THE ROLE OF TRANSFORMATIONAL LEADERSHIP CONSENSUS
AND INNOVATION CLIMATE STRENGTH IN PREDICTING
EMPLOYEE ATTITUDES

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ABSTRACT OF THE THESIS

The Role of Transformational Leadership Consensus and Innovation Climate Strength in Predicting Employee Attitudes

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Although there has been extensive research on the relationship between transformational leadership (TL) and organizational climate, these studies have typically focused on a team’s average rating of the leader and have failed to address the possibility that team members may not agree about the transformational qualities of their leader. This thesis applied dispersion models to the study of TL to address this gap in the literature. Dispersion models capture variability in responses within an organizational unit. In general, it has been proposed that leadership will have stronger effects when team members agree about the level of leadership in the team. This thesis hypothesized that the positive relationship between TL and innovation climate would be moderated by TL consensus (a dispersion measure), such that innovation climate would be highest when both absolute TL and TL consensus were high, and lowest when TL was low and TL consensus was high. Integrating dispersion models as applied to organizational climate, this thesis hypothesized that climate strength (a dispersion measure) would moderate the positive relationship between innovation climate and attitudes toward a specific innovation, such that attitudes toward a specific innovation would be most positive when innovation climate was high and strong, and least positive when innovation climate was low and strong. Because of past support relating these constructs, it was hypothesized that innovation climate would partially mediate the relationship between TL and attitudes toward a specific innovation. The study utilized data from a large-scale research study of home-based child welfare service providers in the Midwestern U.S. Data were collected from 359 providers whose teams were utilizing a specific innovation beginning at some point during the longitudinal 12-wave study. Each participant and team was assessed at multiple time points. Multilevel analysis was used to analyze the data, properly account for the nesting and simultaneously testing both mediation and moderation effects. Results revealed that the TL interaction hypothesis was supported. The climate interaction hypothesis and the mediation hypothesis were not supported. The results demonstrate the importance of consistent perceptions of leadership in addition to overall high levels of TL. Research and practical implications are discussed.
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CHAPTER 1

INTRODUCTION

Transformational leaders inspire followers to ascend beyond self-interest and the
general duties of the job to better the organization by enacting the vision of the leader (Bass,
1999). In doing so, these leaders develop unity around shared organizational values (Bass,
1999). At the team level, transformational leaders work to align team members with, and to
garner team members’ support for, their vision. It is important to understand how
transformational leadership (TL) is perceived at the team level because these team leaders
can have an enormous impact on followers and subsequently the success of an organization.
Specifically, transformational leaders may play a critical role in determining whether
employees are aligned with overall organizational goals (Avolio, 1999; Berson & Avolio,
2004). A large body of research has accumulated on team-level perceptions of TL, with
team-level perceptions of leadership represented as the mean obtained from aggregating each
team member’s individual response about the leader (Chan, 1998; Cole, Bedeian, & Bruch,
2011). However, this approach fails to address an important question regarding team-level
perceptions of leadership: what if team members do not agree on the TL behaviors and
attributes of their leader? Regardless of whether it is the leader who is exhibiting different
behaviors to each follower, or if it is only that the followers perceive the same behaviors
differently, the resulting outcome is that followers vary in their perception of the
transformational qualities and behaviors of their leader, which has implications for how they
subsequently think about their work and behave in their organizations. For instance, this
disagreement in perceptions about a leader may create tension in the team, impacting team
cohesion and team performance.

In order to identify these differences, dispersion measures are needed. Dispersion
refers to the variability in members’ responses regarding a particular construct of interest by
analyzing the level of within-team agreement in each team (Chan, 1998). Understanding how
perceptions of TL are dispersed within teams may provide valuable insight about a leader’s ability to be successful because the success of a transformational leader may not only depend on the team’s overall perception of the leader, but also on the level of agreement the team has regarding that perception (Cole & Bedeian, 2007; Cole, Bedeian, & Bruch, 2011). For instance, understanding the dispersion of perceptions regarding a leader’s TL attributes may assist in explaining how two leaders rated similarly on average by their team may have different levels of success if one team is in agreement about the leader and the other is not.

The lack of research on dispersion represents a crucial void in the TL literature (Roberson, Sturman, & Simons, 2007). This thesis aims to address this gap by utilizing dispersion measures to study the variability in perceptions of TL across teams. Previous research has not adequately addressed this question, with a few exceptions (e.g., DeGroot, Kiker, & Cross, 2000; Feinberg, Ostroff, & Burke, 2005; Felfe & Heinitz, 2010; Sanders & Schyns, 2006). However, research in other areas of leadership (e.g., leader-member exchange [LMX]) and in organizational climate, has made more progress integrating ideas related to dispersion (e.g., LMX differentiation and climate strength, respectively). This thesis will build on these literatures to propose a model for how dispersion impacts the relationships between TL, innovation climate, and employee attitudes regarding a specific innovation occurring in the organization.

The present paper will further the dispersion literature by applying dispersion measurements to TL and innovation climate to demonstrate the effect that dispersion can have on achieving outcomes of innovation climate and attitudes toward a specific innovation. Such information is needed because leadership is often a crucial antecedent to climate creation and preservation (Zohar & Tenne-Gazit, 2008). Knowing how followers’ leadership perceptions are dispersed in teams may help organizations to identify which leaders will be most successful in gaining support for a particular climate. This could also have implications for how leaders are developed and coached, as dispersion measures provide insight as to how leaders are perceived by followers, and could be used to as a source of feedback for further developing these leaders. This thesis aims to reveal how variability in TL, or TL consensus, interacts with TL to support an innovation climate. An innovation climate is a climate in which followers view the policies and values of the organization support a new innovation that benefits the employees, organization, and/or society as a whole (Aarons & Sommerfeld,
2012; Anderson & West, 1998; King, de Chermont, West, Dawson, & Hebl, 2007). As described by King et al. (2007), “Innovation is linked with discretion and may allow individuals to adapt when entering new roles in a changing environment” (p. 635). Hence, when an organization’s climate is high in innovation, this “may enable their workforce to cope with exigent requirements of their jobs” (King et al., 2007, p. 636). As organizations continue to change at a rapid pace, it is particularly important for leaders to be able to develop support for innovation climate. In fact, researchers have recommended that organizations emphasize innovation because it increases organizational effectiveness in today’s quickly changing business environment (Somech & Drach-Zahavy, 2013).

It is also important to understand how leadership and climate may impact attitudes toward a new innovation in the workplace because “attitudes can be influential in the willingness to adopt and implement an innovation” (Aarons & Sawitzky, 2006, p. 63). Most studies on attitudes toward change have analyzed general change attitudes without regard to the specific type of change that is of interest. However, research on attitude towards a specific change is needed because it may be that cultivating attitudes that target a specific innovation leads to better outcomes of that targeted innovation than attitudes about change in general. Some researchers have addressed this need by analyzing attitudes toward a specific change (e.g., Aarons & Sawitzky, 2006; Aarons & Sommerfeld, 2012; Klein, Conn, & Sorra, 2001), and this thesis contributes to this literature by analyzing attitudes toward a specific innovation.

In summary, the goal of this thesis is to advance our understanding of TL and how its relation to innovation climate and attitudes toward a specific innovation are impacted by dispersion in leadership and climate perceptions within teams. In what follows, this thesis will 1) summarize research on TL, innovation climate, and attitudes toward a specific innovation to provide a context for the proposed research model; 2) describe the benefit of using dispersion to complement other methods of measuring team-level constructs; 3) present past research on dispersion of leadership and climate strength; and 4) propose hypotheses regarding the relationships of TL, innovation climate, and attitudes toward a specific innovation and how those relationships are affected by dispersion, thus contributing to the literature on dispersion as applied to leadership and climate. Figure 1 presents the hypothesized model for this thesis.
Transformational Leadership and Attitudes Toward Innovation

The roots of TL go back to the concept of transforming leadership as described by James McGregor Burns (1978). In 1985, Bass introduced the concept of TL into the contemporary leadership literature, setting the foundation for contemporary study of TL. TL is typically conceptualized as having four core dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1999; Conger, 1999; Korek, Felfe, & Zaepnickel-Roth, 2010). Together, these four dimensions inspire followers to emulate the mission of the leader, motivate and stimulate followers to think critically about issues to develop solutions to problems, and, perhaps most importantly, inspire followers to “transcend their own self-interests, presumably including their own self-realization” (Bass, 1999, p. 12). Essentially, transformational leaders mold followers to look beyond their own interests to help coworkers and the organization as a whole (Bass, 1999).

A distinguishing factor of TL is that it goes beyond task completion to foster innovative ideas and creativity in followers (Eisenbeiss, van Knippenberg, & Boerner, 2008). Thus, one emphasis of TL in the literature is its focus on developing innovation (defined as “the intentional introduction and application within a role, group, or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization, or wider society,” West & Farr, 1990, p. 9) in followers. There is a particularly strong link between innovation and the TL dimension of intellectual stimulation, as this behavior can “help subordinates to think about old problems in new ways” (Bass, Waldman, Avolio, & Bebb, 1987, p. 75). The remaining
TL dimensions (i.e., inspirational motivation, idealized influence, and individualized consideration) work in conjunction with intellectual stimulation to guide followers to realize their potential and empower them towards new ways of thinking (Eisenbeiss et al., 2008). Transformational leaders can motivate followers intrinsically, leading to “greater creative and innovative efforts to support organizational goals” (Aarons & Sommerfeld, 2012, p. 423).

A number of researchers have theorized a positive relationship between TL and team innovation, speculating that the role-modeling component of TL combined with intellectual stimulation causes such leaders to exhibit creative behaviors to followers and encourage followers to be innovative (Eisenbeiss et al., 2008; Jung, Chow, & Wu, 2003; Paulsen, Callan, Ayoko, & Saunders, 2013). Transformational leaders connect followers’ values with the collective organizational vision, thus intrinsically motivating followers (Jung et al., 2003), which inspires them to think creatively (Amabile, Hill, Hennessey & Tighe, 1994). Even with this theoretical background, the actual amount of empirical research regarding TL and innovation is small and inconsistent (Eisenbeiss et al., 2008). Past research has found support for a positive relationship between TL and innovation (Jung et al., 2003), between TL and creativity (Jung, 2001; Sosik, Kahai, & Avolio, 1998), and between TL and research and development (a construct similar to innovation; Keller, 1992). However, not all researchers have found a significant relationship between TL and innovation (Wilson-Evered, Härtel, & Neale, 2001) or a significant relationship between TL and the performance of research and development teams (Waldman & Atwater, 1994), and one study found a significant negative relationship between TL and creativity (Jaussi & Dionne, 2003). These differences in findings suggest that moderators play a part in this relationship (Eisenbeiss et al., 2008). Paulsen et al. (2013) highlighted the need for studies to take into account the follower’s role in the shaping and perception of a leader’s TL behaviors. The present study addresses the role of the follower by studying the level of agreement followers have regarding their perceptions of the transformational qualities of their leader (i.e., TL consensus) and how this relates to innovation climate and followers’ attitudes toward innovation. If followers have low consensus of TL attributes, then the leader may not be as successful in forming an innovation climate, resulting in a low level of innovation.
Positive attitudes toward change (noting that innovation is a particular aspect of change) are fundamental to the success of change programs (Vakola & Nikolaou, 2005), and thus it is important to understand methods for influencing attitudes toward change in order to effectively implement change in organizations. Gotham’s (2004) review indicated that adopters of innovations (i.e., new mental health and substance abuse treatments) were more likely to have positive attitudes towards the change than non-adopters (See Rogers, 1995; Rohrbach, D’Onofrio, Backer, & Montgomery, 1996, for specific examples from the review), suggesting that followers’ attitudes can influence the willingness to adopt new innovations (Aarons & Sawitzky, 2006), as supported by past research (Aarons & Sommerfeld, 2012; Vakola & Nikolaou, 2005). Because attitudes may have a vital role in the adoption of new innovations, it is important to understand how leaders may influence attitudes toward innovation. This study theorizes that when followers perceive the leader as highly transformational, followers will adopt a more positive attitude towards change because the leader has role-modeled (through the TL dimension of idealized influence) innovative behaviors to followers, and role modeling not only influences the observer’s behaviors, but also influences their attitudes regarding what is important (Bandura, 1986). Transformational leaders also praise followers for being innovative, and inspire followers to try new methods to approaching problems (inspirational motivation), creating positive attitudes towards innovation in followers because of the innovative solutions that can result from creative problem solving. In addition, transformational leaders consider each follower’s goals individually, and relate these goals to the overall goal of innovation, demonstrating the need for innovation in order to make the goals a reality. Transformational leaders also demonstrate the importance of thinking creatively (intellectual stimulation) to achieve tasks, which should inspire followers (inspirational motivation) to think positively towards the innovation.

The empirical literature on leadership and attitudes provides support for these proposed relationships. For example, Svensen, Neset, and Eriksen (2007) found a positive relationship between team leadership and attitudes toward change, suggesting that leadership does relate to follower attitudes. Choi’s (2011) review suggested that effective leadership practices help reduce cynicism towards change (Bommer, Rich, & Rubin, 2005; Cindy, Neubert, & Xiang, 2007), and also revealed that trust in leadership (Qian & Daniels, 2008; Rafferty & Simons, 2006) increased readiness toward change, which is a construct similar to
attitudes toward change. In addition, past research has conceptualized TL to influence attitudes of followers (Bommer, et al., 2005; Podsakoff, MacKenzie, Moorman, & Fetter, 1990). Also, according to Bandura’s (1986) social learning theory, role modeling, which is central to the idealized influence component of TL, “teach[es] new behaviors and modif[ies] attitudes” (Bommer et al., 2005, p. 740). Along these lines, Aarons and Sommerfeld’s (2012) empirical results demonstrated that transformational leaders can engender positive attitudes towards a specific innovation.

An important contribution of this thesis is that it focuses on a specific type of innovation occurring in the workplace, and analyzes how a leader can cultivate support for that innovation over time. If the leader has encouraged a specific type of innovation (as opposed to encouraging general innovation), then followers’ attitudes will likely reflect that innovation specifically because it more closely aligns with the vision of the leader. Therefore, the present study predicts the following:

Hypothesis 1a: TL will be positively related to followers’ attitudes toward a specific innovation.

INNOVATION CLIMATE

One mechanism that can help to explain how TL is related to followers’ attitudes is the climate the leader creates in his/her team. There are many different definitions of climate; Ehrhart, Schneider, and Macey (2014) identified five broad themes common to most existing definitions: 1) climate emerges from many mechanisms; 2) the experiences that these mechanisms produce shape climate; 3) climate is based on shared experiences and meaning; 4) shared experiences emerge from interactions; and 5) climate describes these shared experiences. Shared perception is central to these themes. As such, climate can be defined as “the shared meaning organizational members attach to the events, policies, practices, and procedures they experience and the behaviors they see being rewarded, supported, and expected” (Ehrhart et al., 2014, p. 69). Climate has been studied as a general molar climate or can be focused on a specific process or strategy (Ehrhart et al., 2014). There are two types of focused climates: process climates, which focus on processes within the organization, and strategic climates, which are specific to a certain aspect of climate present in the organization (Ehrhart et al., 2014). One such strategic climate, innovation climate, is a central part of the model to be tested in this thesis.
Innovation climate is defined as “the extent to which the values and norms of an organization emphasize innovation” (King et al., 2007, p. 634). Innovation climate is important because it mitigates the effect of increasing work demands on organizational performance (King et al., 2007), and can strengthen the relationship between creative ability and innovation implementation (Somech & Drach-Zahavy, 2013). Team climate for innovation is positively related to team satisfaction (Gil, Rico, Alcover, & Barrasa, 2005), team innovation (Sui, Chen, & Wang, 2012), project performance, and the rate of progress in research and development teams (Pirola-Merlo, 2010). In addition, innovation climate is positively correlated with individual employee satisfaction (Johnson & McIntye, 1998) and creative outcomes in individual employees (Hsu & Fan, 2010). Thus, past findings support the assertion that innovation climate can be beneficial to organizational success.

Understanding how to form a climate for innovation is important because of the many positive outcomes that this climate can induce.

In this thesis, innovation climate is viewed as an outcome of TL because leaders play an important role in shaping the climate of an organization (e.g., Lewin, 1951; Luria, 2008; Litwin & Stringer, 1968; McGregor, 1960; Schneider, Ehrhart, Mayer, Saltz, & Niles-Jolly, 2005). Specifically with regard to TL and innovation climate, transformational leaders inspire followers to unite towards a common vision of the organization, and this common vision could be one of innovation. As previously described, TL behaviors can lead to creative thinking and actions in followers and can influence their perceptions by demonstrating what is important in the organization. This thesis proposes that the shared focus on innovation that transformational leaders cultivate in their followers creates a climate towards innovation because followers share a common perception of what the organization values and supports (i.e., innovation). There is research evidence to support this relationship. Aarons and Sommerfeld (2012) found a positive association between TL and innovation climate for teams implementing evidence-based practice (processes that are based on empirical evidence derived from systematic data collection that includes making observations, conducting experiments, and testing hypotheses; American Psychological Association [APA], 2006). Past research examining TL in CEOs found a positive relationship between TL and climate for support for innovation (Jung, Wu, & Chow, 2008). In addition, articulating a vision and providing individual support, both of which are characteristics of TL, were found to
positively relate to a climate for organizational innovation (Sarros, Cooper, & Santora, 2008). Replicating past research on the relationship of TL and climate, specifically innovation climate, it is hypothesized:

Hypothesis 1b: TL will be positively related to innovation climate.

This thesis also proposes that innovation climate is a predictor of follower attitudes toward a specific innovation. Climate should influence attitudes because a worker’s opinion is influenced by the perceptions of his/her team. This theory is supported by Festinger’s concept of social influence, which states, “Opinions, attitudes, and beliefs which people hold must have some basis upon which they rest for their validity” (Festinger, 1950, p. 252). Hence, this thesis suggests that this basis could be coming from the climate in the organization.

Innovation climate is positively related to the attitudinal outcomes of team-level job satisfaction (Gil et al., 2005; González-Romá, Peiró, & Tordera, 2002) and individual-level job satisfaction (Johnson & McIntye, 1998), suggesting that innovation climate can influence attitudes. However, there is little research on how innovation climate relates to attitudes toward a specific type of innovation. One exception is research by Aarons and Sommerfeld (2012), which demonstrated that innovation climate was related to positive attitudes toward a specific innovation in programs implementing new innovations. Climate captures follower perceptions of the beliefs, values, and policies of the organization. If followers perceive an innovation climate in their organization, this suggests that innovation is valued, rewarded, and supported by the structure and policies of the organization, which in turn should cultivate positive attitudes in the followers regarding a specific innovation occurring in the organization.

Past research on other types of climate also provides evidence that a strategic climate can influence employee attitudes. For example, past research found job insecurity climate was negatively related to job satisfaction and organizational commitment (Sora, De Cuyper, Caballer, Peiró, & De Witte, 2013). Other research has shown that safety climate is positively correlated with job satisfaction and organizational commitment (Clarke, 2010), and climate for inclusion is positively correlated with unit satisfaction (Nishii, 2013). Choi’s (2011) literature review revealed that certain organizational climates reduced negative attitudes towards change. These climates included an involved, decision-making climate
(Brown & Cregan, 2008) and an information-sharing climate (Qian & Daniels, 2008; Stanley, Meyer, & Topolnytsky, 2005).

Therefore, there is theoretical and empirical support for the relationship between climate, specifically innovation climate, and attitudes toward innovation. However, many of these studies do not focus on attitudes toward a specific innovation of interest. If an organization is in the process of implementing a particular innovation in the organization, and followers perceive a high innovation climate such that innovation is valued in the organization, followers’ attitudes regarding that specific innovation should be more positive than if the innovation climate were low. Thus, the following is hypothesized:

*Hypothesis 1c*: Innovation climate will be positively related to attitude towards a specific innovation.

Integrating the above hypothesized relationships (i.e., TL with innovation climate, TL with attitudes towards a specific innovation, and innovation climate with attitude towards a specific innovation) into a single model, the current study proposes a partial mediation effect of innovation climate, as innovation climate may be a mechanism for transmitting the effects of TL onto followers’ attitudes towards innovation:

*Hypothesis 1d*: The relationship of TL and attitudes toward a specific innovation will be partially mediated by innovation climate.

Thus, this thesis extends the current TL literature by suggesting that innovation climate may play a part in explaining the relationship between TL and attitudes toward innovation. Nevertheless, the primary contribution of this study is its examination of dispersion of innovation climate (i.e., innovation climate strength) and TL (i.e., TL consensus) as they impact innovation climate and followers’ attitudes toward a specific innovation. Before addressing the specific dispersion hypotheses, an overview of various composition models used when conducting multilevel research is provided.

**Composition Models and Team-Level Constructs**

Chan (1998) identified five composition models for measuring team-level constructs: additive, direct consensus, referent-shift consensus, dispersion, and process models. The additive model (used when researchers are interested in higher-level variables and take no consideration for the variance in individual-level responses) and the process model (used when variables may not be stable and researchers are interested in processes) address
different types of questions than are of interest to this study. However, the direct and referent-shift consensus composition models, which are widely utilized for measuring team-level constructs, are central to the research questions of this study. This thesis addresses the potential problems of the consensus composition models and presents the dispersion composition model as a useful supplement.

**Consensus Composition Models**

According to Chan (1998), there are two approaches to consensus models: direct consensus, in which participants respond to items phrased with an individual-level referent, or referent-shift consensus, in which items are phrased with a referent to the higher level of analysis that is of interest, such as at the team level. Both referent-shift and direct consensus composition models involve participant responses being aggregated at the higher level of interest (Chan, 1998; Feinberg et al., 2005). However, before deeming that the overall mean of the aggregated data is representative of the construct at the higher level, an overall level of agreement among the individual responses must be attained (Chan, 1998; Kozlowski & Hattrup, 1992). This requirement exists to ensure that the aggregated score accurately depicts the higher-level perception of the construct. To clarify, if individuals that comprise a team are generally in agreement regarding the construct, and thus there is low variability in responses, the aggregated score may accurately reflect the team-level construct. However, if the individuals comprising the team are not generally in agreement regarding the construct, so that there is more deviation in the responses, then it is deemed that the overall team-level mean would not accurately represent the team-level response, and this data is not aggregated (Chan, 1998).

The prequalification of agreement is a weakness of the consensus composition models, as there are numerous consequences that may result from this requirement. For instance, if team member responses are aggregated at the team level, yet the team members’ responses vary and do not satisfy the standard agreement requirement, the data for those teams cannot be used to represent the team (Chan, 1998). Thus, the consensus composition models imply that data that does not behave in the necessary way (i.e., by demonstrating agreement) are not used. As such, consensus composition models fail to recognize that teams low in agreement may function differently than those high in agreement, and this information
may be vital to understanding how team-level constructs impact outcomes (Cole, Bedeian, & Bruch, 2011).

A crucial consequence to limiting data to only teams that meet a predetermined level of agreement is that it relies on the assumption that teams need agreement and that a lack of agreement is not useful (Roberson et al., 2007). Some researchers using consensus composition models do not have a cutoff value of required agreement. Instead, they view agreement as a continuum and use theory to justify the appropriate level of analysis (Ehrhart et al., 2014; LeBreton & Senter, 2008). Eliminating the agreement cutoff helps alleviate some issues of the consensus composition models. However, another problematic issue still exists; consensus composition models dismiss within-team variance as error variance without considering that the variance could be attributed to another construct (Chan, 1998). This oversimplification ignores the possibility that disagreement among team members may affect the outcome differently than agreement among team members, regardless of the level of the construct of interest. The shortcomings in the consensus composition models demonstrate the need for more research to utilize a different technique to measure team-level constructs (e.g., leadership and climate).

**Dispersion Composition Model**

To overcome the insufficiencies of the consensus composition models, many researchers have turned their attention to Chan’s (1998) dispersion composition model (e.g., Cole, Bedeian, Hirschfeld, & Vogel, 2011; Harrison & Klein, 2007). When referring to the dispersion composition model, numerous terms are used. Differentiation is frequently used to describe a dispersion measure in the LMX literature. When a team is high in differentiation, it is low on agreement, thus high in dispersion. Another term for dispersion is strength, and this term is used specifically when describing a dispersion model of organizational climate. High climate strength indicates high agreement, thus low dispersion. The term consensus, which is separate from and not to be confused with Chan’s (1998) consensus composition model, is often used to represent a construct that measures dispersion. When referring to consensus in the context of the dispersion model, consensus of a construct becomes a construct itself, and when there is high consensus of that construct, there is high agreement, and thus low dispersion. In order to be consistent with the terms most commonly used in the
research literature, the present paper will use the term strength in regards to climate, differentiation in regards to LMX, and consensus in regards to TL to represent the dispersion measurement of these constructs.

A fundamental distinction of the dispersion composition model from direct and referent-shift consensus composition models is that the dispersion composition model does not require agreement and instead utilizes the disagreement as its own construct (Chan, 1998). The dispersion model can be used to analyze team consensus as a construct in itself and not just as a precursor for measuring constructs at the team level. The dispersion composition model is similar to the direct and referent-shift consensus composition models in that all models require individuals to respond to items and these responses are then compiled to form the measure at the team level. Unlike the consensus composition models, the aggregation does not use the overall mean to represent the construct at the team level. Instead, a measure of variability is used to denote the team-level representation of the construct (Chan, 1998). As opposed to the consensus composition models that view within-team variance as error variance, the dispersion composition model considers the variance and analyzes how within-team variance differs across teams. This is an important benefit of the dispersion model because analyzing this variance in team members’ perceptions can provide important insights (Cole, Bedeian, Hirschfeld et al., 2011). With the dispersion model, the variance in responses at the individual level is used to understand the construct at the higher level.

One concern with the dispersion composition model is that dispersion as its own construct is often related to the main construct of interest. As Bliese and Halverson (1998) stated, dispersion measures “have a degree of interdependence between absolute level effects and consensus effects” (p. 565). To clarify, the dispersion measure of a construct and the construct itself, as measured by absolute level (e.g., mean), are correlated. Korek et al. (2010) found TL consensus and TL had a correlation of .49, which provides further basis for the concern regarding the redundancy that may exist when measuring the dispersion of a construct and how it relates to that construct itself.

Although past research has found redundancy between the two, there is a theoretical basis that consensus constructs can provide additional explanation of variance above and beyond the construct itself (Korek et al., 2010; Feinberg et al., 2005). Lindell and Brandt
(2000) provided conceptualization for the benefit of measuring consensus as its own construct, theorizing that consensus measures provide additional insight beyond what can be found with the absolute measure of the construct. The basis for this argument is that high consensus would yield a more reliable mean than low consensus, and thus be a better indicator of the construct’s relationship with other variables than only studying the absolute level of that construct by itself (Ehrhart et al., 2014; Lindell & Brandt, 2000). Lindell and Brandt (2000) found climate strength did not provide additional variance beyond the absolute climate level, and thus the hypothesis that climate strength moderated the relationship between absolute climate level and an outcome was not supported (Lindell & Brandt, 2000). However, Feinberg et al. (2005) found that the interaction of TL behaviors and team agreement of those behaviors “account[ed] for an additional 9% of the variance in TL style beyond that accounted for by the main effects” (p. 480). This provides support for the current study’s position that although TL and TL consensus are correlated, the level of dispersion may impact an outcome above and beyond absolute levels of TL. The current study integrates the referent-shift (i.e., TL and innovation climate) and dispersion composition models (i.e., TL consensus and climate strength) into a single model, thus benefiting from the advantages of each model.

**Leadership Consensus and Innovation Climate**

Although there is limited research on TL consensus, the application of dispersion models to LMX, usually referred to as LMX differentiation, has received more attention and provides some insight to understanding TL consensus. For example, Henderson, Wayne, Shore, Bommer, and Tetrick (2008) found that as LMX differentiation increased, the relationship between absolute-level LMX (i.e., the mean level obtained from aggregating individual responses) and psychological contract fulfillment strengthened. In another example, Liden, Erdogan, Wayne, and Sparrowe (2006) studied the interaction between the median LMX level and LMX differentiation on team performance and found significant results at low levels of LMX, but not at high levels. Another study found a significant positive relationship between LMX differentiation and team performance at later times, but insignificant relationships at earlier times (Naidoo, Scherbaum, Goldstein, & Graen, 2011). Ford and Seers (2006) found that the more differentiation in LMX ratings, the more
disagreement existed regarding climate (i.e., supportive management climate and contribution climate). However, no significance was found for the interaction hypothesis that at low absolute LMX and low LMX differentiation, climate agreement would be high. Schyns (2006) found a significant relationship between leader differentiation and job satisfaction when using a single dimension of LMX (i.e., contribution). Although these studies have contributed to understanding the impact that leadership differentiation (i.e., dispersion) can have on various outcomes, there are still many relationships that have yet to be explored more thoroughly, and other applications of dispersion beyond LMX.

One such application is to apply dispersion to other forms of leadership, such as TL. There is some support that TL consensus can influence an organization’s climate. Research has found TL consensus to be positively related to team cohesiveness (Sanders & Schyns, 2006), and cohesion can be considered a component of climate (Xue, Bradley, & Liang, 2011), suggesting TL consensus can influence climate. In addition, Korek and colleagues (2010) provided conceptual support for their finding that TL consensus was positively related to climate, stating that consensus “should be strongly related to organizational climate, because the consensus denotes group members’ perceptions of the quality of their shared social environment” (Korek et al., 2010, p. 372). This thesis extends this research by focusing on a strategic climate as opposed to organizational climate in general. Focusing on a strategic climate demonstrates the specific outcomes that result from TL consensus as opposed to simply looking at whether the resulting climate is generally positive or negative, which is what molar climate measures demonstrate.

In addition to the research on the direct outcomes of TL consensus, researchers have also investigated leadership consensus as a moderator, which is another focus of this thesis. One study analyzing TL consensus as a moderator of the relationship between TL and team empowerment found empowerment was highest when TL and TL consensus were both high (Cole, Bedeian, & Bruch, 2011). Researchers have speculated the importance of studying consensus as a moderator in other relationships as well. DeGroot et al. (2000) reasoned that consensus may be the reason their meta-analysis revealed that team-level outcomes of TL were stronger than individual-level outcomes, stating TL effects may be “stronger when a leader has similar relationships with subordinates or uses a single style to relate to each group” (p. 363). TL consensus may also help to explain how TL attributions can predict TL
behaviors. Researchers found that the highest TL attributions occurred when team consensus was high and transformational leader behaviors were high (Feinberg et al., 2005). The difference in TL attributions at high and low consensus was greatest when TL behaviors were high (Feinberg et al., 2005). The lowest TL attributions occurred when TL behaviors were high and consensus was low (Feinberg et al., 2005). This suggests that having team consensus matters most when TL behavior is high.

Festinger’s (1950) social influence theory supports the importance of leadership consensus. The social influence theory argues that when considering social aspects of the team, the need to form team agreement is strong (Bliese & Britt, 2001; Festinger, 1950). Thus, “one would expect team members to exert pressure to maintain consensus about the quality of group leadership (a social attribute that is not easily verified)” (Bliese & Britt, 2001, p. 427). Hence, when there is low consensus at high TL behaviors, the team’s lack of agreement on the relevant issue of leadership may create conflict among team members that may lead to lower positive outcomes than would occur if the team were in agreement. To support this concept, consider the results by Bliese and Halverson (1998) who found that leadership consensus was positively related to team-level psychological well-being. The authors concluded a lack of consensus “leads to stressful work environments that, in turn, contribute to poor psychological well-being among group members” (Bliese & Halverson, 1998, p. 575). The results of these studies align with Festinger’s (1950) social influence theory and suggest that TL consensus must be considered in addition to absolute levels of TL (Bliese & Halverson, 1998; Feinberg et al., 2005) because the internal conflict that low consensus may cause could affect how TL relates to an outcome.

As previously hypothesized, a transformational leader forms an innovation climate, uniting followers to a common goal towards innovation. This thesis argues that TL consensus will influence this relationship. High TL consensus means that followers share similar perceptions of their leader’s TL, whereas low TL consensus means that followers do not hold similar perceptions regarding their leader’s TL. Some of these differences in perceptions may be due to the behaviors that the leader conveys. TL behaviors are either “evidenced by personal identification with the leader” (Kark, Shamir, & Chen, 2003, p. 254), such as behaviors demonstrating individualized consideration, or “evidenced by social identification with the group” (Kark, et al., 2003; p. 254), such as behaviors demonstrating inspirational
motivation. As such, transformational leaders foster both a collective group atmosphere as well as individualized relationships with each follower. However, a leader may favor certain behaviors over others, influencing the follower perceptions (and thus consensus) of the leader. A transformational leader may emphasize behaviors that foster a group identification (e.g., behaviors representing the inspirational motivation TL component), which could form higher TL consensus among followers because of the “social identification” such behaviors create. When followers have consensus about the leader, this demonstrates they are in agreement regarding the leader and thus share similar perceptions of the leader. As the level of agreement in followers increases (i.e., higher consensus), it suggests that the leader is more consistent in performing TL behaviors. If TL is high and consensus is high, it suggests the leader is consistently high in performing TL behaviors. Thus, the leader is consistent in uniting followers towards a common organizational vision and in inspiring innovation in followers, resulting in a high innovation climate.

When overall the leader is relatively high in TL but there is relatively low consensus among followers regarding TL, the resulting climate should be lower than when both TL and consensus are high. This is because the leader is likely demonstrating transformational behaviors to some followers, but the leader is not consistent in performing TL behaviors to all followers. It may also mean that the leader is exhibiting more “personal identification” behaviors that are differentiated with each follower (e.g., behaviors representing the individualized consideration TL component; Kark et al., 2003) and not the team as a whole. Because the leader is treating followers differently, follower perceptions of the leader may vary (i.e., low consensus) even though the leader is rated as highly transformational overall. Although most followers may observe TL behaviors that encourage support towards what the organization values, some followers may not observe these behaviors and will not be exposed to the same amount of encouragement and understanding of what is valued. These differentiated TL behaviors could have negative repercussions on a team, as past research found differentiated CEO TL was negatively associated with team potency (Zhang, Li, Ullrich, & van Dick, in press). Thus, the combination of high TL and low TL consensus should result in lower levels of innovation climate than high TL and high consensus because followers have not received consistent messages from the leader, and thus do not share similar perceptions about what is valued in the organization.
When TL is low and consensus is high, it suggests the leader is consistently low in performing TL behaviors, and is displaying similarly low behaviors to all followers. Thus, the leader may not be successful in creating an innovation climate because the leader is consistently failing to demonstrate TL behaviors to encourage followers to support innovation and a climate towards innovation. However, when both TL and TL consensus are low, the leader has inconsistently demonstrated TL behaviors to followers. Overall, behaviors in support of innovation are minimal, but the leader may at least demonstrate TL behaviors that inspire support for innovation to some followers. Although not an ideal scenario, the inconsistent support for innovation is likely to produce more positive outcomes in terms of innovation climate than when subordinates are in agreement that support for innovation is low (i.e., when TL is low and consensus is high). Therefore, the present thesis posits the following (see Figure 2):

**Proposed Model for TL, TL Consensus, and Innovation Climate**

![Proposed Model for TL, TL Consensus, and Innovation Climate](image)

*Figure 2. Proposed moderation hypothesis in which the effect of TL on innovation climate is moderated by TL consensus.*

**Hypothesis 2:** The relationship between TL and innovation climate will be moderated by TL consensus such that innovation climate will be highest when both absolute TL and TL consensus are high, and lowest when TL is low and TL consensus is high.
CLIMATE STRENGTH AND ATTITUDES TOWARD INNOVATION

Similar to TL consensus, which addresses the within-team agreement of TL, climate strength captures the within-team agreement of the climate level (Luria, 2008; Roberson et al., 2007; Zohar & Tenne-Gazzit, 2008). At first, researchers were hesitant to embrace climate strength as a construct because it violated what had been considered an underlying assumption of climate: team members should be in high agreement regarding climate perceptions in order for the team-level aggregation to be considered an accurate representation of the construct (Ehrhart et al., 2014). However, once the benefits of the dispersion model were realized, climate strength research grew. As noted by Ehrhart et al. (2014), Lindell and Brandt’s (2000) study provided a foundation for future climate researchers to expand upon by demonstrating that climate strength measures yield a more reliable mean than aggregate climate measures, resulting in higher validity when analyzing how climate relates to other outcomes.

Researchers have typically focused on climate strength’s moderating role. Schneider, Salvaggio, and Subirats (2002) found that a climate’s ability to endure over time depends on the strength of that climate; strong climates persisted longer than weak climates (Luria, 2008; Schneider et al., 2002). Thus, it is important to take the strength of a climate into account (Luria, 2008). Specific climate studies that utilized climate strength as a moderator found numerous positive results. For instance, goal climate strength strengthened the relationship of goal climate on organizational commitment (González-Romá et al., 2002). Goal achievement climate strength strengthened the relationship of goal achievement climate on team member performance and manager performance (González-Romá, Fortes-Ferreira, & Peiró, 2009). Climate strength has been found to correlate with numerous outcomes as well. Examples include research that found service climate strength was positively related to store profitability (Sowinski, Fortmann, & Lezotte, 2008), change information climate strength was negatively related to team stress (Rafferty & Jimmieson, 2010), and change information climate strength was positively related to team well-being (Rafferty & Jimmieson, 2010). As such, climate strength can influence the relationship of climate on an outcome. The current study extends this research model in the context of innovation climate strength.
A strong climate towards innovation suggests that there is consistency regarding the importance of innovation. If the innovation climate is high and strong, followers consistently perceive innovation as valuable to the organization. This thesis posits that followers will then adopt a positive attitude towards the specific innovation that the organization supports because they realize the importance and value of this innovation for the organization. When innovation climate levels are relatively high but climate strength is relatively low, attitudes towards a specific innovation may be weaker because followers are not consistent in their perceptions regarding whether or not the organization supports innovation. A component of climate is that followers share common perceptions about what the organization values. If there is high innovation climate and low strength, this may lower an individual’s positive attitude towards innovation because of the lack of consistency regarding its importance. In addition, this may indicate that the organization’s policies and procedures are inconsistent with regard to their support for innovation, sending unclear messages to employees. As a result, attitudes toward innovation may be lower when a climate is high and weak than when a climate is high and strong.

If the innovation climate is low and strong, followers consistently perceive innovation as not very important to the organization, so the individual-level attitudes toward the innovation may be neutral or even negative because it is not valued by the organization or a measure of organizational success. The innovation may simply get in the way of the follower’s ability to complete tasks, and thus they may not feel positively towards implementing innovations in the workplace. In contrast, if there is a low innovation climate and low strength, there is inconsistency regarding the extent to which follower perceive the organization does not value innovation. There is likely some indication the organization values innovation, but overall the support is not strong. Thus, employees are less inclined to react positively to innovation, but attitudes toward innovation will likely be more positive than when innovation climate is low and strong.

There is past research demonstrating a link between innovation climate, climate strength, and attitudes. For instance, González-Romá et al. (2002) found that innovation climate strength moderated the relationship of innovation climate and work satisfaction. Specifically, they found that the effect of innovation climate on organizational commitment and on work satisfaction was stronger when innovation climate strength was high than when
innovation climate strength was low (González-Romá et al., 2002). Research has also found innovation climate strength moderated the relationship between innovation climate and commitment (González-Romá et al., 2002; Van Vianen, De Pater, Bechtoldt, & Evers, 2011). In other research, Wang, Rode, Shi, Lou, and Chen (2013) studied innovation climate strength as an outcome of the interaction of TL and diversity. They found that when TL was high, there was a positive relationship between group diversity and innovation climate strength, and this relationship reversed when TL was low. Wang et al. (2013) also found that high innovation climate strength increased the relationship between innovation climate and employee creativity when climate strength was high. However, none of these studies focused on a specific innovation in the workplace, as is the addressed in the present study. Based on past research demonstrating that climate strength impacts the relation of a strategic climate to attitude outcomes (i.e., organizational commitment and job satisfaction; González-Romá et al., 2002), the present study predicts the following (see Figure 3):

![Proposed Model for Innovation Climate, Innovation Climate Strength, and Attitudes Toward a Specific Innovation](image)

**Figure 3.** Proposed moderation hypothesis in which the effect of innovation climate on attitudes toward a specific innovation is moderated by innovation climate strength.

**Hypothesis 3:** The positive relationship between innovation climate and attitudes toward a specific innovation will strengthen as innovation climate strength increases such that attitudes toward a specific innovation are most positive when innovation climate is high and strong, and least positive when innovation climate is low and strong.
Overall, this study contributes to the literature on this topic by (1) focusing on employee attitudes towards a specific change; (2) including dispersion models of both leadership and climate in a single model; (3) integrating and extending past research on the relationships among TL, innovation climate, and attitudes by testing the relationships in a single model; (4) applying the study of these issues in the setting of child welfare, and (5) using longitudinal data to test relationships that have typically been studied only cross-sectionally.
CHAPTER 2

METHOD

SAMPLE

This thesis utilized data from a larger scale research project in which home-based services providers from community based private non-profit organizations across Oklahoma participated in the Organizational Readiness for Innovation (ORIN; R01MH072961) study. Data were collected from 359 service providers and supervisors of mental health agencies whose teams were utilizing a specific innovation beginning at some point during the course of the longitudinal study. The average age of participants was 36.11 years (SD = 10.95, range = 22.08-68.74), and the average tenure in the agency was 1.38 years (SD = 2.38, range = 0.00-25.00). Of the participants, 89.9% were women and 10.1% were men. The majority of the participants worked full-time (95.8%) and had an average caseload of 16.51 cases per month (SD = 3.73, range = 0-35). The sample was 66.5% Caucasian, 17.3% African American, 9.2% Native American, 3.9% Hispanic, 0.8% Asian American, and 2.2% reported ‘other.’ Regarding the highest education received, 1.2% reported high school graduate, 3.7% reported some college, 54.2% reported college graduate, 18.6% reported some graduate work, and 22.3% reported master’s degree.

For the purpose of this thesis, the implementation of SafeCare®, an evidence-based practice to reduce or prevent child neglect, was utilized to represent the implementation of a specific innovation in the organization. For a practice to be considered evidence-based, it must be based on the best research evidence, clinical experience, and patient values (American Psychological Association [APA], 2006; Institute of Medicine, 2001). SafeCare was developed based on principles of behavioral analysis from a project (i.e., Project 12-Ways; Lutzker & Rice, 1984) aimed at preventing the abuse and neglect of children by assessing their environment and teaching parents to address problem areas through skill development (Gershater-Molko, Lutzker, & Wesch, 2003). SafeCare is provided in-home for
at risk families and children (Gershater-Molko et al., 2003). It is a structured program that uses measurement of observed behaviors, skill modeling, skill training and practice, and other behavioral intervention methods to achieve outcomes in three areas: (1) child health, (2) parenting, and (3) home safety (Aarons, Sommerfeld, Hecht, Silovsky, & Chaffin, 2009; Gershater-Molko et al., 2003). All participating teams completed training in SafeCare during the longitudinal study, and some were already implementing SafeCare during the first wave of the study.

**PROCEDURE**

Executive leaders in community-based organizations (CBOs) were contacted to engage in the research study and after consent to participate was obtained from each agency, employees were contacted via email to participate in the study. All home visitors were invited to participate, and those agreeing responded to web-based surveys that contained demographic questions as well as questions about their work. Participants were asked for their consent before completing the survey. They were informed that their participation was voluntary and that their responses would be confidential. Each participant received a $40 incentive in the form of a gift certificate to a major online retailer for participating in the survey.

Twenty-five teams participated over the course of the longitudinal study. Descriptive statistics regarding team size across the 12 waves are in Table 1. Teams were identified using organizational charts, as supplied by agency administrators. Due to the nature of the study and its focus on dispersion measures, teams were classified based on employees reporting to their direct supervisor. Thus, all members of a team reported to the same direct supervisor. Participants completed a web-based survey in which they self-selected their direct supervisor from a list of supervisors to provide clarity as to which supervisor the participant was referring to when answering leadership questions. This ensured that all participants of a team reported about the same supervisor.

To complete the web-based survey, each participant was provided a unique username and password via email. The password and username remained the same for each wave of data collected so that responses could be paired to the same participant across all 12 waves of the study. Using the web-based survey allowed participants the opportunity to log on and
Table 1. Team Size Across Waves

<table>
<thead>
<tr>
<th>Wave</th>
<th>M</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>102</td>
<td>90</td>
<td>74</td>
<td>93</td>
<td>100</td>
<td>86</td>
<td>103</td>
<td>101</td>
<td>113</td>
<td>123</td>
<td>108</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>Min.</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<td>2</td>
</tr>
<tr>
<td>Max.</td>
<td>8.2</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Mean</td>
<td>5.3</td>
<td>5.0</td>
<td>4.8</td>
<td>5.1</td>
<td>5.7</td>
<td>4.9</td>
<td>4.5</td>
<td>5</td>
<td>5.1</td>
<td>6.0</td>
<td>5.5</td>
<td>5.8</td>
<td>6.0</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.7</td>
<td>1.5</td>
<td>2.1</td>
<td>1.8</td>
<td>2.2</td>
<td>1.3</td>
<td>1.3</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
<td>1.8</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Note. N is at the individual level and refers to the number of participants in each wave, whereas the remaining rows are referring to the team size for each wave in the data.

complete the survey whenever was convenient for them. The survey took approximately 45 to 90 minutes to complete.

The study collected survey responses from May 2004 until November 2010, totaling six years, six months and 12 days from start to completion. In total, there were 12 waves of data collected, with each wave occurring about every six months. Due to agency scheduling differences, survey waves differed slightly in timing at each agency. Participation rate at each wave never dropped below 90% and averaged > 95% across waves. The appropriate Institutional Review Boards (IRB) granted approval for the original ORIN study (University of California, San Diego, IRB project #071275) and the present study (San Diego State’s Institutional Review Board, IRB project #1908097).

Because the complexity of the data analysis required a large sample size, each participant and team was utilized at multiple time points to maximize the sample size. There were 12 waves in the study. Thus, a team may form multiple data points in the study, depending on how many waves in which the team participated. At a minimum, a team could have one data point if the team had only participated in three consecutive waves (e.g., waves 1-3). This is because the predictor (i.e., TL) was assessed at Time (T) 1, the mediator (i.e., innovation climate) was assessed at T2, and the outcome (i.e., attitudes toward a specific innovation) was assessed at T3. For example, if a participant from a team responded during waves 1 thru 4, then that participant was included in the sample twice: Once to analyze TL at T1, innovation climate at T2, and attitudes toward a specific innovation at T3; and a second time to analyze TL at T2, innovation climate at T3, and attitudes toward a specific innovation at T4. Thus, a team must have participated in at least three consecutive waves of the study in order to be included in the analyses.
At a maximum, a team could have 10 data points if the team had participated in all twelve waves (i.e., the first data point for waves 1-3, the second data point for waves 2-4, the third data point for waves 3-5, the fourth data point for waves 4-6, the fifth data point for waves 5-7, the sixth data point for waves 6-8, the seventh data point for waves 7-9, the eighth data point for 8-10, the ninth data point for 9-11, and the tenth data point for 10-12).

TL consensus was assessed at the same time point/wave as TL. Innovation climate strength was assessed at the same time point/wave as innovation climate. If a participant switched teams during a time sequence (e.g., the participant was in a different team at T1 and T2 than at T3), then that time sequence was not included in the final dataset. Thus, each case contained three time points in which the participant’s team was consistent. There were cases in which the team’s supervisor was not consistent across three consecutive waves. A control variable was created to account for cases in which the supervisor was replaced during a time sequence. In addition, teams began implementing EBP at different time points across the study, and received coaching regarding EBP implementation at different times, forming a 2X2 design. The specific time in which EBP was implemented and whether or not coaching occurred was not the main interest of this thesis, but could be considered potential confounds. As such, control variables were created to account for both EBP and coaching. These variables were coded to account for whether or not EBP and/or coaching was occurring, and if so, at which time point(s) in the sequence (i.e., time 1, time 2, and/or time 3).

**Measures**

The variables of interest for this thesis are TL, innovation climate, and attitudes toward a specific innovation (in this case, SafeCare, an evidence-based practice).

**Transformational Leadership**

TL was measured using four subscales from the Multifactor Leadership Questionnaire 5X (MLQ; Bass & Avolio, 1995). The MLQ is one of the most frequently used measures of TL (Eisenbeiss et al., 2008). Although usually the MLQ anchors refer to frequency of behaviors, the response scale in this study was changed to be consistent with other measures in the survey. As such, participants responded to a 5-point Likert scale ranging from 0 (not at all) to 4 (to a very great extent) to indicate the leadership attributes and behaviors of their leader. These subscales measured the four dimensions of TL, which were previously
described in the introduction. These subscales are Idealized Influence ($\alpha = .93$, eight items, “Instills pride in you for being associated with him/her”), Inspirational Motivation ($\alpha = .90$, four items, “Talks optimistically about the future”), Intellectual Stimulation ($\alpha = .80$, four items, “Re-examines critical assumptions to question whether they are appropriate”), and Individualized Consideration ($\alpha = .88$, four items, “Spends time teaching and coaching”). The overall Cronbach’s alpha reliability was excellent ($\alpha = .96$). Positive manifestation, in which the participant responds similarly positively or negatively to all subscales within the composite measure, is a common occurrence across these subscales, and past research often combines them to form a composite TL measure. This thesis also combined the four subscales to form a composite TL scale. In order to form the team-level measure of TL, the mean from all employees within a team was used to represent the team-level response. Appendix A contains the full TL measure utilized in this thesis.

**Innovation Climate**

Innovation climate was assessed using the Organizational Support for Innovation subscale from the Team Climate Inventory (Anderson & West, 1998). Team members responded to eight items using a 5-point Likert scale that ranged from 0 (not at all) to 4 (a very great extent) to respond about innovation in the organization (e.g., “This team is always moving toward the development of new answers”). The Coefficient alpha was good ($\alpha = .96$). Similar to the TL measures, innovation climate is a team-level variable and thus was computed using the mean score obtained from employee responses within a team. Appendix B contains the full innovation climate measure utilized in this thesis.

**Attitudes Toward a Specific Innovation**

The specific innovation measured was SafeCare, an evidence-based practice. As such, the 15-item Evidence-Based Practice Attitude scale (EBPAS; Aarons, 2004) was utilized to assess each individual’s attitudes towards the adoption of a new innovation, an evidence-based practice in the organization. The measure contained four subscales, which can be combined to form an overall composite attitude score. This measure utilized a 5-point Likert scale that ranged from 1 (not at all) to 5 (to a very great extent). The four subscales are Appeal ($\alpha = .87$, four items, “It was intuitively appealing?”), Requirements ($\alpha = .94$, three items, “It was required by your supervisor?”), Openness ($\alpha = .87$, four items, “I like to use
new types of therapy/interventions to help my clients”), and Divergence ($\alpha = .69$, four items, “I know better than academic researchers how to care for my clients”). The Divergence scale was reverse-coded before including it in the composite EBPAS measure. The coefficient alpha for the full 15-item measure was good ($\alpha = .84$). This thesis addresses each individual’s attitudes toward an innovation, and as such individual-level responses were used based on the self-rated data from the online survey. Appendix C contains the full EBPAS measure utilized in this thesis.

**Dispersion Measures**

In addition, dispersion measures were calculated for the TL and innovation climate measures. Numerous methods have been used to measure the level of agreement within teams. However, Roberson et al. (2007) argued that “the standard deviation is the most effective index for assessing within-group consensus” (p. 587) for the purpose of detecting interactions/moderation effects. Roberson et al. (2007) conducted a simulation study comparing different dispersion measurement techniques (i.e., coefficient of variation measures, standard and average deviation, interrater agreement indexes). The coefficient of variation has low likelihood of detecting true relationships (Bedeian & Mossholder, 2000) and interaction effects (Roberson et al., 2007), and the normalized coefficient of variation performs worse at detecting interactions than most other indexes (Roberson et al., 2007). Another way to measure consensus is to use interrater agreement indexes. However, when the purpose is to detect interaction effects, both the alternative interrater agreement ($a_{wg}$) and revised interrater agreement ($r_{wg}$) indexes do not perform as well as the standard and average deviation indexes (Roberson et al., 2007). In addition, the standard and average deviation indexes outperform the coefficient of variation methods for detecting interactions (Roberson et al., 2007). Roberson et al. (2007) concluded that in comparison to average deviation, “standard deviation has a higher likelihood of detecting significance when strength or interaction effects are present” (p. 584). Following Roberson et al.’s (2007) recommendation, researchers now commonly use the standard deviation to measure dispersion of leadership (e.g., LMX differentiation, Le Blanc & González-Romá, 2012) and climate (e.g., team procedural justice climate strength, Roberson & Williamson, 2012; change participation climate strength, Rafferty & Jimmieson, 2010). Similarly, the present study utilized the
standard deviation of each team in order to calculate TL consensus and innovation climate strength scores. Low scores will indicate high consensus and strength, and high scores will indicate low consensus and strength. To ease interpretability of results, scaled variables for TL and innovation climate were mean centered.

One difficulty with measuring dispersion is that there is a Gaussian inverted u-shaped distribution regarding TL and innovation climate overall ratings such that it is less plausible to have a team high in mean ratings and in dispersion than it is to have a team that is high in mean ratings and low in dispersion. To illustrate the data as it relates to dispersion and mean ratings, scatterplots of the level-2 (teams at a specific time point) data have been created for both TL and innovation climate (Figures 4 and 5, respectively). These scatterplots were divided into quadrants based on a median-split of the team-level data in order to demonstrate the distribution of data across combinations of mean and dispersion ratings. In general, these graphs show a range of dispersion values across the range of the TL and climate mean scores.

![Figure 4. Scatterplot of overall TL (measured using the mean) and TL consensus (measured using SD). Note: Quadrants were determined based on a median-split of team-level distribution.](image-url)
Figure 5. Scatterplot of overall innovation climate (measured using the mean) and innovation climate strength (measured using SD).

Note: Quadrants determined based on a median-split of team-level distribution.

ANALYSES

Descriptive and correlational statistics were utilized in the initial analysis. Data were normally distributed for the variables of interest (i.e., TL, innovation climate, and attitudes toward a specific innovation). Descriptive statistics are presented in Table 2. Hypotheses were tested using multilevel modeling in which employees were nested within their teams. Team membership was classified based on the reporting relationships of employees to their primary supervisor. Team-level variables were TL, TL consensus, innovation climate, and innovation climate strength. Attitudes toward a specific innovation was an individual-level variable.

Multilevel analyses in Mplus utilizing maximum likelihood estimation (Muthen & Muthen, 2010) was used to analyze the data and to properly account for the nesting of individuals within teams across 12 waves. Because of the unique structure of the dataset, three-level random effects analysis was used. Specifically, individuals were nested in wave-specific teams that were then nested under overarching team clusters that remained stable over the course of the study. Individuals sometimes switched teams midway through a set of
Table 2. Descriptive Statistics

<table>
<thead>
<tr>
<th>Construct</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL Mean</td>
<td>0.20</td>
<td>3.76</td>
<td>2.71</td>
<td>0.57</td>
</tr>
<tr>
<td>TL Consensus</td>
<td>0.02</td>
<td>2.39</td>
<td>0.69</td>
<td>0.26</td>
</tr>
<tr>
<td>Innovation Climate Mean</td>
<td>0.25</td>
<td>3.58</td>
<td>2.46</td>
<td>0.53</td>
</tr>
<tr>
<td>Innovation Climate Strength</td>
<td>0.00</td>
<td>1.52</td>
<td>0.74</td>
<td>0.27</td>
</tr>
<tr>
<td>Attitudes toward specific innovation</td>
<td>1.00</td>
<td>4.00</td>
<td>2.70</td>
<td>0.60</td>
</tr>
</tbody>
</table>

*Note.* The descriptive statistics for TL and Innovation Climate constructs are based on assigning the level-2 team scores to the individuals in those teams. TL Consensus and Innovation Climate Strength were measures using SD. Higher values measured using the SD represent lower consensus and lower strength.

consecutive waves (e.g., the participant was in team 1 at time 1 and 2, but was relocated to team 2 at time 3). To account for these changes, only instances in which a participant was in the same team for three consecutive waves were included in the dataset. There was also a repeated measures structure to this dataset; an individual may form multiple cases in the dataset because the person participated in multiple sets of three timepoints (e.g., waves 7, 8, and 9; and waves 10, 11, and 12). Thus, even though conceptually the questions of interest are at two levels, three levels were specified in the analyses to account for the unique structure of the data. Twenty-five unique teams (overarching teams across all waves; level 3) formed 177 team-level data points (wave-specific teams; level 2) from 462 individual-level data points (wave-specific individuals; level 1), of which these points were developed from 359 total participants. Information regarding team size across all 12 waves of the study is available in Table 1. This thesis examined the extent that TL (level-2 predictor variable) and innovation climate (level-2 mediator variable) are related to attitudes toward a specific innovation (level-1 outcome variable). In addition, this thesis addressed the moderating effect of TL consensus (level-2 moderator variable) on the relationship between TL and innovation climate as well as the moderating effect of innovation climate strength (level-2 moderator variable) on the relationship between innovation climate and attitudes toward a specific innovation. Innovation climate was also assessed as a mediator of the relationship between TL and attitudes toward a specific innovation, forming an upper-level 2-2-1 mediation model. The asymmetric confidence interval test available in RMediation (Tofighi & MacKinnon, 2011), which expands beyond the original PRODCLIN program developed by MacKinnon, Fritz, Williams, & Lockwood (2007), was utilized to test the partial mediation hypothesis. Preacher, Zyphur, and Zhang (2010) described this distribution of the product...
method for assessing mediation in their article that provided a framework for assessing multi-level mediation.
CHAPTER 3

RESULTS

PRELIMINARY STATISTICAL ANALYSIS

The means and standard deviations for the variables in the hypothesized model are included in Table 2. A correlation matrix for all variables of interest is included in Table 3, and this table also includes reliabilities for the overall scales. Note that in both tables, level-2 team scores were assigned to the individuals in those teams. Note also that all correlations with consensus and climate strength must be interpreted in line with their operationalization using the standard deviation of the scales. Thus, more consensus or strength is indicated by lower values of these measures. The strongest correlation was between TL and innovation climate ($r = .50, p < .01$). TL was also correlated with TL consensus ($r = -.29, p < .01$), such that as overall TL ratings increased, consensus increased. TL consensus was correlated with both innovation climate ($r = -.16, p < .01$) and innovation climate strength ($r = .12, p < .05$). In addition, innovation climate was correlated with innovation climate strength ($r = -.12, p < .05$), such that as overall innovation climate ratings increased, strength increased. Innovation climate was correlated with attitudes toward a specific innovation ($r = .17, p < .01$). TL was also significantly related to attitudes toward a specific innovation ($r = .10, p < .05$).

MODEL TESTING

The results of the hypothesized model (Model 1) are presented in Figure 6. The results were mixed for the components of Hypothesis 1. The effect of TL on innovation climate (path a) was significant ($B = .424, p < .001$), supporting Hypothesis 1a. The direct path from TL to attitudes toward a specific innovation was not significant ($B = .039, p > .05$). Thus, Hypothesis 1b was not supported. In addition, the effect of innovation climate on attitudes toward a specific innovation (path b) was not significant ($B = .070, p > .05$); thus, Hypothesis 1c was not supported. The mediation hypothesis was tested using RMediation,
Table 3. Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. TL Mean</td>
<td>(.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. TL Consensus</td>
<td>-.29**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Innovation Climate Mean</td>
<td>.50**</td>
<td>-.16**</td>
<td>(.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Innovation Climate Strength</td>
<td>0.01</td>
<td>.12*</td>
<td>-.12*</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5. Attitudes Toward Specific Innovation</td>
<td>.10*</td>
<td>-0.07</td>
<td>.17**</td>
<td>0.01</td>
<td>(.84)</td>
</tr>
</tbody>
</table>

Note. The correlations for the TL and Innovation Climate constructs are based on assigning the level-2 team scores to the individuals in those teams. TL Consensus and Innovation Climate Strength were measures using SD. Higher values measured using the SD represent lower consensus and lower strength. Reliabilities are included in parenthesis, and were calculated at the individual-level.

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Figure 6. Summary of the results of the hypothesized moderated mediation model (Model 1).
*Correlation is significant at the 0.05 level (2-tailed).
***Correlation is significant at the 0.001 level (2-tailed).

which expands beyond the program, PRODCLIN, for testing mediation (MacKinnon et al., 2007).

RMediation computes the confidence intervals (CIs) “for the distribution of the product of two normal random variables” (Tofighi & MacKinnon, 2011, p. 699) and was developed based on MacKinnon’s et al. (2002) article. Confidence intervals were computed in RMediation using the mediation indirect path coefficients and standard errors for both path a and path b. The results revealed that for $\hat{a} = 0.424$ (SE = 0.062) and $\hat{b} = 0.07$ (SE = 0.093), the indirect effect estimate is 0.029(SE = 0.039). The distribution of the product of coefficients method 95% CI is [-0.05, 0.106]. Because the confidence interval contained zero, the results were not significant, and Hypothesis 1d that the relationship between TL and
attitudes toward a specific innovation would be partially mediated by innovation climate was not supported.

Hypothesis 2 predicted that the relationship between TL and innovation climate would be moderated by TL consensus such that innovation climate will be highest when both absolute TL and TL consensus were high, and lowest when TL was low and TL consensus was high. MPlus multilevel analysis was used to test this hypothesis, and found that the positive relationship between TL and innovation climate was significantly moderated by TL consensus ($B = -0.378, p = .010$). As shown in the graph in Figure 7, as TL consensus increased, the positive relationship between TL and innovation climate strengthened, supporting Hypothesis 2. Specifically, the highest innovation climate occurred when overall TL and TL consensus were high, and the lowest innovation climate occurred with TL overall was low and TL consensus was high; Hypothesis 2 was fully supported.

![Graph](image)

**Figure 7. Results of Hypothesis 2; the positive relationship between TL and innovation climate was moderated by TL consensus.**

Hypothesis 3 predicted that the positive relationship between innovation climate and attitudes toward a specific innovation would strengthen as innovation climate strength increased such that attitudes toward a specific innovation would be most positive when innovation climate was high and strong, and least positive when innovation climate was low and strong. The Mplus multilevel analysis result was not significant ($B = .149, p > .05$), and thus Hypothesis 3 was not supported.
Review of the scatterplot distribution of TL mean and consensus scores demonstrated one extreme data point ($M = 1.94$, $SD = 2.39$), which was located in the low TL mean and low TL consensus quadrant. When this team was omitted from the analyses, similar patterns in results emerged for most hypotheses. TL predicted innovation climate ($B = .429$, $p < .001$), and did not directly predict attitudes toward a specific innovation ($B = .048$, $p > .05$). Consistent with previous results, the partial mediation hypothesis (Hypothesis 1) was not supported; for $\hat{a} = 0.429$ (SE = 0.064) and $\hat{b} = 0.065$ (SE = 0.094), the indirect effect estimate was 0.027 (SE = 0.04), and the distribution of the product of coefficients method 95% CI was [-0.053, 0.107]. Consistent with previous results, the innovation climate interaction hypothesis (Hypothesis 3) was not supported ($B = .162$, $p > .05$). Contrary to previous results, the transformational leadership interaction hypothesis (Hypothesis 2) was not significant ($B = -.323$, $p > .05$).

**ADDITIONAL MODEL ANALYSES**

An additional model (Model 2) was tested to determine whether a full mediation model would better fit the data than the hypothesized partial mediation model (Model 1). Thus, Model 2 contained the same relationships as were hypothesized in Model 1, except that the direct path from TL to attitudes toward a specific innovation was removed. The results of Model 2 are depicted in Figure 8. The pattern of results for Model 2 did not differ from that of Model 1. The effect of TL on innovation climate (path a) was significant ($B = .424$, $p < .001$), supporting Hypothesis 1b, and the effect of innovation climate on attitudes toward a specific innovation (path b) was not significant ($B = .086$, $p > .05$), and Hypothesis 1c was not supported.

RMediation was used to test the mediation. For $\hat{a} = 0.424$ (SE = 0.062) and $\hat{b} = 0.086$ (SE = 0.086), the indirect effect estimate is 0.036 (SE = 0.037). The distribution of the product of coefficients method 95% CI is [-0.035, 0.112]. Because the confidence interval contained zero, the results could not be determined to be better than chance, and were not significant. Thus, Hypothesis 1d was still not supported after removing the direct effect of TL on attitudes toward a specific innovation. Consistent with the results of Model 1, the results of Model 2 supported Hypothesis 2 and did not support Hypothesis 3. Specifically regarding Hypothesis 2, the positive relationship between TL and innovation climate was significantly
Figure 8. Summary of the results of Model 2.

*Correlation is significant at the 0.05 level (2-tailed).

***Correlation is significant at the 0.001 level (2-tailed).

moderated by TL consensus and the results (and graph) were exactly the same as with Model 1. The results for Hypothesis 3 were not significant in Model 2 ($B = .139, p > .05$).

**MODEL COMPARISON**

In order to determine which model had better fit, a chi-square difference test was conducted. To compare multilevel models, Satorra’s (2000) Satorra-Bentler scaled chi-square difference test is needed, which uses a scaling correction to better approximate the chi-square difference. To compare models using the Satorra-Bentler method, first the difference test scaling correction (cd) must be computed. To calculate the cd, the following formula is utilized: $cd = (d0 * c) - d1*c1) / (d0-d1)$. In this formula, $d0$ represents the degrees of freedom in the nested model, which is the more restrictive model with more degrees of freedom (Model 2), and $d1$ represents the degrees of freedom in the comparison model, which is the model with fewer degrees of freedom and is less restrictive (Model 1; the hypothesized model). The scaling correction factor is represented as $c0$ for the nested model (Model 2) and as $c1$ for the comparison model (Model 1). Once the cd is calculated, the second step is to calculate the Satorra-Bentler scaled chi-square difference (TRd), taking into account the difference test scaling correction (cd). This second formula is as follows: $TRd = (T0*c0) - (T1*c1) / cd$. In this formula, $T0$ represents the chi-square value for the nested model (Model 2), and $T1$ represents the chi-square value for the comparison model (Model 1).

The above formulas were used to compare the nested model (Model 2), in which a moderated full mediation was tested, to the comparison model (Model 1; the hypothesized model), in which a moderated partial mediation was tested. The nested model’s chi-square
value was $\chi^2 (5) = 1.655$, and the scaling correction factor was 2.199. The comparison model’s chi-square value was $\chi^2 (4) = 1.377$, and the scaling correction factor was 2.397. The Satorra-Bentler scaled Chi-Square difference test was TRd (1) = .241, $p = .624$. Thus, the Satorra-Bentler scaled Chi-Square difference test was not significant, and the most parsimonious model represents the better fitting model. Therefore, the full mediation model (Model 2) was the better-fitting model.

**Exploratory Analyses**

To determine if certain dimensions of TL were more predictive of innovation climate and attitudes toward a specific innovation, exploratory analyses of the proposed model were conducted. Each dimension of TL was entered into the model individually in separate analyses. The results paralleled that of the TL composite scale; the direct effect of TL to innovation climate was significant and in the same direction for all subscales (i.e., individualized consideration, $B = .382$, $p < .001$; idealized influence, $B = .341$, $p < .001$; inspirational motivation, $B = .422$, $p < .001$; and intellectual stimulation, $B = .434$, $p < .001$). In addition, the interaction of TL overall and TL consensus was significant for two of the four subscales (i.e., inspirational motivation, $B = -.253$, $p = .033$; and intellectual stimulation, $B = -.411$, $p = .002$). The overall pattern of relationships for the inspirational motivation interaction graph and for the intellectual stimulation interaction graph was very similar to that found for the graph for the composite TL scale, which is shown in Figure 7. When the extreme data point previously described ($M = 1.94$, $SD = 2.39$; located in the low TL mean and low TL consensus quadrant) was removed from the dataset, all the direct effects remained significant (i.e., individualized consideration, $B = .377$, $p < .001$; idealized influence, $B = .348$, $p < .001$; inspirational motivation, $B = .421$, $p < .001$; and intellectual stimulation, $B = .443$, $p < .001$). However, the two interactions that had previously been significant (i.e., the intellectual stimulation interaction and the inspirational motivation interaction) were no longer significant (i.e., inspirational motivation, $B = -.204$, $p > .05$; and intellectual stimulation, $B = -.330$, $p > .05$).
CHAPTER 4

DISCUSSION

The purpose of this thesis was to expand research on TL and innovation climate by integrating dispersion measures of each construct and examining how both the level and dispersion of these variables work together to predict attitudes towards a specific innovation. A leader’s transformational behaviors, along with how followers perceive these behaviors, can determine the extent to which a leader is able to cultivate focused climates in an organization. This thesis examined the role of transformational leaders in developing an innovation climate by analyzing both the average rating of leaders by their teams and the consistency in those perceptions within each team (i.e., TL consensus). In addition, it examined how a team’s average perception of the climate and consistency in these perceptions (i.e., innovation climate strength) may influence individual-level attitudes regarding a specific innovation within the organization. Overall, there was mixed support for the hypothesized model.

Hypothesis 1a-d addressed the direct effects among TL, innovation climate level, and follower attitudes. Hypothesis 1a addressed the relationship between TL and attitudes toward a specific innovation; it was not supported. This is inconsistent with past research that analyzed leadership attributes that lead to positive attitudes toward general change (e.g., Bommer et al., 2005; Cindy, et al., 2007; Qian & Daniels, 2008; Rafferty & Simons, 2006). Hypothesis 1b was supported; TL positively predicted innovation climate, consistent with past research (Aarons & Sommerfeld, 2012; Jung, et al., 2008; Sarros, et al., 2008). Hypothesis 1c was not supported; innovation climate did not predict followers’ attitudes toward a specific innovation, contrary to previous research (Aarons & Sommerfeld, 2012). Hypothesis 1d that innovation climate would partially mediate the relationship between TL and attitudes toward a specific innovation was also not supported. In addition, the hypothesized moderated partial mediation model (Model 1), which included the direct effect
of TL on attitudes toward a specific innovation, did not fit the data significantly better than the moderated full mediation model (Model 2). Together, these results show that although a leader does have some influence over the innovation climate, neither TL nor innovation climate influenced followers’ perceptions about innovation, suggesting that other factors may overpower a leader’s ability to affect followers’ attitudes regarding a specific innovation.

If the innovation directly impacts the follower’s role and work processes, making the innovation central to the follower’s job, the leaders’ ability to influence these attitudes could become limited and secondary to other more central factors related to the EBP or followers’ responses to it. The specific innovation of interest in this study, the EBP of SafeCare, substantially influenced followers’ work because it altered the foundation for how they implement services to their clients. The centrality of EBP to followers’ work functions, and the extent to which it changed their work processes, may have caused individual-level factors (e.g., personality traits and emotional intelligence, as studied in Vakola, Tsaousis & Nikolaou, 2004; or occupational stress as studied in Vakola & Nikolaou, 2005), to prevail over the influence that the leader or climate had on follower attitudes. For instance, if a new innovation substantially impacts a follower’s job, and the follower is low on the personality trait openness to experience, which “concerns the degree to which an individual is creative, curious, and cultured” (Cascio & Aguinis, 2011, p. 212), the individual may be less likely to react positively towards the innovation than if the innovation was less direct in impacting the follower’s work functions. Past research findings support the concept that openness to experience can lead to more positive attitudes toward change (Vakola, et al., 2004). Another example is tolerance for ambiguity, which is positively associated with resistance to change (Oreg, 2003), suggesting that those who are less comfortable with ambiguity may perceive EBP less positively because the innovation may bring about uncertainty in how to perform new functions of their job.

It may also be that the perceptions of the innovation itself impact followers’ attitudes towards it. If the follower disagrees with the purpose of EBP, or with certain components of SafeCare, than it would be more difficult to influence their attitudes towards this innovation, regardless of the transformational qualities of that follower’s leader. Future research could investigate a variety of types of innovation to determine if the severity and characteristics of the innovation, along with follower individual differences, determines whether or not a leader
or climate has influence on followers’ attitudes of that innovation. In cases in which the innovation is less central to a follower’s direct work functions, the follower may identify less with the impact of the innovation on him/herself individually, and be more susceptible to the influence of the leader and climate, allowing the leader’s behaviors and the organization’s climate to shape follower attitudes regarding that innovation above and beyond the influence of followers’ individual differences.

It may also be that the follower perceives that the climate is supportive of innovation in general, but may be less supportive of the specific innovation of interest. For instance, if followers perceived that the organization supports most change, but its policies, procedures, and structure are not conducive to EBP, then followers’ may be mixed in their attitudes regarding that EBP. Followers may also distinguish between what the organization supports, and what they support as individuals. EBP, the specific innovation of interest for this thesis, is a drastic shift in how followers provide services to their clients because EBP de-emphasizes the role of service providers’ intuition in developing a treatment plan and instead focuses more on empirical findings to dictate treatment (Spring, 2007). Thus, some followers who are fundamentally opposed to this model for providing services may perceive EBP negatively even when they are aware that their organization, and thus the climate, is supportive of the innovation. Future research could consider matching the climate with the innovation of interest by studying a climate specific to EBP instead of innovation climate. A climate specific to EBP would be more focused on the specific innovation occurring in that organization, and thus may better predict followers’ attitudes towards the EBP. Alternatively, researchers could investigate how innovation climate relates to followers’ attitudes toward innovation in general.

Beyond the direct effects, Hypotheses 2 and 3 introduced the moderating role of dispersion constructs in the hypothesized relationships. Hypothesis 2, that TL consensus would moderate the relationship between TL and innovation climate, was supported. The highest levels of innovation climate were when overall TL and TL consensus were both high, and the lowest levels occurred when overall TL was low and TL consensus was high. Therefore, is important to cultivate high TL consensus in addition to high overall ratings of TL, as differences can result when a team agrees about the transformational qualities of their leader as compared to when a team is not in agreement. Other research has also found
Hypothesis 3 was not supported; innovation climate strength did not moderate the relationship between innovation climate and attitudes toward a specific innovation. This result is inconsistent with previous research on the moderating influence of innovation climate strength on innovation climate and attitudes (González-Romá et al., 2002; Van Vianen, et al., 2011). However, these previous studies did not focus on attitudes regarding change or a specific innovation, as was the focus of this thesis. Innovation climate strength is the agreement that followers within a team have regarding the innovation climate within the organization. It may be that a follower’s individual attitudes toward a specific innovation are not influenced by innovation climate strength because the follower is able to distinguish his/her own attitudes regarding a specific innovation as separate from the team’s perception. It may also be that the pattern of the dispersion within the team influences whether or not dispersion impacts individual follower attitude. For instance, it may be that almost all members agree about the organization’s climate, but that a few outliers differ in their perceptions. Or, it may be that there are subgroups within in the team such that the distribution is bimodal regarding the organization’s climate. Depending on this pattern of dispersion, different individual attitudes towards the innovation may result.

Past research has found support that individual outcomes differ depending on the leadership dispersion pattern present within a team (Li & Liao, 2014), and that team level outcomes differ depending on the climate dispersion pattern within that team (González-Romá & Hernández, 2014). Li and Liao (2014) studied patterns of dispersion in LMX, termed LMX differentiation. Specifically, they analyzed how bimodal LMX configuration (differentiation in which two similarly sized subgroups exist), fragmented LMX configuration (differentiation in which most members have distinct ratings of the leader and there is a lot of heterogeneity in responses), minority LMX configuration (differentiation in which only a few members differ from the rest of the team), and shared LMX configuration (i.e. low or no differentiation teams) moderated the relationship between LMX quality (i.e., individual-level LMX rating) and individual-level role engagement. Their results suggested that the effect of LMX quality on role engagement differed depending on the LMX configuration within the team, supporting the theory that the pattern of the dispersion may
influence individual-level outcomes. As previously explained in the social influence theory, in situations in which a person depends on social reality to validate his/her opinions, as is the case in leadership or climate perceptions, “an attitude is ‘correct,’ ‘valid’ and ‘proper’ to the extent that it is anchored in a group of people with similar beliefs, opinions, and attitudes” (Festinger, 1950, p. 272-273). Thus, if a follower’s team is differentiated with a minority pattern in which that follower perceived the climate differently than all other team members who perceive the climate similarly, then that follower’s attitude may be more influenced by the team’s perceived innovation climate than if the follower were in a differentiated team with a bimodal pattern. Thus, Hypothesis 3 may be inconclusive not because climate strength is not a factor, but because its effect is being masked by differential effects that could be occurring from different patterns of dispersion. In another study, the team’s communication quality was lower and task conflict was higher when the team’s climate was nonuniform with weak dissimilarity (a climate low in strength with no more than one subgroup) than when the team’s climate was uniform (a climate high in strength) (González-Romá & Hernández, 2014). No significant results were found for a nonuniform climate with a strong dissimilarity (a climate low in strength with more than one subgroup; González-Romá & Hernández, 2014). Future research could investigate the role of dispersion patterns in innovation climate strength and TL consensus to determine its influence on innovation outcomes.

Exploratory analyses of each dimension of TL revealed that each dimension directly predicted innovation climate. Regarding the interactions, the idealized influence interaction and the inspirational motivation interaction were significant, and followed the same pattern of results as that found for the composite TL scale. This suggests that different dimensions of TL may influence innovation climate to different degrees.

**LIMITATIONS AND FUTURE RECOMMENDATIONS**

One limitation of this thesis was the complexity of the repeated measures data structure. Although this was a strength in that including the same individual at multiple time points increased the sample size, it also created a cross-classified nested structure within the dataset in which followers were nested both within and across teams. This is because followers sometimes switched teams across the 12 waves of the study, as is common in similar behavioral health and social service settings. Thus, team composition was not
consistent across waves, and it was not possible to account for the nesting of individual followers across teams across waves, particularly due to the small level 3 sample size ($n = 25$) and lack of power. However, the three-level analysis did nest individuals within time-specific teams within overall teams, accounting for the longitudinal aspect of the study. Future research should utilize a longitudinal design as was done in this study, but do so in a sample in which team composition is more stable across time to sufficiently account for individual-level nesting and any cross-classified analysis issues (Cafri, Hedeker, & Aarons, in press).

Another limitation is the small team-level samples for each quadrant of TL overall and consensus (see Figure 4). For instance, the mean on TL tended to be high, so there were relatively few low TL teams with high or low consensus. In addition, one extreme point from this quadrant played a crucial role in determining the results of the hypothesis. When this team was removed, the TL interaction hypothesis was no longer significant. Similarly, when this team was removed from the exploratory analyses that analyzed each dimensions of TL separately, none of the TL interactions were significant. These non-significant findings may be a result of having insufficient power to detect true effects. The sample size was relatively small considering the complexity of the three-level analyses. A bigger sample in which there were more teams and each team was larger and there would be more opportunity for followers within each team to vary may have increased the power enough to determine significance. Future studies utilizing a larger sample size with more variability in TL mean and censuses responses are needed to provide further support for the TL interaction hypothesis.

This thesis utilized a sample of child welfare service providers to analyze how leadership and climate dispersion predict individual attitudes toward a new innovation in the form of EBP. Other areas of behavioral health are also adopting EBP as an innovative method for providing services to clients. Future research could expand on this study to determine the influence of leadership and climate in follower attitudes towards EBP in other behavioral health settings such as mental health or substance use disorder treatment to determine if these results can be replicated and to increase the generalizability of the results. In addition, researchers could analyze different types of innovations to determine how leadership and climate dispersion impact followers’ attitudes towards other innovations. As
previously speculated, it may be that the impact and centrality of the innovation to the follower’s work functions determines the extent to which absolute measures and dispersion measures of leadership and climate impact follower attitudes.

TL was measured by creating a composite score that averaged across the four components of TL. Although this is a strength in that it represents the conceptualization of TL as it is in the literature, it may be that certain components of TL are more influential than others in affecting follower perceptions regarding innovation climate and attitudes toward a specific innovation, which is why this thesis conducted exploratory analyses of each dimension of TL. Future research could create a latent TL variable to differentially weight each component of TL mathematically as opposed to weighting each component equally. Using latent variables would remove measurement error and would improve the strength of the power, increasing the ability to detect true effects. Another option would be for future research to further examine how each component of TL impacts innovation outcomes individually, as was done in the exploratory analyses of this thesis. Although the effects were fairly consistent across the TL dimensions in the exploratory analyses for this study, theoretically the intellectual stimulation component of TL should be more influential in impacting innovation climate and attitudes than other TL components because this component is regarding the leaders’ behavior of challenging follower’s to think creatively and problem solve (Bass et al., 1987), which could encourage innovation in followers. It may also be that different dimensions of TL may be more beneficial when studying different types of climate. Future research could investigate the relationship of each TL dimension as it relates to other types of strategic climate.

As previously suggested, researchers could look at dispersion patterns of TL consensus and innovation climate strength to determine how different configurations of dispersion may impact outcomes differently. Although this study focused on TL consensus, it did not distinguish between whether this consensus was a result of leader behaviors or a result of follower perceptions regarding that leader. Future studies could examine how each contributes to follower consensus within a team. In addition, future research could extend the current model to include innovation implementation, as research supports the concept that follower attitudes regarding change lead to change implementation (Aarons & Sommerfeld, 2012; Vakola & Nikolaou, 2005). Future research could consider matching the type of
climate being studied with that of the innovation of interest, such as by studying a climate for EBP as it relates to follower attitudes toward EBP, or innovation climate as it relates to follower attitudes towards general innovation.

**Research Implications**

This research addresses the critical role of TL consensus, a construct that is in its early stages of development, in determining team-level outcomes. The results demonstrate that team consensus plays an important part in determining outcomes, bringing into question the relevancy of continuing to study team-level TL using only the mean. One difficult question that is raised by this thesis and other research on leadership dispersion is whether research on TL as measured by the mean is meaningful. Past researchers that aggregated followers’ scores, dismissing variance as error, over-simplified the contextual factors that can determine whether or not a leader is effective (Cole, Bedeian, & Bruch, 2011). Consensus measures take into account the role of the follower. In accordance with the argument made by other leadership consensus researchers (Cole, Bedeian, & Bruch, 2011), this thesis suggests that measuring the TL mean should not be considered obsolete, nor should it be considered sufficient. It is the exchange between the leader and followers that contributes to the follower attributions of TL; it is not just the mean-level of leaders’ behaviors or the followers’ consensus regarding these behaviors, but the interplay of the two that shapes that process of TL and its effect on outcomes (Cole, Bedeian, & Bruch, 2011). If there is strong agreement within the team regarding the leader, then studying the mean will provide adequate information regarding the relationship between the leader and an outcome (though consensus may still influence the strength of the relationship, as was found in this thesis). However, when there is not agreement within the team regarding the leader’s transformational behaviors, taking consensus into account is necessary to truly understand the effect that the leader is having on the team and how it will shapes outcomes.

It is also necessary to take the situational context into account when studying consensus. For issues of importance and in situations involving social attributes that are difficult to assess through observation, consensus of follower responses is one method for followers to assess the quality of that social attribute (Bliese & Britt, 2001; Festinger, 1950). Leadership is one example of a social attribute that cannot be easily verified through
observation alone, causing follower consensus to play an important role in defining the effectiveness of that leader (Bliese & Britt, 2001). In cases in which the situation does not directly affect the follower’s role, or in which observations are sufficient for making conclusions about that construct, consensus may not have a part in influencing the absolute-level of that construct on an outcome.

The results of this research demonstrate that it is not only absolute-level TL, but also the consensus of that leadership that matters. Thus, having consistent follower perceptions of the leader is needed to achieve the highest innovation climate outcomes, suggesting that leaders should demonstrate transformational behaviors consistently to all followers. Having consistent leadership in which a leader exhibits the same transformational behaviors to all followers assumes that all followers within a team require the same behaviors from their leader. However, the most appropriate leadership approach to utilize within a team may depend on individual factors specific to each follower within that team such that the leader should individualize his or her leadership approach to match each follower’s needs. This is consistent with situational theories of leadership, such as that proposed by Tannenbaum and Schmidt (1958), which suggested situational factors should be considered by leaders when determining a leadership style, and that of Hersey and Blanchard (1982), which furthered this approach by focusing on the follower in determining the most appropriate leadership approach. Vroom, Yetton, and Jago’s contingency models (Vroom & Yetton, 1973; Vroom & Jago, 1988) also describe the importance of the situation and context in determining the most appropriate approach to leadership (Vroom & Jago, 2007). The immensity of studies incorporating leadership and situational factors, including the role of the follower, demonstrates the importance of understanding leadership as behaviors that can adapt to the particular context at hand. As such, creating consensus in followers in order to lead to better outcomes may be more complicated than simply demonstrating the same transformational behaviors consistently to all followers.

In any case, this thesis furthers the conversation regarding the importance of understanding how dispersion can impact the effect that team-level constructs have on outcomes. The results of this thesis suggest that dispersion measures, which are only beginning to be studied, represent a crucial next-step in understanding how the role of the leader and followers interplay to affect outcomes. These results demonstrate that more
research is needed on consensus. This research should span across situations, and encompass constructs beyond social attributes such as leadership and climate, to truly distinguish in which contexts consensus influences relationships. In addition, future research should incorporate LMX, which focuses on the dyadic relationship between a leader and each follower (Graen & Uhl-Bien, 1995), to further understand how leadership consensus, TL, and the context at hand interplay to influence outcomes. Specifically, future research could analyze how TL consensus and LMX interact. This would allow both the dyadic relationship of each leader with his or her followers as well as the team’s consensus of that leader’s transformational behaviors to be analyzed simultaneously, allowing researchers to better understand the complex interplay between the leader, follower, and team in determining outcomes.

Another important implication from this study is the finding that dispersion measures are construct-specific. Preliminary analyses of the correlation matrix revealed that TL consensus and innovation climate strength were only weakly correlated ($r = .12$). This suggests that agreement on one construct, such as TL, does not necessarily mean that the team will agree on another construct, such as innovation climate. This is an important finding because it indicates that measures of dispersion are not simply studies of general agreement or disagreement within a team, but that how dispersion of one construct relates to another depends on the constructs of interest. Therefore, future research should analyze how TL consensus and dispersion measures of other constructs correlate to further understand the construct-specific nature of team-level dispersion measures.

**Practical Implications**

This thesis demonstrates the need for transformational leaders in cultivating a climate towards innovation. Organizations in the process of a wide-scale change effort should strive to select and cultivate transformational leaders, as these leaders are vital players in creating a climate that supports innovation. An innovation climate is fundamental to innovation success because it can lead to better innovation implementation (Somech & Drach-Zahavy, 2013). In addition, this thesis provides valuable information about the importance of leadership consensus in creating a high innovation climate in a team. Organizations can utilize these findings to better understand how to influence an innovation climate in the organization by
fostering high TL consensus in the organization. Specifically, these findings could help organizations use dispersion measures to identify leaders who have failed to create consensus among followers, and encourage these leaders to improve their relationships with select followers who may have viewed the leader as less transformational.

Organizations can use these findings to influence their training and development practices. Specifically, organizational interventions that train leaders to embrace and enact the ideology and behaviors that characterize the components of transformational leadership could be developed to improve the transformational qualities of leaders, thus leading to higher innovation climate in the organization. Past research has found support for the role of training in increasing leaders’ transformational behaviors (Barling, Weber, & Kelloway, 1996; Kelloway, Barling, & Helleur, 2000) as well as in increasing leaders’ ability to support EBP implementation (Aarons, Ehrhart, Farahnak, & Hurlburt, 2015). In addition to training leaders to be transformational, training could focus on teaching leaders to be egalitarian and consistent in the behaviors they convey to their team. In this way, the training would focus not only on the transformational behaviors of the leader, but also on how to convey these behaviors consistently so as to create a strong climate within the team. One component of this training could be to include coaching and feedback to leaders regarding the leadership behaviors. Past research on leadership and safety found that workers’ safety behaviors improved when supervisors were provided feedback and coaching regarding safety communication (Zohar & Luria, 2003). Organizations could incorporate feedback to leaders regarding their frequency and consistency in conveying transformational behaviors to all followers in order to increase both the mean-level TL and the TL consensus ratings for leaders. Consensus is a function of both leaders’ behaviors and followers’ perceptions of the leader. As such, training leaders to behave consistently may not be enough to create high TL consensus in a team. It is also important to consider training leaders in how to manage follower perceptions of their leadership, as well as training followers directly regarding managing their own perceptions of what should be expected from their leaders. Organization could also provide followers with training about how to be resilient in the face of ambiguity and encourage a mindset oriented towards change.

Organization can also use these results to align the selection system with change efforts. Cynicism toward change negatively predicted TL behaviors in past studies (Bommer,
Rubin, & Baldwin, 2004), whereas consideration of future consequences, which refers to the leader’s ability to consider “distal outcomes of current activities” (Zhang, Wang, & Pearce, 2014, p. 331), positively predicted TL (Zhang et al., 2014). As such, organizations should select leaders who are open to change efforts and are high in consideration of future consequences. These qualities could be assessed by having the applicant complete validated measures of these constructs (Reichers, Wanous, & Austin, 1997; and Strathman, Gleicher, Noninger, & Edwards, 1994 for specific examples). In addition, focusing selection measures on the four components of TL can guide selection towards identifying leaders high in TL qualities.

The results of this thesis suggest that factors other than leadership and climate may impact follower attitudes towards a specific innovation in the workplace. Past research on personality suggests that individual levels of extraversion, agreeableness, and conscientiousness are associated with more positive attitudes toward change (Vakola, et al., 2004). Organizations could incorporate personality measures in the selection process for followers to ensure selection of followers who may be more likely to view change positively, and thus support the innovation in the organization. It may also be useful to look at measures of follower adaptability to identify those who would better adapt to change in the organization. In addition, organizations could aim to hire followers with “extending-fit” to help create support for change in the organization (Powell, 1998). “Extending-fit” individuals are those who possess core values that reflect the organization’s values, but who also value components that are representative of the new innovation being implemented in the organization.

CONCLUSION

This thesis furthers the research literature on dispersion by applying it to TL and innovation climate. Very few studies currently exist regarding TL consensus as it relates to climate, and this thesis addresses this void. Although there are studies on climate strength, none were identified that utilized a cross-level moderation approach to examining how innovation climate strength can moderate the relationship between innovation climate at the team level and attitudes toward a specific innovation at the individual level. Finally, the longitudinal component of this study demonstrates a major contribution to the literature.
Most studies on dispersion are cross-sectional, and thus this thesis took a more methodologically rigorous approach by examining each variable at different times to suggest causal relationships. The findings demonstrate the necessity of studying and cultivating high TL consensus in addition to overall TL (particularly regarding the TL dimensions of intellectual stimulation and inspirational motivation), addressing a void in the literature and providing insight for how to encourage successful innovation in organizations.
REFERENCES


APPENDIX A

TRANSFORMATIONAL LEADERSHIP
SUBSCALE

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<td>Not at all</td>
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**Intellectual Stimulation**
Re-examines critical assumptions to question whether they are appropriate.
Seeks differing perspectives when solving problems.
Gets you to look at problems from many angles.
Suggests new ways of looking at how to complete assignments.

**Inspirational Motivation**
Talks optimistically about the future.
Talks enthusiastically about what needs to be accomplished.
Articulates a compelling vision of the future.
Expresses confidence that goals will be achieved.

**Idealized Influence**
Talks about his/her most important values and beliefs.
Instills pride in you for being associated with him/her.
Specifies the importance of having a strong sense of purpose.
Goes beyond self-interest for the good of the group.
Acts in ways that builds your respect.
Considers the moral and ethical consequences of decisions.
Displays a sense of power and confidence.
Emphasizes the importance of having a collective sense of mission.

**Individualized Consideration**
Spends time teaching and coaching.
Treats you as an individual rather than just a member of the group.
Considers that you have different needs, abilities, and aspirations from others.
Helps you develop your strengths.
APPENDIX B

TEAM CLIMATE INVENTORY: SUPPORT FOR INNOVATION SUBSCALE

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Assistance in developing new ideas is readily available.
This team is open and responsive to change.
People in this team are always searching for fresh, new ways of looking at problems.
In this team, we take the time needed to develop new ideas.
People in the team cooperate in order to help develop and apply new ideas.
Members of the team provide and share resources to help in the application of new ideas.
Team members provide practical support for new ideas and their application.
The team is always moving toward the development of new answers.
## APPENDIX C

### EVIDENCE-BASED PRACTICE ATTITUDE SCALE

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I like to use new types of therapy/interventions to help my clients.
I am willing to try new types of therapy/interventions even if I have to follow a treatment manual.
I know better than academic researchers how to care for my clients.
I am willing to use new and different types of therapy/interventions developed by researchers.
Research-based treatments/interventions are not clinically useful.
Clinical experience is more useful than using manualized therapy/treatment.
I would not use manualized therapy/interventions.
I would try a new therapy/intervention even if it were very different than what I am used to doing.

**If you received training in a therapy or intervention that was new to you, how likely would you be to adopt it if:**

- It was intuitively appealing?
- It "made sense" to you?
- It was required by your supervisor?
- It was required by your state?
- It was being used by colleagues who were happy with it?
- It was required by your agency?
- You felt you had enough training to use it correctly?