Deluga, 1992). This is known as LMX theory and describes the dyadic relationships that are developed through a series of “exchanges” that occur between the leader and the follower over time (Dansereau, Graen & Haga, 1975), and how this relationship impact the relationship quality between the leader and each follower (Graen & Uhl-Bien, 1995). Nevertheless, with the technological advancements, the operation of interdependent tasks and these leadership behaviors are challenged in that they are likely facilitated by cues that are more difficult to transmit, detect and interpret in a virtual work context (Judge & Piccolo, 2004).

Based on this we wanted to investigate whether or not the level of task interdependence and level of virtuality has a moderating effect on the relationship between transformational leadership and LMX. Although there are several studies that have looked at virtual leadership, there is still relatively little research on how leaders build relationship with their followers working on independent tasks in a virtual team contexts (Hambley et al., 2007). Given that virtual team members typically tend to make other demands of their leaders, this may lead to a set of challenges for leaders, especially when it comes to building work relationships between followers and leaders (Purvanova & Bono, 2009). Thus, research needs to assess what might influence this relationship in order for leaders to adapt to the

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virtual context more successfully. In order to understand the implications these factors have, we conducted a quantitative study where we analyzed data collected from subordinates working in a virtual context. More specifically we used questionnaires where the followers assessed their leader's behaviors, the level of virtuality and the received task interdependence.

There are many practical and theoretical contributions we intend to address with this study. First of all, the aim of the study is to expand the current virtual team understanding, as these work units are an established reality in many organizations (Bell & Kozlowski, 2002). Surprisingly few quantitative field studies are available when it comes to research regarding how leaders build relationship with their virtual team members (Hertel, Konradt & Orlikowski, 2004). Most virtual team leadership research is laboratory-based, even though some researchers argue that the complexity of virtual teams cannot be adequately captured in the laboratory (e.g., Martins et al., 2004; Kahai & Avolio, 2006). Clearly, more field research on specific leadership styles and behaviors within virtual teams is needed to fill this gap in literature. Secondly, by carrying out this research we intend to contribute to virtual team literature in order to provide a wider understanding of the potential possibilities and challenges a virtual business environment might cause. As the use of virtual settings increases, it is important that organizations learn how to adapt and use advanced technology systems to their advantage, and understand how leaders can successfully build strong relationships with their follower. Several researchers have commented on the fact that despite the prevalence of interest in the topic, there is a lack of clarity on what is known and the direction that future research should take (Bell & Kozlowski, 2002; Griffith & Neale, 2001). Lastly, this study intends to contribute to the current literature gap by investigating the joint moderating roles of team virtuality and task interdependence on the relationship between transformational leadership and LMX, as this has not been looked at before. In order to investigate this further the research question that will be considered in this thesis is:

*To what extent do team virtuality and task interdependence jointly moderate the relationship between transformational leadership and LMX?*



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## 2.0 Theory and Hypotheses

### 2.1 Leadership Theory

Various studies investigating how leadership behavior might affect the relationship between leaders and followers have used measures of transformational leadership as the antecedent (Yukl, 1999; 2009). Although there are several theoretical approaches when studying leadership behaviors, one of the most common approaches when discussing team virtuality is transformational leadership (Hambley et al., 2007). Given that previous results have yielded its importance in virtual settings (Avolio, Walumbwa & Weber, 2009), this leadership approach will be in focus.

Transformational leadership behavior has become a well-known leadership approach, and was first suggested in 1978 by Burns and later expanded by Bass (1985). According to Burns (1978:4), “*the result of transforming leadership is a relationship of mutual stimulation and elevation that converts followers into leaders and may convert leaders into moral agents*”, leading to a transforming effect on both leaders and followers (Krishnan, 2005). Moreover, Bass (1985) defined a transformational leader as a person who motivates followers to do more than they are originally expected to do. Thus, the concept of transformational leadership is most often related to leaders that influence their followers by expressing strongly-held beliefs and values, generating intellectual stimulation and inspiring their followers to rise above their immediate self-interest (Huang et al., 2010).

There are four different dimensions that have been identified as components of transformational leadership. The first dimension is *charismatic leadership* or *idealized influence*, which refers to whether or not the leader is perceived as being a confident and powerful leader by his or hers followers, as well as the degree to which the leader behaves in an admirable way causing followers to identify with them. The next dimension is *inspirational motivation*, which describes how leaders inspire and motivate their followers by articulating shared visions and goals, which can often lead to increased enthusiasm and motivation. The third component, *intellectual stimulation*, is the extent to which a leader has

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performance expectations and encourages creativity and innovation amongst its followers, as well as challenge their own assumptions, values and beliefs. The last dimension of transformational leadership is *individual consideration*, which describes a leader's ability to provide intellectual stimulation by showing personal concern for its followers, their needs and extent to which they listen to these concerns (Antonakis, Avolio & Sivasubramaniam, 2003).

## 2.2 LMX

Leaders have also proven to play an important role when influencing, and building relationship ties with their followers (Dansereau et al., 1975). LMX theory holds a unique place among the leadership theories that have been most successful in explaining how leaders influence subordinates (Dansereau et al., 1975; Graen & Scandura, 1987). LMX theory, in contrast to transformational leadership, stands as more relationship-based, focusing solely on how reciprocal social exchanges between leaders and followers evolve, are nurtured and sustained (Martin et al., 2016). Traditionally, LMX research relied on role and social exchange theories to explain how different types of relationships between leader and follower develop (Graen & Uhl-Bien, 1995). Whereas leaders convey role expectations to their followers and provide rewards to followers who satisfy these expectations, followers hold role expectations of their leaders, with respect to how they are to be treated and the rewards they are to receive for meeting expectations of the leader (Wang, Law, Hackett, Wang & Chen, 2005). This illustrates the reciprocal process in the dyadic exchanges between leader and follower, wherein each party brings to the relationship different kinds of resources for exchange (Wang et al., 2005).

According to Martin et al. (2016) LMX can be divided into a scale, where low LMX relationships are based primarily on the employment contract and involve mainly economic exchanges that focus on the completion of work. In contrast, high LMX relationships extend beyond the formal job contract where the aim is to increase follower's ability and motivation to perform at a higher level. The positive exchanges between the leader and follower increase feelings of affect and liking for the leader, and this also motivates followers to want to meet the leader's work demands. These exchanges are more social in nature involving mutual

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respect, affect, support, loyalty and felt obligation. Thus, the theory emphasize how different types of exchanges impact the quality of the relationship between leaders and each follower (Martin et al., 2016).

As LMX posits that followers' work-related attitudes and behaviors depend on how their leaders treat them (Buch, Thompson & Kuvaas, 2016), the construct is undoubtedly of great importance in organizational settings. Early studies of LMX reveal persuasive evidence to suggest that due to time, resources or cognitive pressures, leaders sometimes only form close relationships with a few team members (Dienesch & Liden, 1986; Graen & Uhl-Bien, 1995). For example, leaders develop high quality relationships with members whom they have had successful interactions in the past. As a result, these members are offered opportunities not available to others. In order to maintain a balanced exchange relationship, employees reciprocate by adopting attitudes and behaviors that reflect the support derived from leader-member relationships. Therefore, increased levels of supervisory support have a positive impact on members' performance, because the norms of reciprocity influence members to perform beyond normal job expectations (Wayne, Shore & Liden, 1997).

Indeed, LMX has been shown to be positively related to various organizational outcomes, such as work performance, job satisfaction, job commitment, organizational commitment, intentions to stay, innovation, career progress and employee empowerment (Gerstner & Day, 1997; Martin et al, 2016).

Additionally, some research claim that LMX also reduces certain undesirable outcomes, including role conflict and ambiguity and job problems (Gerstner & Day, 1997). In addition to influencing aforementioned organizational behaviors, Gottfredson and Aguinis (2017) argued that LMX has a mediating effect on the relationship between major leadership behaviors, such as transformational leadership and follower performance. Thus, LMX might be an underlying mechanism explaining why leadership is related to follower performance through leadership behavior.

Linking transformational leadership and LMX together has been well established in the existing literature (Deluga, 1992; Krishnan, 2005; Wang et al., 2005), particularly as transformational leaders contribute to fulfilling the psychological

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contract implicit in their social exchange relationships with followers (Gerstner & Day, 1997). This was supported by Basu and Green (1997) who found a strong positive correlation between transformational leadership and LMX. This particular research also provided evidence that suggests that there is no clear distinction between the two constructs. Additionally, Shunlong & Weiming (2012) showed that transformational leadership has a great positive effect on LMX, to the extent that LMX measures mutual respect, trust and the overall quality of the working relationship. Deluga (1992) found that the two transformational leadership behaviors, *individualized consideration* and *idealized influence*, have implications for the dyadic relationship between leader and follower, and were shown to have a significantly positive relationship to LMX. Lastly, in a study conducted by Wang et al. (2005), it was illustrated that the most effective leaders express their transformational behaviors within a personal, dynamic and relational exchange context. Common features of these leaders, is that they are conscious to follower contributions, to the exchanges and reciprocate in ways that build follower self-worth and self-concept. As noted, this indicates that LMX relationships between leaders and followers are strengthened in that way that leaders with transformational features contributes to fulfilling the psychological contract within their work-related relationships with their followers. Based on these findings, we therefore propose the following hypothesis:

*H1: There is a positive relationship between transformational leadership and LMX.*

### **2.3 Team Virtuality**

In addition to the positive relationship between transformational leadership and LMX, past research have also exposed the notion that transformational leadership and LMX are the most prevalent approaches used in research on virtual teams (e.g., Avolio et al., 2000; Hambley et al., 2007; Hoch & Kozlowski, 2014). Advancements in information systems and technology have changed the way we work and it is becoming more common to organize in virtual ways, which also have created a new work context (Bell & Kozlowski, 2002). Today's organizations can now conduct work anytime, anywhere, in real space or through technology (Hambley et al., 2007). Resulting from more technically oriented,

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complex and dynamic positions, there has been an increasing emphasis on remotely distributed teams as organizing units of work (Bell & Kozlowski, 2002).

By using virtual teams, organizations can save their employees from increased travel, coordination and costs associated with bringing together geographically, temporally and functionally dispersed employees to work on a common task (Martins et al., 2004). Thus, virtual teams makes it easy for organizations to access the most qualified individuals for a particular job, regardless of their location. Additionally, virtual teams enable organizations to respond faster to increased competition and provide greater flexibility to their employees to allow them to work from home or on the road (Bell & Kozlowski, 2002). Such benefits can be a major contributor for attracting and retaining the right employees for certain tasks in organizations, which can be crucial for an organization's survival in today's competitive employment market (Martins et al., 2004).

While it is undeniable that virtual teams will play an important role in shaping future organizations, various research have criticized this way of developing work units, emphasizing its numerous challenges (e.g., De Guinea et al., 2012; Cramton, Orvis & Wilson, 2007; Carte & Chidambaram, 2004). When comparing a traditional workplace to the virtual team environment, the interactions between leaders and followers, such as the methods and modes of communication, feedback and direction, take a substantially different form in a virtual setting (Meyer, 2011). Consequently, this may cause coordination and technological problems, in addition to major motivational challenges resulting from the reduced level of face-to-face contact (Hertel et al., 2004). Thus, the change in team structure leads to substantial workplace modifications such that successful leadership behaviors will be vastly different than the leadership behaviors in a traditional workplace (Meyer, 2011). Given that virtual teams typically tend to make other demands of their leaders than conventional team members, this may lead to a set of challenges when it comes to interaction between leader and follower (Purvanova & Bono, 2009).

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## *2.4 Transformational leadership and LMX in virtual teams*

Previous findings from Purvanova & Bono (2009) has indicated the importance of transformational leadership in virtual contexts (e.g., Wang et al., 2005; Sosik, 1997; Purvanova & Bono, 2009). Particularly, Purvanova & Bono (2009) found that transformational leadership behavior tended to be more influential in highly virtual teams. Hence, transformational leadership is often a preferred leadership behavior, also in virtual teams. However, previous research has also indicated that transformational leader behavior causes weaker relations for virtual teams (Hambley et al., 2007; Howell & Hall-Merenda, 1999). Thus, the central behavior within transformational leader behavior, such as inspiring follower motivation and stimulating the followers to stretch their capabilities, are likely facilitated by cues that are more difficult to transmit, detect and interpret in a virtual work context (Judge & Piccolo, 2004).

Within virtual teams, leaders are also playing a crucial role when influencing, and building relationships with their followers (Dansereau et al., 1975). LMX theory is a process of exchange which also is possible to maintain when working in virtual teams (Howell & Hall-Merenda, 1999). However, these relationship ties might be more difficult to develop, given that the leader has little to no face-to-face contact with their team members (Hoch & Kozlowski, 2014). Past research by Kimball and Eunice (1999) confirms this finding, and stated that virtual teams tend to more easily lose focus on building relationships within the team. This is also supported by Jarvenpaa and Tarniverdi (2000), who noted that demanding project deadlines in virtual settings might contribute to weaken the ties between the team members. Additionally, research has noted that the spatial distance between team members when using virtual communication can prevent the ability of the virtual leader to mentor and develop followers (e.g., Bell & Kozlowski, 2002). Lastly, Hambley et al. (2007) found that employees stated that it is easier to become too task-focused in virtual settings, which often lead to a lack of “human element” and depersonalization. Hence, we expect that team virtuality will affect the positive relationship between transformational leadership and LMX. Therefore, the following hypothesis will be examined:

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*H2: Team virtuality will moderate the positive relationship between transformational leadership and LMX such that transformational leadership will be more positively related to LMX when team virtuality is low.*

### **2.5 The role of Task Interdependence**

The notion that virtual teams work on interdependent tasks towards a common objective has been noted in several definitions of virtual teams. As Driskell et al. (2003) noted, one of the core features of virtual teams is that they are locally distributed and include interdependent team members who work together on common tasks. This is supported by Stewart & Barrick (2000), who argued that the virtual way of organizing work units involves interaction with other team members, where the individual maintains a given level of interdependence. Hence, task interdependence implies the extent to which team members depends upon each individual's desire to attain their own aims and goals (Campion, Medsker & Higgs, 1993).

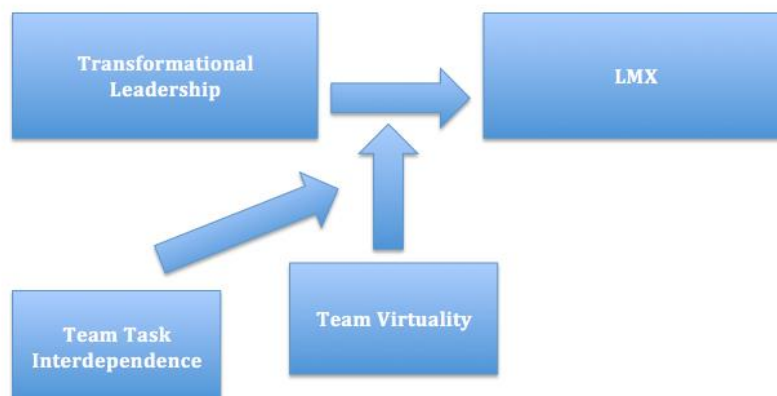
In organizations, task interdependence can be viewed as a combination of formally prescribed roles, technology requirements and team member interactions that contributes and affect team members' coordination and social interaction needs (Rico & Cohen, 2005). Virtual team members are usually chosen for their expertise, competence and prior virtual team experience (Bell & Kozlowski, 2002). Thus, they are expected to have the technical knowledge, skills and abilities to be able to contribute to a team's effectiveness and operate effectively in a virtual environment (Bell & Kozlowski, 2002). Furthermore, team tasks differ in their degree of interdependence, requiring different communication and coordination support from virtual team members (Rico & Cohen, 2005). As interdependent tasks facilitate cooperation in the sense that group members depend on each other to accomplish work, it is crucial for leaders to be aware of the opportunities the "right" management of teams who works together to attain common goals (Sosik, Avolio, Kahai and Jung, 1998).

For virtual teams, leaders will need to implement a system in which team members will be able to regulate their own performance as a team (Kozlowski et al., 1996). To accomplish this, virtual team leaders need to provide a clear,

engaging direction (Hackman & Walton, 1986) along with specific individual goals and opportunity for reflection of group and personal development (Bell & Kozlowski, 2002). Because virtual teams usually are distributed, they are less likely to be aware of the wider situations and dynamics of the overall team environment and external conditions change, such as modified task specifications, new deadlines or changes in the team's goals (Bell & Kozlowski, 2002). Therefore, communication with each other, the need for virtual team leaders to monitor or develop, or build relationships between team members and leader may not be as crucial when task interdependence is high. As interdependent tasks require more cooperation and collaboration among group members, one can argue that the relationship between transformational leadership behavior and LMX will be negatively impacted when the level of virtuality and task interdependence is high. Arguably, this can be due to distribution of the functions by the team itself, which leads to leaders being less valued by their team members (Hunsaker & Hunsaker, 2008). Based on this, we hypothesize:

*H3: Team task interdependence and team virtuality will jointly moderate the relationship between transformational leadership and LMX such that transformational leadership will have less positive effect on LMX in teams where virtuality and task interdependence is high than in teams where virtuality and task interdependence is low.*

## 2.6 Conceptual Framework



*Figure 1: Conceptual framework*



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The model above (see figure 1) is a graphical illustration and description of the research question – how transformational leadership behavior, the independent variable, may relate to LMX, the dependent variable. Additionally, the model focuses on how the level of team virtuality and team task interdependence moderates the aforementioned relationship, and moreover how these affect the direction and/or strengths between the variables.

### **3.0 Methodological Framework**

#### ***3.1 Data collection***

In order to further investigate the hypotheses, a quantitative research design was used. A quantitative design allows researchers to get a larger participation sample than qualitative research would. As quantitative design makes it possible for researchers to collect a larger participation sample, a more general conclusion is allowed to be drawn about the extent to which team virtuality and task interdependence can moderate the effect between transformational leadership and LMX (Bryman & Bell, 2015). Moreover, quantitative research is particularly useful in this setting, as teams that are physically dispersed have been investigated. By distributing surveys, the research has managed to collect data from a broad set of participants, in addition to saving valuable time. In contrast, qualitative methods (e.g. interviews and observations) would be more problematic to arrange, as this requires a lot of time and resources (Bryman & Bell, 2015). Lastly, quantitative research is particularly effective when researching various relationships, such as the association between transformational leadership and LMX, and what factors might affect this relationship.

#### ***3.2 Procedure***

In order to answer the research question and test the three hypotheses, we distributed surveys using Qualtrics, a web-based program. Questionnaires were distributed at two different points in time, with a time lapse of approximately six weeks in order to collect the desired data. Although the research entailed tailored surveys that were sent out to followers of the company at two different points in time, both included questions about how employees perceive themselves as followers and moreover how they perceived their leaders behavior. Additionally,

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the surveys differed the first and second time in order to eliminate potential response bias.

We made sure that our contact persons in each company explained our purpose with the survey and assurance of confidentiality, as well as distributing an information letter about the research and procedure. Both questionnaires were distributed through e-mail and the participants were asked to use a personal link to answer the surveys. Anonymity was ensured by sending out personal links to all followers, not entailing any personal information. Additionally, the personal link was used to map out who participated in the first survey, so the second survey could be sent out to the intended participants. Meaning that only participants responding to the first survey, received and could complete the second survey. Furthermore, personal links were used in order to see whether certain patterns would re-occur in the different teams.

### ***3.3 Sample***

Two companies took part in the survey. The first company sells visual communication and collaboration technologies, whereas the other specializes in the aluminum industry. Both companies operate with working units located at the same office, and in physically dispersed national and international offices. To collect a representative sample, approximately 300 employees of the two companies received the questionnaires. All in all, 49 male (62%) and 30 female (38%) employees, with age differences ranging from age 20 - 63, responded.

### ***3.4 Measures***

In order to conduct research in Norway, it was necessary to get approval from Norwegian Social Science Data Services (NSD). Therefore, an application was sent to NSD prior to the distribution of the surveys. When we got approval from NSD, the surveys were distributed to the two companies.

All items related to the independent, dependent and moderating variables were measured using a likert scale, except the control variables such as age, gender and tenure in order to ensure reliable and valuable measures. All measures were adopted from previous research, ensuring that they had been previously tested.

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### 3.4.1 Transformational Leadership

This research explored transformational leadership behavior as the independent variable. Transformational leadership behavior inventory (TLI), coined Podsakoff, MacKenzie, Moorman & Fetter (1990) was used to assess the leader behaviors measured in the study. This scale is designed to measure six key dimensions of transformational leadership that have been identified in the research literature (e.g. Bass, 1985; Bennis & Nanus, 1985; Kouzes & Posner, 1987). The six key dimensions are: articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high performance expectations, providing individualized support and intellectual stimulation. The measure comprises 22 items. The followers answered questions about how they perceive their leaders behavior including items like: *My leader.... (a) is always seeking new opportunities for the unit/department/organization, (b) is able to get others committed to his/her dream of the future, (c) fosters collaboration among work groups,(d) has ideas that have forced me to rethink some of my own ideas that I have never questioned before.* The participants were asked to answer the questions using a 7-point likert scale and range their answer from 1 (strongly disagree) to 7 (strongly agree).

### 3.4.2 LMX

In order to measure the dependent variable, LMX, the questionnaire used items from the LMX 7 scale, which emerged from Graen and Uhl-Bien's model (1995). The model is based on three dimensions; respect, trust and obligation. Graen & Uhl-Bien (1995) argue that LMX also includes (1) mutual respect for the capabilities of the other, (2) the anticipation of deepening reciprocal trust with the other, and (3) the expectation that interacting obligation will grow over time as career-oriented social exchanges blossom into a partnership. These dimensions differ from antecedents to LMX and describe the stages of relationship development from the initial interactions to mature relationships (initial stage involves respect and then trust, and mutual obligation follows). Building on these factors the questionnaire included 7 items, using a 7-point likert scale. Some of the questions included were: *(1) Do you know where you stand with your leader ... (2) do you usually know how satisfied your leader is with what you do? and (3)*

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*Regardless of how much formal authority he/she has built into his/her position, what are the chances that your leader would use his/her power to help you solve problems in your work?.* By completing this questionnaire, one can get useful insight to the quality of the leader-member relationship and illustrate the degree to which the relationship is characterized as a partnership, as described in the LMX model (Northouse, 2012).

### *3.4.3 Team Virtuality*

For the purpose of this paper, team virtuality refers to virtual tools such as e-mail, teleconferencing and collaborative software. Team virtuality was in this thesis the moderator, because it affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable (Baron & Kenny, 1986). To measure the level of team virtuality, items such as the frequency of face-to-face interaction with leader and communication platform were included, as this indicates the degree of virtuality and whether or not it has a moderating effect on the predicted relationship. Thus, the electronic dependence was measured by asking about the extent to which members relied on the three forms of electronic communication; e-mail, teleconferencing and collaborative software), using a 7-point scale (1=not at all, 7=to a very great extent).

### *3.4.4 Task Interdependence*

The second moderator in this thesis was received task interdependence, emphasizing how dependent a group is of each other to complete a task. The items consisted of “*The job activities are greatly affected by the work of other people*”, “*The job depends on the work of many different people for its completion*” and “*My job cannot be done unless others do their work*”. These items were measured using Morgeson & Humphrey (2006)’s “The Work Design Questionnaire (WDO)”. Followers of the respective organizations indicated their agreement with these statements on a 7-point likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

### *3.4.5 Control variables*

Several variables were controlled for in order to rule out any alternative explanations and to explore whether these had an effect on the aforementioned

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relationships. Age was included as well as gender, as some research suggests that these can affect attitudes (Chan, Taylor & Markham, 2008; Spreitzer, 1995). Age was measured using open questions, as open questions often manage to get a more accurate overview of the age spread. Gender was measured as a dummy variable coded as 1 equals male and 2 equals female. Tenure in the organization and with current leader was also implemented as this might influence the leader-member relationship. Similarly to age, this item was answered using an open question so the participants could give an exact number, enabling a more accurate representation. Education level was also implemented and was measured using six categories (*1. Middle school, 2. High school, 3. Associate's degree, 4. Bachelor's degree, 5. Master's degree, 6. Doctorate's degree*).

## **4.0 Results**

### ***4.1 Reliability***

The constructs used in the questionnaires are based on measures that have previously been tested and proven to be reliable. However, it is wise to test the reliability, to make sure that the constructs are measuring what they are supposed to measure. In order to estimate this, a measure of Cronbach's Alpha coefficient was used. Cronbach's Alpha is one of the most commonly used measures of reliability and tests the correlation of items of the same scale. Ideally the score should be over .7 for the constructs to be considered reliable (Pallant, 2010). The Cronbach's Alpha was calculated for 4 constructs, including transformational leadership behavior, LMX, virtuality and task interdependence. The transformational leadership behavior (n= 79) variable was reliable with a Cronbach's Alpha of .954. The LMX (n=79) indicated a score of .906 for the 7 items. For virtuality (n=79) the results indicated a score of .713, whereas received task interdependence (n=79) had an estimate of .908. Thus, all the scales maintained the desired score of above .7, which illustrates reliable measures for all constructs.

### ***4.2 Data analysis***

Multiple regression analyses were performed using SPSS to test the three hypotheses that have been proposed. This statistical technique analyses the

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relationship between the independent variable (transformational leadership) and the dependent variable (LMX), and the mediators (team virtuality and task interdependence).

The first regression analysis had transformational leadership as the independent variable and LMX as the dependent variable. By carrying out a linear regression analysis, the results showed that transformational leadership behavior had a significant contribution on predicting LMX ( $\beta = .600, p < .05$ ) (see table 1). The analysis had an R-square of .415, which means that 41.5% of the variance in LMX is explained by transformational leadership. The adjusted R-square was .350 and therefore the model reached statistical significance ( $p = .000$ ). The first hypothesis was supported showing a positive association between transformational leadership and LMX.

The second regression analysis included the same independent and dependent variables, transformational leadership and LMX. However, the analysis also included the level of virtuality as a moderating variable to see if this affected the positive relationship between transformational leadership and LMX. The results showed a significant relationship reporting ( $\beta = -.422, p < .05$ ) (see table 1). This indicates that the second hypothesis was supported by showing that team virtuality will moderate the positive relationship between transformational leadership and LMX such that transformational leadership will be more positively related to LMX when team virtuality is low.

**Table 1***Coefficient variables resulting from multiple regression analysis*

		LMX		
Model		B	Std.Error	p
1	(Constant)	6,524	,973	,000
	Gender	,011	,306	,970
	Education	-,077	,129	,552
	Age	-,023	,017	,170
	Tenure	-,011	,022	,604
2	(Constant)	7,016	,792	,000
	Gender	-,340	,257	,192
	Education	-,037	,105	,725
	Age	-,027	,013	,051
	Tenure	-,007	,017	,673
	Transformational leadership (TL)	,655	,130	,000
3	(Constant)	7,043	,813	,000
	Gender	-,365	,257	,164
	Education	-,051	,105	,629
	Age	-,020	,014	,173
	Tenure	-,025	,019	,191
	TL	,571	,141	,000
	Team Virtuality(TV)	,178	,189	,355
	Task Interdependence (TI)	-,078	,099	,439
	TLxTV	-,662	,219	,004
	TLxTI	-,037	,089	,682
	TVxTI	,229	,168	,182
	TLxTVxTI	-,268	,123	,036

*Note:* Dependent Variable: LMX; N=79

In order to test the third hypothesis, the model included all the variables previously tested, in addition to received task interdependence. The aim was to explore whether team virtuality and task interdependence would have a jointly moderating effect on the positive relationship established in the first hypothesis. By carrying out the regression in SPSS, the results revealed a significant result ( $\beta = -.321, p < 0.05$ ) (see table 1). Meaning that the third hypothesis also was supported. More specifically, this displayed that team task interdependence and team virtuality jointly moderates the relationship between transformational leadership and LMX such that transformational leadership will have a less positive effect on LMX in teams where virtuality and task interdependence is high than in teams where virtuality and task interdependence is low (see figure 2)

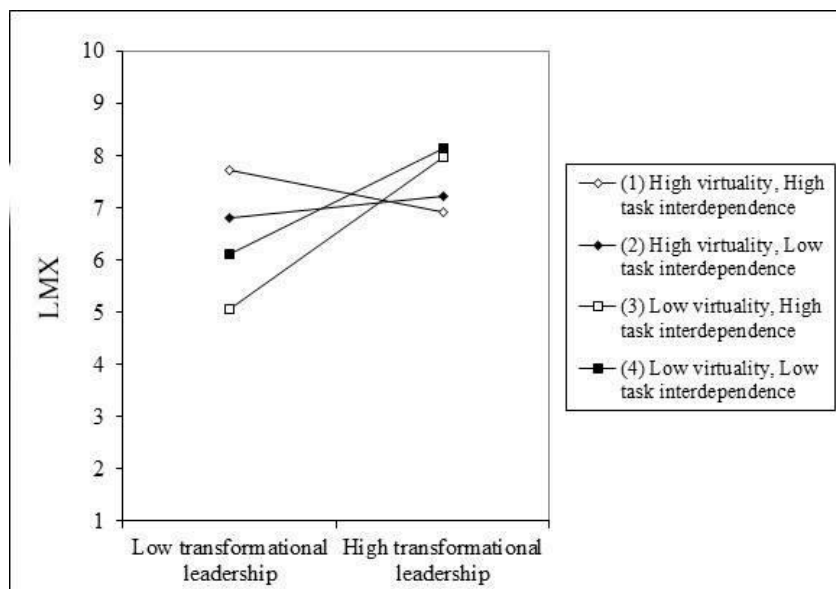


Figure 2: Interaction plot illustrating the three-way interaction among transformational leadership, team virtuality and task interdependence on LMX.

## 5.0 Discussion

The aim of this study was to examine transformational leadership behaviors influence on LMX, in addition to see whether the degree of team virtuality and received task interdependence would jointly affect this relationship. Thus, team virtuality and team task interdependence were tested as possible moderators between the hypothesized relationships.



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For hypothesis 1, we expected that there was a positive relationship between transformational leadership and LMX. The present study supported this claim, which suggests that transformational leadership behavior is a positive predictor for the dyadic relationship between leader and follower. These findings are in line with previous transformational leadership research that have found that LMX and transformational leadership to various extents are connected (Basu and Green, 1997; Bettencourt, 2004; Howell and Hall-Merenda, 1999; Piccolo and Colquitt, 2006; Pillai, Scandura & Williams, 1999; Tse and Lam, 2008; Wang et al., 2005). Furthermore, Deluga (1992) found that the two transformational leadership behaviors, *individualized consideration* and *idealized influence*, have implications for the dyadic relationship between leader and follower, and were shown to have a significantly positive relationship to LMX. This might relate to our findings, as transformational leadership behaviors, such as *individualized consideration* and *idealized influence* seem to contribute to higher LMX. Arguably, these leadership behaviors transform their followers, ultimately helping them to reach their full personal potential and achieve the highest level of performance (Dvir, Eden, Avolio & Shamir, 2002). Based on this, one can argue the leaders develop a stronger relationship with their followers through transformational leadership behaviors, which can help us understand the present findings of this paper.

Hypothesis 2 was also supported which indicates that team virtuality have a moderating effect on the positive relationship between transformational leadership and LMX, such that transformational leadership will be more positively related to LMX when team virtuality is low. These findings agrees with previous research conducted within the field, as other researchers have noted that spatial distance between team members using non-face-to-face communication can negatively impact the ability of the leader to interact with followers in virtual teams (e.g., Bell & Kozlowski, 2002). However, previous findings illustrates that although it is desirable to have transformational leaders in virtual teams, it is more difficult to keep such teams and leadership behavior effective than in conventional teams (Judge & Piccolo, 2004).

Additionally, our findings are supported by a study conducted by Hambley et al. (2007), who found that followers noted that it is easy to become too task-focused

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in virtual work, becoming depersonalized and lacking a “human element” in the course of their employment. In alignment with other findings, our result suggests that higher level of virtuality might lead to a loss in focus on relationship building between followers and leaders. Moreover, Hoch & Kozlowski (2014) found that interpretations of leader behavior as transformational are likely facilitated by cues that are more difficult to transmit, detect and interpret in a virtual work context. However, existing literature has stated that although LMX is concerned with the nature and the quality of the dyadic relationship between the team leader and each member, the exchange can be maintained via forms of electronic communication such as e-mail, teleconferencing and by using collaborative software. Nevertheless, this may be difficult to monitor, as the leader has little to no face-to-face contact with team members (Hoch & Kozlowski, 2014). The results presented in this study contributes to earlier findings and gives us a more advanced understanding of how transformational leadership behaviors can be more difficult in a virtual team settings. Based on our findings, we therefore recommend that the leader should facilitate the building of social connections between virtual team members so that their relationships can be more personalized.

Although these results indicates that the relationships and personalized communication disappear in virtual settings, earlier findings illustrates that personalizing relationships between the leader and virtual followers, as well amongst team members, is still a highly valued quality (Hambley et al., 2007). Furthermore, something worth noting is that transformational leadership and LMX are focused on individual consideration, hence leaders will express a personal concern for their followers. This indicates that leadership behavior and the LMX relationship is perceived subjectively. Moreover, communication may vary from individual to individual due to lack of face-to-face interaction and each member may have different degree of contact with their leader. Thus, this will influence their own perception, which may impact the results of this study.

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As illustrated in hypothesis 1 and previous literature, transformational leadership is claimed to be a positive predictor for LMX. Although our results claim that the degree of virtuality will have a negative impact on the relationship between transformational leadership and LMX, we still recommend that organizations working with virtual teams should continue investing in transformational leadership behavior to help develop a strong dyadic relationship between employees and leader. However, as our results yielded the importance of face-to-face contact, we suggest that before collaborating virtually, and also during collaboration, face-to-face meetings, and more frequent communication should be encouraged to improve LMX, in order to ultimately improve organizational outcomes.

Further the analysis determined that there is a three-way interaction among transformational leadership, team virtuality and team task interdependence on LMX such that transformational leadership is less effective in building LMX in high team virtuality and high task interdependence conditions. This supports our third hypothesis. More specifically, this demonstrates that transformational leadership is less effective in building LMX in high team virtuality and high interdependence condition.

Some argue that in highly virtual teams, leadership substitution might be a solution. Thus, working in a virtual team where the task interdependence is high can affect the quality of LMX as the team members are more dependent on each other, rather than a team leader. By creating a task structure where group members work closely with each other and coordinate their activities frequently, as the work of one team member can have implications for others (Hertel et al., 2004). Consequently, when task interdependence is high, the team members feel that their personal contribution is highly indispensable and leads to higher effectiveness of the whole team. Based on this, our findings suggest the prevalence of leadership substitution, which could imply that followers are less dependent on leaders and that leader influence on their relationships are less effective. As such, this suggests that leaders should focus on building relationships at the team level (Hambley et al., 2007) and for virtual team leaders

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to make the team more self-managing, and distribute functions to the team itself (Manz & Sims, 1987).

Another possible explanation for the present findings could be that transformational leadership is simply a less effective style in building relationships with followers under such conditions, despite previous research preferring transformational leadership in virtual settings. Ultimately, this indicates that other kinds of leadership behaviors would be more effective, such as more team-focused leadership styles (Hoch & Kozlowski, 2014) and leadership build on the premises that leadership should be collectively exercised (Kirkman et al., 2004).

### ***5.1 Limitations and future research***

Although this study has shed light on some important findings, the limitations that might constrain the conclusion in this study, in addition to recommendations for future research, should also be acknowledged. First of all, even though the sample size was sufficient (79 respondents), a larger number of participants would be desirable. When conducting research from small samples sizes, one should be careful when interpreting and generalizing the results, as it has a reduced chance of detecting a true effect (Bryman & Bell, 2015). Moreover, our sample size included data collected from participants within two different organizations. However, it could be useful to investigate the hypotheses further using a bigger sample size from a wider range of companies, working within different domains and different degrees of virtuality.

Secondly, self-reporting questionnaires were used in the present study, which might have affected the results as it can cause self-reporting bias. Self-reporting bias might lead to participants answering questions based on social desirability and in a socially acceptable way, or by “faking good” (Cozby, 2001). Each report showed the name of each person who responded to the questionnaires, which was done in order to investigate if there was a pattern within certain teams. However, the participants were informed that the data would be treated anonymously and that their responses would not be published. Therefore, we expect that while questions about relationships and transformational leadership behavior may be

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sensitive, there were no reasons for the participants to not answer the questions honestly.

Another issue with the way the data was collected was that only the followers rated their leader's behavior and their relationship with their leader. As LMX is measured on a personal level varying from each individual, this would ultimately require leaders to complete the questionnaire multiple times, assessing the quality of the relationships they have with each of their followers (Graen & Uhl-Bien, 1995). Due to both limited time and limited respondent rate, this was not done in this study. Thus, to get a more representative result, future research should include data from both leaders and their team members.

Previous research have illustrated some of the complications leaders might face when working in virtual setting, and how this can have consequences for trust and building relationship with followers and team member (Bell & Kozlowski, 2002). Although, the results from our study indicated that the more virtual team, the weaker relationship between transformational leadership and LMX, further investigation is called for. How task interdependence, together with the degree of virtuality, might moderate the positive relationship between transformational leadership behavior and LMX has, to our knowledge, not previously been investigated in the literature. Therefore, more compelling evidence is needed before a final conclusion can be drawn, ultimately gaining a greater understanding of the matter. In addition to exploring this research gap further, future research should also investigate other variables that might influence the relationship between transformational leadership and LMX, as there might be other underlying mechanisms causing this effect.

Another suggestion for future research is to look at how the relationship between task interdependence and virtuality affects team performance, as this study did not unveil this. Performance have by many researchers been investigated in virtual team settings, for instance by Huang et al., (2010) which illustrated that leaders who increase their transformational leadership behaviors in virtual teams achieve higher levels of team performance. Likewise, as LMX is proven to have a positive effect on organizational outcomes, it could be useful to explore whether this has a mediating effect on team performance. Thus, findings by Martin et al., (2016)

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illustrates that there is a strong positive relationship between team performance and LMX. However, to our knowledge, it seems like task interdependence is not covered within this context either. Therefore, it is strongly recommended to further explore this field, as it can be a great contribution to virtual teams in highly interdependent organizations. By diving into a field where previous research is almost non-existent, we hope to inspire to additional research, and to open other researchers eyes to this field and to confirm our findings. We believe that future research can find other explanations we have not thought of.

### ***5.2 Practical & theoretical implications***

Despite the limitations in this study, the findings have irrefutably interesting implications for future practice. The results indicate that transformational leadership behavior has a positive association with LMX. Therefore, it is recommended that organizations working with virtual teams should continue investing in transformational leadership to help develop a strong dyadic relationship between the employees and leaders. However, as the degree of virtuality have a moderating effect on the relationship between transformational leadership and LMX, meaning that the relationship becomes weaker in high virtual teams, one should try to find other solutions for maintaining the relationship between leader and follower as well. Thus, face-to-face meetings are a pivotal element in virtual teams. Therefore, before collaborating virtually, and also during the collaboration, face-to-face meetings are still encouraged in order to improve LMX, in order to ultimately improve organizational outcomes.

As for theoretical implications, the study shed light on some interesting findings that contributes to the virtual team leadership literature. Based on the present findings one can make assumptions about the role of task interdependence in team work and how this might be a substitute for leadership in virtual settings. Our findings provides implications for further practice, and may indicate that followers are less dependent on leaders and that leaders influence on their relationship between the leader and each follower have less effect than previously expected.

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## 6.0 Conclusion

This study contributes to the leadership literature by examining transformational leadership, team virtuality and task interdependence on LMX in actual business settings. To our knowledge, this is the first study investigating these specific constructs together, particularly in “real-life” organizations. The current study has, contrary to previous findings, found that transformational leadership behavior might not be as effective for building relationships in virtual teams. Rather, our study provides evidence that virtual work units tend to make other demands of their leaders when it comes to relationship building between leader and each follower. Thus, we have illustrated that the relationship between each follower and leader will be negatively influenced by high virtuality and high task interdependence, even though the leader is bearing transformational characteristics. To understand how to lead and build strong relationship ties with their team member, has become important for practitioners and leaders, as work becomes more and more distributed. Future generations of workers experienced with collaborating in virtual teams will enter the workforce, and technological advanced teams and collectives will emerge. Therefore, virtual environments will continue to be a critical issue for the successful accomplishment of work (Goh & Wasko, 2012).

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## 8.0 Appendices

### *8.1 Appendix 1: Cover letter*

Virtual Teams & Leadership – Master Thesis Project

As a part of our MSc Programme in Leadership & Organizational Psychology at BI Norwegian Business School, we are conducting a research project about leadership behavior and relationship building in virtual teams. Your participation is important in order to better understand how different leadership styles may affect virtual team outcomes. It will take approximately 15 minutes to answer the survey. Please be reminded that there is no ‘right’ or ‘wrong’ answer and it is important for you to express what you “have in mind”.

The survey will be accomplished using an online poll tool - Qualtrics. The survey consists of a series of questions. For most questions, you will answer by marking on a scale from 1-7 (indicating the extent to which the individual agrees or disagrees with a number of statements). In addition, there are some demographic questions with selection options.

The survey will be sent out in two stages. The current survey is the first survey. A second survey will be sent out in April 2017. There are two advantages to this: 1) you have fewer questions to answer at a time. 2) The data have higher reliability. Your answers to the surveys during this period will be linked to your e-mail address. All personal data will be made anonymous by the end of the project, 01/09/2017.

It should be noted that the survey is reported to the Personvernombudet for research, Norsk senter for forskningsdata AS. Participation in the survey is voluntary, and it is possible to withdraw at any time without giving a reason.

#### **Confidentiality**

BI representative is responsible for ensuring that no information is lost. All information will be kept strictly confidential throughout the project period – the data is encrypted. In addition, all direct personal data in the project are stored separately from the answers given in the survey.

The information from the survey will be treated confidentially by BI’s representative, who is subject to confidentiality. There will be no reports to your organization at the individual level. If you have questions regarding the survey, please contact:

Hannah Roll, MSc Student by email address: [Hannah.H.Roll@student.bi.no](mailto:Hannah.H.Roll@student.bi.no)

Ines Preuss, MSc Student by email address: [Ines.T.Preuss@student.bi.no](mailto:Ines.T.Preuss@student.bi.no)

Sincerely,  
Hannah & Ines  
MSc in Leadership and Organizational Psychology  
BI Norwegian Business School  
Nydalsveien 37, 0484, Oslo

**8.2 Appendix 2: Survey follower time 1**

Thank you for your participation in this survey about leadership and virtuality. You will now be presented with several questions that we want you answer as accurately as possible. Please select the answers that feels right for you, rather than what you think others will respond. This survey will take approximately 15 minutes to complete. Thank you for your time!

Q1 This question is about the extent to which you rely on electronic communication in your daily work. Please indicate your overall reliance from not at all to a very great extent on the following three forms of electronic communication.

	Not at all	Very little	Little	Neutral	Moderate	High	To a great extent
Email							
Teleconferencing							
Collaborative software							

Q2 In the following, we are interested in how far the virtual team work environment (VTWE) aligns with other work systems. Our VTWE fits well with...

	Not at all fitting	Low fitting	Somewhat fitting	Neutral	Moderate fitting	High fitting	Extremely fitting
our current staffing procedures (i.e., recruitment procedures for team members)							
the current degree of self-management we have within our team							
the current decision making procedures our team has to apply or is applying							
the current training opportunities offered from our organization							
the current possibilities for flexible work assignments							
the current degree of communication							

the current compensation systems							
----------------------------------	--	--	--	--	--	--	--

Q3 Please indicate which the following statements describe your work situation.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I have significant autonomy in determining how I do my job							
I can decide on my own how to go about doing my work							
I have considerable opportunity for independence and freedom in how I do my job							

Q4 Next, we want to know how far the leadership of your team leader is supportive for working in a virtual team work environment. The leadership style of my leader...

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
supports the goals of the virtual team work							
supports the virtual team work							
aligns with the virtual team work							
utilizes the virtual team work in a positive way							

Q5 Do you know where you stand with your supervisor...do you usually know how satisfied your leader is with what you do?

- Never
- Rarely
- Sometimes
- About half of the time
- Often
- Most of the time

- Always

Q6

	Not at all	Very little	To a certain degree	Moderate	A fair amount	Quite a bit	A great deal
How well does your supervisor understand your job problems and needs?							
How well does your supervisor recognize your potential?							

Q7 Using the scales presented below, please answer the following statements:

	None	Very small	Small	Moderate	High	Very high	Always
Regardless of how much formal authority he/she has built into his/her position, what are the chances that your supervisor would use his/her power to help you solve problems at work?							
Again, regardless of the amount of formal authority your supervisor has, what are the chances that he/she would "bail you out," at his/her expense?							

Q8 I have enough confidence in my supervisor that I would defend and justify his/her decision if he/she were not present to do so?

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Agree
- Strongly agree

Q9 How would you characterize your working relationship with your supervisor?

- Very poor
- Poor
- Fair
- Neutral
- Good
- Very good
- Exceptionally good

Q10 Below is a set of statements that may or may not describe your supervisor's behavior at work. Using the scale below, please indicate to what extent you agree or not agree that each statement is descriptive of your leaders behavior.

My leader....

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
is always seeking new opportunities for the unit/department/organization							
presents an interesting picture of the future for our group							
has a clear understanding of where we are going							
inspires others with his/her plans for the future							
is able to get others committed to his/her dream of the future							
leads by "doing" rather than simply "telling"							
provides a good model to follow							
leads by example							
fosters collaboration among work groups							
encourages employees to be "team players"							

gets the group to work together for the same goal							
develops a team attitude and spirit among his/her employees							

Q11 My leader .....

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
shows that he/she expects a lot from us							
insists on only the best performance							
will not settle for second best							
acts without considering my feelings							
shows respect for my personal feelings							
behaves in a manner that is thoughtful of my personal needs							
treats me without considering my personal feelings							
has provided me with new ways of looking at things which used to puzzle me							
has ideas that have forced me to rethink some of my own ideas that I have never questioned before							

has stimulated me to think about old problems in new ways							
---	--	--	--	--	--	--	--

Q12 Please indicate to what extent this describes your work situation on the following statements:

	Not at all fitting	Low fitting	Somewhat fitting	Neutral	Moderate fitting	High fitting	Extremely fitting
Our team works together in a well-coordinated fashion							
Our team has very few misunderstandings about what to do							
Our team needs to backtrack and start over a lot							
We accomplish tasks smoothly and efficiently							
There are much confusion about how we can accomplish tasks							

Q13 This section is about how the members of your team view self-management. To what extent do you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Members of this team are eager to take on the responsibilities traditionally reserved for management							
Members of this team fully accept making more and more decisions, such as planning and scheduling work							
Members of this team fully support taking on the responsibilities for production-related concerns							

Q14 To what extent do you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My leader delays responding to urgent questions							
My leaders avoids making decisions							
My leader avoids getting involved when important issues arise							
My leader is absent when needed							

Q15 There are no 'correct' or 'incorrect' answers. Answer according to your own feelings, rather than how you think 'most people' would answer. Try not to let your response to one statement influence your responses to other statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
In uncertain times, I usually expect the best							
It's easy for me to relax							
If something can go wrong for me it will							
I'm always optimistic about my future							
I enjoy my friends a lot							
It's important for me to keep busy							
I hardly ever expect things to go my way							



I don't get upset too easily							
I rarely count on good things happening to me							
Overall, I expect more good things to happen to me than bad							

Q16 Think of a task where you want to do your best. When you answer the following questions, please think about how you prepare for that kind of situation. Rate how true each statement is for you.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I go into these situations expecting the worst, even though I know I will probably do OK							
I generally go into these situations with positive expectations about how I will do							
I've generally done pretty well in these situations in the past							
When I do well in these situations, I often feel really happy							
When I do well in these situations, I often feel relieved							
I often think about how I will feel if I do very poorly in these situations							
I often think about how I							

will feel if I do very well in these situations							
I often try to figure out how likely it is that I will do very poorly in these situations							
I often try to figure out how likely it is that I will do very well in these situations							

Q17 Please indicate to what extent you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I often feel disconnected from what is happening in my team or in my firm							
I often feel that I am not really part of the team because I am located so far away							
I often feel disconnected from fellow team members located apart from me							
The physical distance between my team members and I leaves me feeling isolated							

Q18 Read each sentence below and then indicate how much you agree with it. There are no right or wrong answers.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I have a certain amount of intelligence, and I really can't do much to change it							
My intelligence is something							

about me that I can't change very much							
I can learn new things, but I can't really change my basic intelligence							

Q19 To what extent do you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The job requires me to accomplish my job before others complete their job							
Other jobs depend directly on my job							
Unless my job gets done, other jobs cannot be completed							

Q20 Please indicate to what extent you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The job activities are greatly affected by the work of other people							
The job depends on the work of many different people for its completion							
My job cannot be done unless others do their work							

---

Q21 Gender

- Male
- Female

Q22 Age

\_\_\_\_\_

Q23 Education

- Middle school
- High school diploma
- Associate's degree
- Bachelor's degree
- Master's degree
- Doctorate degree

Q24 Current place of employment:

\_\_\_\_\_

Q25 How long have you been working there?

\_\_\_\_\_

Q26 How long have you been working with your current supervisor?

\_\_\_\_\_

Q34 What is the name of your supervisor? (This question will only be used to map out the organizational structure of the organization)

\_\_\_\_\_

Q27 Employment

- Full time
- Temporary
- Part-time (insert percentage) \_\_\_\_\_

Q28 What is your work domain? (Name of unit/department in organization)

\_\_\_\_\_

Q29 Which office is your current (majority of your work days) work location (country and city)?

\_\_\_\_\_

Q30 Do you currently have any managerial responsibilities?

- Yes
- No

**8.3 Appendix 3: Survey follower time 2**

Thank you for taking part in our study about leadership and virtuality. This will be the second and last survey we ask you to fill out. Like the previous survey, you will now be presented with questions that we want you to answer as accurately as possible. Please select the answers that feels right for you, rather than what you think others will respond. This questionnaire is shorter and will take approximately 10 minutes to fill out.

Thank you for your time!

Q1 Do you know where you stand with your supervisor...do you usually know how satisfied your leader is with what you do?

- Never
- Rarely
- Sometimes
- About half of the time
- Often
- Most of the time
- Always

Q2

	Not at all	Very little	To a certain degree	Moderate	A fair amount	Quite a bit	A great deal
How well does your supervisor understand your job problems and needs?							
How well does your supervisor recognize your potential?							

Q3 Using the scales presented below, please answer the following statements:

	None	Very small	Small	Moderate	High	Very high	Always
Regardless of how much formal authority he/she has built into his/her position, what are the chances that your supervisor would use his/her power to help you solve problems at work?							
Again, regardless of the amount of formal authority your supervisor has, what are the chances that he/she would “bail you out,” at his/her expense?							

Q4 I have enough confidence in my supervisor that I would defend and justify his/her decision if he/she were not present to do so?

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Agree
- Strongly agree

Q5 How would you characterize your working relationship with your supervisor?

- Very poor
- Poor
- Fair
- Neutral
- Good
- Very good
- Exceptionally good

Q6 Below is a set of statements that may or may not describe your supervisor’s behavior at work. Using the scale below, please indicate to what extent you agree or not agree that each statement is descriptive of your leaders behavior.

My leader....

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
is always seeking new opportunities for the unit/department/organization							
paints an interesting picture of the future for our group							
has a clear understanding of where we are going							
inspires others with his/her plans for the future							
is able to get others committed to his/her dream of the future							
leads by “doing” rather than simply “telling”							
provides a good model to follow							
leads by example							
fosters collaboration among							

work groups							
encourages employees to be "team players"							
gets the group to work together for the same goal							
develops a team attitude and spirit among his/her employees							

Q7 My leader .....

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
shows that he/she expects a lot from us							
insists on only the best performance							
will not settle for second best							
acts without considering my feelings							
shows respect for my personal feelings							
behaves in a manner that is thoughtful of my personal needs							
treats me without considering my personal feelings							
has provided me with new ways of looking at things which used to puzzle me							

has ideas that have forced me to rethink some of my own ideas that I have never questioned before							
has stimulated me to think about old problems in new ways							

Q8 Please indicate to what extent the items below describe your feelings and behavior during work hours. Please answer according to what really reflects your experience rather than what you think your experience should be. Please rate each item separately from every other item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Today, I found it difficult to stay focused on what's happening in the present							
Today, I found myself listening to someone with one ear, doing something else at the same time							
Today, I found myself doing things without paying attention							
Today, I snack without being aware that I'm eating							
Today I rushed through activities without being really attentive to them							



Q9 Please indicate the extent to which you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I set specific goals before beginning a task							
I think of several ways to solve a problem and choose the best one							
I consciously focus my attention on important information							
I create my own examples to make information more meaningful							
I consider several ways to solve a problem before I answer							
I ask myself if I have considered all options when solving a problem							
I ask others for help when I don't understand something							
I stop and go back over new information when it is not clear							
I ask myself how well I accomplish my goal once I'm finished							
I ask myself if I have considered all options after							

I solve a problem							
-------------------	--	--	--	--	--	--	--

Q10 Please indicate the extent to which you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I suggest new ways to achieve goals or objectives							
I come up with new and practical ideas to improve performance							
I am a good source of creative ideas							
I exhibit creativity on the job when given the opportunity to							
I often have new and innovative ideas							
I come up with creative solutions to problems							
I often have a fresh approach to problems							
I suggest new ways of performing work tasks							

Q11 Please rate the overall performance of your team from 1 (extremely bad) to 7 (extremely good):

	1	2	3	4	5	6	7
How well do you think your team performs?							
What is the quality of the work carried out by your team?							

Q12 Please indicate the extent to which the following statements describe your work situation:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I have significant autonomy in determining how I do my job							

I can decide on my own how to go about doing my work							
I have considerable opportunity for independence and freedom in how I do my job							

Q13 Please indicate the extent you agree with the following statements from strongly disagree (1) to strongly agree (7):

- Our team work together in a well-coordinated fashion
- Our team have very few misunderstandings about what to do
- Our team need to backtrack and start over a lot
- We accomplish tasks smoothly and efficiently
- There is much confusion about how we accomplish tasks

Q14 Please indicate to what extent you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
In general, I am satisfied with my job							
All in all, the job I have is great							
My job is very enjoyable							

Q15 To what extent do you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I often feel disconnected from what is happening on my team or in my firm							
I often feel that I am not really part of the team because I am							

located so far away							
I often feel disconnected from fellow team members located apart from me							
The physical distance between my team members and I leaves me feeling isolated							

Q16 Kindly indicate to what extent you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My leader delays responding to urgent questions							
My leader avoids making decisions							
My leader avoids getting involved when important issues arise							
My leader is absent when needed							

Q17 To what extent do you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The job allows me to make my own decisions about how to schedule my work							
The job allows me to decide on the order in which things							

are done on the job							
The job allows me to plan how I do my work							
The job requires me to accomplish my job before others complete their job							
Other jobs depend directly on my job							
Unless my job gets done, other jobs cannot be completed							
The job activities are greatly affected by the work of other people							
The job depends on the work of many different people for its completion							
My job cannot be done unless others do their work							

Q18 How much do you and your leader disagree about the content of decision related to your work?

- Not at all
- Very little
- To a certain degree
- Moderate
- A fair amount
- Quite a bit
- A great deal

Q19 How frequently are these disagreements between you and your leader about ideas related to your work?

- Never
- Rarely
- Sometimes
- About half of the time
- Often

- Most of the time
- Always

Q20 To what extent are there differences of professional opinion between you and your leader?

- None
- Very small
- Small
- Moderately
- High
- Very high
- Always

Q21 How much personal friction is there between you and your leader?

- None at all
- Very little
- To a certain degree
- Moderate
- A fair amount
- Quite a bit
- A great deal

Q22 How much are personality clashes evident between you and your leader?

- None at all
- Very little
- To a certain degree
- Moderate
- A fair amount
- Quite a bit
- A great deal

Q23 Here we would like to hear how you perceive your immediate leader. To what extent do you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
In uncertain times, he/she usually expects the best							
It is easy for him/her to relax							
If something can go wrong for him/her it will							
He/She is always optimistic about his/her future							
He/She enjoys his friends a lot							

It is important for him/her to keep busy							
He/She hardly ever expects things to go his/her way							
He/She doesn't get upset too easily							
He/She rarely counts on good things happening to him/her							
Overall, he/she expects more good things to happen to him/her than bad							

Q24 To what extent do you agree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I have complete faith in my leader							
I respect my leader							
I am proud to be under my leader's command							
I trust my leader's judgement and decisions completely							
My leader represents values that are important to me							
My values are similar to my leaders values							

My leader is a model for me to follow							
---	--	--	--	--	--	--	--



BI Norwegian Business School - campus Oslo

# GRA 19502

Master Thesis

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**Programme:**

MSc In Leadership and  
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**Title:**

The Importance of Transformational Leadership  
in Virtual Teams:  
The Mediating Role of Leader-Member-  
Exchange (LMX)

**Supervisor:**

Sut I Wong

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## **Abstract**

The practice of using virtual teams allows people to communicate and work across borders, time and cultures. Due to this, the concept is consistently becoming more popular in organizations (De Guinea, Webster & Staples (2012). Together with rapid technological advancements in collaboration styles and communication tools, the use of the right leadership approach is becoming more important in order to maintain effective teams (Hambley, O'Neill, & Kline, 2007). In this theoretical framework, it is indicated that the leadership style with the strongest effect in virtual teams is transformational leadership. However, research fail to explain which specific mechanisms that mediates these results. Therefore, this report will examine transformational leadership in different contexts of virtual work units, and examine the mediating effect leader-member-exchange (LMX) has on this relationship.

## Introduction

Teamwork and people collaborating to reach a common goal is central in most organizations and is more frequently used in modern business to deliver high performance in a competitive environment (Naquin & Tynan, 2003). However, rapid technological advancements have led to a new paradigm of work - it can now be conducted anytime, anywhere, in real space or through technology. This has led to the emergence of more virtual ways of organizing and particularly virtual teams have started to be an important work structure in many organizations (Hambley, O'Neill, & Kline, 2007). The increasingly emphasis on remotely distributed, "virtual" teams undoubtedly impact the way teams are led and the ways teams collaborate and communicate (Bell & Kozlowski, 2002).

A wide range of research has demonstrated the crucial role of leadership in order for virtual teams to function properly. Additionally, research has revealed that the most effective leaders in virtual teams are transformational leaders and that these leaders are great influencers. Indeed, analyses at team level revealed that the effect of transformational leadership on team performance was stronger in virtual teams compared to face-to-face teams. Furthermore, it has been illustrated that leaders who increase their transformational leadership behaviors in virtual teams achieve higher levels of team performance. Thus, we want to focus on transformational leadership as extensive empirical evidence has yielded its effectiveness, and in addition has been proven to play an important role in teams that rely on computer-mediated communication (Purvanova & Bono, 2009).

However, there is no clear indication in the literature what might be the underlying mechanisms for the importance of transformational leadership in virtual teams. Nevertheless, another interesting finding by Martin, Guillaume, Thomas, Lee & Epitropaki (2016) showed that there is a strong positive relationship between team performance and the leader-member-exchange approach (LMX), which describes the dyadic relationship between leader and subordinate. The results illustrated that LMX can be seen as a predictor for both task performance and citizenship behavior, and in addition reduce

counterproductive behavior. Based on this, it could be interesting to see if LMX can have mediating effect on the relationship between transformational leadership and team performance. This is important not only to provide boundary conditions for when transformational leadership might lead to performance, but also address theoretical key issues.

Furthermore, Huang, Kahai and Jestice (2010) underline the importance of conducting more data from actual organizational settings and contexts to enhance our understanding of virtual leadership. Hence, this study intends to contribute to the existing literature by providing an analysis of the mediating effects of LMX on positive work outcomes associated with leadership in virtual teams in organizational settings. The study is of practical significance as it can provide understanding of the importance of transformational leadership in virtual teams and how organizations can strengthen this through LMX practices.

Hence, the research question in this thesis is to consider:

*To what extent is transformational leader behavior related to virtual team performance, and is this relation mediated by LMX?*

## **Theoretical Framework**

Advancements in information systems and technology have changed the world of work. A faster pace of change in the workplace has resulted in more global organizational activities, an increase in domestic and international competition and a continued shift from production to service/knowledge-based work environments (Townsend, DeMarie, & Hendrickson, 1998). As positions have become more technically oriented, complex and dynamic, heavy demands are placed upon organizations and its employees. As a response to these changes, organizational systems, structures, and processes have evolved to become more flexible and adaptive. Horizontal organizational structures and team-based work units have become more commonplace and, with advances in technology, there has been an increasing emphasis on remotely distributed, “virtual” teams as organizing units of work (Bell & Kozlowski, 2002).

### ***Virtual Teams***

Virtual teams have been defined as groups of individuals who work together in different locations on interdependent tasks, sharing the responsibility for outcomes, while relying on technology to provide most of their communication. While previous definitions of virtual teams have tended to contrast virtual teams and face-to-face teams and therefore focused on physical dispersion and technology-based interaction, “virtualness” has according to De Guinea, Webster & Staples (2012) evolved to include degree of separation of members (distance), proportion of members who work virtually (configuration), and the proportion of time that team members work apart. Thus, recent definitions tend to incorporate the traditional dimensions of virtual teams, but also highlight the fact that virtual teams are teams first, with “virtualness” being treated as a team characteristic. Therefore, this assignment have adopted the definition by Martins, Gilson & Maynard (2004) which defines virtual teams as “*teams whose members use technology to varying degrees in working across locational, temporal and relational boundaries to accomplish an interdependent task*”.

Undoubtedly, virtual teams will play a huge role in the design of future organizations. Indeed, virtual teams can be highly beneficial when keeping up with the new methods of working in units. Firstly, by using virtual teams instead of traditional face-to-face teams, organizations can save employees for increased travel, coordination and costs associated with bringing together geographically, temporally and functionally dispersed employees to work on a common task (Martins et al., 2004). Secondly, virtual teams makes it easy for organizations to access the most qualified individuals for a particular job regardless of their location, enable organizations to respond faster to increased competition and provide greater flexibility to individuals working from home or on the road (Bell & Kozlowski, 2002). Additionally, such benefits can be a major contributor for attracting and retaining the right employees for certain tasks in organizations, which can be crucial for an organization's survival in today's competitive market (Martins et al., 2004).

Although it is clear that virtual teams will play an important role in shaping future organizations, various research have criticized this way of developing work units. For instance, media richness and social presence theories emphasize that such communication is less personal, with fewer nonverbal cues. Moreover, attribution theory highlight that virtual teams are likely to make attribution errors because members have less knowledge of their teammates and their environments. Thus, there is potential for attribution errors to go uncorrected. Additionally, perspectives within categorization, such as social identity theory, self-categorization theory and the similarity/attraction paradigm, all suggest that people categorize themselves into subgroups according to salient cues. That is, people tend to identify more closely with people they perceive as being similar to themselves. As a result of this, subgroups may develop in virtual team settings. As in-and out-group characteristics become salient in subgroups, individuals become more biased towards their own subgroups (De Guinea et al., 2012). Moreover, such teams provide several challenges for leadership functions, and research illustrates its influence on leaders and their styles of leading (Bell & Kozlowski, 2002).

### ***Leadership***

A wide range of research has demonstrated the crucial role of leadership in relation to team effectiveness and performance. There are several theoretical approaches to study leadership behaviors, and when talking about virtual teams, the most common approach is the contemporary framework that separates between transactional and transformational leadership (Hambley et al., 2007). At first the two concepts were suggested by Burns (1978), but the theory was later developed by Bass (1985). He suggested that transformational and transactional leadership are two distinct concepts and that the most efficient leaders had characteristics of both styles. Furthermore, he also argued that transformational leadership consisted of four dimension and transactional leadership of three (Judge and Piccolo, 2004).



Transformational leadership is usually associated with leaders that influence their followers by articulate strongly-held beliefs and values, generate intellectual stimulation and inspire them to rise above their immediate self interest (Huang, Kahai & Jestice, 2010). Transformational leadership has additionally been proven to play a central role in determining the success or failure of teams in organizations (Judge & Piccolo, 2004). There are four different dimensions that have been identified as the components of transformational leadership. The first dimension is *charismatic leadership* or *idealized influence*, which refers to whether or not the leader is perceived as being a confident and powerful leader by his or hers follower, and to what degree the leader behaves in an admirable way that causes followers to identify with the leader. The next dimension is *inspirational motivation*, which describes how leaders inspire and motivate their followers by articulating shared visions and goals, that can leads to increased enthusiasm and motivation. The third component, *intellectual stimulation*, illustrates to which extent a leader have performance expectations and encourage creativity and innovation as well as challenge their own assumptions, values and beliefs. The last dimension of transformational leadership is the *individual consideration*. This aspect describes a leader's ability to provide intellectual stimulation by showing personal concern for its followers and their needs and to what extent they listen to these concerns (Antonakis, Avolio, & Sivasubramaniam, 2003). All these different behaviors are argued to transform their followers helping them to reach their full potential and achieve the highest level of performance (Dvir, Eden, Avolio, & Shamir, 2002).

What describes a transactional leader is according to Bass and Avolio (1993) a leader that tends to gain follower compliance by either offering rewards or threatening punishment and view the leader-follower relationship as a process of exchange. The three dimensions that describe this leadership style are contingent reward, management by exception—active, and management by exception—passive (Judge & Piccolo, 2004). The first dimension, *contingent reward*, describes to which extent a leader sets up constructive transactions or exchanges with followers and if the leader establishes the rewards and clarifies the

expectations (Judge & Piccolo, 2004). The last two dimensions is a difference in management that depends on the timing of the leader's intervention (Howell & Avolio, 1993). An active leader refers to a leader that monitor followers' performance and take corrective actions to ensure that the standards are met. Passive leaders, on the other hand, only interfere after the standards have not been met, by for example giving negative feedback (Greiman, 2009).

Laissez-faire leadership is another type of leadership behavior, and is an even more passive form of leadership. Combined with transformational and transactional leadership, the three styles forms the full range leadership approach. This model is widely accepted and used as a basis for many studies looking at leadership in virtual teams (Hambley et al., 2007). What characterizes laissez-faire leadership behavior is that leaders avoid making decision, hesitating to take action and are not present when needed. In other words, there is no leadership at all (Hinkin & Schriesheim, 2008).

### ***Virtual Team Leadership***

Leadership within virtual teams can be defined as “*a social influence process mediated by advanced information technologies to produce a change in attitudes, feelings, thinking, behavior, and/or performance with individuals, groups, and/or organizations*” (Avolio, Kahai & Dodge, 2001, p. 617). The changing nature of the workforce has also implications for traditional leadership and the features of virtual teams tend to make leadership demands of such teams different from the demands of traditional face-to-face teams. For instance may the electronic communication context, the lack of face-to-face interaction, and spatial dispersion lead to a set of challenges for leaders, for example in successfully influencing followers (Purvanova & Bono, 2009).

In recent years in the leadership literature, many important findings have started to emerge, particularly in virtual team leadership context (Purvanova & Bono, 2009). For instance, Avolio et al. (2001) suggested a theoretical framework including the term of “e-leadership” and the use of adaptive structuration theory (DeSanctis & Poole, 1994) in order to explain how communication technologies may influence

the way team members and leaders create new team structures and cultures. In addition, Sosik with colleagues (1997) found that transformational leadership led to higher levels of group potency, which refers to the team's belief that they could be effective, which in turn led to team effectiveness. Transactional leadership did not have this effect, however their study also indicated that both leadership styles are important in virtual teams. Furthermore, qualitative studies within the field have shed light on important information about the experience of team leaders and members in relation to effective and ineffective leadership behaviors, challenges virtual teams might experience and suggested ideas helping teams in an electronic communication context to function successfully (Hambley et al., 2007). Overall, the general findings of this literature suggest that virtual teams calls for a more active rather than passive form of leadership style, and especially that transformational leadership behavior are of greater importance when teams use new communication technologies (Purvanova & Bono, 2009). Based on this literature we therefore hypothesize:

*H1: Transformational leadership will be positively related to team performance.*

The existing leadership literature do as illustrated show that transformational leadership have a significant impact on team effectiveness. Furthermore, as mentioned results have yielded that the leadership style is important in virtual teams (Purvanova & Bono, 2009). Based on these findings one can argue that the degree of virtuality may have a moderating effect on the need of transformational leadership behavior and also its effect on team outcomes. Thus, we argue that:

*H2: The positive relationship between transformational leadership and team performance will be stronger for teams that are more virtual than for teams that are less virtual.*

### ***Leader-Member Exchange (LMX)***

Within work units, different types of relationships develop between leaders and their subordinates, or member. In contrast to transformational leadership, LMX

stands as more relationship-based, focusing explicitly on how one-on-one reciprocal social exchanges between leader and follower evolve, nurture, and sustain the binary relationship between leader and subordinates. More specifically, the theory emphasizes that due to different types of exchange, the quality relationship between the leader and each follower will be different (Martin, Guillaume, Thomas, Lee, & Eitropaki, 2016). Whereas leaders convey role expectations to their subordinates and provide rewards to followers who satisfy these expectations, subordinates hold role expectations of their leaders, with respect to how they are to be treated and the rewards they are to receive for meeting leader expectations. There is a reciprocal process in the dyadic exchanges between leader and follower, wherein each party brings to the relationship different kinds of resources for exchange. Role negotiation occurs over time, defining the quality and maturity of a leader-member exchange, and leaders develop relationships of varying quality with different followers over time (Wang, Law, Hackett, Wang, & Chen, 2005).

Traditionally, LMX research has relied on role and social exchange theories to explain how different types of relationships between leader and subordinate develop. Low LMX relationships are based primarily on the employment contract and involve mainly economic exchanges that focus on the completion of work. In contrast, high LMX relationships extend beyond the formal job contract where the aim is to increase follower's ability and motivation to perform at a high level. Additionally, the exchanges are more social in nature involving mutual respect, affect, support and loyalty, and felt obligation (Martin et al., 2016). With foundation in role and social exchange theories, LMX suggests that a variety of rules and norms govern the pattern of exchanges between people. For example, a common rule is that of reciprocity, where the actions of one person lead to the expectation that the other person will act in mutual ways. The favorable treatment the follower receives from the leader leads to feelings of obligation to "pay back" the leader by working hard as a means of reciprocation. In addition, the positive exchanges between the leader and follower increase feelings of affect and liking

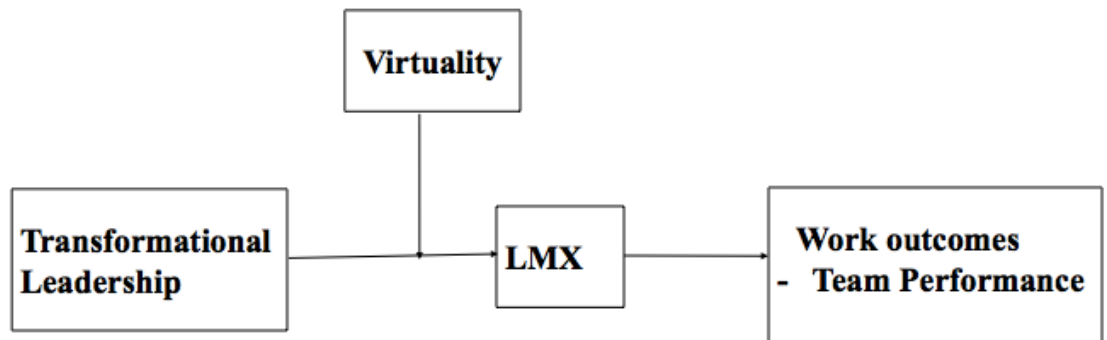
for the leader, and this also motivates followers to want to meet the leader's work demands (Martin et al., 2016).

As mentioned, the literature indicates the importance of transformational leadership in virtual contexts. Moreover, research has conducted that the more virtual a team is composed, the more influence leadership behavior will have on the team. Although findings suggest that virtual teams rely on transformational leadership in order to function most effectively (Purvanova & Bono, 2009), the underlying mechanisms of what causes these results remain unknown. Thus, we argue that it is important to study what factors might mediate this relationship in order to enhance leadership effectiveness, which in turn might affect organizational outcomes and team performance. Results from Wang et al. (2005) suggest that effective leaders express their transformational behaviors within a personal, dynamic relational exchange context. Due to this, we expect LMX to be an important influencing factor between transformational leadership and team performance. Whereas the approach involves the dyadic relationship between leader and subordinate, transformational leadership contributes to fulfill the psychological contract implicit in their social exchange relationships with followers. They are sensitive to follower contributions to the exchanges and reciprocate in ways that build follower self-worth and/or self-concept (Wang et al., 2005). Therefore, the following hypothesis is proposed:

*H3: LMX will mediate the moderated relationship between transformational leadership and team performance depending on the degree of the team virtuality.*

## Conceptual Framework

### *Conceptual Model:*



The model above is a graphical illustration and description of the research question – how transformational leadership behavior, the independent variable, may relate to team performance, the dependent variable. Additionally, the model focus on how LMX mediates the aforementioned relationship and moreover how virtuality as a moderator affects the direction and/or strengths between the variables.

## Methodological Framework

This section will describe the research method intended to verify the hypotheses. Initially, the research design will be described. A cross-sectional approach is considered to be the most relevant framework in order to conduct the necessary research, because it is applied to explore new constructs and the relationship between these. Furthermore, it is important to establish in what ways data should be collected. This thesis will collect data quantitatively by reasons such as time, capacity and in order to collect enough amounts of data.

### *Research Design*

The research design is the framework that specifies the type of information to be collected, the sources of data, and the data collection procedure. Kinnear and Taylor (1996) described the research design as a basic plan, which guides the data collection and analysis phases of the research project. Thus, research designs carry

an important influence on the validity and reliability of the results attained. As a result, the research design provides a solid base for the whole research (Tripathy and Tripathy, 2015). We will perform a cross-sectional study in order to verify our hypotheses. A cross-sectional approach is applied to explore new constructs and the relationship between the constructs. We will send surveys to leaders and subordinates at one point in time. However, in order to verify the data we will do a repeated measure and send out a similar survey once more, with a time lag of two to three months. This will be done to look for potential bias.

### ***Data collection***

When collecting data, quantitative and qualitative approaches are considered to be the two main methods. In general, quantitative methods involve the processes of collecting, analyzing, interpreting and writing the results of a study. When collecting data quantitatively, various forms can be used. Collecting data from surveys is one of the most acknowledged, and captures information through the input of responses to a research instrument containing questions, such as questionnaires. The main methods for distributing surveys are via postal mail, phone, website or in person (Bryman & Bell, 2015). Contradictory, qualitative approaches to data collection, analysis, interpretation and report writing consists of purposeful sampling, collection of open-ended data, analysis of text or pictures, representation of information in figures and tables, and personal interpretation of the findings (Creswell, 2013). In order to verify the study's hypotheses about leadership and virtual teams, observations of employees and leaders, personal interviewing and questionnaires can be implemented. However, observations and personal interviewing usually demands a lot in terms of time and resources. Thus, quantitative approaches tend to be more preferred (Bryman & Bell, 2015). The appropriate choice due to this project's limited resources in both time and money, as well as a basis for verifying the hypotheses is therefore quantitative.

### ***Procedure & sample strategy***

To collect the data we will be conducting online survey. Questionnaires will be distributed at two points in time, from two or more companies that operate in virtual teams. Hydro and Viju Group have already agreed to participate and in

addition to these two, we will approach relevant organizations that are desirable for our data collection. After approval from the companies we will arrange for the survey to be sent out. The participants will be leaders and subordinates that work in a virtual context and the questionnaires will be collected electronically through email. We aim to collect data from at least 30 teams which in total will be approximately 100 participants.

### *Measures*

In order to send out questionnaires to Norwegian companies, we need to get authorization from NSD (Norwegian Social Science Data Services). Thus, we will fill out an application form and apply in the end of January.

In order to ensure reliable and valuable measures the questionnaire will contain various items that covers all included variables that will be measured on a five-point likert scale, except the control variables such as age, gender etc.

### *Transformational leadership*

This research will explore transformational leadership behavior as the independent variable.

We will base our surveys on the widely acknowledged Multifactor Leadership questionnaire (MLQ) from Avolio and Bass (2004). The items cover all the dimensions of transformational leadership, which accordingly can give us insight to the perceived transformational leadership behavior in the virtual teams.

### *Team performance*

Team performance is in this study the dependent variable, and we will measure this construct by looking at leaders and subordinates rating of own performance and leader effectiveness, including items like : “In the past, the team has been effective in reaching its goals”.

### *LMX*

The mediating variable in this thesis is LMX. In order to measure this the questionnaire will use items from the LMX 7, which is based on Graen and Uhl-Bien's model (1995).



The questions can be completed by both leaders and subordinates, and by completing this, one can get useful insight of how the LMX theory works. The score the participants get illustrates the quality of leader-member relationship.

### *Degree of virtuality*

Virtuality is in this thesis the moderator because it affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable (Baron, R. M., & Kenny, D. A., 1986). To measure the level of virtuality we will include items that covers frequency of face-to-face interaction with leader, communication platform and such, as this will indicate the degree of virtuality and whether or not it has a moderating effect on the predicted relationship.

## **Thesis Progression**

***January:*** After handing in the preliminary, we will continue to establish contact with relevant companies and organizations, which we can collect our data from. We also aim to finalize our surveys so we can apply for authorization to NDS.

***February:*** In February, our application has hopefully been approved by the NBS. We plan to distribute the first round of questionnaires to both leaders and subordinates in the desired companies. We will additionally continue to search for and read up on relevant literature.

***March:*** In addition to search and read up on relevant literature, we will collect the data from the first questionnaires.

***April:*** A couple of weeks in April will be set aside to work with other courses and prepare for our exams that will take place this month. We will also prepare to send out the second survey.

***May:*** In May, we will send out the second questionnaire. After we have collected all the data we will analyze this.

***June:*** Start to put the whole thesis together including the literature review, analysis, discussion and conclusion.

***July:*** Continue the writing of the thesis.

***August:*** We will double-check references and our data analysis. Additionally, we will proofread the text and finish the writing.

***September:*** Hand in Master Thesis on September 1st.

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