


# The Moderating Effects of Leader-Member Exchange for Technology Acceptance: An Empirical Study Within Organizations


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## ABSTRACT

Within the technology acceptance literature, the issue of top management support and commitment has been studied extensively; however, the issue of leadership *per se* has not been addressed directly. A missing piece of the leadership puzzle as it relates to technology acceptance is an exploration of how top management support gets translated in the organizational hierarchy. This study introduces leader-member exchange (LMX) to better understand this missing piece. Specifically, this research explores the role direct supervisors play in the acceptance process by end users based on the moderated model of LMX and supervisor influence. The empirical test results in the field setting show that LMX is a significant moderator for most of the technology acceptance variables within organizations. The study explores the role of the quality of the relationship between supervisors and employees as end users. It also highlights the role of LMX and supervisor influence as a conduit for the acceptance process among end users in the organization.

## KEYWORDS

Attitude, Behavioral Intention, Goal Commitment, Leader-Member Exchange, Social Influence, Technology Acceptance

## 1. INTRODUCTION

This study attempts to shed light on the role of leadership in the acceptance process by moving beyond the usual “top management support.” Within the IS literature, and specifically within the technology acceptance literature, the issue of top management support and commitment has been studied extensively (e.g., Hwang et al., 2017; Grover et al., 2019); however, the issue of leadership *per se* has not been addressed directly. A missing piece of the leadership puzzle as it relates to technology acceptance is an exploration of how top management support gets translated in the organizational hierarchy.

Even with the extensive research which linked management support to positive outcomes, there seems to be a paucity of research aimed at exploring how such support affects specific constructs that are relevant to individuals’ acceptance of a technology (Lewis et al., 2003; Hwang et al., 2016b). Most

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studies that looked at the issue of management support were mainly concerned with top management support. What is missing, however, is a deeper understanding of how such support influences specific beliefs and attitudes of prospective end users within organizations. To our knowledge, few studies attempted to address this limitation. For example, Igbaria et al. (1995) reports that management support influenced PU and perceived usage. In a later study, Igbaria et al. (1997) finds that management support influenced PU and PEOU directly and usage indirectly. Along the same lines, Lewis et al. (2003) finds significant support for the relationship between top management support and PU and PEOU. Speier and Venkatesh (2002) also report a significant relationship between management support and the constructs of image and visibility.

Leader-Member Exchange (LMX) is introduced in this study to better understand this missing piece. Specifically, this research attempts to explore the role direct supervisors play in the acceptance process by end users. The LMX construct specifically measures and captures the quality of the relationship between employees and their direct supervisor. Studies that looked at LMX as it relates to change have found that those who enjoy higher-quality relationships with their supervisors have the strongest change climate perceptions (Tierney, 1999). Also, LMX has been found to affect the relationship between supervisors' influence tactics and those tactics' effectiveness in dealing with resistance to change (Furst & Cable, 2008). Higher quality exchanges are usually found to be less resistant to change (e.g., Van Dam et al., 2008).

The research model in this study integrates variables from multiple disciplines and attempts to explore the relationships between the social influence variable (Supervisor Influence) and the model's variables. Furthermore, LMX (Leader-Member Exchange) is introduced as a moderating variable for these relationships. Recently, Hwang et al. (2016a; 2016c) called for the further investigation of the role of LMX in the system implementation based on the literature review in this field. This study attempts to shed some light on the role of leadership in the acceptance process by moving beyond the usual "top management support".

## **2. LITERATURE REVIEW**

### **2.1. Technology Acceptance: What Has Been Said About Leadership?**

Leadership is one of the most studied topics in organizations; however, not enough literature exists on the issue of leadership in the IS discipline as it relates to technology acceptance. Within the IS literature, and specifically within the TA literature, the issue of leadership *per se* has not been addressed directly, even as the issue of top management support and commitment has been studied extensively. An exception is an effort by Neufeld et al. (2007) in which they integrate the UTAUT with charismatic leadership theory. Specifically, the study finds significant support for the relationship between the perceived charismatic leadership behaviors of project champions and the antecedents of behavioral intention and usage behavior.

Agarwal (2000) points to the fact that management support and commitment has received consistent attention from researchers. By identifying twenty-four studies that looked at and studied management support, Neufeld et al. (2007) argue that even with all the diverse and inconsistent conceptual definitions, weak measures, and insufficient theorization, one can definitely make the case that top management support is highly associated with desirable outcomes such as use, success, performance effectiveness, and acceptance. In a review of the IT innovation adoption research, Jeyaraj et al. (2006) report that top management support was one of the best predictors of individual IT adoption alongside computer experience, perceived usefulness, behavioral intention, and user support.

Top management commitment and support has been conceptualized and measured in several ways which reflect the dispensing of support messages and signals, leading by example, and making sure that resources needed to ensure implementation success are available (Agarwal, 2000). Within the ERP implementation literature, top management support has been repeatedly listed as one of

the most critical success factors for ERP implementation efforts (Nah et al., 2001; Aladwani, 2001; Akkermans & Van Helden, 2002; Grubljesic et al., 2019; Zang et al., 2019; Guan et al., 2017). It has also been argued that the lack of support signals from top management may reduce the chances of successful implementation (Yetton et al., 1999).

In a qualitative study, Gallivan (2001) finds that clear and strong signals of top management support facilitated all stages of innovation assimilation. In the same study, Gallivan argues that even though top management support might be highly related to the committing of resources to facilitate the implementation process, the two factors should be looked at separately because top management support does not necessarily mean that resources will be made available. Other research further argues (based on the finding that top management commitment and support influenced ease of use perceptions) that users attribute the availability of resources and support to top management commitment. In a way, top management commitment can therefore be viewed as a factor that helps users overcome obstacles which might arise during the implementation (Igarria et al., 1997; Lewis et al., 2003; Priyadarshinee, 2018; Gupta et al., 2016).

Worth mentioning here is a study by Ward et al. (2005), which was longitudinal in nature, that found a different pattern of relationships between top management commitment and users' attitudes toward using the technology that was being introduced. Specifically, the study found that top management commitment has no significant effect on users' attitudes at time-1 and had a significant negative effect on attitudes at time-2, when users had some direct experience with the system. The authors argue that this might be a result of an unrealistic representation by top management about what the system would be like and what it would do (Ward et al., 2005). Interestingly, in the same study, the authors also looked at the relationship between managers' influence and users' attitudes and found that the former has a significant negative impact on the latter. However, looking at the scale items used to measure the management influence shows that two items were used, one capturing the direct supervisor influence and the other capturing top management influence. By the same token, items designed to measure top management commitment do not seem to match what the construct means; thus, in a way it reinforces what Neufeld et al. (2007) suggest regarding the lack of consistent theoretical and conceptual foundations. One can further argue that even with those studies that attempted to examine the effects of top management support and/or commitment on specific technology acceptance beliefs and constructs, there is still a lack of emphasis on the complexity of the leadership processes at differing organizational levels (Sharma & Yetton, 2003).

The inconsistency and confusion that exists becomes even more obvious when the distinction between top management support and "local" management support is blurred. That is, for example, when management support, top management commitment, and management influence all seem to refer to the same underlying construct, yet we do not know what they are attempting to measure due to the absence of measurement items used in the studies (Sharma & Yetton, 2003). What is even more problematic is the lack of a clear definition regarding top management support. Is it leadership? Is it the resources allocated? Is it the messages that employees hear? Is it the visibility of such support? An exception to the blurring issue is the study by Lewis et al. (2003) in which they introduced top management commitment and local management commitment as two distinct constructs with differing influences on users' beliefs.

A missing piece of the leadership puzzle as it relates to technology acceptance is an exploration of how top management support gets translated in the organizational hierarchy and how it manifests its effects on users at different levels within an organization. Agarwal (2000) argues that, if not addressed at the appropriate level within an organization, management support may not be as valuable as it could be. That is, it does not allow us to pay sufficient attention to what actually happens as the management support "filters down" the organizational hierarchy.

Supporting this premise, Leonard-Barton (1987) argues that one's immediate supervisor is central to how they respond to organizational influences such as top management support. Kozlowski and Doherty (1989) argue that because supervisors are the most salient representatives of management

actions, policies, and procedures, subordinates tend to generalize their perceptions of supervisors to their organization at large. Furthermore, Rice and Ayden (1991) suggest that one's supervisor is a primary information resource during technology implementation. Also, building on previous literature, Zmud (1984) finds additional support for the argument that management's attitude exerts the strongest influence on users' use of process innovations. Additionally, Lewis et al. (2003) argue that management commitment passes through the multiple levels that exist within an organization. They further argue that employees' behaviors and beliefs are affected by messages they receive and perceive from both the top management and their direct supervisor. As such, they suggest that studies which introduce management support as a variable in their explanatory models should consider the fact that support occurs at multiple levels. Before Lewis et al. (2003), Fichman (1992) said that "*The net result is that studies of individual adoption within organizational settings must either incorporate managerial influences into the analysis or rule them out as a potentially confounding factor*" (p. 4).

Recently, Venkatesh and Bala (2008) called for more research aimed at developing a "*richer conceptualization of management support to enhance our understanding of its role in IT adoption contexts*" (p. 297). They suggest using LMX (Leader-Member Exchange) theory to understand how management influences the adoption of information technologies in organizations. The role of direct supervisors in influencing the beliefs and attitudes of employees has been addressed in the literature. For example, it has been argued that the influence of management support on employees' attitudes and behaviors will be indirect and subjective in nature; that is, how an employee interprets and perceives what they observe regarding top management behaviors and attitudes toward a technology implementation effort will be dependent on more ambiguous evidence than, say, messages they receive from their direct supervisor (Leonard-Barton & Deschamps, 1988).

## 2.2. The Leader-Member Exchange Theory (LMX)

The behavioral approach view that some leadership behaviors are universally effective failed to acknowledge the existence of both situational and follower influences. As a result, new approaches emerged. Contingency or situational theories suggest that the organizational and/or work group situation will impact the degree to which a given leader's behavior will be effective (Yukl, 2006). For the purpose of this research, the focus is on one leadership theory—the Leader-Member Exchange (LMX) theory. The uniqueness of LMX stems from the fact that it shifts the focus to the relationship between leaders and followers, whereas prior theories largely focused on leaders (Yukl, 2006).

Many LMX studies show that the quality of the relationship plays an important role when it comes to influencing work-related behaviors and experiences (Graen & Uhl-bien, 1995; Liden et al., 1997). Also, LMX research suggests that employees with high-quality exchanges enjoy open communication, while low-quality exchanges are marked by a more closed communication pattern (Mueller & Lee, 2002). In the change management literature, communication plays a critical role in reducing uncertainty and increasing employees' sense of control during change endeavors, such as the deployment of a new information system that will alter many aspects of employees' daily work routines; therefore, information that is credible, trustworthy, and useful is pivotal to successful change (Klein & Kim, 1998; Lewis, 1999; Bordia et al., 2004; Almeida et al., 2016; Magni & Pennarola, 2008; Al-Momani et al., 2018). Furthermore, Michael et al. (2005) found support for the premise that supportive supervisor communication influences employees' contextual performance (i.e., behaviors which support the broader organizational environment) through leader-member exchanges.

High-quality leader-member exchanges are characterized by trust, liking, respect, and support (Graen, 2003; Liden & Maslyn, 1998). As such, employees in high-quality relations are expected to view their leader as a credible source of information. Henderson et al. (2006) argue that the credibility of the source is an important determinant of *goal commitment*. They add that leaders who provide clear and useful information regarding the rewards and purposes of the behavior and develop their employees' sense of self-efficacy will likely improve goal commitment amongst them. Leaders can influence subordinates' perceptions of self-efficacy in many ways, one of which is showing confidence

in their ability to perform well and, by providing support, paving the way for subordinates to do the same (Locke & Latham, 2002). On the other hand, if leaders are not viewed as a credible source of information, their influence effectiveness becomes questionable. LMX has also been positively related to job attitudes and performance evaluations (Dienesch & Liden, 1986; Liden, Sparrowe, & Wayne, 1997). This positive relation with attitude adds support to the premise that leaders do influence followers' perceptions.

Looking at LMX through a different lens, Graen and Uhl-Bien (1995) argue that LMX is both a transactional and transformational social exchange process. The relationship begins with limited exchanges that are largely transactional in nature, but with time those transactions are either "transformed" to a point where they become partnerships (i.e., high-quality exchanges and in-group status) or they remain transactional (i.e., low-quality exchanges and out-group status) (Bass, 1999). As such, in-group employees enjoy a leadership experience that is transformational in nature. Stated differently, transformational leadership perceptions become dependent on the nature of the relationship (high- vs. low-quality); thus, one employee might see a leader's behavior as transformational, while another might not view it the same way. Wang et al. (2005) found that LMX fully mediated the relationship between transformational leadership and both task performance and Organizational Citizenship Behaviors (OCB). Their findings suggest that task performance and OCB depend on how each member personally interprets the leader's behaviors. Also, LMX was found to mediate the relationship between transformational leadership behaviors and organizational commitment (Lee, 2005).

For this research, the relevance of such findings, and those that will be discussed when the hypotheses are introduced, stems from the fact that direct supervisors and managers represent the closest organizational representatives and that their actions might have some influence on how prospective end users will react to the introduction of the new system or technology. Additionally, by introducing LMX as a moderating variable, this research is mainly focused on exploring the role that the employees' supervisor has in affecting the employees' direct beliefs, attitudes, and ultimately, behaviors.

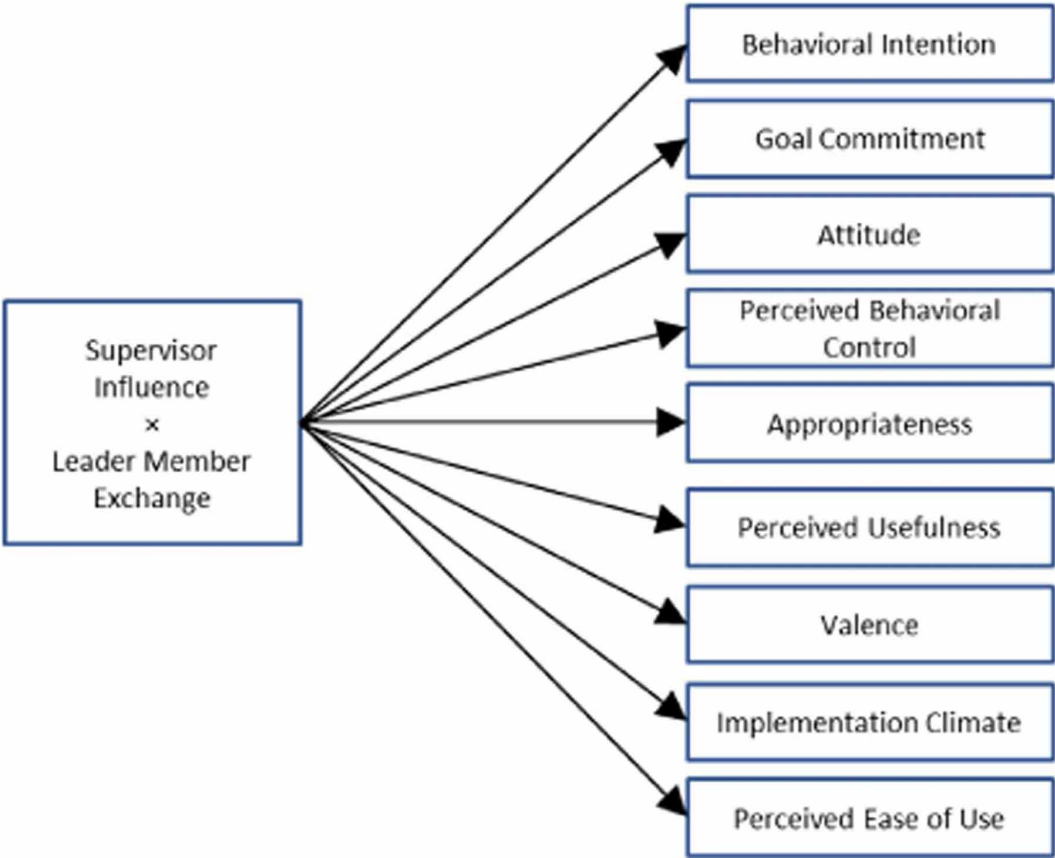
### 3. RESEARCH QUESTION AND HYPOTHESES

In this study, the research question asks: "In a mandatory adoption environment, and specifically in the pre-implementation phase, what role does LMX play in moderating the relationship between Supervisor Influence and the Technology Acceptance Variables?"

To better understand the process through which Supervisor Influence affects the beliefs of the end users, the relationships between Supervisor Influence and the model's variables are tested in a Moderated Model (See the research model in Figure 1). As the focus of the study and the main social influence variable chosen, Supervisor Influence was modeled as an independent variable for each of the study's variables. LMX is then introduced as a moderator to this relationship. We test the path significance of the moderating effects of supervisor influence and LMX on the various dependent constructs as shown in Figure 1. The relationship between Supervisor Influence and each of the Model's variables is grounded in the Theory of Planned Behavior (TPB) which postulates that Normative Beliefs and Subjective Norm affect the Attitudinal and Control Beliefs (Ajzen, 1991).

Research on social influence in organizational settings has generally been less than specific with regards to identity and the uniqueness of each socially influential entity (Rice & Aydin, 1991). For example, the Theory of Reasoned Action (TRA) and the later Theory of Planned Behavior introduced social influence in the form of the construct "subjective norm," which was defined as the perceptions of whether relevant others think that one should or should not behave a certain way. The generality of the term "relevant others" might be sufficient for some situations, but for others, we might need to dig deeper so as to understand the nature of the process. To their credit, both theories introduce normative beliefs as a second level for understanding the inner works of social influence. In a typical

Figure 1. Research Model



study, normative beliefs would be elicited from a representative sample where subjects are asked to identify specifically who the relevant others are. In the final survey, subjects will also be asked to rate their motivation to comply with the specific relevant others.

Compliance, identification, and internalization represent the underlying mechanisms by which social influence affects behavior (Kelman, 1958). Simply stated, compliance represents the type of influence where an actor adopts a specific behavior because they have to. This act of compliance occurs when the entity calling for the adoption of the behavior has the power to reward the compliant behavior and/or punish noncompliance. On the other hand, Identification is primarily based on feelings of obligation—that is, an actor adopts a behavior because they are expected to do so by a social entity that they belong to or are attached to. Internalization occurs when social influence attempts are adopted by an actor because the behavior itself and the attached meanings to such behavior are intrinsically rewarding. In other words, the behavior is adopted because the actor wants to and is intrinsically motivated to do so (Kelman, 1958).

Social information processing theory (Salancik & Pfeffer, 1978) came as a response to the lack of consideration paid to the role of social context in affecting attitudes and behaviors in the workplace. Compared to other theories which viewed workplace behaviors and decisions as being rooted in contemplation and need-satisfaction models, the theory argues that employees spend more time dealing with the consequences of their actions than the time they spend thinking about future behaviors and beliefs. As such, they rely on cues from their social context as means to guide their behavior and shape their attitudes. Such arguments seem to go against the arguments which were used to build TAM2.

Specifically, Venkatesh and Davis (2000), based on theories from multiple disciplines, suggest that people engage in specific behaviors in an effort to achieve higher-level goals. This research adopts the view that, as suggested by the social information processing theory, the complexity of the workplace warrants a closer look at the social context and its role in forming attitudes and influencing behaviors in workplace environments. And while people might behave in certain ways to achieve higher-level goals sometime in the future, one can argue that in a mandated adoption environment like the one this research attempts to study, social influence is expected to play an influential role.

Social information processing theory further postulates that attitudes and beliefs are subject to influence from the social context. This influence operates through the process of observing and actually interacting with and within the social context. Behaviors and comments from people that are socially relevant might shape one's perception of reality. The theory further suggests that social influence affects one's "attentional" processes. Certain aspects of the workplace might become more salient as a result of the social influence process, thus resulting in what might be termed selective exposure (Salancik & Pfeffer, 1978). Let's consider, for example, a department where a new system will be implemented. If much of the discourse is about how beneficial the system will be, then one might assume that positive attitudes are more likely. On the other hand, if the discourse is about how the system is designed to shift power bases, one can be almost certain that attitudes will be more negative if those affected perceive that they will be losing power (e.g. Markus, 1983).

Within the IS literature, the issue of leadership has not been addressed sufficiently. As mentioned earlier in the review, there appears to be a tendency to focus on top management support and commitment as being representative of leadership constructs, and while this might be important, it does not offer a complete picture of the leadership processes that take place in the workplace. Rice and Aydin (1991) suggested that relying on measuring the influence of "generalized" others contributes to the ambiguity surrounding the specific nature of social influence processes. Largely missing is an understanding of the role and influence of the direct supervisor on relevant acceptance variables.

In their study of managerial influence on the adoption of an innovation, Leonard-Barton and Deschamps (1988) found that not all subordinates perceive their manager's influence equally and that such influence is mediated by individuals' characteristics. Those differences between employees can be looked at as contingencies. Managerial influence attempts aimed at individuals who are innovative and receptive to innovation might not be as influential as attempts that target employees who "score" less on such variables. Yetton et al. (1999) developed a contingent framework for innovation implementation that is based on the nature of the technology. This study proposes another contingency which is viewed as being important in the context of a mandatory adoption environment. This contingency is the quality of the relationship between a supervisor and their subordinates—that is, LMX.

Research findings leave little doubt that transformational leadership is related to many positive and desirable organizational outcomes, including organizational commitment (Bycio et al., 1995), satisfaction with supervision (Podsakoff et al., 1990), organizational citizenship (Podsakoff et al. 2000), and employee performance (Yammarino, 1993). Also, transformational leadership is considered an important antecedent to successful organizational change efforts (Atwater & Bass, 1995; Eisenbach et al., 1999). Bommer et al. (2004) found that managers who are more cynical in regard to change are less likely to engage in transformational leadership behaviors, thus suggesting that their followers will be less motivated to be more engaged in the change effort. On the other hand, leaders who supported the change and engaged in transformational behaviors were effective in reducing subordinates' change-related cynicism (Bommer et al., 2005).

Those combined findings support the premise that leaders do have a role in influencing employees' work-related perceptions (especially the ones who enjoy high quality relations with their leaders). The findings also highlight that the quality of the relationship between the supervisor and their subordinates represents the context and the lens through which they experience organizational realities (Gerstner & Day, 1997). The leader's behaviors and their proximity to the member should make their influence that much stronger. Specifically, within high-quality relationships it was found that both the leader

and the member share the way in which they experience and interpret organizational interactions to a great extent (Graen & Schiemann, 1978).

Lines (2005) argues that valence is an important predictor of the negativity or positivity of an attitude. It can be further argued that valence perceptions might serve as a motivational force that can help individuals make decisions regarding their behavior as it relates to the attitude object. If one believes that they will be eventually rewarded for achieving a goal, then it will serve as reminder that they should keep working toward that goal with a more positive attitude. Appropriateness follows discrepancy in the sense that once a need has been recognized, one has to believe that the chosen course of action is appropriate. Rogers (2003) points out that an innovation's compatibility is usually assessed along three lines: socio-cultural values and beliefs, previously-introduced ideas, and the need for the innovation. Markus (2004), in the context of describing what she termed "Technochange misfits," suggests that a cultural misfit represents a critical obstacle to the success of a technochange effort.

Venkatesh and Davis (2000) attempted to address the social influence issue in TAM2 by reintroducing the concept of subjective norm and another variable, namely, image. Social influence was hypothesized to operate mainly through the three aforementioned mechanisms: Internalization, Identification, and Compliance (Kelman, 1958). Most relevant to this research is the finding by Venkatesh and Davis (2000) that identification processes play a significant role in affecting acceptance throughout—that is, its effects were consistently significant through time. This influence was hypothesized to work through the effects of subjective norm on perceived usefulness. Behavioral intention represents the direct antecedent of behavioral performance. Finally, Lewis et al. (2003) found significant support for the relationship between top management support and PU and PEOU. Hwang et al. (2017) investigated the relationships between multiple adoption variables and behavioral intention in the mandatory adoption in an organization but did not test the supervisor or leader-member moderated relationships in the model.

Based on the above discussion and literature review, a moderated model testing the effects of Supervisor Influence on the research model's variables is proposed, where LMX represents the moderating variable. This research adopts the view, which is supported by research findings, that employees will not only do the tasks required by their formal job description but go beyond those requirements to maintain the kind of reciprocal relationship they have with their direct supervisors. Building on the literature discussed above, the following hypotheses are proposed to represent the moderated model:

Hypothesis 1: LMX moderates the relationship between Supervisor Influence (SupInf) and Behavioral Intention (BI); among higher-quality exchanges, a stronger SupInf-BI relationship is expected.

Hypothesis 2: LMX moderates the relationship between Supervisor Influence (SupInf) and Goal Commitment (GoalCmt); among higher-quality exchanges, a stronger SupInf-GoalCmt relationship is expected.

Hypothesis 3: LMX moderates the relationship between Supervisor Influence (SupInf) and Attitude (Att); among higher-quality exchanges, a stronger SupInf-Att relationship is expected.

Hypothesis 4: LMX moderates the relationship between Supervisor Influence (SupInf) and Perceived Behavioral Control (PBC); among higher-quality exchanges, a stronger SupInf-PBC relationship is expected.

Hypothesis 5: LMX moderates the relationship between Supervisor Influence (SupInf) and Appropriateness (App); among higher-quality exchanges, a stronger SupInf-App relationship is expected.

Hypothesis 6: LMX moderates the relationship between Supervisor Influence (SupInf) and Perceived Usefulness (PU); among higher-quality exchanges, a stronger SupInf-PU relationship is expected.

Hypothesis 7: LMX moderates the relationship between Supervisor Influence (SupInf) and Valence (Val); among higher-quality exchanges, a stronger SupInf-Val relationship is expected.

Hypothesis 8: LMX moderates the relationship between Supervisor Influence (SupInf) and Implementation Climate (ImpClimt); among higher-quality exchanges, a stronger SupInf-ImpClimt relationship is expected.

Hypothesis 9: LMX moderates the relationship between Supervisor Influence (SupInf) and Perceived Ease of Use (PEOU); among higher-quality exchanges, a stronger SupInf-PEOU relationship is expected.

#### 4. RESEARCH METHODOLOGY

This research was conducted at the individual level of analysis and used the survey method in an organizational setting as the means to collect the data. This self-report method was used to measure the latent variables. Survey items measuring all the variables were adopted from previous studies where they had gone through multiple reliability and validity tests. All measurements used a 5-point Likert scale. The survey was further reviewed by the researcher and the necessary changes were made accordingly. The PBC item “Given the resources, opportunities, and knowledge it will take to use the system, it would be easy for me to use SharePoint upon its rollout” was removed based on the review and some of the comments that were made by members of the group. The item wording was extremely similar to the items measuring the variable PEOU. The majority of the group also commented on other items, such as the Goal Commitment items “It is hard to take the goal of using SharePoint upon its rollout seriously” and “It wouldn’t take me much to abandon the goal of using SharePoint upon its rollout.” Further deliberations revealed that the mandatory nature of the project and the fact that prospective users haven’t interacted with the system yet made those items inappropriate for the purposes of the study. Additionally, the Valence variable item “With the change to SharePoint in my job I will experience more self-fulfillment” was mentioned by some group members as being too general because using the system or creating content most likely will not be the main job for the prospective users. Also, to them the item stood out and seemed to be outside the “realm” of the survey in general. The decision was made to keep the items and test them in the following refinement step. Some additional minor changes in the wording were made in order to reflect the temporal requirements of the study and the context of the implementation project. The study’s detailed measurement items and sources are shown in the Appendix.

The mandatory nature of the project stems from the fact that the SharePoint implementation was a strategic decision by the university leadership. The implementation team has the “stick” but it was not used, nor would it be unless it was necessary. Once the foundation for the project was built, the only option that the involved entities had was getting on board because no other options existed. However, by being involved, the university entities have a say in many aspects of the implementation. The implementation team believed that the attractiveness and the improvements that SharePoint would bring were enough to keep people in line without the need of “heavy handed” enforcement. Furthermore, the implementation team made sure they had a consistent message when approaching the involved parties. From a technical enforcement perspective, the team had the power to tell people that if they want to be a part of “University.edu” they have to have SharePoint, thus making the cost of not getting on the SharePoint bus very high.

A Purposive sampling technique, which was followed by “snowball” sampling, was used to recruit participants in the Content Management Systems (CMS) implementation project in one of the largest Universities in the Chicago area. Purposive sampling is mainly concerned with “selecting units (e.g., individuals, groups of individuals, institutions) based on specific purposes associated with answering a research study’s questions” (Teddlie & Yu, 2007). The email recipients were given the option to opt out of further communications if they didn’t want to be a part of the study. The introductory email was sent to around 220 prospective users. A final list of 200 willing participants was compiled based on the responses from the introductory email. The finalized list of participants was sent an email containing a link to an anonymous online survey. Of the 200 willing participants, 172 people

participated in the survey (see Table 1 for demographics). The data was screened for uncompleted surveys and any anomalies. A final list of 148 usable surveys was used in the data analysis.

## 5. TEST RESULTS

We used PLS for the data analysis. PLS is a component-based approach that places minimal demands on sample size and distributional assumptions. Additionally, it has the ability to handle complex models with multiple moderating relationships. The evaluation of the measurement model is mainly concerned with the reliability and the validity of the constructs' measures. This evaluation procedure focuses on the internal consistency (composite reliability), indicator reliability, convergent validity, and discriminant validity (Chin, 2010). Specifically, composite reliability is used to assess the internal consistency of the measurement model, while individual indicator reliability and the average variance extracted (AVE) are used to assess the convergent validity. Furthermore, the cross loadings are used to evaluate the discriminant validity (Hair et al., 2013; Malaquias and Hwang, 2019; Malaquias et al., 2018; Lee et al., 2014).

While Cronbach's alpha is the most common criterion to evaluate internal consistency reliability, in PLS it is recommended that Composite Reliability is used as the main criterion to evaluate internal consistency. Hair et al. (2013) argue that Cronbach's alpha assumes equality of reliability among all the indicators measuring a construct, is sensitive to the number of measurement items, and has a tendency to underestimate internal consistency reliability. Furthermore, the PLS algorithm prioritizes the indicators according to their respective reliability. Thus, it is recommended that composite reliability is used as the main criterion to evaluate the internal consistency reliability of the measurement model. Composite reliability values between .70 and .90 are considered to be satisfactory.

For Convergent validity purposes, the assessment depends on the Average Variance Explained (AVE) and the outer loadings (indicator reliability). To demonstrate convergent validity, the item loading should be .708 or higher (Hair et al., 2013) and the AVE for the construct should be higher than .50. To establish Discriminant validity, the cross loadings for the indicators are examined. Each construct's indicators should load highest on their associated construct. That is, if there are cross loadings that are greater than the indicators' outer loadings, then we have a discriminant validity problem. Discriminant validity is further established by using the Fornell-Larcker criterion. This criterion states that the square root of each construct's AVE should be greater than its highest correlation with any other construct. This can also be defined as having the AVE for each construct be greater than the squared correlation with all other constructs (i.e., the approach utilized in this study).

Two items were deleted from the analysis. One item measuring PBC, "I will have control over using SharePoint," had a low indicator reliability score (.54), which was unacceptable. Deleting this item increased the other two items' reliability. The other item excluded from the analysis was item number one for Valence, "The change to using SharePoint in performing some of my tasks will increase my feeling of accomplishment." Even though the item's reliability was acceptable (.79), it had the lowest outer weight and it increased the correlation of "Valence" with the variables Perceived Usefulness and Appropriateness. Also, the item's loading value on PU was extremely close to its loading on Valence.

The tables below display the results of the measurement model analysis. Table 2 shows the correlations between the model's variables, while Table 3 shows the Composite reliability, AVE, Cronbach's alpha, and the squared correlations among the model's variables. Table 4 shows the outer loadings and the cross loadings for each item. By examining these tables based on the criteria discussed above, it can be confirmed that the validity reliability of the measurement model has been established and we can proceed to examine the structural model.

A moderating variable is one that affects the strength of the direct relationship between an independent variable and a dependent variable. A moderating variable can either be categorical (e.g., gender) or continuous (e.g., LMX). Chin (2010) argues that the product term approach provides

Table 1. Demographics

Gender	Frequency	Percent
Male	70	47.3
Female	78	52.7
Total	148	100
Age	Frequency	Percent
20-29	20	13.5
30-39	61	41.2
40-49	39	26.4
>50	28	18.9
Total	148	100
Tenure	Frequency	Percent
0-2yrs	21	14.2
2-5yrs	41	27.7
5-10yrs	36	24.3
>10yrs	50	33.8
Total	148	100
Education	Frequency	Percent
High School	1	0.7
2 Year College	7	4.7
Bachelors Degree	37	25
Masters Degree	88	59.5
Doctoral	15	10.1
Total	148	100
LMX Length	Frequency	Percent
0-6months	12	8.1
6months-2yrs	38	25.7
>2yrs	98	66.2
Total	148	100

better estimates of the interaction effects by accounting for measurement error, which could affect the strength of the relationship negatively, thus making it less “detectable”. For the product term approach, if independent variable X has two indicators (i.e., measurement items) and the moderator variable has two indicators, the product term will have four product indicators. Within SmartPLS 2.0,

**Table 2. Correlation Matrix (Square Root of AVE on the diagonal).**

	App	Att	BI	GoalCmt	ImpClmt	LMX	PBC	PEOU	PU	SupInf	Valence
App	0.8982										
Att	0.7813	0.9046									
BI	0.546	0.6456	0.8888								
GoalCmt	0.6916	0.7642	0.775	0.8915							
ImpClmt	0.4171	0.4162	0.4873	0.5346	0.8044						
LMX	0.1707	0.1974	0.1922	0.2119	0.2572	0.83831					
PBC	0.4587	0.5941	0.4297	0.5502	0.3787	0.0963	0.8655				
PEOU	0.5396	0.5451	0.4159	0.5738	0.3412	0.1373	0.7257	0.8666			
PU	0.7274	0.7327	0.6363	0.7127	0.3717	0.1967	0.4235	0.5529	0.8877		
SupInf	0.4963	0.5112	0.6869	0.5747	0.5166	0.3259	0.3394	0.3311	0.5109	0.8744	
Valence	0.7991	0.7932	0.6721	0.8033	0.5076	0.2764	0.5158	0.554	0.8058	0.5709	0.8823

**Table 3. The Composite reliability, AVE, Cronbach's alpha, and the squared correlations**

Composite Reliability	AVE	Cronbach Alpha		App	Att	BI	GoalCmt	ImpClmt	LMX	PBC	PEOU	PU	SupInf	Valence
0.9435	0.8068	0.92	App	1										
0.9311	0.8184	0.889	Att	0.6104	1									
0.9185	0.79	0.8667	BI	0.2981	0.4168	1								
0.9207	0.7948	0.8707	GoalCmt	0.4783	0.584	0.6006	1							
0.9015	0.6472	0.8632	ImpClmt	0.174	0.1732	0.2375	0.2857	1						
0.9429	0.7028	0.9301	LMX	0.0291	0.039	0.0369	0.0449	0.0661	1					
0.8565	0.7491	0.665	PBC	0.2104	0.353	0.1846	0.3027	0.1434	0.0093	1				
0.9005	0.7511	0.8347	PEOU	0.2912	0.2971	0.173	0.3292	0.1164	0.0189	0.5266	1			
0.9177	0.7881	0.8659	PU	0.5291	0.5368	0.4049	0.5079	0.1381	0.0387	0.1794	0.3057	1		
0.9069	0.7647	0.8464	SupInf	0.2463	0.2613	0.4718	0.3302	0.2668	0.1062	0.1152	0.1096	0.261	1	
0.9132	0.7785	0.8572	Valence	0.6386	0.6292	0.4517	0.6452	0.2576	0.0764	0.266	0.3069	0.6493	0.3259	1

this process is simple and involves the use of the (Create Moderating Effect) function which produces the Product term for the interaction effect. After the interaction term is created, the PLS algorithm is run again to obtain the path coefficient for the product term. The significance of the interaction effect is tested using the same Bootstrapping procedure applied before. The results for testing the moderated relationships are presented in Table 5 below. A more thorough discussion and graphs of the moderated model are presented in the discussion section.

## 6. DISCUSSION

### 6.1. LMX and It's Moderating Role

As mentioned earlier, one of the major drivers behind this research is to understand the role direct supervisors play in the end users' acceptance of the new system being introduced to the workplace. The introduction of LMX as a moderating variable will allow for a better understanding of the identification, internalization, and compliance processes through which social influence is said to affect attitudes and beliefs. By focusing on the direct supervisor's influence, the quality of the relationship with them can be viewed as the lens and/or the conduit through which end users interpret that influence. This will offer insight into how it affects their beliefs regarding their use of the new system.

Support is found for Hypothesis 1, which postulated that LMX moderates the relationship between Supervisor Influence and Behavioral Intention, as shown in Figure 2. The compliance process which operates between Supervisor Influence and Behavioral Intention is moderated by the quality of the relationship between the end user and their supervisor. LMX strengthened the positive relationship between Supervisor Influence and Behavioral Intention for both lower- and higher-quality exchanges.

Table 4. Items' Loading and Cross Loadings

	App	Att	BI	GoalCmt	ImpClmt	LMX	PBC	PEOU	PU	SupInf	Valence
Appr1	<b>0.9183</b>	0.7416	0.5016	0.6165	0.3607	0.1759	0.4306	0.4755	0.6861	0.3872	0.7249
App2	<b>0.9105</b>	0.7073	0.5052	0.6795	0.43	0.1555	0.4507	0.526	0.671	0.4793	0.7528
App3	<b>0.8652</b>	0.6509	0.4347	0.5595	0.2763	0.0829	0.3045	0.4385	0.5635	0.3974	0.6215
App4	<b>0.898</b>	0.7034	0.5167	0.6265	0.4259	0.193	0.4544	0.4972	0.6863	0.5201	0.7664
Att1	0.7542	<b>0.9108</b>	0.5463	0.7093	0.3212	0.1345	0.5836	0.5736	0.6824	0.4343	0.7321
Att2	0.6518	<b>0.8877</b>	0.6257	0.6868	0.4307	0.3084	0.4932	0.4469	0.6711	0.5269	0.7425
Att3	0.7109	<b>0.9153</b>	0.5835	0.677	0.3821	0.0977	0.5324	0.4534	0.6343	0.4291	0.6779
GoalCmt1	0.4762	0.6201	0.6751	<b>0.8601</b>	0.5047	0.1847	0.4489	0.4308	0.565	0.4813	0.6474
GoalCmt2	0.6311	0.6766	0.7388	<b>0.9022</b>	0.4704	0.2111	0.5187	0.5523	0.6313	0.5373	0.7172
GoalCmt3	0.733	0.7439	0.6583	<b>0.9114</b>	0.4578	0.1707	0.5014	0.5461	0.706	0.5166	0.7803
ImpClmt1	0.3664	0.3544	0.37	0.4133	<b>0.8012</b>	0.2421	0.2633	0.3204	0.3655	0.4091	0.4706
ImpClmt2	0.3505	0.3964	0.3945	0.4545	<b>0.751</b>	0.3127	0.3198	0.2265	0.2338	0.4734	0.4273
ImpClmt3	0.3669	0.3443	0.329	0.4167	<b>0.8263</b>	0.1575	0.2779	0.3069	0.3217	0.395	0.4178
ImpClmt4	0.2697	0.2796	0.4413	0.4268	<b>0.7953</b>	0.1152	0.3555	0.2632	0.2913	0.3857	0.3271
ImpClmt5	0.3225	0.2944	0.4194	0.4333	<b>0.8454</b>	0.1985	0.3014	0.259	0.2875	0.407	0.3967
BI1	0.5028	0.6257	<b>0.9067</b>	0.7301	0.4179	0.1836	0.3527	0.3336	0.5505	0.6034	0.6121
BI2	0.4957	0.5442	<b>0.8482</b>	0.6178	0.4041	0.1387	0.3641	0.366	0.5918	0.5991	0.5861
BI3	0.4599	0.5504	<b>0.9101</b>	0.7136	0.4758	0.1873	0.4282	0.4101	0.5587	0.6299	0.5947
LMX1	0.1447	0.1827	0.1347	0.1691	0.2088	<b>0.8715</b>	0.0659	0.0966	0.1762	0.2398	0.2451
LMX2	0.1213	0.1874	0.211	0.2184	0.3021	<b>0.8068</b>	0.1577	0.1476	0.155	0.3213	0.2542
LMX3	0.2088	0.1424	0.0832	0.134	0.2232	<b>0.8139</b>	0.0895	0.1161	0.1385	0.2878	0.2393
LMX4	0.1295	0.1825	0.1707	0.1908	0.2002	<b>0.8721</b>	0.0486	0.0501	0.1796	0.2627	0.2385
LMX5	0.1303	0.1463	0.1817	0.1075	0.1383	<b>0.8326</b>	-0.02	0.0372	0.1571	0.2902	0.1993
LMX6	0.199	0.1839	0.1466	0.2344	0.2389	<b>0.875</b>	0.1213	0.1855	0.1848	0.2832	0.2623
LMX7	0.1079	0.1113	0.1325	0.165	0.1794	<b>0.792</b>	0.1023	0.1942	0.1553	0.1999	0.1788
PBC1	0.4027	0.5144	0.3748	0.5251	0.3111	0.1028	<b>0.8656</b>	0.6018	0.377	0.311	0.4355
PBC2	0.3914	0.514	0.3689	0.4273	0.3443	0.064	<b>0.8654</b>	0.6544	0.356	0.2764	0.4573
PEOU1	0.4976	0.5305	0.4091	0.537	0.3592	0.0504	0.6452	<b>0.8662</b>	0.5034	0.2816	0.487
PEOU2	0.4426	0.3853	0.2768	0.4513	0.2764	0.1471	0.6298	<b>0.8822</b>	0.4146	0.2722	0.4199
PEOU3	0.4571	0.4878	0.3832	0.4953	0.2439	0.1675	0.6092	<b>0.8514</b>	0.5109	0.3056	0.5267
PU1	0.6664	0.706	0.6147	0.6912	0.3075	0.1498	0.3818	0.4762	<b>0.9015</b>	0.5221	0.7808
PU2	0.6982	0.6549	0.5949	0.6172	0.35	0.1528	0.3476	0.4826	<b>0.9</b>	0.4598	0.6734
PU3	0.5645	0.5809	0.473	0.5819	0.3362	0.2302	0.4026	0.5202	<b>0.8612</b>	0.3652	0.6863
SupInf1	0.5158	0.5443	0.6349	0.5949	0.463	0.417	0.3636	0.3681	0.5186	<b>0.9018</b>	0.5815
SupInf2	0.4471	0.4562	0.6323	0.5318	0.5175	0.1614	0.284	0.3161	0.4823	<b>0.8773</b>	0.5401
SupInf3	0.3221	0.321	0.525	0.3586	0.3617	0.2758	0.233	0.1642	0.3197	<b>0.8432</b>	0.3535
Valence2	0.7925	0.7016	0.4887	0.6279	0.3508	0.2415	0.4143	0.4723	0.71	0.4728	<b>0.8628</b>
Valence3	0.7788	0.7525	0.6365	0.7494	0.4777	0.2288	0.5079	0.5182	0.8006	0.5185	<b>0.9315</b>
Valence4	0.557	0.646	0.6386	0.7376	0.5009	0.2617	0.4369	0.4739	0.6219	0.5158	<b>0.8505</b>

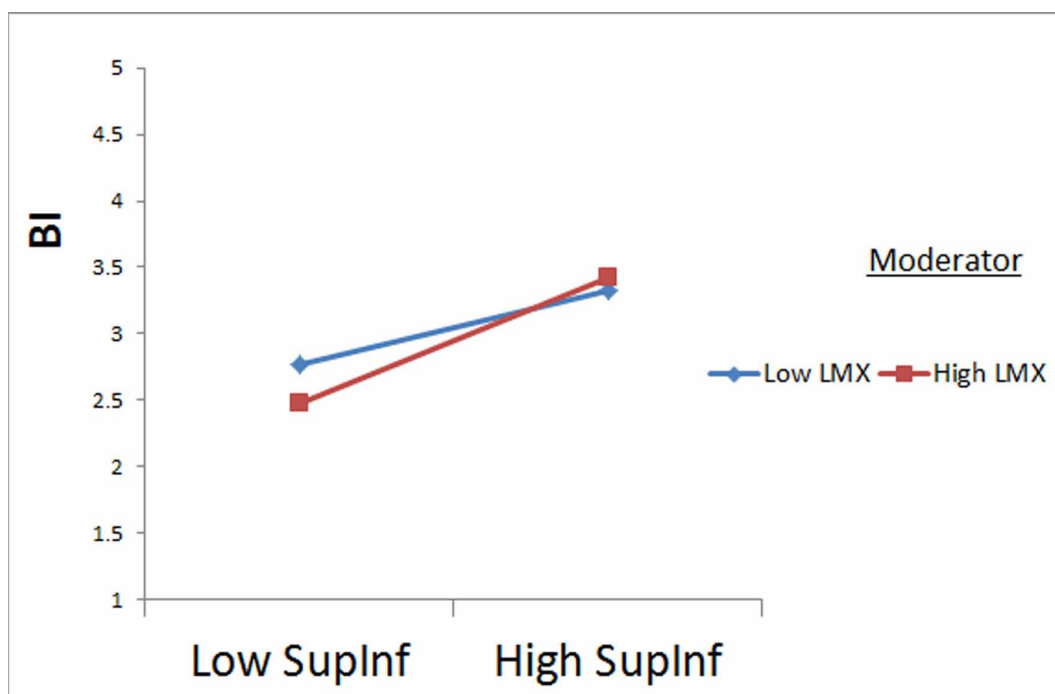
From a quality-of-exchange perspective, end users with higher-quality exchanges might view their acceptance of influence from their supervisors as a form of reciprocity and/or obligation which is not driven by mere compliance. For end users with lower-quality exchanges, the acceptance of influence is either due to the lack of other options or to avoid punishment.

Table 5. The results for testing the moderated relationships

Hypotheses	Interaction term	Dependent Variable	Path Coefficient	t-value	Sig.
1	SupInf × LMX	Behavioral Intention	0.098	1.997	**
2	SupInf × LMX	Goal Commitment	0.031	0.72	ns
3	SupInf × LMX	Attitude	-0.012	0.355	ns
4	SupInf × LMX	Perceived Behavioral Control	0.131	2.153	**
5	SupInf × LMX	Appropriateness	0.272	4.705	***
6	SupInf × LMX	Perceived Usefulness	0.198	3.207	***
7	SupInf × LMX	Valence	0.236	3.65	***
8	SupInf × LMX	Implementation Climate	0.114	1.809	ns
9	SupInf × LMX	Perceived Ease of Use	0.117	2.727	***

Note: SupInf: Supervisor Influence; LMX: Leader-Member Exchange; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Figure 2. Graphical Model of Hypothesis 1



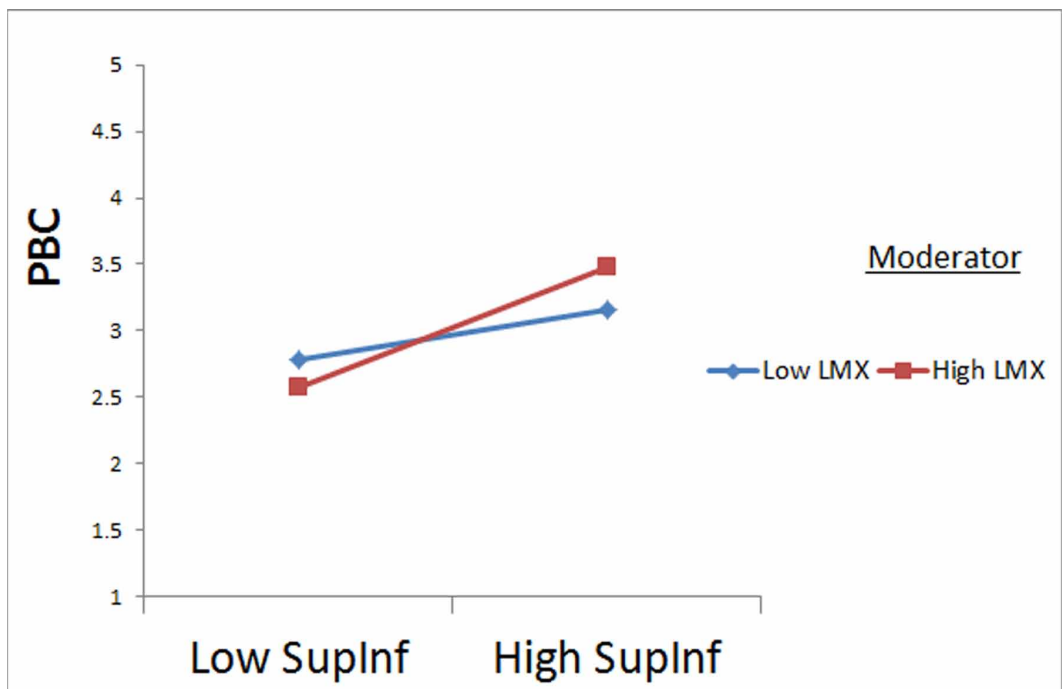
To further understand the process by which identification affects end users' acceptance of the new system, the moderating effect of LMX on the relationship between Supervisor Influence and both Goal Commitment and Attitude is tested. No support is found, thus the rejection of both Hypotheses 2 and 3. The relationship between Supervisor Influence and both variables without the moderator is also found to be non-significant. This finding suggests that the identification process through which social influence of the supervisor affects Attitude and Goal Commitment is not as direct as hypothesized. Through affecting other beliefs, as the support for the following hypotheses shows, both identification

and internalization processes ultimately affect attitude and goal commitment indirectly. One might further argue that end users, regardless of the quality of the exchange they have with their direct supervisor, form their Attitude and Goal Commitment using a more complex process. Hollenbeck and Klein's (1987) Expectancy Theory Model of the antecedents and consequences of goal commitment offers some insight into such a process. They argue that Goal Commitment is a function of both the attractiveness and expectancy of goal attainment, and that both attractiveness and expectancy of goal attainment are affected by a multitude of variables which can be classified to situational personal factors. This, combined with the fact that both variables in our research model are dependent variables influenced by other variables, suggests that forming one's attitude of and commitment to a goal is subject to a more complex process influenced by variables other than supervisor influence. It also suggests that supervisor influence represents only one aspect of the overall social influence process, which is the product of influence by a number of relevant others such as peers, top management, implementers, etc.

As shown in Figure 3, LMX is found to moderate the relationship between Supervisor Influence and Perceived Behavioral Control (PBC) by strengthening the relationship between the two, thus supporting Hypothesis 4. This finding is expected since employees who perceive that their supervisor supports their use of the new system expect that resources (such as time to train) will be provided and supported by their supervisor. This relationship is stronger for end users with higher-quality exchanges. Such users have higher expectations for their supervisors based on the relationship they have.

Support is found for Hypothesis 5, which postulated that LMX moderates the relationship between Supervisor Influence and Appropriateness, as shown in Figure 4. Furthermore, of all the tested moderated relationships, this one had the highest effect size. Appropriateness has been introduced as a variable measuring the end users' perception of how suitable or "fit for the organization" the system is. Supervisor influence on this variable is suggested to operate through an identification process similar to the way subjective norm is hypothesized to affect image in TAM2. As the source

Figure 3. Graphical Model of Hypothesis 4

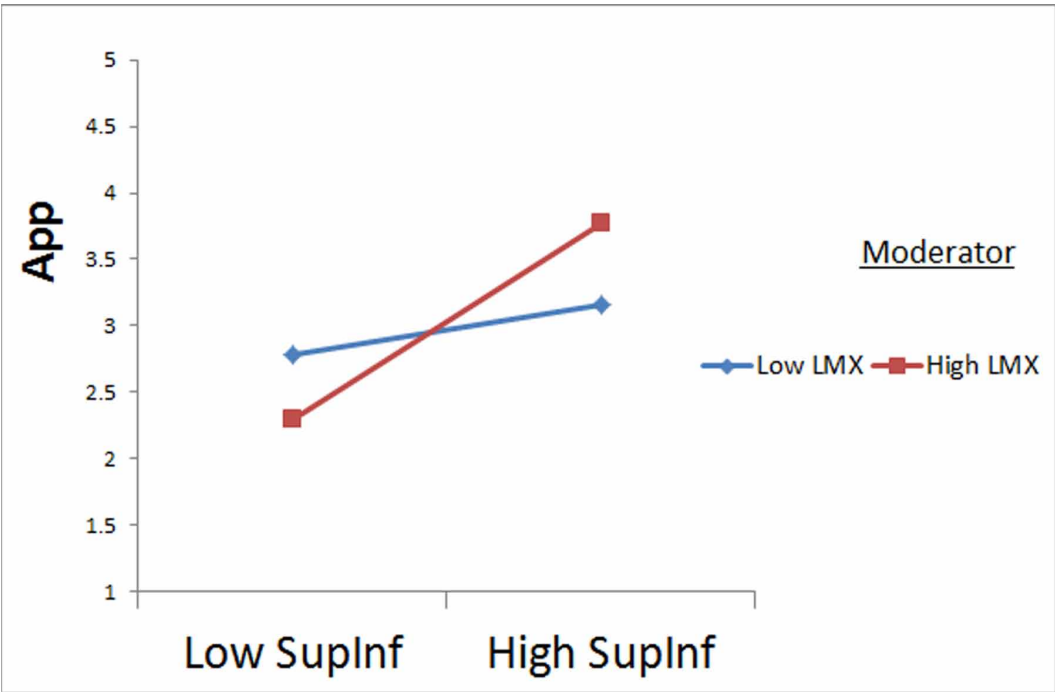


of credible information, especially for end users with higher-quality exchanges, the supervisor influenced beliefs about the appropriateness of the system to the organization. Social information process theory (Salancik & Pfeffer, 1978) also supports this finding; by relying on information from the social context, end users utilize those cues as guides which will ultimately affect and help shape their beliefs. Furthermore, communication between the supervisor and their direct employees, specifically with those enjoying a higher-quality exchange, will have more influence in shaping their perceptions about the appropriateness of the system and its effects on issues like the brand of the organization.

Support is also found for Hypothesis 6, which postulated that LMX moderates the relationship between Supervisor Influence and Perceived Usefulness, as shown in Figure 5. Previous research on technology acceptance (e.g., Schepers & Wezels, 2007; Venkatesh & Davis, 2000) found that, through internalization processes, subjective norm influences Perceived Usefulness. This research extends this finding by specifically identifying that such a process is more prominent for end users who enjoy higher-quality relationships with their supervisors. Through internalization, end users interpret information and cues from relevant and important others as indicative of reality. Building on what has been discussed about social information processing theory, one might further argue that this influence on usefulness beliefs is driven by directing attentional processes where the supervisor makes aspects of the usefulness of the system more salient to the end user. A higher-quality exchange, which is characterized by trust and open communication, amplifies this internalization process.

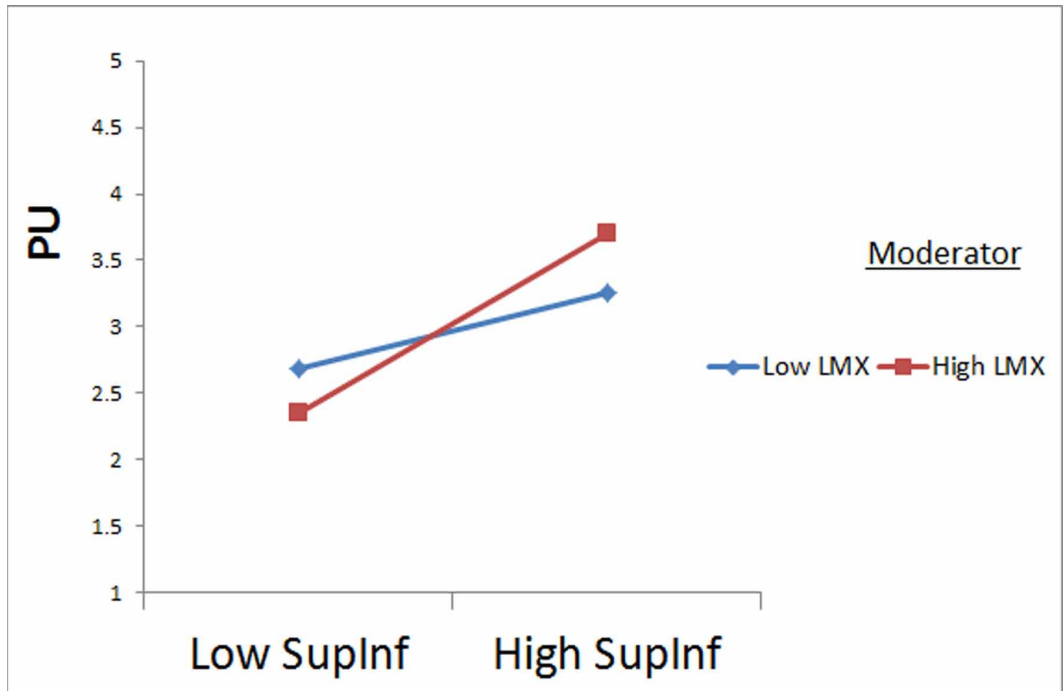
Hypothesis 7, which postulated that LMX moderates the relationship between Supervisor

Figure 4. Graphical Model of Hypothesis 5



Influence and Valence, is supported, as shown in Figure 6. A higher Supervisor Influence and Valence relationship is found among end users with higher-quality exchanges. This finding is consistent with the previous findings of this study—through an identification process, especially among end users with higher-quality exchanges, the supervisor influences and shapes their beliefs about the benefits

Figure 5. Graphical Model of Hypothesis 6

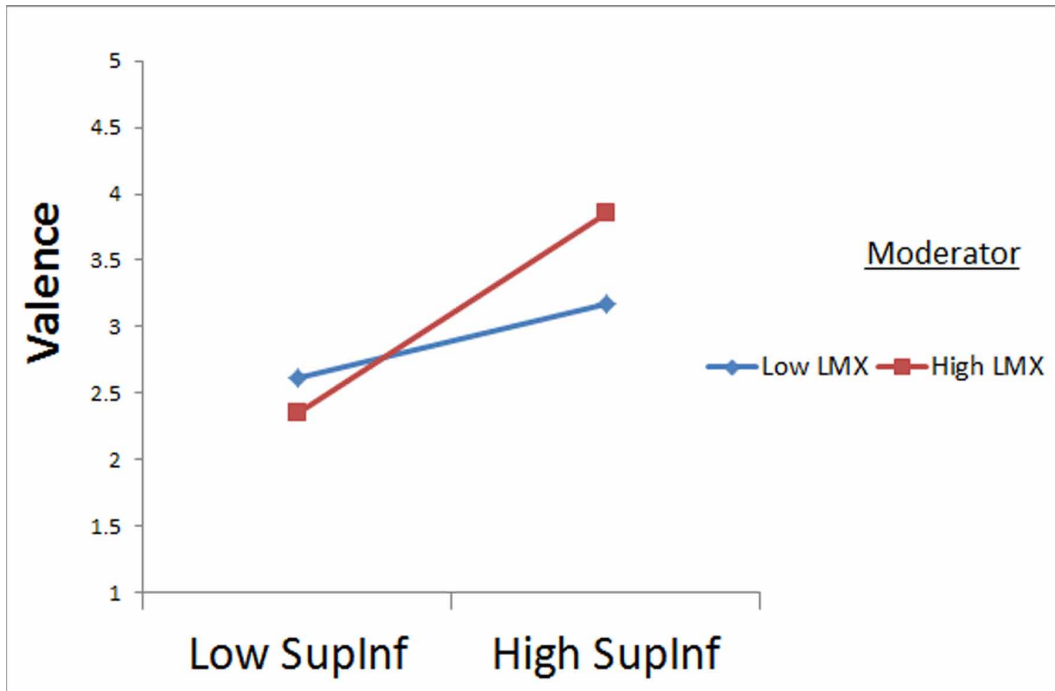


they will personally receive from using the new system. For lower-quality exchanges, the acceptance of such influence by the supervisor might stem from their knowledge about the new system. It could also signal to those end users that their acceptance of the new system that their supervisor supports could help improve the quality of the exchange. Among higher-quality exchanges, through their acceptance of this influence, end users are contributing to and maintaining the relationship. Furthermore, the direct supervisor has the power to provide tangible rewards and benefits.

Hypothesis 8, which postulated that LMX moderates the relationship between Influence and Implementation Climate, is not supported. The direct effect of supervisor influence on Implementation Climate without the moderating effect is significant, which suggests that supervisor influence affects end users' perceptions about the implementation climate within the organization. The lack of significance for the moderating effect might stem from the fact that, as mentioned earlier in the literature review, implementation climate represents an umbrella variable aimed at capturing the overall policies and procedures at the organization. As an umbrella variable, end users might view supervisor influence as one of the overall factors that influences their perceptions about the implementation climate for the project in the organization. Furthermore, this finding suggests that their evaluation of the implementation climate within the organization might be dependent on cues from multiple sources that go beyond the supervisor and the quality of the relationship they have with them. In such a case, LMX becomes less influential in interpreting those cues that come from multiple resources.

Finally, Hypothesis 9, which postulated that LMX moderates the relationship between Supervisor Influence and Perceived Ease of Use, is supported, as shown in Figure 7. Building on what has been discussed regarding the finding that LMX moderates the relationship between Supervisor Influence and Perceived Behavioral Control, a similar argument can be presented here. End users with higher-quality exchanges might expect more resources to be made available by or through their supervisor for the purpose of making them skilled at using the new system. Additionally, through an internalization process, end users, especially those with higher-quality exchanges, might take the influence attempts

Figure 6. Graphical Model of Hypothesis 7



from their supervisor regarding the ease of using the system as cues to reality; thus, they may perceive the system to be easier to use. One might further argue that in higher-quality exchanges, both parties share some characteristics, thus making this “similarity” a basis for influencing perception about one’s efficacy which will ultimately affect their perceptions about the ease of using the system.

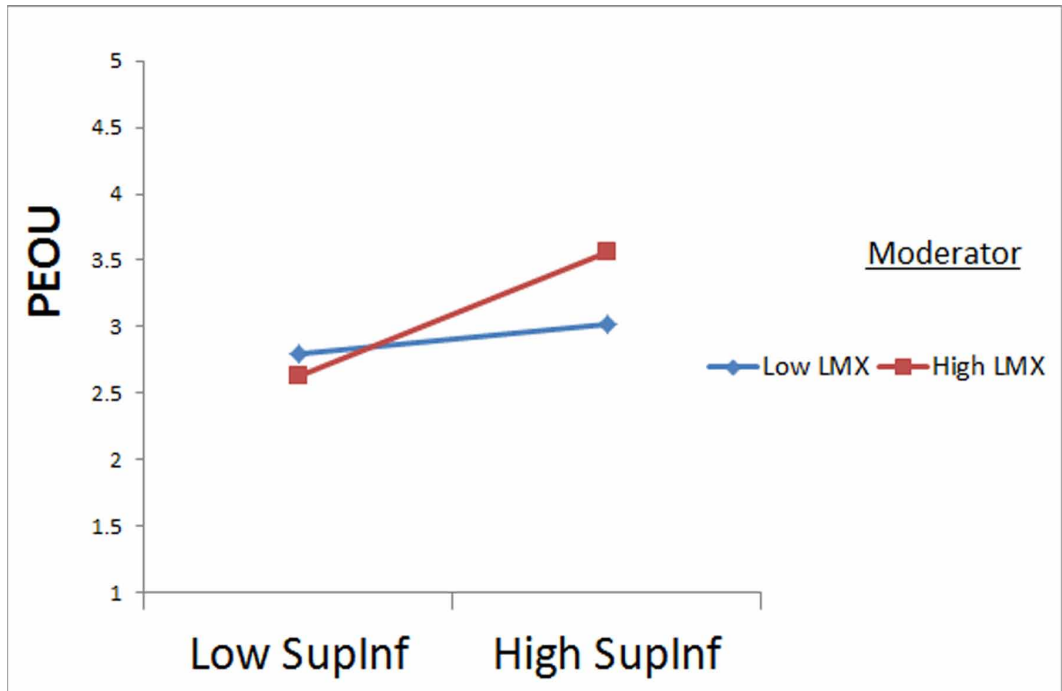
## 6.2. Limitations and Future Research

While this study offers new insights about the moderating roles of LMX for technology acceptance phenomenon at the pre-implementation stage in a mandatory environment, it is not without limitations. First, the sample for this study was drawn from a single organization (Educational) and for one system (Content Management). Additionally, the items measuring the study’s variables were modified to reflect both the nature of the project (i.e., the system to be implemented) and its stage. As such, the results of the study may not be generalizable to other contexts.

The second limitation is the use of the self-reporting survey method to collect the data for the study. Measuring all variables in the same survey might raise the issue of common method bias; as such this bias cannot be ruled out. Future research can test the model with another research methodology, such as case study, to validate the model. Furthermore, for respondents, answering items measuring Perceived Ease of Use and Perceived Usefulness may have posed a challenge since they had not interacted with the system yet. However, the fact that they could have been familiar with Content Management Systems in general and Microsoft products (i.e., interface) may have reduced that possibility. Another issue is the measurement of LMX, which may have also been a challenge to respond to due to the sensitivity of the concept. Responding to items that “evaluated” the relationship with the supervisor may have been an issue for some respondents.

The third limitation is the cross-sectional nature of the study. Data was collected at one point in time during the project. Perceptions may change over time, thus causal inferences are hard to make. Additionally, the fact that the study collected data at the pre-implementation stage limits the ability

Figure 7. Graphical Model of Hypothesis 9



to generalize the findings beyond that point. However, this study is exploratory in nature and attempts to understand the acceptance phenomenon at this stage. Data was not “historical” but was collected before system use, so “memory bias” is less of a concern.

Future research could overcome many of these limitations by extending the study to more organizations and different systems. Furthermore, a longitudinal study collecting data at multiple points of the project would offer deeper insights into the acceptance process as it relates to organizational change efforts. For example, data can be collected after the first training, after the last training, upon rollout, and after three months of usage. Future research could also look into incorporating more organizational and contextual variables into acceptance models. The change management, social psychology, and leadership literatures are example of fields that can enrich and deepen our understanding of the technology acceptance phenomenon.

LMX theory fails to explain the particulars of how high-quality exchanges are created. LMX theory is also objected to on grounds of fairness and justice, as some followers receive special attention from leaders in a workplace while other followers do not. Given that there are limitations on the complete understandings of LMX in the organization, future research should investigate how high-quality exchange creation and special attention of leaders can influence the system implementation based on the findings in this study.

This study’s findings offer an opportunity to guide future research. For example, introducing organization-wide systems (such as SharePoint, which will be used throughout the university) can alter some of the existing organizational-based relationships. Research could look into how some users may embrace the technology as a means to “escape” a low-quality exchange they have with their supervisor. By acquiring such skills, those users might be able to move more “freely” within the organization. Additional research may also look at the effects of introducing such technologies on webmasters and within organizations. Systems such as SharePoint offer non-technical staff the ability to author and publish content more easily than before, thus making them less dependent on IT staff.

Additionally, one of the major issues in the IS field is the lack of studies that look into moderating effects beyond the usual individual factors, such as age and gender. This study looked at LMX as a moderating variable; the role of other moderating variables should be explored. This will allow for a better understanding of factors that affect the strength of the relationships between the variables of interest.

## **7. CONCLUSION**

The research model for this study was developed to understand the LMX moderating roles in technology acceptance phenomenon at the pre-implementation stage in a mandatory environment. By responding to the call for the further investigation on the role of LMX in system implementation (Hwang et al., 2016a), this study explored the role of the quality of the relationship between supervisors and employees as end users. It also highlighted the role of LMX and supervisor influence as a conduit for the acceptance process among end users. The technology acceptance literature has been criticized for its disregard of organizational dynamics (Legris et. al., 2003; Garwood & Poole, 2018; Falco & Kleinhans, 2018; Peng et al., 2018; Wang et al., 2017; Wang et al., 2018; Raguseo, 2018). The introduction of a new technology into a workplace is in fact a change endeavor that is subject to contextual factors which affect individuals' reactions to the technology and its use. This study integrated organizational and social factors into a moderating model of LMX. These results and their analysis showed that this model has high explanatory and predictive power and is valuable in offering insights and guidance for implementers initiating technology-related changes within organizations.

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## APPENDIX

### The Study's Measurement Items

Table 6.

<b>LMX (Graen &amp; Uhl-Bien, 1995):</b>
How often do you feel that your supervisor is satisfied with your work; Do you know where you stand with your leader?(Rarely...Very Often)
What are your expectations to receive support from your supervisor when solving work related issues? (None...Very High)
Overall, how well does your supervisor understand your job / problems and needs? (Not a bit...A great deal)
How well does your supervisor recognize your potential? (Not at all...Fully)
How would you characterize your working relationship with your supervisor? (Extremely Ineffective...Extremely Effective)
I have enough confidence in my supervisor that I would defend and justify his/her decisions if he/she weren't present to do so. (Strongly Agree...Strongly Disagree)
Regardless of the amount of formal authority your supervisor has, what do you think are the chances that your supervisor would use his/her power to help you solve problems in your work? (None...Very High)
<b>Appropriateness (Armenakis et al., 2007): (Strongly Disagree...Strongly Agree)</b>
The change to SharePoint will improve the performance of our organization.
I believe that the change to SharePoint will have a favorable effect on our operations.
When I think about the change to SharePoint I realize that it is appropriate for our organization.
I believe that the change to SharePoint will prove to be the best for our situation as an organization.
<b>Attitude (Fishbein &amp; Ajzen, 1980):</b>
All things considered, my expectation and use of SharePoint upon its roll-out is: (Very Bad...Very Good)
All things considered, my adoption/use of SharePoint upon its roll-out is: (Very Worthless...Very Valuable)
All things considered, my adoption use of SharePoint upon its roll-out is: (Very Negative...Very Positive)
<b>Behavioral intention (Taylor &amp; Todd, 1995): (Strongly Agree...Strongly Disagree)</b>
I intend to use SharePoint when it is implemented/rolled out.
I intend to use SharePoint frequently upon its roll-out.
I intend to use SharePoint to perform my tasks that require its use once it has been rolled out.
<b>Goal commitment (Klien et al. 2001): (Strongly Disagree...Strongly Agree)</b>
Quite frankly, I don't care if I achieve the goal of using SharePoint upon its roll-out or not.
I am strongly committed to pursuing the goal of using SharePoint upon its roll-out.
I think that using SharePoint upon its roll-out is a good goal to shoot for.
<b>Implementation Climate (Klein et al., 2001): (Strongly Disagree...Strongly Agree)</b>
People here really don't care about the success of SharePoint Implementation/Migration project.
In DePaul, there is a big push for people to make the most of the change to SharePoint as a content management system
At DePaul, the SharePoint Implementation/Migration project takes a back seat to other projects.
People here put a lot of effort into making the SharePoint Implementation/Migration project a success
The SharePoint Implementation/Migration project is a top priority here.
<b>Perceived Ease of Use (Davis, 1989): (Strongly Disagree...Strongly Agree)</b>
I would find it easy to get SharePoint to do what I want it to do when it comes to performing my tasks
I think SharePoint will be easy to use.
It would be easy for me to become skillful at using SharePoint to perform my tasks.
<b>Perceived Behavioral control (Ajzen 1991; Taylor &amp; Todd, 1995): (Strongly Disagree...Strongly Agree)</b>
I believe that I will have the resources necessary to use SharePoint.
I believe that I will have the Knowledge necessary to use SharePoint upon its roll-out.
<b>Perceived Usefulness (Davis, 1989): (Strongly Disagree...Strongly Agree)</b>
I believe I would find using SharePoint in my job to be useful.
Using SharePoint would enhance my effectiveness in my job.
Using SharePoint in my job would improve my performance.
<b>Valence (Armenakis et al., 2007): (Strongly Disagree...Strongly Agree)</b>
In the long run, DePaul's decision to adopt SharePoint will be worthwhile for me.
The change to using SharePoint upon its roll out will be beneficial to me.
With SharePoint implementation, I don't believe there is anything for me to gain.
<b>Supervisor Influence (Thompson et al. 1991; Taylor &amp; Todd, 1995): (Strongly Disagree...Strongly Agree)</b>
My Manager/Supervisor is supportive of the use of SharePoint for my job upon its roll out.
My supervisor would think that I should use SharePoint upon its roll out.
I will have to use SharePoint in performing some of my tasks because my supervisor expects me to do...

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