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**TEAM TEMPORAL LEADERSHIP:
CONSTRUCT DEVELOPMENT AND VALIDATION**

A Thesis in

Psychology

by

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ABSTRACT

Recently, researchers have called for an increased emphasis on time's role in team and leadership research. Mohammed and Nadkarni (in press) proposed "team temporal leadership" as a unidimensional, task oriented construct representing the degree to which team leaders schedule, synchronize, and allocate their team's time. This research adopted the previous task oriented conceptualization and expanded the construct to include a second dimension (relationship oriented team temporal leadership). A scale reflecting this multidimensionality was developed and validity evidence was established regarding the scale's factor structure, relationships with similar constructs, and team level outcomes. This evidence was collected in a series of four separate studies. CFA results indicated that the two dimensional model of team temporal leadership (task and relationship orientations) was stable over two separate samples. Each dimension exhibited unique patterns of relationships with correlates that were consistent with predictions. Finally, team level task and relationship oriented team temporal leadership each explained significant incremental variance in willingness to follow the leader and perceived leader effectiveness above controls including team size, initiation of structure, and consideration. Suggestions for future research on team temporal leadership are provided along with theoretical and practical implications of this research.

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Chapter 1

Introduction and Literature Review

The lives of both individuals and organizations are permeated by temporal issues. Indeed, all work is considered to be affected in some way by deadlines, time limits, and schedules (Marks, Mathieu, & Zaccaro, 2001). The literature on work teams in particular converges on a view of teams as dynamic systems that perform within an inherently temporal context (Ilgen, Hollenbeck, Johnson, & Jundt, 2005). Although researchers increasingly recognize the importance of temporality for team functioning, it is conceptually less reflected in the empirical literature. In fact, time was recently described as “the most neglected critical issue” in team research (Kozlowski & Bell, 2003, p.364). Mohammed, Hamilton, and Lim (2009) stated that “an increased concern with temporal matters is of extreme importance for future research on teams” (p. 341). Ancona and colleagues advocated for the use of a “temporal lens” that views time in the foreground of team research (Acona & Chong, 1999; Ancona, Goodman, Lawrence, & Tushman, 2001; Ancon, Okhuysen, & Perlow, 2001). Although team researchers in the past decade have gained an appreciation for the role of temporal matters in teamwork (Mathieu, Maynard, Rapp, & Gilson, 2008), there remains a great deal to be understood.

In addition to the team literature, the leadership literature also lacks an appropriate emphasis on the role of time. Bluedorn and Jaussi (2008) suggest that the use of temporal variables in leadership research has been scarce and that temporal theory has not made its mark on many examinations of the leadership process. However, the authors

also note that “it is difficult, if not impossible, to consider leadership without time playing a role (p.434).” Ancona and colleagues also stressed the importance of time in the leadership process by emphasizing the need to view leadership through a temporal lens (Ancona et al., 2001). Given the paucity of literature placing time’s role in the foreground of this critical organizational function, research is needed to provide a foundation for hypotheses about and measurement of temporal influences on leadership.

Due to the dramatic increase in the use of work teams in organizations (Hollenbeck, DeRue, & Guzzo, 2004), an increased emphasis is being placed on the role of leadership in teams (Burke, Stagl, Klein, Goodwin, Salas, & Hapin, 2006; Hackman & Wageman, 2005; Zaccaro, Rittman, & Marks, 2001). In fact, Zaccaro et al. (2001) argued that effective leadership is the most critical factor in the success of organizational teams. Kozlowski and Ilgen (2006) point out that while research identifies leadership as a promising leveraging point for enhancing team processes, more leadership research needs to be conducted targeting team level outcomes such as team effectiveness.

Recognizing both the integral role played by temporal variables in the leadership process as well as the criticality of leadership for the effectiveness of work teams, Mohammed and Nadkarni (in press) developed the construct of team temporal leadership. They defined team temporal leadership as “leader behaviors that aid in structuring, coordinating, and managing the pacing of task accomplishment within the team” (p. 8). The primary purpose of Mohammed and Nadkarni’s (in press) study was to examine team temporal leadership as a moderator of temporal diversity (individual differences in understandings of time or preferences as to the use of time) and team performance.

Therefore, the conceptualization of the construct was not thoroughly developed, and a full validation of the measure was not conducted.

The current research had several purposes. First, it expanded the conceptualization of team temporal leadership to be a multidimensional construct. Mohammed and Nadkarni (in press) conceptualized and measured team temporal leadership as a unidimensional construct. However, research in the leadership literature has long found two factors in the study of leader behavior: task (the degree to which a leader organizes the roles of followers and is oriented toward goal attainment) and relationship (the degree to which a leader shows concern and respect for followers) orientation. These two factors are considered the most robust of leadership constructs (Euwema, Wendt, & Emmerik, 2007; Judge, Piccolo, & Ilies, 2004). Mohammed and Nadkarni (in press) emphasized the task oriented behaviors associated with team temporal leadership; this research will explore the possibility that both task and relationship oriented dimensions exist. The importance of this contribution is emphasized in a meta-analysis of general leadership behavior research by Judge, Piccolo, and Ilies (2004). Their results found an overall correlation of .48 between relationship oriented behaviors and leadership outcomes, compared to .29 for task oriented behaviors.

The second purpose of the current research was to develop a scale that reflects the multidimensional conceptualization of team temporal leadership by including task and relationship orientated components. Many of the most commonly used measures in the leadership literature have been subject to stark criticism concerning the nature of the construct they actually measure (Scherbaum, Finlinson, Barden, & Tamanini, 2006). According to Hunter, Bedell-Avers, and Mumford (2007), a common fallacy of

leadership research is to rely on measures that fail to capture critical and essential leadership behaviors. An important contribution of this paper is the construction of a measure that better approximates the range of behaviors critical to team temporal leadership.

Finally, the third purpose of the current research was to provide evidence of the psychometric validity of the team temporal leadership scale. Numerous scholars have articulated concern over the lack of agreement concerning the psychometric quality and soundness of factor structure in popular leadership measures (Hunter et al, 2007; Scherbaum et al., 2006; Rafferty & Griffin, 2004). The use of measures with poor psychometric properties “precludes consistency in instrument interpretation across studies and samples (Hunter et al., 2007, p. 438).” Pedhazur and Schmelkin (1991) note that the numbers used in statistical analysis are supplied by measures, and thus the quality of a measure is inextricably linked to the interpretation and meaningfulness of data. Therefore, construct validity and soundness of factor structure are central to an instrument’s utility (Clark & Watson, 1995). Evidence for construct validity rests on the determination of a construct’s nomological network (Chronbach & Meehl, 1955); this is accomplished by demonstrating convergent and discriminant validity (Campbell & Fiske, 1959). This paper adds value by collecting evidence supporting the construct validity and factor structure of a measure of team temporal leadership. The measure will help leadership and team researchers continue to sharpen the temporal lens through which they frame theory and research.

This paper will be organized in the following manner: First, I will review the literature on leadership, team leadership and the role of time in the leadership process. I

will then conceptualize team temporal leadership as a multidimensional construct involving task and relationship oriented temporal leadership behaviors and describe items that were developed for a measure that reflects this multidimensionality. After item development, I will describe the first study in the current project, which involved a Q-sort task that was conducted to support the scale's content validity. I will then discuss three more independent studies which served to refine the scale and demonstrate its construct validity. The second study involved item reduction through exploratory factor analysis and reliability estimation. The third study provided evidence for the scale's factor structure attained through confirmatory factor analysis and also provided convergent and discriminant validity evidence concerning its relationships with other constructs. Finally, the fourth study examined the measure's utility by testing its ability to predict three important indicants of effective leadership at the team level.

Literature Review

Leadership in Organizations

Decades of work in the leadership field have generated a preponderance of research and theory. Beginning in the late 1940's leadership progressed through a series of stages (Hunt, 1999; Zaccaro, 2007), including the leadership trait approach (Stodgill, 1948), the leader behavior approach (Fleishman, 1953), and the situational contingency model approach (Dansereau, Graen, & Haga, 1975; Fiedler, 1967; House & Mitchell,

1974). During the 1970's, leadership research reached a fallow period which ended at the onset of transformational and charismatic leadership theories (Hunt, 1999). Since the work of Burns (1975), House (1977), and Bass (1985), the transformational/charismatic approach to leadership has garnered most of the attention in leadership research. While distinct in several significant ways, these theories are similar in that they attribute a leader's extraordinary impact on followers to his or her articulation of a future oriented vision (Mumford, Strange, & Bedell, 2006). Due to the wide reaching impact these visions can have (House, Spangler, & Woycke, 1991; Shamir, House, & Arthur, 1993), a major effect of the transformational/charismatic movement has been an increased emphasis on upper level leaders of organizations (Hunt, 1999; Mumford et al., 2006).

Two modern trends in leadership research hold particular relevance for the current research: increased attention to multi-level issues, and an increased focus on temporality. As noted by Hunt (2005), the field of leadership is exploding with research giving due recognition to "levels of analysis and ever more and more often...temporality" (p.1). First, it is becoming increasingly apparent that leadership researchers must be cognizant of the multiple levels involved in the leadership process. Yammarino and colleagues emphasized that researchers must specify whether the units of interest in a leadership study are at the individual, dyad, group, or collective units of analysis (Yammarino, Dionne, Chun, & Dansereau, 2005). Generalization of leadership findings from one level to another may be hampered by cross-level paradoxes whereby behaviors that constitute effective leadership at one level may have deleterious effects at another (Hunter et al., 2007). Although the current emphasis on upper level management (leadership studied at the collective unit of analysis) is due in part to a surfeit of early work on lower level

management, the majority of that early work viewed leadership at a wholly dyadic level (Hunter et al., 2007). Recently, increased emphasis on levels of analysis in the leadership field has resulted in a proliferation of attention to leadership in teams (Day, Gronn, & Salas, 2006; Zaccaro, Rittman, & Marks, 2001). The focus of team level leadership research is on the day-to-day routine interactions between a leader and his/her direct reports (Mumford et al., 2006; Mumford & Van Doorn, 2001; Yammarino et al., 2005). Continued attention is needed at this crucial level of leadership influence in order to account for the unique experience of teams involving dynamic processes which occur over time (Kozlowski & Ilgen, 2006). A second modern trend in leadership research is an increased focus on temporality (Hunt, 2005). Although few empirical studies make this focus explicit, several theoretical papers have called leadership scholars to give temporal influences an overt role in research on the leadership process (Ancona et al., 1991; Bluedorn & Jaussi, 2008; Halbesleben, Novicevic, Harvey, & Buckley, 2003). Merging these trends in the leadership field, it is apparent that the time is right to focus on intra-team leadership with an explicit temporal component. The growing literature on the leadership of teams will now be reviewed.

Leadership in Teams

Although the leadership field has recently increased its emphasis on the leadership of work teams, much of the work has been theoretical and we thus “know surprisingly little about how leaders create and manage effective teams” (Zaccaro, et al. 2001, p. 452). Additionally, most of the work in this area has involved general leadership

theories, which may not be directly applicable to leadership at the team level (Kozlowski & Ilgen, 2006; Morgeson, DeRue, & Karam, 2009). Approaches to team leadership differ from the broad applicability of general leadership approaches because they must account for the unique aspects of the team context: the dynamic processes team members engage in over time through which they synchronize their knowledge, skill, and effort (Kozlowski & Ilgen, 2006). Therefore, team leadership should be viewed as an input factor which influences processes, emergent states, and performance (Mathieu, Maynard, Rapp, & Gilson, 2008). The recent literature has promulgated various theoretical frameworks and models of team leadership (Day et al. 2004; Hackman & Wageman, 2005; Morgeson et al., 2009; Zaccaro et al., 2001). However, a common thread underlying these models is their view of the team leader as responsible for a set of functions, as opposed to a specific set of behaviors (Kozlowski & Ilgen, 2006; McGrath, 1962). This is referred to as the functional leadership approach (McGrath, 1962).

According to Morgeson et al. (2009), an understanding of team processes is necessary to understand the functions for which team leaders are responsible. Marks, Mathieu and Zaccaro (2001) refer to team processes as interdependent team activities that orchestrate taskwork for the accomplishment of goals. As teams operate, they perform in recurring cycles of interdependent action which can be divided into transition and action phases (Marks et al., 2001; Kozlowski, Gully, McHugh, Salas, & Cannon-Bowers, 1996). Transition phases, in which teams must focus on evaluation and planning activities, provide the input to a subsequent action phase in which teams engage in acts that contribute to goal performance (DeChurch & Marks, 2006; Marks et al, 2001). Effective team leadership is present when it provides valuable input to current and subsequent

performance cycles (Day et al., 2004). Taking a functional perspective, DeChurch and Marks (2006) expressed that the role of a leader is to enhance transition and action processes within teams through coaching and facilitating roles. The role of leadership is complicated by challenges that arise from the team, organization, and environmental context as the team works across the transition and action phases (Morgeson et al., 2009). These challenges create needs which must be met in order for the team to be successful (Morgeson, DeRue, & Karam, 2009); the function of leadership is to satisfy these needs. Needs encountered during the transition phase include mission analysis, goal specification, strategy formulation, and planning (DeChurch & Marks, 2006; Marks et al., 2001). In the action phase, the needs involve monitoring progress toward goals, systems monitoring, team monitoring and backup responses, and coordination activities (DeChurch & Marks, 2006; Marks et al., 2001). Throughout the team's cycles, interpersonal needs such as conflict management, motivating, and affect management also arise (Marks et al., 2001).

As the vast majority of team leadership models operate from the functional approach, this review will briefly describe four representative frameworks. These frameworks include the model of dynamic team leadership proposed by Kozlowski and colleagues (Kozlowski, Gully, McHugh et al., 1996; Kozlowski, Gully, Salas, & Cannon-Bowers, 1996), Hackman and Wageman's (2005) model of expert coaching, Zaccaro and colleagues' functional model of team leadership (Zaccaro et al., 2001), and Morgeson et al.'s (2009) integrative view of team leadership. First, Kozlowski and colleagues proposed a framework in which team leaders play a dual pronged role whereby they influence both team performance management and team development (Bell &

Kozlowski, 2002; Kozlowski, et al., 1996; Kozlowski, et al., 1996). This framework incorporates a temporal element whereby development behaviors are most critical in the early stages, and performance management behaviors take a larger role in later team functions. Second, Hackman and Wageman's (2005) model of team coaching emphasized three leadership functions including: a) motivational, in which the leader minimizes motivation problems, b) consultative, in which the leader invents strategies for task accomplishment, and c) educational, in which the leader fosters the development of members' knowledge and skill. Hackman and Wageman (2005) made the role of time in their model explicit by stating that coaching interventions are more effective when they address issues a team is ready for at the time they are made. It is notable that Hackman and Wageman (2005) explicitly recognized the task/person focused distinction in team leadership by explicitly defining team coaching in terms of addressing task performance processes-not interpersonal relationships. Third, the framework proposed by Zaccaro et al. (2001) holds that leadership influences team effectiveness through effects on cognitive, motivational, affective, and coordinative team processes. According to this model, the leader influences these processes through generating, planning, and implementing solutions to problems faced by the team. Most recently, Morgeson et al. (2009) developed a functional framework of specific ways in which leadership satisfies team needs essential to each phase of a team's performance cycle. Transition phase functions included defining the mission, providing feedback, and establishing goals. On the other hand, action phase functions included monitoring the team, managing team boundaries, and supporting the social climate. This view of leadership is especially

valuable due to its integration of leadership functions with the model of team processes proposed by Marks et al. (2001).

Although these four team leadership frameworks vary as to which of the many dynamic contingencies they account for (Kozlowski & Ilgen, 2006), two critical categories of team needs underlie each of the models: facilitating taskwork and facilitating teamwork (Mathieu et al., 2008). These have been referred to as task focused (dealing with task accomplishment) and person focused behaviors (dealing with developing team members or maintaining socioemotional aspects of the team) (Burke et al., 2006; Mathieu et al., 2008). This dichotomy is present in the dual-forked model proposed by Kozlowski and colleagues in that leaders first emphasize instructional or regulatory functions which emphasize task cycles and then shift their emphasis to person focused developmental functions later in team development (Bell & Kozlowski, 2002; Kozlowski, et al., 1996; Kozlowski, et al., 1996). The task-focused/people-focused dichotomy is echoed by Hackman & Wageman (2005), who delineate their three expert coaching functions as dealing with task rather than interpersonal elements of team performance. A final example is Zaccaro and colleague's (2001) model, which also emphasizes task oriented leadership functions (e.g. problem diagnosis, planning solutions, and implementing solutions). The dichotomous approach to critical behaviors in team leadership was recently supported in a meta-analysis whereby team leadership functions were broken into task and person focused behaviors (Burke et al., 2006). Task focused leadership accounted for 12% of the variance in team performance while person-focused leadership accounted for 10% of this variance (Burke et al., 2006).

In summary, approaches to team leadership differ from general approaches to leadership because they must account for the dynamic processes in which team members engage over time. Approaches to team leadership generally view team leaders as responsible for a set of functions, which can generally be broken into task and person focused in nature. Another area receiving increasing emphasis in the leadership field will now be reviewed: an explicit focus on temporality as a part of the leadership process.

Leadership and Time

In addition to an increased emphasis on teams, Hunt (2005) also indicated that modern movements in the leadership field more often recognize temporality's role in the leadership process. However, the literature remains lacking in two general respects. First, the majority of the work to which Hunt referred is conceptual, and little empirical work has been conducted in these areas. Second, while recent theoretical movements may recognize temporality as relevant to leadership processes, the role of time is often only portrayed superficially and there remain very few explicitly time focused theoretical or empirical articles in the leadership field. According to Bluedorn & Jaussi (2008), "the formal use of temporal variables in leadership research has been scarce and scattered" (p. 657). Temporality must move from the background to the foreground of research on leadership processes (Ancona et al., 2001). The nascent movement to give temporal variables an explicit role in the study of leadership has been advanced by three conceptual papers including Ancona et al.'s (2001) call to view leadership through a temporal lens, Halbesleben et al.'s (2003) article on temporal complexity's role in leading

innovative work, and Bluedorn and Jaussi's (2008) review and theoretical article on leaders, followers, and time. Each will briefly be reviewed.

The first paper to call for the move of time into the foreground of leadership research was presented by Ancona and colleagues (2001). The authors coined the term "temporal leadership" as part of a conceptual discussion emphasizing the critical need for scholars to view organizational research through a temporal lens. Maintaining their focus primarily on top management teams, the authors outlined four management challenges which require teams to enact temporal leadership. The first of these was entrainment of organizational cycles to external cycles. Ancona and Chong (1999) defined entrainment as the adjustment of the pace or cycle of an activity to match or synchronize with that of another activity. Ancona et al.'s (2001) list of management challenges also included managing across multiple time frames, creating organizational structures that allow for operation in the future and present time frames, and creating a clear, consistent vision. In closing, the authors admitted the inchoate nature of their work and that further development of temporal leadership would involve looking at other temporal parameters such as speed, rhythm, and scheduling. While the top management challenges described by Ancona and colleagues (2001) may be relevant to leadership at the organizational level, parameters such as speed, rhythm, and scheduling may be more salient to team level leadership, the subject of the current work.

A second conceptual article highlighting the importance of time with regards to effective leadership was written by Halbesleben et al. (2003). The authors described "temporal complexity," a multidimensional competency model they proposed to be critical in effective leadership of innovative work. The authors asserted that temporal

complexity is dependent on a leader's awareness of the synchronization of people needed for the innovation project, sequences of events that occur together, gaps and pauses in the work process, simultaneity of work on multiple tasks, time related individual differences, and timelessness (an immersion in one's work which involves "losing track of time"). According to the authors, awareness of temporal complexity allows leaders to influence innovation by facilitating other leadership competencies, particularly the initiation of structure and consideration of individual time-related differences. Contrary to the work by Ancona and colleagues (2001), Halbesleben et al.'s (2003) article took a multilevel approach that accounted not only for upper level management considerations, but also for the day-to-day interactions between lower level managers and subordinates. For example, the authors noted that the synchronization of people/groups working on innovative projects involves "steps that occur throughout all levels of management" (Halbesleben et al., p. 441). The process of synchronization is reminiscent of the function referred to as "coordination" in the team leadership literature (Zaccaro et al., 2001). The similarities between these concepts reflect the salience of temporal issues in the examination of intra team leadership.

Bluedorn and Jaussi (2008) provided a third conceptual article with the explicit purpose of considering leadership from a temporal perspective. The authors reviewed extant empirical and theoretical work in the leadership field that made reference to temporal considerations. The works described incorporated time in numerous capacities including how leaders spend their time (Bligh & Hess, 2007), the historical period in which leadership is occurring (Weber & Parsons, 1947), how aspects of leadership can change over time (Avolio & Bass, 1995), how leaders can use time as a signal

(Finkelstein, 2006), how leaders develop over time (Giambatistia, 2004), and whether leaders exhibit behaviors at the right time (Casimir, 2001). However, Bluedorn and Jaussi (2008) concluded the contribution of these works to the body of research with an explicit focus on time to be tangential at best, and that this area of study presents leadership scholars with “abundant theoretical and empirical opportunities” (Bluedorn & Jaussi, p. 657). The current project takes advantage of the research opportunities described by Bluedorn and Jaussi (2008) by offering future researchers a psychometrically sound measure that focuses explicitly on temporal factors relating to the team leadership. The small body of temporally focused literature on the leadership of teams will now be reviewed.

Team Leadership and Time

Thus far, this review has separately examined trends in the leadership field which emphasize studying team leadership and explicitly integrating time into study of leadership. However, very few scholars have merged these trends to undertake empirical work focusing on the engagement of leaders in intra-team time related activities. Three extant studies that make team leadership the focal point of empirical work regarding leadership and time will now be reviewed.

First, Kane and colleagues considered team leadership as the focal point of an empirical examination of leadership and time (Kane, Zaccaro, Tremble, & Masuda, 2002). Their experiment consisted of 96 student leaders of three person teams performing tasks which involved producing and selling products. The researchers took a functional

view of team leadership and included a dimension coined “monitoring time” as one of their measures of leader behaviors. Monitoring time was operationalized as the number of times student leaders requested time checks during the study and clearly reflected coordination functions as described by Zaccaro et al. (2001). The researchers found monitoring time to be the strongest predictor of group profit, a task performance measure calculated by subtracting the total cost of purchased materials from the revenue generated by selling products. This study lends empirical support to the critical nature of coordination functions to effective team leadership.

Morgeson and DeRue (2006) conducted a second study which examined temporal characteristics of events teams face and how these events influence the amount of time a leader spends in intervention. The study utilized 42 self managed teams from four different organizations, each with one formally designated leader. The researchers found that leaders exhibited more task focused, structuring behaviors as the urgency of an issue increased. In particular, leaders exhibited high levels of structuring behaviors such as delegating and revising timelines when the team drew close to a project’s deadline. However, the authors also reported that team leaders must walk a fine line between managing the timeliness of their team’s activities while also allowing the team to develop.

A third relevant study was conducted by Mohammed and Nadkarni (in press), who proposed team temporal leadership as a new construct and examined it in terms of moderating and main effect relationships with team performance. Taking a functional approach whereby a leader’s function is “to do, or get done, whatever is not being adequately handled for group needs” (McGrath, 1962, p. 5), the authors examined the

role of leadership in satisfying temporally relevant team needs. Mohammed and Nadkarni (in press) based their delineation of relevant needs on McGrath's (1991) Time, Interaction, and Performance (TIP) theory which views temporal ambiguity, conflicting temporal interests, and a scarcity of temporal resources as arising challenges that create a need for scheduling activities, synchronizing events, and allocating temporal resources. Team temporal leadership was defined as "leader behaviors that aid in structuring, coordinating, and managing the pacing of task accomplishment within the team" (p. 8). Examples of behaviors associated with team temporal leadership included building in time for contingencies, reminding team members of deadlines, prioritizing and allocating time, and coordinating the team to finish work on time.

Mohammed and Nadkarni (in press) utilized a sample of 299 employees divided into 71 teams from an outsourcing provider firm in India. The purpose of the study was to examine when temporal individual difference diversity within work teams has beneficial or deleterious effects on team performance. The authors found significant moderating effects for team temporal leadership on the relationships exhibited by both time urgency ("the need to have control over deadlines and feeling chronically hurried") and pacing style ("preferred pattern of effort distribution over time in working toward deadlines") with team performance (Mohammed & Nadkarni, in press, p.2). Diversity on these temporal individual differences was more positively related to team performance when the team leader was rated higher on team temporal leadership than when he or she was rated lower. Moreover, team temporal leadership exhibited a strong positive main effect on team performance. Taken together, these promising empirical results not only suggest conditions when group heterogeneity on temporal individual differences may be

beneficial, but also warrant further study of team temporal leadership. Mohammed and Nadkarni (in press) called for further development and validation of the construct.

Mohammed and Nadkarni (in press) measured team temporal leadership with a seven item scale developed by the authors for use in the study. The measure included a combination of items adapted and modified from the temporal planning scale (Janicik & Bartel, 2003), the temporal reminder scale (Gevers, Rutte, & van Eerde, 2006), and items developed specifically for the measure itself. Sample items include “To what extent does your project leader remind members of important deadlines” and “To what extent does your project leader urge members to finish subtasks on time.” With response choices ranging from 1 (not at all) to 5 (a great deal), the items exhibited adequate internal consistency reliability ($\alpha=.90$) and loaded onto a single factor in an exploratory factor analysis. In addition, a mini-validation study of 302 students in a business policies course demonstrated the scale’s convergent and discriminant validity with initiation of structure and consideration and its predictive validity on subordinate’s willingness to follow the leader. Nevertheless, further construct development and a series of proposed studies investigating the team temporal leadership scale’s factor structure and construct validity evidence will now be discussed.

Theoretical Framework Underlying Team Temporal Leadership

The theoretical framework underlying team temporal leadership draws from two general theories. The first, McGrath’s (1991) TIP theory, is rooted in the temporal literature. The second, the functional leadership approach, derives from the leadership

literature. Each of these theoretical backgrounds is needed to provide sufficient rationale for the construct of team temporal leadership. The theories will now be reviewed.

McGrath's Time, Interaction, and Performance Theory of Groups

McGrath developed his TIP theory over the course of several years of publications and research, gradually developing a perspective on aspects of time relevant to work groups (McGrath, 1991; McGrath & Kelly, 1986; McGrath & Rotchford, 1983). According to McGrath and colleagues, organizations' view of time as a valuable commodity which must be put to use economically and rationally leads to three generic temporal problems: temporal ambiguity, conflicting temporal interests and requirements, and scarcity of temporal resources (McGrath, 1991). These problems are considered to be at the heart of organizational efficiency, cost, and productivity, and each necessitates characteristic organizational responses (McGrath & Rotchford, 1983). The organizational responses to McGrath's (1991) three temporal problems include scheduling of activities (in response to temporal ambiguity), synchronization of activities (in response to conflicting temporal interests), and allocation of temporal resources (in response to temporal ambiguity) (McGrath, 1991). The three temporal problems will now be described along with the accompanying responses organizations use to deal with each of them.

The first temporal problem organizations face is temporal ambiguity regarding when events will occur and how long they will last. This uncertainty leads to a need for

predictability, which organizations achieve primarily through the organizational response of scheduling of activities (McGrath & Rotchford, 1983). Temporal ambiguity is reduced when organizations set schedules which specify when events occur and provide a unified set of deadlines and temporal milestones through which employees may keep track of their progress (Zerubabel, 1981). According to Schriber & Gutek (1987), scheduling depends on pace, the rate at which activities can be accomplished.

The second temporal problem organizations face is conflicting temporal interests and requirements. This conflict is due to different purposes, goals, and preferences for outcomes amongst specialized, segmented, and separated parties in organizations (McGrath, 1991; McGrath & Kelly, 1986). Temporal conflict compels the organizational response of synchronization (McGrath, 1991). Synchronization necessitates coordinating the activities of different team members or segments of the organization (McGrath & Kelly, 1986). This reduces conflict by improving coordination and adjusting the work cycles of individuals in the organization (Schriber & Gutek, 1987). Akin to scheduling, synchronization involves the timing of starts and stops of multiple activities.

Organizations may achieve coordination by disseminating preset algorithms or establishing temporal norms (McGrath, 1991; McGrath & Rotchford, 1983). Janicik and Bartel (2003) define temporal norms as the informal rules that groups adopt to regulate responses to temporal issues. The authors claim that norms corresponding to numerous temporal issues, such as punctuality and time awareness, can develop in work teams.

The third temporal problem regards scarcity of temporal resources (McGrath, 1991). As organizations often equate time with money, they must utilize it economically and rationally; time thus becomes a scarce resource. Organizations mitigate this problem

by temporal prioritization and the allocation of temporal resources to prioritized activities. Allocation of temporal resources refers to the amount of time devoted to an activity, regardless of when the amount actually occurs (Schriber & Gutek, 1987).

In summary, McGrath described three generic temporal problems as well as organizational solutions to these problems (McGrath, 1991). Although TIP does not specifically address the role of leadership, it does clearly specify the temporal problems relevant to work teams. Given their position at the interface of higher management and the work team, responsibility for implementation of organizational responses to temporal problems may often fall to team leaders. Functional leadership provides a framework for understanding the role of leadership in solving these temporal problems.

Functional Leadership

In addition to TIP, team temporal leadership's theoretical framework is also rooted in the functional leadership approach. Functional leadership is the most common perspective from which researchers study team leadership. The key assertion of the functional leadership approach is that the leader's main job is "to do, or get done, whatever is not being adequately handled for group needs" (McGrath, 1962, p.5). Hackman and Walton (1986) took this assertion one step further in stating that "If a leader manages, by whatever means, to ensure that all functions critical to both task accomplishment and group maintenance are adequately taken care of, then the leader has done his or her job well" (p. 25). Notable in Hackman and Walton's (1986) statement is their recognition of the task/person dichotomy in team functions.

According to Morgeson and colleagues (2009), team leaders function to satisfy team needs (Morgeson et al., 2009). Although the functional leadership approach has informed several overarching frameworks of team leadership (Hackman & Wageman, 2005; Kozlowski, et al., 1996; Morgeson et al., 2009; Zaccaro et al., 2001), each tends to emphasize two distinct domains of functions filled by team leaders: those related to tasks, and those related to people (Burke et al., 2006; Kozlowski & Ilgen, 2006; Mathieu et al., 2008). These overarching domains of team functions reflect the emphasis of functional leadership on both task accomplishment and group maintenance (Hackman & Walton, 1986).

A critical function often acknowledged, but not fully delineated, by functional models of team leadership involves meeting the temporal demands of team based work (Bell & Kozlowski, 2002; Zaccaro et al., 2001). Scholars have mentioned this function in the literature on team leadership as a part of larger discussions concerning “facilitating processes” (Fleishman, Mumford, Zaccaro, Levin, Korotkin, & Hein, 1991), and “the monitoring and management of team performance” (Bell & Kozlowski, 2002). Zaccaro and colleagues explicitly recognized timing functions in their model of team leadership, but went only so far as to say that leaders function “to coordinate the pacing and speed of task accomplishment” (Zaccaro et al., 2001, p. 474). Coordination refers to a team process whereby the interdependent actions of team members are orchestrated in terms of sequence and timing (Marks et al. 2001). Indeed, team effectiveness is dependent on the degree to which team members are able to coordinate their actions (Zaccaro et al., 2001). The criticality of coordination may owe itself to the greater likelihood that team leaders who focus on coordination are able to anticipate the actions of other team members and

synchronize their actions so that unnecessary errors are avoided (Komaki, Desselles, & Bowman, 1989). While models of team leadership recognize the importance of coordination and timing functions, these functions have yet to be fully delineated and measured. Team temporal leadership fills this void in the team leadership literature by placing time at the forefront of critical leadership functions.

According to Mumford and colleagues, the functional leadership approach inherently asks the question “What must the leader do to facilitate group maintenance and task accomplishment?” (Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000, p.13). The authors insist that the problems organizational leaders face as they attempt to manage both people and tasks must be considered to answer this question. A comprehensive delineation of the temporal problems facing team-based organizations is offered by McGrath’s TIP theory of groups, and it is argued that it is the function of team leaders to implement organizational solutions to these problems. The conceptualization of team temporal leadership merges the TIP theory and the functional leadership approach by suggesting that team leaders are often in the best position to implement solutions to time related problems faced by work teams (Mohammed & Nadkarni, in press).

Delineation of Team Temporal Leadership

Task Oriented Team Temporal Leadership

Mohammed and Nadkarni (in press) delineated behaviors associated with team temporal leadership in terms of McGrath’s (1991) organizational responses to temporal

problems: scheduling, synchronizing, and allocating temporal resources (Mohammed & Nadkarni, in press). These behaviors are clearly directive and task oriented in nature (Judge, et al., 2004). Indeed, Mohammed and Nadkarni (in press) explicitly stated that team temporal leadership captures task-oriented, as opposed to supportive, relationship-oriented leadership behaviors.

Behaviors included in this task oriented team temporal leadership dimension (referred to henceforth as TOTL) are scheduling, synchronizing, and allocating temporal resources (Mohammed & Nadkarni, in press). Each of these behaviors allows the leader to deal with temporal problems faced by the team (McGrath, 1991). First, scheduling deals primarily with reducing temporal ambiguity by making work activities predictable, providing deadlines, and providing milestones by which team members may track their progress (McGrath & Rotchford, 1983; Zerubavel, 1981). Examples of behaviors associated with scheduling include reminding team members about deadlines and setting interim milestones. Second, synchronization deals with conflicting temporal interests by coordinating the activities of team members to ensure work is finished on time. To accomplish synchronization, the leader must adjust the work cycles of team members performing different tasks (Kelly & McGrath, 1986; Schriber & Gutek, 1987). Behaviors which exemplify synchronization include coordinating the team to meet client deadlines through informing team members of schedules and the progress being made by the rest of the team (Mohammed & Nadkarni, in press; Yukl, Wall, & Lepsinger, 1990). Finally, allocating resources helps the team deal with scarce temporal resources by building in time for unforeseen contingencies, prioritizing tasks by organizational value, and assigning tasks based on those priorities (Kelly & McGrath, 1986; Mohammed &

Nadkarni, in press; Schriber & Gutek, 1987). Mohammed and Nadkarni (in press) mentioned building in time for problems as an example of a behavior associated with allocation of temporal resources. The current research adopts the task oriented framework developed by Mohammed and Nadkarni (in press) while also expanding team temporal leadership to include supportive behaviors.

Relationship oriented Team Temporal Leadership

Given that many leadership constructs have been found to be multidimensional (Judge et al., 2004), team temporal leadership may have a relationship-oriented dimension that has not been previously considered. Hunter and colleagues (2007) have argued for more comprehensive leadership measures that account for the complexity of leader behaviors. The current proposal answers this call by expanding the conceptualization and measurement of team temporal leadership.

Three conceptual arguments support the proposed relationship oriented dimension of team temporal leadership. First, the dual-forked task and relationship oriented leader behavior dimensions are among the most robust of leadership constructs (Euwema, Wendt, & Emmerik, 2007; Judge et al., 2004). Therefore, focusing on only one dimension ignores an entire category of behaviors that have been shown to be important to leadership. In addition, the parallel dichotomy between taskwork and teamwork behaviors is also heavily used in the team literature (e.g. Mohammed, Mathieu, & Bartlet, 2002). Second, the relationship oriented dimension has well established practical utility in the general leadership research. Indeed, in a meta-analytic investigation of leader

behavior research, Judge et al (2004) found that relationship oriented behaviors exhibited stronger relationships than task oriented behaviors with outcomes such as follower satisfaction and follower motivation. This practical utility has even been demonstrated in a temporal context. In a study of white collar employees, Casimir (2001) found that leader pressure for speedy task completion from followers was viewed unfavorably except when the leader contiguously exhibited relationship oriented leadership behaviors. Based on these conceptual arguments, the relationship oriented dimension of team temporal leadership seems worthy of further exploration.

The delineation of relationship oriented team temporal leadership (referred to henceforth as ROTL) will draw from both McGrath's (1991) TIP theory of groups and the leader behavior literature. First, TIP theory provides a conceptual framework from which to understand the temporally relevant functions relationship oriented leader behavior can fill. Second, the leader behavior literature informs the organization of specific behaviors which constitute ROTL.

As previously described, organizations respond to three generic temporal problems by scheduling activities, synchronizing activities, and allocating temporal resources (McGrath, 1991). However, individuals respond to the same temporal problems in ways that are often in conflict with organizational responses to the same problems, leading to residual problems (McGrath & Kelly, 1986). This conflict occurs when organizational responses give individual teams/individuals little voice in decisions regarding responses to temporal problems (McGrath & Kelly, 1986). However, a team leader may be able to reduce this discrepancy when he or she is responsible for implementing organizational responses to temporal problems (Mohammed & Nadkarni,

in press). A team leader, considered the “linking pin” between work group members and upper level management (Likert, 1967), is situated such that he or she can allow team members to have a voice in decisions regarding responses to temporal problems. A team leader’s behaviors which reduce conflict between organizational and individual responses to temporal problems constitute ROTL. Therefore, ROTL includes showing respect, appreciation, and support for the time related problems faced by team members and the preferences those members have for dealing with them. Delineation of behaviors involved in ROTL draws from the literature on managing conflict (Yukl, 1999), positive reward behaviors (Podsakoff, Bommer, Podsakoff, & MacKenzie, 2006), and consideration behaviors (Bass, 1990). Attention will be paid to how each behavior associated with ROTL contributes to minimizing discrepancies between organizational and individual responses to the temporal problems outlined by McGrath (1991).

The first indicator of ROTL derives from conflict management (Yukl, 1999). According to TIP (McGrath, 1991), the problem of conflicting interests rises in part due to different preferences for action amongst individual members of the organization. Although not specified by McGrath, these different preferences for action likely refer to differences in temporal individual differences (Mohammed & Nadkarni, in press). Referred to by Bluedorn & Denhardt (1998) as among the fundamental parameters of individual differences, temporal individual differences are differences across individuals with regards to the way time is experienced and used (Kaufman, Lane, & Lindquist, 1991). Examples of temporal individual differences include time perspective (preferences for focusing on the past, present, or future), punctuality (attitudes toward being on time), and polychronicity (preference for doing more than one thing at a time) (Francis-Smythe

& Robertson, 1999). Yukl and colleagues (1990) define conflict management as encouraging the constructive resolution of conflict and encouraging cooperation. This description of conflict management aligns well with Halbesleben et al.'s (2007) assertion that conflicting time personalities can lead to conflict while complementary time personalities can lead to increased productivity. Therefore, ROTL involves a leader's attempts to minimize the deleterious effects of temporal individual difference diversity as well as to recognize and utilize temporal individual differences in ways that benefit the team. Team leaders may meet the needs caused by conflicting temporal interests (McGrath 1991) in two ways. The leader can help team members become more aware of the temporal individual differences between them (Bluedorn & Jaussi, 2008; Kaufman et al., 1991), or they can assign tasks based on temporal work preferences to achieve a "match" (Kaufman et al., 1991, p. 91). Further examples of temporal conflict management behaviors include working with team members to find an acceptable working pace, helping members settle differences about how to allocate time for task performance, and recognizing differences in member's preferences for working with schedules, deadlines, and lists when assigning tasks.

The second set of behaviors comprising ROTL derives from positive reward behavior, which has received strong interest in the leadership literature (Yukl, 1999, Podsakoff et al., 2006; Judge & Piccolo, 2004). In an extensive factor analysis including the Managerial Practices Survey as well as the Multifactor Leadership Questionnaire, positive reward behavior loaded onto the relationship oriented dimension of leader behavior (Yukl, 1999). Positive reward behavior involves both contingent rewards and recognition given by leaders to followers who engage in desirable behaviors. The degree

to which team leaders have access to tangible rewards may vary considerably, likely influencing the effectiveness of contingent reward behaviors (Judge & Piccilo, 2004). Therefore, the focus here is on recognizing team members for the achievement of temporally relevant goals. Examples of time related recognition behaviors include providing praise to team members for completing work by the deadline or making efficient use of available time. According to Kaufman et al. (1991), individuals whose temporal preferences do not fit those of the organization can still “choose to adapt to the organization’s time preferences.” (p. 88). Recognition behaviors may therefore help avoid conflicting responses to temporal problems by rewarding team members for responding to temporal problems in ways communicated by the leader.

The third and final category of relationship oriented temporal leadership behaviors involves temporally referenced consideration behaviors. Consideration behaviors involve an emphasis on the comfort, well being, status, and contributions of followers (Stogdill, 1963). Bass (1990) identified consideration to include supportive behavior and participative group decision making. However, previous delineations of consideration behaviors have not emphasized time. Within the context of team temporal leadership, consideration behaviors regard the comfort and well being of members with respect to temporal demands and seeking the contributions of team members before making decisions about scheduling and allocation of temporal resources. These behaviors are closely linked with the previously described conflict management behaviors in that they emphasize listening to group member preferences. Consideration behaviors may allow team leaders to avoid conflicting responses to scarce temporal resources. This problem regards a mismatch between the demand for the employee’s time

and the employee's capacity for giving that time. A team leader exhibiting temporal leadership would be more likely to seek member input regarding time availability before making time allocation decisions. Participative decision making may therefore help employees avoid role overload (Kahn, 1964). Behaviors such as a leader's availability for support and encouragement to team members working in crunch time, listening to member's complaints and input about how to allocate temporal resources, and utilizing team member's suggestions about the pacing of work constitute examples of ROTL. In summary, the current proposal delineates two dimensions of team temporal leadership: a) TOTL, which consists of scheduling, synchronizing, and allocating temporal resources, and b) ROTL, which involves temporally referenced conflict management, positive reward, and consideration behaviors.

General Overview of the Scale Development Procedure

According to Schmitt & Klimoski (1991), demonstration of construct validity evidence is an essential aspect of the development of quality measures. However, the authors further noted that this can be an arduous and time consuming process. The steps involved in this process have been outlined in the psychometric literature (e.g. Ghiselli, Campbell, & Zedeck, 1981; Nunnally & Bernstein, 1994). Hinkin (1998) provided a succinct summary of the steps involved in this process. The steps included a) item generation, b) questionnaire administration, c) initial item reduction, d) confirmatory factor analysis, e) convergent/discriminant validity, and f) replication. By utilizing multiple samples in a multiple step process, researchers can display adequate sampling of

content, factor structure, convergent and discriminant validity, and predictive validity for a newly developed scale. The current project involved four of the basic stages summarized by Hinkin (1998): item generation, initial item reduction, confirmatory factor analysis, and convergent/discriminant validity. Procedures involved with these four steps will now be reviewed in brief.

Item Generation

The first stage of scale development, item development, involves the generation of individual items to assess the construct under consideration. The goal of this stage is to develop items that sample the construct's domain and demonstrate construct validity. While measuring the complete domain of interest is not possible, domain sampling theory suggests that researchers should strive to develop items that adequately represent the construct of interest (Ghiselli, Campbell, Zedeck, 1981). Hinkin (1998) recommends a deductive approach, which utilizes the construct's definition to guide item development, because it helps assure construct validity (Schwab, 1980).

Content validity assessment should follow item generation (Hinkin, 1995). A necessary precursor to establishing construct validity (Schreishem, Powers, Scandura, Gardiner, & Lankau, 1993; Schwab, 1980; Anderson & Gerbing, 1991), content validity can be defined as the degree to which a measure's items are a proper sample of the theoretical content domain of a construct (Nunnally & Bernstein, 1994). The assessment of content validity serves as a pretest that removes conceptually inconsistent items (Hinkin, 1995). The benefits of this process include providing evidence for content

adequacy, fortification of construct definitions, and reducing the number of items which fail in subsequent empirical testing of the measure such as confirmatory factor analyses (Anderson & Gerbing, 1991). Anderson and Gerbing (1991) developed a technique for assessing substantive validity (a type of content validity; the extent to which items of a scale reflect the construct of interest) using a Q-sort task. This method is especially valuable because of its intuitive appeal and its compatibility with very small sample sizes such as 20 or less (Anderson & Gerbing, 1991).

Initial Item Reduction

The next step in scale development is initial item reduction, a two part process consisting of exploratory factor analysis (EFA) and reliability assessment. Factor analysis serves to examine the item's factor structure and facilitate the refinement of the new measure (Hinkin, 1995). The EFA is an important phase of item reduction because it allows for the deletion of poorly loading items (Hinkin, 1995). Prior to conducting an EFA, it is advisable to examine the inter-item correlation matrix and eliminate items that correlate poorly with all other items (Hinkin, 1998). The scree test tends to perform well as a means by which to determine the number of factors present in the analysis (Fabrigar et al., 1999). This method utilizes a plot of successive eigenvalues to determine the transition point at which the eigenvalues represent random error rather than important factors (Nunnally & Bernstein, 1994). When examining factor loadings, the .4 criterion level for a meaningful factor loading is an advisable cutoff point at which items falling

below should be deleted (Ford, MacCallum, & Tait, 1986). Moreover, items that either load highly on more than one factor or fail to load onto either factor should be deleted.

After conducting the EFA to establish dimensionality (Anderson & Gerbing, 1988), internal consistency reliability should be calculated for each dimension of the scale. Coefficient alpha, which reflects both the number of items and their average correlation (Nunnally & Bernstein, 1994), is the most commonly accepted measure of reliability (Hinkin, 1995). Calculation of reliability at this stage is critical for two reasons. First, reliability is a necessary condition for construct validity (APA, 1995). Second, it provides important information about item-specific variance (Cortina, 1993). This information can be used to delete items that “will improve or not negatively affect the reliability of the scales” (Hinkin, 1998, p. 113). Nunnally’s (1978) suggestion of .70 as the minimum acceptable internal consistency coefficient is generally still accepted, although reliability should often be significantly higher (Hinkin, 1998).

Confirmatory Factor Analysis

The next step recommended by Hinkin (1998) is to perform a confirmatory factor analysis to test the significance of the overall model’s fit to the data and each item’s loading onto its specified factor. Hurley and colleagues (1997) recommend that researchers integrate both exploratory and confirmatory factor analysis (CFA) into a multiple sample study in which data is first explored and then tested in the confirmatory analysis (Hurley, et al., 1997). The added advantage of an exploratory analysis with a confirmatory analysis is that researchers have more precision in evaluating the

measurement model (Hinkin, 1995). Although researchers may choose from a number of indices from which fit may be judged (Hurley et al., 1997), multiple fit indices should be utilized to provide convergent evidence in the assessment of model fit (Chan & Schmitt, 1997; Medsker, Williams, & Holahan, 1994; Wheaton, 1987). According to Hinkin (1998), researchers who follow the scale development process through to this point can have confidence in the content validity, internal consistency, and factor structure of their measure.

Convergent and Discriminant Validity

The final step in the scale development process involves demonstrating “the extent to which the scales correlate with other measures designed to assess similar constructs (convergent validity) and to which they do not correlate with dissimilar measures (discriminant validity)” (Hinkin, 1998, pp.115-116). Convergent validity for measures of newly proposed constructs is usually assessed by examining the association of the new measure with other theoretically relevant constructs (Brown, Trevino, & Harrison, 2005; Kumar & Beyerlein, 1991; Levashina & Campion, 2007). Discriminant validity, on the other hand, provides evidence that measures purportedly assessing different constructs in fact do so. This step also involves developing the new measure’s “nomological network” through providing criterion-related validity evidence (Chronbach & Meehl, 1955). Criterion related validity evidence is displayed by examining relationships with other variables with which the scale is expected to correlate (Hinkin,

1998). Demonstrating convergent, discriminant, and criterion-related validity can provide strong evidence for a new measure's construct validity (Hinkin, 1998).

Chapter 2

Outline of Current Research

The instrument that was expanded and validated in the current project is the Team Temporal Leadership Scale (TTLS). In accordance with the four general phases of scale development outlined above, the present study involved a series of four independent studies conducted to provide evidence for the validity of the TTLS. Study 1 involved item development and content validity assessment of the TTLS through the use of a Q-sort task. Study 2 utilized an undergraduate student sample for initial item reduction through EFA and reliability estimation. Study 3 involved an independent undergraduate student sample to statistically test the scale's factor structure using CFA. In addition, convergent/discriminant validity was assessed for each dimension of the TTLS (Hinkin, 1998). Finally, Study 4 utilized a sample composed of in tact student teams working on class projects to retest the scale's factor structure through CFA and to provide criterion-related validity evidence for the measure of team temporal leadership. Three categories of specific correlates were covered in Studies 3 and 4: characteristics of the rater, ratings of the leader, and leadership outcomes. As described below, specific predictions regarding these correlates are summarized in Table 1.

Characteristics of the Rater

It is predicted that each dimension of the TTLS will exhibit a minimal correlation with the rater's age and gender. Although each of these demographic variables are related to individual level time management behaviors (Macan, Shahani, Dipboye, & Phillips, 1990), an individual team member's proclivity is not expected to influence his or her perception of the leader's behavior towards the team as a whole. Age and gender exhibited nonsignificant relationships with the previous unidimensional measure of team temporal leadership (Mohammed and Nadkarni, (in press). This study will seek to replicate these findings for the task oriented dimension and extend them to the relationship oriented dimension of team temporal leadership.

***Hypothesis 1:** Rater age will be unrelated to (a) TOTL and (b) ROTL.*

***Hypothesis 2:** Rater gender will be unrelated to (a) TOTL and (b) ROTL.*

Campbell (1960) suggested that new constructs should always be examined for social desirability in order to demonstrate discriminant validity. This procedure ensures that participants do not differentially respond to items because of differences in perceived social value rather than differences in appraisal of content. Brown et al. (2005) gave two basic reasons why social desirability should not display significant correlations with follower ratings of their leaders. First, if followers are asked to rate someone else in terms of leadership, there should be little incentive for biased responding. Second, responses are anonymous and the leader being rated should not see the specific leadership levels being ascribed to him or her by the team member. However, Judge et al. (2004) expressed

concern that relationship oriented leader behavior scales may have a social desirability component which has biased previous measures of relationship oriented leader behaviors. Therefore, it is worth investigating team temporal leadership's relationship with this variable. Each dimension of the TTLS is predicted to be unrelated to a respondent's tendency to provide socially desirable responses.

***Hypothesis 3:** Social desirability will be unrelated to (a) TOTL and (b) ROTL.*

Ratings of the leader

Initiation of Structure. Initiation of structure is defined as “the degree to which a leader defines and organizes his role and the roles of followers, is oriented toward goal attainment, and establishes well-defined patterns and channels of communication” (Judge et al., 2004, p.36). It is predicted that TOTL will exhibit a significant, positive relationship with initiation of structure because both constructs capture task-focused behaviors (Fleishman, 1973; Mohammed & Nadkarni, in press; Yukl, 2006). However, the constructs will not be redundant because team temporal leadership encompasses a narrower set of behaviors characterized by a temporal referent (Mohammed & Nadkarni, in press). As discussed by Mohammed and Nadkarni (in press), task oriented behaviors such as maintaining standards of performance, standardizing task procedures, monitoring operations, defining task roles, and clarifying objectives (Fleishman, 1973, 1995; Yukl, 2006) fall outside the realm of team temporal leadership. Initiation of structure's expected positive correlation with the task oriented dimension of the TTLS is also based on the confirmatory factor analysis performed by Mohammed and Nadkarni (in press). In

their mini-validation study, the best fitting model was one which specified team temporal leadership and initiation of structure to be separate factors. In addition to the expected positive correlation between initiation of structure and the task oriented dimension of the TTLS, it is also expected that initiation of structure's relationship with the task dimension will be stronger than its correlation with the relationship oriented dimension of the TTLS.

***Hypothesis 4:** Initiation of structure a) will be positively correlated with TOTL, and b) the correlation between initiation of structure and TOTL will be stronger than the correlation between initiation of structure and ROTL*

Consideration. Consideration is defined as the extent to which a leader exhibits concern for the welfare of the other members of the group (Bass, 1990). Due to their shared emphasis on relationship oriented behaviors, it is expected that consideration will exhibit a significant correlation with ROTL. However, ROTL encompasses a somewhat different set of behaviors than consideration, and is characterized by an explicit emphasis on temporality. Consideration behaviors such as backing up subordinates in their actions and standing up for subordinates (Fleishman, 1953) do not fall in the domain of ROTL because they lack an emphasis on temporality. Therefore, relationship oriented team temporal leadership is not expected to be redundant with the consideration dimension of leader behaviors. Additionally, consideration is expected to exhibit a stronger correlation with relationship oriented team temporal leadership than with TOTL.

***Hypothesis 5:** Consideration a) will be positively correlated with ROTL, and b) the correlation between consideration and ROTL will be stronger than the correlation between consideration and TOTL*

Production Emphasis. The TOTL dimension is also expected to correlate significantly with production emphasis (Stogdill, 1963). Production emphasis refers to the extent to which a leader exercises pressure in order to achieve higher levels of productivity from his or her followers (Nicol, 2009). This pattern of leader behavior was proposed by Stogdill (1959) as conceptually distinct from consideration and initiation of structure. Production emphasis theoretically overlaps with TOTL because it involves time oriented elements such as a leader's emphasis on working at a rapid pace, being ahead of other groups, and working overtime. However, TOTL should be distinguishable from production emphasis because it includes a broader set of temporally relevant behaviors such as reminding team members of deadlines, allocating time to tasks, and coordinating the work of team members. Moreover, production emphasis includes behaviors such as hassling members to work harder that are not associated with TOTL. In addition to TOTL, production emphasis is expected to also be positively correlated with ROTL. A leader would not be likely to praise members for completing work on time or encourage the team as deadlines approach unless that leader valued completing work in a timely manner. However, the constructs are distinct not only because of production emphasis' lack of a temporal referent, but also its task oriented nature. Therefore, while the measures are expected to correlate, it is expected that the correlation between production emphasis and TOTL will be stronger because these two measures share a task orientation

Hypothesis 6: Production emphasis a) will be positively correlated with TOTL, and b) the correlation between production emphasis and TOTL will be stronger than the correlation between production emphasis and ROTL

Servant Leadership. Liden and colleagues recently conceptualized servant leadership on the premise that leaders rely on individual communication to understand the unique characteristics and interests of their subordinates (Liden R. C., Wayne, Zhao, & Henderson, 2008). Servant leadership was defined as a leader's focus on developing his/her subordinates to their fullest potential effectiveness, leadership potential, and stewardship (Greenleaf, 1977). Although Liden and colleagues (2008) delineated servant leadership as consisting of 7 dimensions, the dimension of "emotional healing" is of particular interest to the current project. Emotional healing is defined as "the act of showing sensitivity to others' personal concerns" (Liden et al., p. 162), and is expected to correlate positively with ROTL for two primary reasons. First, the two constructs overlap in their heavy person orientation; each involves concern for subordinate's well-being. Second, unlike other dimensions of servant leadership, emotional healing has a temporal referent (Bluedorn & Jaussi, 2009). A leader high in emotional healing devotes time to talk with his or her subordinates on a personal level. For these reasons, emotional healing is expected to exhibit a significant correlation with ROTL. However, the constructs are distinct because emotional healing concerns a more limited set of behaviors. It does not encompass ROTL markers such as recognition for meeting temporally relevant goals and consideration of subordinate preferences in decisions about the allocation of temporal resources. Although TOTL will likely correlate positively with servant leadership

because both are measuring perceptions of leadership behaviors, servant leadership's correlation with the relationship oriented dimension is expected to be stronger.

***Hypothesis 7:** The emotional healing dimension of servant leadership a) will be positively correlated with ROTL and b) the correlation between emotional healing dimension of servant leadership and ROTL will be stronger than emotional healing's correlation with TOTL.*

Contingent Reward. Contingent reward behavior may also overlap with the dimensions of team temporal leadership. Contingent reward involves “clarifying expectations and identifying the rewards (the followers) will receive for meeting these expectations” (Podsakoff et al., 2006, p.114). According to Podsakoff and colleagues, contingent reward is the principal behavior associated with transactional leadership, a leadership style based on an exchange process between a leader and his or her subordinates (Podsakoff, MacKenzie, Moorman, & Fetter, 1990). Leaders high in TOTL will tend to score higher on contingent reward because they both involve clarifying expectations for task accomplishment to subordinates (Judge & Piccolo, 2004). Indeed, transactional leaders tend to emphasize work standards and task-oriented goals (Tracey & Hinkin, 1998). However, TOTL is distinguished from contingent reward by the focus on temporality and the broader set of behaviors it encompasses. Behaviors such as building in time for problems and allocating time to tasks are not related to contingent reward. Contingent reward is also expected to correlate with the ROTL factor. Each of these approaches involves the use of reinforcement for achieving goals. Moreover, previous research has found contingent reward behavior to correlate strongly with consideration, a

construct closely related to ROTL (Seltzer & Bass, 1987, as cited in Bass, 1990).

However, contingent reward is not expected to be redundant with ROTL. While contingent reward is restricted to providing reinforcement, ROTL also involves temporally referenced behaviors such as recognizing subordinate's preferences about the use of time and seeking member input regarding the allocation of temporal resources.

Therefore, a positive correlation is expected between ROTL and contingent reward.

However, the constructs are expected to be distinct.

***Hypothesis 8:** Contingent reward will be positively correlated with: (a) TOTL and (b) ROTL.*

Laissez-Faire Leadership. Laissez-faire will be the next correlate included. Judge and Piccolo (2004) described laissez-faire leadership as the absence of leadership; they further noted that leaders high on laissez faire leadership avoid decision making, hesitate, and are often absent at times when they are needed. While laissez-faire leadership refers to the absence of leadership behaviors, a high score on each dimension of the TTLS indicates the presence of leadership behaviors. A high score on the task oriented dimension means the leader engages in leadership behaviors involving scheduling, synchronizing, or allocating time. Furthermore, a high score on the relationship oriented dimension indicates that the leader engages in behaviors dealing with time related conflict, recognition, or consideration behaviors. Therefore, a negative correlation is expected between laissez-faire leadership and both TOTL and ROTL.

***Hypothesis 9:** Laissez faire leadership will be negatively correlated with: (a) TOTL and (b) ROTL.*

Time Management. Subordinate ratings of their leader's time management behavior will also be included in the current construct validity examination. Research in the area of time management shows that individuals differ in the extent to which they set and prioritize goals, plan tasks, and monitor progress (Macan, T. H., 1994; Peeters & Rutte, 2005). Lakein (1973) described the process of time management as determining needs and wants and then ranking them in order of importance. Activities associated with time management include setting deadlines, making schedules, and completing priority tasks (Macan, 1994). Setting deadlines, making schedules, and prioritizing tasks are also key behaviors associated with TOTL (Mohammed & Nadkarni, in press). Therefore, leaders who score highly on a measure of individual time management behaviors are expected to also score highly on the TTLS. In addition to TOTL, time management is expected to also correlate positively with ROTL. A leader would not be likely to value time enough to praise members for completing work on time or encourage the team as deadlines approach unless that leader valued temporal issues in completing his or her personal work roles. However, the correlation between time management behaviors and ROTL is not expected to be as strong as the correlation between production emphasis and TOTL.

Hypothesis 10: *Ratings of a team leader's time management behaviors (a) will be positively correlated with TOTL and (b) the correlation between time management and TOTL will be stronger than the correlation between time management and ROTL.*

Liking. Hunter and colleagues (2007) cautioned about the biasing potential of liking, which refers to the amount of interpersonal attraction within a relationship (Liden, Wayne, & Stilwell, 1993). The authors noted a number of studies which have demonstrated liking's potential biasing effect on related leadership constructs. For example, Brown and Keeping (2005) found that a substantial portion (32% on average) of leaders' ratings on the MLQ was influenced by the degree to which they are liked by the subordinates rating them. Performance appraisal researchers have also argued that liking may lead raters to notice information consistent with their positive (or negative) affect toward the rater. Furthermore, studies examining leader-member exchange have consistently found liking to exert a strong influence on the quality of exchange (Engle & Lord, 1997; Liden, Wayne, & Stilwell, 1993). Heeding this warning, the current study will examine liking's relationship with each team temporal leadership dimension to determine whether the measure of team temporal leadership suffers from a "liking" bias. Antonioni & Park, (2001) found that peer ratings of "consideration of others," a construct that overlaps with ROTL, exhibited a correlation of .43 with liking. Coupled with the logical expectation that subordinates will tend to like a leader who provides them with rewards and encouragement, ROTL may therefore be expected to exhibit a significant correlation with liking. However, the correlation is not expected to be so high as to suggest redundancy. Some subordinates may tend to like a leader who provides structure to their work schedules, particularly those who tend to procrastinate. However, TOTL is not expected to correlate with liking as highly as the relationship oriented dimension.

Hypothesis 11: *Liking will (a) be positively correlated with ROTL. (b)The correlation between liking and ROTL will be stronger than that between liking and TOTL.*

Micro-Managing. Based on qualitative research with a biotechnical company, Alvesson and Sveningsson (2003) described micro-managing to involve taking away decisions from people that should make them and failing to delegate or trust subordinates. Several researchers have included similar leadership behaviors in taxonomies of ineffective leadership. McCall and Lombardo (1983) found that managers often cited a failure to delegate (overmanaging) as a critical reason for managerial failure, and Rasch and colleagues included “overcontrolling behavior” in their taxonomy of ineffective leadership behaviors (Rasch, Shen, Davies, & Bono, 2008). Rooney and Gottlieb (2007) demonstrated that micro-managing may be tied to deleterious outcomes, as it exhibited significant positive correlations with job strain and turnover intentions along with negative correlations with job satisfaction and autonomy perceptions. As TOTL involves directive behaviors such as setting deadlines and urging members to complete subtasks, it is critical to show that the behaviors measured by the TTLS are indeed constructive rather than destructive and over-controlling. While TOTL is expected to exhibit a small positive correlation with micro-managing because they share an emphasis on directive behaviors, TOTL is expected to be empirically distinct from micro-management. ROTL, on the other hand, involves several behaviors that run counter to those encompassed by micro-management. For example, while micro-management involves limiting subordinate’s participation (Rooney & Gottlieb, 2007), leaders high in

ROTL tend to consult team members before making decisions about the use of time. Therefore, it is expected that ROTL will exhibit a negative correlation with micro-management.

***Hypothesis 12:** Micro-managing (a) will be positively correlated with TOTL and (b) negatively correlated with ROTL.*

Leadership Outcomes

Willingness to follow. Willingness to follow the leader refers to the likelihood that a subordinate will follow the guidance of his or her leader and work towards goal attainment (Burke, Sims, Lazzara, & Salas, 2007). Considered an affective outcome, subordinates' willingness to follow their leader is a critical determinant of a particular leader's effectiveness (Burke et al., 2007). Mohammed and Nadkarni (in press) found that the previous unidimensional task-oriented dimension of team temporal leadership explained significant variance in willingness to follow the leader. The current work will demonstrate the concurrent validity of the new TTLS with regard to willingness to follow by replicating the results of Mohammed and Nadkarni (in press) with the refined task oriented dimension and extending to the new relationship oriented dimension.

TOTL is expected to be positively related to willingness to follow the leader for three reasons. First, an empirical reason is that the team temporal leadership measure used by Mohammed and Nadkarni (in press) explained significant variance in willingness to follow the leader above initiation of structure, consideration, and demographic control variables. Second, a theoretical reason is that subordinates prefer to follow successful

leaders (Maccoby, 2008), and the timely completion of work is a fundamental indicator of team success (Hackman, 1990). Therefore, followers will likely be more willing to follow a leader when he/she actively engages in scheduling, synchronization, and allocation of temporal resources because these behaviors convey that the leader is doing what it takes to get work done in a successful manner. Third, a theoretical reason is that individuals who face temporal ambiguity experience role ambiguity (McGrath & Rotchford, 1983). When a proximal team leader provides deadlines and schedules, team members' struggles with role ambiguity are alleviated. Followers will likely prefer to follow a leader under whom they experience less role stress; especially when the leader is also viewed as doing what it takes to be successful.

It is expected that subordinates will also be more willing to follow a leader when they rate him/her more highly on ROTL for three reasons. First, numerous scholars have commented that the most convincing findings concerning the validities of task and relationship oriented behaviors is the correlation between relationship oriented behavior and satisfaction related criteria (Bass, 1990; Judge et al., 2004; Yukl, 2006). Indeed, Macoby (2008) commented that the most effective approach to gaining the followership of subordinates is for a leader to involve them in decision making. Second, TIP suggests that individuals who are not given a voice in decisions regarding scheduling, synchronization, and allocation of time resources may experience role overload (McGrath & Rotchford, 1983). Role overload, a mismatch between the time an individual has available and the time it takes to complete assigned tasks (Kelly & McGrath, 1986), may be the most pervasive form of stress (Kahn et al., 1964). Therefore, employees will likely prefer to follow a leader who gives them a voice in the decision making process and

supports their desire to achieve a match between time requirements and availability (McGrath & Rotchford, 1983). Third, Burke and colleagues suggest that subordinates are more likely to follow their leader's guidance when they perceive that leader as benevolent (Burke et al., 2007). Leaders who engage in relationship oriented behaviors such as providing praise to team members who complete work by the deadline and utilizing team member's suggestions about the pacing of work will likely be viewed as benevolent, further contributing to subordinate's willingness to follow their team leader. Team members who view their leader as successful, are given a voice by their leader in decisions regarding time related issues, and perceive that leader as benevolent will likely exhibit higher levels of followership toward that leader. Therefore, it is expected subordinates who rate their leader highly on each dimension of the TTLS will also display higher levels of willingness to follow the leader.

***Hypothesis 13:** Willingness to follow the leader will be positively related to (a) TOTL and (b) ROTL.*

Perceived Leader Effectiveness. Perceived leader effectiveness refers to subordinates' perceptions of their leader's performance in influencing and guiding his or her group toward goal achievement (Judge, Bono, Ilies, & Gerhardt, 2002). Perceptions of leader effectiveness are important to study because of their relationships with two important criteria of effective team leadership: subordinates commitment to and identification with the leader (Meyer, Becker, & Vandenberghe, 2004).

TOTL is expected to relate positively to perceived leader effectiveness for two reasons. The first regards Mohammed and Nadkarni's (in press) finding that team

temporal leadership was positively related to team performance. Merging these results with those reported by Weber and colleagues that group success tends to be overly attributed to the leader (Weber, Camerer, Rottenstreich, & Knez, 2001), subordinates will likely view a leader who exemplifies high levels of TOTL as more effective. The second reason involves the meta-analysis performed by Judge and colleagues in which task oriented leadership behaviors and leadership effectiveness criteria exhibited a strong positive correlation (Judge et al., 2004).

The relationship oriented dimension of the TTLS is also expected to correlate with perceptions of leader effectiveness. The meta-analysis performed by Judge and colleagues lends support to this prediction because relationship oriented leader behaviors exhibited an even stronger correlation with leader effectiveness criteria than did task oriented behaviors (Judge et al., 2004). Moreover, research suggests that several leader behaviors associated with ROTL including recognition behaviors and conflict management are consistently associated with leadership effectiveness criteria (Judge & Piccolo, 2004; Podsakoff et al., 2006; Yukl & Kim, 1995). In summary, both the task oriented and relationship oriented dimensions of the TTLS are expected to correlate positively with perceived leader effectiveness.

Hypothesis 14: *Perceived leader effectiveness will be positively related to (a) TOTL and (b) ROTL.*

Performance. Although affective measures like willingness to follow the leader and perceived leader effectiveness provide important validity evidence, it is also critical to examine team temporal leadership's effects on unit level performance (Hogan, Curphy,

& Hogan, 1994; Morgeson et al., 2009). Such would be especially important to the current project because it would examine ratings from a source other than the individuals who complete the survey.

Teams who exhibit high levels of TOTL are expected to achieve higher levels of performance for several reasons. First, a theoretical reason is that performance should be improved via the communication of the project's timeframe through scheduling, synchronizing, and allocating temporal resources. According to Gersick (1988, 1989), teams tend to shift from their initial focus on developmental aspects of the project to focusing on completing the task around the midpoint of the project timeframe. By initiating structure through instructions about schedules, deadlines, and synchronization, TOTL can be expected to facilitate these midpoint transitions (Okhuysen & Waller, 2002). Theoretical reasons also include that setting interim milestones and encouraging the completion of subtasks may help to ensure that the team's pace is such that a project will be completed on time without sacrificing quality because the team's activities will be aligned with external time constraints (Waller, Zellmer-Bruhn, & Giambatista, 2002). A third theoretical reason is that leaders who exhibit high levels of TOTL will ensure that members of a project team are working in synchrony. This should prevent asynchrony of schedules between group members, which can lead to project failure (Halbesleben et al., 2003). Empirically, the relationship should be expected based on Mohammed and Nadkarni's (in press) finding that their TOTL measure explained significant variance in subjective performance ratings.

ROTL is also expected to predict team performance for several theoretical reasons. First, considering member's opinions in decisions about the use of time may

ensure that individuals are assigned to aspects of the project that fit their time personality. Halbesleben and colleagues described the importance of matching team member's responsibilities on a project with their time personality (Halbesleben et al., 2003). Conflicting time personalities can result in tension and dissatisfaction within the team, which is likely harmful to a team's performance (Mohammed & Nadkarni, in press). Team leaders may be able to reduce these conflicts if they make an effort to understand the time personalities of their team members. Second, consulting with team members about the use of time should increase knowledge sharing within the team, which may help the leader understand aspects of the time frame such as the pace and rhythm of team members' work. According to Crossan and colleagues, such an understanding contributes to a leader's ability to make necessary changes to timelines in reaction to events (Crossan, Cunha, Vera, Cunha, 2005). Knowledge sharing about temporal matters should also reduce the likelihood that team members will map out inconsistent schedules for task accomplishment, which could have a detrimental effect on the team's timely performance. Finally, increasing team member's efficacy may also be a mechanism by which ROTL contributes to team performance. Giving team members the opportunity to voice their opinions about the use of time, expressing confidence in their ability to meet deadlines, and recognizing them for meeting temporal milestones should increase their efficacy for completing work on time (Schaubroeck, Lam, & Cha, 2007; Srivastavaeff, Bartol, & Locke, 2005).

***Hypothesis 15:** Team performance will be positively related to (a) TOTL and (b) ROTL.*

Because the temporal referent in team temporal leadership is expected to tap an important aspect of leadership not currently assessed by measures of initiation of structure or consideration, it is important to test the incremental utility of the TTLS dimensions for the study of leadership outcomes. Past validation efforts have used hierarchical regression to test for the incremental validity of newly developed leadership constructs over and above previous leadership measures (Bass, Avolio, Jung, & Berson, 2003; Hinkin & Schriesheim, 2008; Mohammed & Nadkarni, in press). The present study used a similar methodology to demonstrate that each dimension of the new TTLS provides a unique incremental contribution to explaining willingness to follow the leader, perceived leader effectiveness, and team performance above initiation of structure and consideration.

Hypothesis 16: (a) TOTL and (b) ROTL will be significantly related to subordinate willingness to follow the leader after controlling for initiation of structure and consideration.

Hypothesis 17: (a) TOTL and (b) ROTL will be significantly related to subordinate perceived leader effectiveness after controlling for initiation of structure and consideration.

Hypothesis 18: (a) TOTL and (b) ROTL will be significantly related to team performance after controlling for initiation of structure and consideration.

Table 1.

Hypothesized Relationships between the Correlates and
Task and Relationship Oriented Team Temporal Leadership

<i>Correlate</i>	<i>Expected</i>		<i>Found</i>	
	<i>Task</i>	<i>Relationship</i>	<i>Task</i>	<i>Relationship</i>
<i>Characteristics of the Rater^a</i>				
Age	∅	∅	-.05	.07
Gender	∅	∅	.09	-.05
Social desirability	∅	∅	-.04	-.04
<i>Ratings of the Leader^a</i>				
Initiation of Structure	Stronger	Weaker	.43**	.25**
Consideration	Weaker	Stronger	.24**	.56**
Production Emphasis	Stronger	Weaker	.57**	.38**
Servant Leadership	Weaker	Stronger	.25**	.50**
Transactional Leadership	+	+	.23**	.56**
Laissez-Faire Leadership	-	-	.03	-.06
Time Management	Stronger	Weaker	.47**	.49**
Liking	Weaker	Stronger	.11	.43**
Micro Management	+	-	.22**	-.05
<i>Leadership Outcomes^b</i>				
Willingness to Follow	+	+	.71**	.74**
Perceived Leader Effectiveness	+	+	.79**	.74**
Team Performance	+	+	.03	.08

Note: ($p < .05$), a minus sign indicates a significant negative correlation is expected ($p < .05$), and a \emptyset indicates that a substantive relationship is not expected; * indicates $p < .05$; ** indicates $p < .01$; ^a indicates correlations reported from Study 3 individual level data; ^b indicates correlations reported from Study 4(b) aggregated data.

Chapter 3

Study 1: Item Generation and Content Validity

Item Generation

A deductive approach to item generation was followed in order to assure the scale's content validity (Hinkin, 1998). The seven items from Mohammed and Nadkarni's (in press) measure of team temporal leadership were included to reflect the hypothesized TOTL dimension. These were supplemented by 10 new items which were created in order to enrich the extant item's sampling of TOTL. In addition, 25 new items were developed to reflect the hypothesized ROTL dimension for a total of 42 items. A list of the 42 previously existing and newly developed items is provided in Appendix A. Some of the new items were adapted from previous scales of relationship oriented leader behaviors (Fleishman, 1953; Stodgill, 1963), but given a temporal referent. An effort was made to ensure that statements were short and simple, used familiar language, and avoided mixing assessment of affective responses with the scale's intended assessment of behaviors (Hinkin, 1998; Harrison & McLaughlin, 1993). The rating scale from Mohammed and Nadkarni's (in press) team temporal leadership measure, which provided five agree-disagree response choices ranging from "not at all" to "a great deal" was adapted for all new items.

Content Validity: Item-Sort Task.

Participants. Schriesheim and colleagues (1993) noted that subjects are appropriate for participating in a content validity assessment if they have sufficient intellectual ability to rate the correspondence between items and definitions of various theoretical constructs and the lack of any pertinent biases. Therefore, data for Study 1 was collected from 11 graduate and undergraduate students taking a course on industrial/organizational psychology.

Procedure. Respondents were provided with definitions of TOTL and ROTL accompanied with the set of items. They were asked to assign each item to the dimension which, in their judgment, it appeared to assess. Additionally, respondents were given the option of “no dimension” to eliminate forced assignment to categories. The coding sheet and instructions for this Q-sort task can be found in Appendix B.

Analyses. Study 1 utilized the two indices proposed by Anderson and Gerbing (2001) for assessing a measure’s content validity: the substantive agreement index (p_{sa}) and the substantive validity index (C_{sv}). First, the substantive agreement index, which assesses the proportion of respondents who assign an item to its intended construct, was calculated for each item. The formula for the substantive agreement index is: $(p_{sa}) = n_c / N$. This is where n_c represents the number of respondents who assign a measure to its proposed construct and N refers to the total number of respondents. Evaluation of the substantive agreement index followed the recommendation to retain items which respondents assign to the right construct .70 percent of the time (Bolino & Turnley, 1999; Holt, Armenakis, Feild, & Harris, 2007; Schriesheim & Hinkin, 1990). Next, the items

were evaluated according to the substantive validity coefficient, which reflects the degree to which participants assign an item to its intended construct more than to any other construct. Calculation of the substantive validity index is as follows: $(C_{sv}) = (n_c - n_o)/N$ where n_o represents the highest number of assignments to a construct other than that which the item was intended to measure. Anderson and Gerbing (1991) suggested comparing substantive validity coefficients to a critical value (the minimum value a C_{sv} could have and not be due to chance alone) based on the binomial distribution. The authors recommended obtaining the critical values from a table developed by Lawshe (1975). According to Lawshe (1975), the critical value for $N=11$ is .59. This value was therefore used as the criteria for retaining items.

Results. Based on the described criteria, items which exhibited both a p_{sa} value greater than .70 and C_{sv} value greater than .59 were determined to adequately represent the underlying construct. Items that failed to meet these criteria were discarded. Accordingly, 40 of the 42 items were retained for further survey administration. Results of this content validity assessment can be found in Table 2.

Table 2.

Results of Item-to-Construct Assignment Task

Item	Item description (abbreviated)	Intended Construct	# Correct	Total N	p _{sa}	Highest # wrong	C _{sv}
1	change the schedule to accommodate preferences.	rel.	9	11	.82	2	.82
2	support team members who are behind schedule.	rel.	11	11	1	0	1
3	remind members of important deadlines.	task	11	11	1	0	1
4	provide encouragement when the team approaches deadlines.	rel.	11	11	1	0	1
5	urge members to finish subtasks on time.	task	11	11	1	0	1
6	set milestones to measure progress.	task	11	11	1	0	1
7	understand differences amongst team members.	rel.	9	11	.82	2	.82
8	consult before setting deadlines.	rel.	11	11	1	0	1
9	articulate schedules for task completion.	task	11	11	1	0	1
10	make him/herself available when deadlines.	rel.	8	11	.73	2	.82
11	help members collaborate.	rel.	11	11	1	0	1
12	encourage members when deadlines are near.	rel.	9	11	.82	1	.91
13	emphasize the importance of deadlines.	task	11	11	1	0	1
14	let members know when other members prefer.	rel.	8	11	.73	2	.82
15	keep members informed of other's progress.	task	8	11	.73	2	.82
16	facilitate collaboration.	rel.	10	11	.91	1	.91
17	prepare and build in time for contingencies.	task	11	11	1	0	1
18	provide members feedback regarding pace.	task	4	11	.36	6	.45
19	express appreciation when team is on schedule.	rel.	11	11	1	0	1
20	see that members coordinate their work.	task	11	11	1	2	.82
21	show flexibility in amount of time devoted.	rel.	5	11	.45	4	.63
22	pace the team so work is finished on time.	task	11	11	1	0	1
23	effectively coordinate the team to meet deadlines.	task	11	11	1	0	1
24	praise you for completing work on time.	rel.	11	11	1	0	1
25	pay compliments to members who get work done.	rel.	11	11	1	0	1
26	see that members make efficient use of their time.	task	11	11	1	0	1
27	give team members credit for meeting deadlines.	rel.	9	11	.82	1	.91
28	give members recognition for coordinating work.	rel.	10	11	.91	1	.91
29	help members settle conflicts regarding pace.	rel.	10	11	.91	1	.91
30	express confidence in team member's abilities.	rel.	9	11	.82	2	.82
31	make sure members have enough time.	task	10	11	.91	1	.91
32	verbally recognize members.	rel.	10	11	.91	1	.91
33	settle differences about how much time to allot.	rel.	10	11	.91	1	.91
34	ensure members are recognized for completing.	rel.	10	11	.91	1	.91
35	consult the team before creating schedules.	rel.	8	11	.73	3	.73
36	provide members time to complete their tasks.	task	9	11	.82	1	.91
37	listen to suggestions concerning how much time.	rel.	11	11	1	0	1
38	prioritize tasks and allocate time to each task.	task	11	11	1	0	1
39	urge members to adjust their pace to coordinate.	task	11	11	1	0	1
40	display a willingness to adjust the pace of work.	rel.	10	11	.91	1	.91
41	set deadlines for completing tasks	task	11	11	1	0	1
42	express appreciation when members make efficient use of time.	rel.	10	11	.91	1	.91

The stem for all items was "To what extent did your team leader." Shaded items were deleted after reviewing Q-sort task results. p_{sa} = proportion of substantive agreement. C_{sv} = coefficient of substantive validity.

Chapter 4

Study 2: Initial Item Reduction

Method

Participants. Participants were 112 undergraduate students at a large northeastern state university who were recruited from introductory psychology courses for which they received course credit. However, 22 of these students were not included in the study's sample because their surveys were characterized by either a large amount of missing data or because they provided the same response to all or nearly all questions on the survey. Furthermore, the data from ten participants were removed prior to analyses because the team context they described was deemed irrelevant to the construct of team temporal leadership. The criteria used to make determinations regarding the appropriateness of the team context were as follows: 1) the group about which the student responded clearly reflected a team context (Guzzo & Dickson, 1996), 2) the team was a task based team, 3) the team had to complete a task by a deadline, and 4) members of the team had some discretion with regards to when they completed the task. Examples of team tasks that did not meet these criteria included sports teams in which the goal was to win and baby-sitting contexts in which the goal was to watch kids. After these deletions, the final sample size was 80. The sample was 81% female; 87% Caucasian, 4% African American/black, 8 % Asian/Asian American, and 1% American Indian. Participants were

58% freshman, 20% sophomores, 9% juniors, and 13% seniors and their average age was 19.56 (SD 2.22).

Measures. Team temporal leadership was assessed using items from the TTLS which was developed in Study 1 of the current project. Sample items include “To what extent is the team leader effective in coordinating the team to meet client deadlines?” and “To what extent does your team leader consult the team before creating schedules?” Each item was followed by a 5 point response format (1 = not at all, 5 = a great deal). Respondents were also given the choice of selecting “not applicable” (NA).

Analyses and Results

An EFA was conducted on the TTLS using a principal components extraction method (Hendrickson & White, 1964). Evaluation of the eigenvalues and scree plot indicated a one factor solution accounting for 40% of the item variance. All but one item loaded above .40 onto the primary factor. Due to the small sample size and theoretical justification for expecting two factors, choices regarding item retainment were not based solely on the EFA. Rather, decisions were based on other empirical considerations (e.g. high number of NA responses, mean above 4.0 on a five point scale, content adequacy, item redundancy, and discrimination of the task and relationship dimensions). All items exhibited item-total correlations above .35 and no opportunities existed for deleting items to improve reliability coefficients. Seven items were deleted because their mean was near or above 4.0 on a five point scale to prevent restriction of range in the final scale. Examination of the frequency with which participants selected the NA response choice

showed a higher rate for conflict items than for other aspects of the team temporal leadership construct. Therefore, all conflict items were removed based on the concern that participants did not find the items relevant. Rationale for this decision will be discussed further in the discussion section of this paper.

After these conceptually and empirically based decisions, items were retained in such a way as to balance content adequacy (to ensure the item content sampled the breadth of the construct's definition) and reduce item redundancy (to ensure no portions of the construct domain were over-sampled in the final scale). Attention was also given to choosing items that may reduce the overlap between task and relationship dimensions. This was accomplished by removing relationship oriented items that included words such as "deadline" or "schedule" when possible. Upon completing the culling process, 10 items remained (5 each for TOTL and ROTL) to be tested through use of CFA in Study 3. The reliability coefficients were $\alpha = .74$ for TOTL and $\alpha = .82$ for ROTL. Factor loadings for the final set of items are provided in Table 3, and a summary of reasons for item decisions is provided in Table 4.

Table 3.

Factor loadings for items retained in Study 1

To what extent did your team leader...	Factor Loading
2. provide support to team members who are behind schedule? ^b	.692
4. provide encouragement when the team approaches deadlines? ^b	.630
5. urge members to finish subtasks on time? ^a	.382 ^c
17. prepare and build in time for contingencies, problems, and emerging issues? ^a	.716
20. pace the team so that work is finished on time? ^a	.555
22. praise you for completing work on time? ^b	.744
23. pay personal compliments to team members who get their work done on time? ^b	.623
24. see to it that members make efficient use of their time? ^a	.720
37. urge members to adjust their pace in order to coordinate their work? ^a	.588
38. display a willingness to adjust the pace of work to meet team members' preferences ^b	.623

^aTask oriented item. ^bRelationship oriented item. ^cItem was retained for theoretical reasons in spite of factor loading.

Table 4.

Summary of Item Decisions in Study 2

Item	Item description (abbreviated)	Dimension	Retained	Range Restriction	Conflict Item/ NA	Content Adequacy/ Redundancy
1	willing to change schedule.	rel. ^a				X
2	provide support to members behind schedule.	rel. ^a	X			
3	remind members of important deadlines.	task ^d		X		
4	provide encouragement when the team approaches deadlines.	rel. ^a	X			
5	urge members to finish subtasks on time.	task ^d	X			
6	set milestones to measure progress.	task ^d				X
7	understand differences amongst team members.	rel. ^c			X	
8	consult before setting deadlines.	rel. ^a				X
9	articulate schedules for task completion.	task ^d				X
10	make him/herself available when deadlines.	rel. ^a				X
11	help members collaborate.	rel. ^c			X	
12	encourage members when deadlines are near.	rel. ^a				X
13	emphasize the importance of deadlines.	task ^d		X		
14	let members know when other members prefer.	rel. ^c			X	
15	keep members informed of other's progress.	task ^e				X
16	facilitate collaboration.	rel. ^c			X	
17	prepare and build in time for contingencies.	task ^f	X			
18	express appreciation when team is on schedule.	rel. ^b		X		
19	see that members coordinate their work.	task ^e		X		
20	pace the team so work is finished on time.	task ^e	X			
21	effectively coordinate the team to meet deadlines.	task ^e				X
22	praise you for completing work on time.	rel. ^b	X			
23	pay compliments to members who get work done.	rel. ^b	X			
24	see that members make efficient use of their time.	task ^f	X			
25	give team members credit for meeting deadlines.	rel. ^b				X
26	give members recognition for coordinating work.	rel. ^b				X
27	help members settle conflicts regarding pace.	rel. ^c			X	
28	express confidence in team member's abilities.	rel. ^a				X
29	make sure members have enough time.	task ^f				X
30	verbally recognize members.	rel. ^b				X
31	settle differences about how much time to allot.	rel. ^c			X	
32	ensure members are recognized for completing.	rel. ^b				X
33	consult the team before creating schedules.	rel. ^a				X
34	provide members time to complete their tasks.	task ^f				X
35	listen to suggestions concerning how much time.	rel. ^a				X
36	prioritize tasks and allocate time to each task.	task ^f				X
37	urge members to adjust their pace to coordinate.	task ^e	X			
38	display a willingness to adjust the pace of work.	rel. ^{a*}	X			
39	set deadlines for completing tasks	task ^d		X		
40	express appreciation when members make efficient use of time.	rel. ^b				X

Note: ^a consideration. ^b positive reward. ^c conflict. ^d scheduling. ^e synchronizing. ^f allocation. *Wording changed

Chapter 5

Study 3: CFA & Convergent/Discriminant Validity

Method

Participants. The study's sample consisted of 181 students from a large northeastern state university who were recruited from introductory psychology courses. Participants received course credit for participation in the study. Although 272 participants were recruited, 40 were not included because their surveys were characterized by either a large amount of missing data or because they provided the same response to all or nearly all questions on the survey. Furthermore, 51 were removed prior to analyses based on the criteria defining a team context relevant to team temporal leadership previously described. Examples of team tasks which did not meet these criteria again included sports contexts in which the goal was to win games as well as a kitchen context in which the goal was to clean dishes. The sample was 62% female, and its racial makeup was 80% Caucasian, 6% African American/Black, and 9% Asian/Asian American, while 3% were listed as "other." Academic standing of the sample was 47% freshman, 28% sophomore, 17% junior, and 8% senior. The average age was 19.56 (SD 2.5) and the average amount of full time work experience was 6 months.

Measures. *Team temporal leadership* was assessed with the 10 item measure described in Study 2. The task and relationship dimensions exhibited alphas of .71 and .79, respectively.

Social Desirability was measured using the short form of the Crowne- Marlowe Social Desirability Scale (Crowne & Marlowe, 1964). Sample items include “I sometimes feel resentful when I don’t get my way” and “No matter who I talk to, I’m always a good listener.” The response scale was true or false format. Cronbach’s alpha for the 10 item scale was $\alpha=.68$.

Initiation of Structure, Consideration, and Production Emphasis were assessed using the LBDQ XII (Stodgill, 1963). Each scale utilized a response format with choices ranging from 1 (never) to 5 (always). Although all three are 10 item scales, three items were deleted from consideration to improve the scale’s reliability. The internal consistency reliability for the seven-item consideration scale was $\alpha=.78$. Examples of consideration items include “Does little things to make it pleasant to be a member of the group” and “puts suggestions made by the group into operation.” Initiation of structure exhibited an internal consistency reliability of $\alpha=.77$. Sample items for initiation of structure include “assigns group members to particular tasks” and “makes sure that his/her part in the group is understood by the group members.” Finally, the internal consistency reliability for production emphasis was $\alpha=.71$. Examples include “permits the members to take it easy in their work” and “drives hard when there is a job to be done.”

Contingent Reward was measured using five items from the contingent reward subscale of the Transformational Leadership Behavior Inventory (TLI: Podsakoff et al., 1990). The scale utilizes a 7 point scale with choices ranging from 1 (strongly disagree) to 7 (strongly agree). Example items include “Gives me special recognition when my work is very good,” “Personally compliments me when I do outstanding work,” and

“Always gives me positive feedback when I perform well.” The measure exhibited high reliability ($\alpha = .89$) in the current study.

Servant leadership was assessed using the emotional healing dimension of Liden et al’s (2008) Servant Leadership Scale. The servant leadership dimension includes four items to which participants respond on a 7 point scale with choices ranging from 1 (strongly disagree) to 7 (strongly agree). Examples include “My manager takes time to talk to me on a personal level,” and “My manager cares about my personal well-being.” The scale demonstrated strong internal consistency reliability ($\alpha = .86$) in the present study.

Laissez-Faire Leadership was assessed using the MLQ-5X (Bass & Avolio, 2000). This measure employs a response scale with choices ranging from 1(not at all) to 5 (frequently, if not always). Sample questions include “My (team leader) avoids getting involved when important issues arise,” and “My (team leader) is absent when needed.” The scale demonstrated adequate internal consistency reliability ($\alpha = .83$).

Time Management of the team leader was assessed using a truncated 10 item version of Macan’s (1994) Time Management Behavior Scale as used by Peeters and Rutte (2005). Items were modified such that participants indicated how often their team leader engages in time management behaviors using a 5-point scale with response choices ranging from 1 (*seldom*) to 5 (*very often*). Sample items include “sets short-term goals” and “completes priority tasks.” The coefficient alpha for the 10 item scale was high ($\alpha = .88$).

Liking was assessed using two items adapted from Wayne & Ferris’ (1990) Member Liking of the Leader Scale which were rated on a 1 (strongly disagree) to

5(strongly agree) scale. The items included in the scale were “I like my supervisor very much as a person” and “I think my supervisor would make a good friend.” The liking items exhibited adequate internal consistency reliability ($\alpha = .91$).

Micro-Managing was measured using a 3 item measure developed for the current study. Items was based on previous conceptualizations of micro-management (e.g. Alvesson & Sveningsson, 2003; Rasch, Shen, Davies, & Bono, 2008) and utilized a 1 (strongly disagree) to 5(strongly agree) scale. Coefficient alpha reliability for the micro-managing scale was $\alpha = .69$.

Analyses

As suggested by numerous scholars of SEM, multiple indices were used to provide convergent evidence in the assessment of model fit (Chan & Schmitt, 1997; Medsker, Williams, & Holahan, 1994; Wheaton, 1987). In particular, chi square divided by degrees of freedom, Bentler and Bonnet’s (1980) normed fit index (NFI), Bentler’s (1990) comparative fit index (CFI), and Steiger’s (1990) root mean square error of approximation (RMSEA) were utilized. The chi square divided by degrees of freedom indicates how closely the model’s fit compares with a perfect fit (Kline, 1998). The NFI is an incremental fit index that compares the hypothesized model to a baseline model. The CFI, another incremental fit index, is a measure of a model’s goodness of fit with the observed sample covariance matrix that accounts for sample size (Bentler, 1990). The NFI and CFI values range from 0-1 with values approaching .95 indicating good fit (Hu & Bentler, 1999). Finally, the RMSEA is an index that takes into account the error of

approximation and asks the question: “how well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available?” (Browne & Cudeck, 1993, pp. 137-138). Values ranging from .08 to point .10 indicate mediocre fit and those under .06 are indicative of good fit (MacCallum et al. 1996; Hu & Bentler, 1999).

Analysis for the convergent/discriminant validity aspect of this study (Hypotheses 1-12) involved Pearson correlations between correlates and both the task and relationship dimensions of the TTLS. In addition, Steiger’s Z tests were conducted to test hypotheses 4 (b), 5 (b), 6 (b), 7 (b), 10 (b), and 11 (b) (Meng, Rosenthal, & Ruin, 1992; Steiger, 1980).

Results

Measurement Model. Maximum likelihood estimation was utilized for the CFAs, which tested the hypothesized model against other potential models. Three models of the scale’s dimensionality were compared so conclusions could be based not only on absolute fit, but also on fit relative to alternative models. Results of the CFAs are presented in Table 5. The first model, which tested a single temporal leadership factor, revealed a mediocre fit to the data: $\chi^2/df = 2.475$, NFI = .812, CFI = .873, and RMSEA = .091. The second model was the hypothesized two factor model including task and relationship oriented dimensions. This model exhibited a superior fit as compared to the one factor model: $\chi^2/df = 1.087$, NFI = .920, CFI = .933, and RMSEA = .022. The correlation between the TOTL and ROTL dimensions was $r = .50$. As previously noted, the task ($\alpha =$

.71) and relationship ($\alpha = .79$) dimensions each exhibited adequate reliability. Finally, the third model included three correlated factors: task oriented behaviors, consideration behaviors, and positive reward behaviors. The relationship oriented dimension was split into two separate factors for this model since contingent reward behavior is sometimes measured separately from consideration (Yukl, 1999). Fit indices for this model indicated a strong fit to the data: $\chi^2/df = .963$, NFI = .933, CFI = 1.000, and RMSEA = .000. Although fit indices for the three dimensional model indicated a marginally better fit than the two factor model, the need for parsimony and theoretical meaningfulness lend support to the hypothesized model. Moreover, the positive reward ($\alpha = .69.$) and consideration ($\alpha = .68$) subdimensions in the three factor model exhibited less than adequate reliability. Accordingly, it was determined that the CFA was largely supportive of the hypothesized model.

Correlational Analyses. The observed correlations for measured variables are provided in Table 6. The first group of correlates regarded characteristics of the raters. Consistent with Hypothesis 1, *age* was unrelated to both TOTL ($r = -.05, ns$) and ROTL ($r = .07, ns$). Discriminant validity was further evidenced by *gender*'s non-significant correlations with both TOTL ($r = .09, ns$) and ROTL ($r = -.05, ns$), as predicted by Hypothesis 2. In support of Hypothesis 3, *social desirability* was unrelated to both TOTL ($r = -.04, ns$) and ROTL ($r = -.04, ns$).

The second group of correlates regarded the leader. Consistent with Hypothesis 4 (a), *initiation of structure* was positively correlated with TOTL ($r = .43, p < .01$); it also correlated significantly with ROTL ($r = .25, p < .01$). A Steiger's Z test supported

Hypothesis 4 (b), in that initiation of structure's correlation with TOTL was significantly stronger than its correlation with ROTL ($Z = 2.59, p < .01$). *Consideration* correlated positively with TOTL ($r = .24, p < .01$) and ROTL ($r = .56, p < .05$), supporting Hypothesis 5 (a). *Consideration* was more strongly related to ROTL than to TOTL ($Z = 4.80, p < .01$), thus Hypothesis 5 (b) was also supported. As predicted in Hypothesis 6 (a), *production emphasis* exhibited strong positive correlations with both TOTL ($r = .57, p < .01$) and ROTL ($r = .38, p < .01$). In support of Hypothesis 6 (b), the correlation between production emphasis and TOTL was the stronger of the two ($Z = 3.00, p < .01$). *Servant leadership* exhibited a positive relationship with ROTL ($r = .50, p < .01$) as predicted in Hypothesis 7 (a) as well as a smaller ($Z = 3.68, p < .01$) significant relationship with TOTL ($r = .25, p < .01$) as predicted by Hypothesis 7 (b). Support for Hypothesis 8 (a) and (b) was provided by significant correlations for *contingent reward* with both TOTL ($r = .23, p < .01$) and ROTL ($r = .56, p < .01$). The stronger correlation for ROTL was not surprising given the similarity between contingent reward and positive reward elements of ROTL. Finally, *time management* exhibited the significant positive relationship with TOTL ($r = .47, p < .01$) that was predicted in Hypothesis 10 (a). However, Hypothesis 10 (b) was not supported because the correlation between time management and ROTL was .49 ($p < .01$) and time management's correlation with TOTL was .47 ($p < .01; Z = .32, ns$).

Several correlates concerning the leader supported team temporal leadership's discriminant validity. Consistent with Hypothesis 11 (a), the relationship between ROTL and *liking* was significant ($r = .43, p < .01$) yet not suggestive of redundancy. Hypothesis 11 (b) was confirmed due to *liking's* weaker relationship with TOTL ($r = .11, ns; Z =$

4.48, $p < .01$). This finding suggests that the TOTL measure does not suffer from “liking” bias. In support of Hypothesis 12 (a), *micro management* had a small positive correlation with TOTL ($r = .22, p < .01$). Hypothesis 12 (b) predicted a negative relationship between ROTL and micro management. However, the correlation was non-significant ($r = -.05, ns$), albeit in the expected direction. Although Hypothesis 12 was only partially supported, the results suggest that team temporal leadership is not likely to be perceived aversively by subordinates. Although Hypothesis 9 predicted negative correlations between the team temporal leadership dimensions and *laissez-faire leadership*, the relationship was not significant for either TOTL ($r = .03, ns$) or ROTL ($r = -.06, ns$). Despite being contrary to predictions, these findings do support the discriminant validity of each team temporal leadership dimension.

Although the correlations indicated that TOTL was not redundant with initiation of structure and ROTL was not redundant with consideration, CFA analyses were conducted to further support these findings. First, a CFA was conducted including items from the TOTL and initiation of structure scales. Two models were fit to the data: a unidimensional model in which all items were forced onto the same latent factor, and a two-dimension model in which TOTL and initiation of structure items were specified to load on their respective factors. Results for the unidimensional model indicated a poor fit to the data: $\chi^2/df = 2.337$, NFI = .637, CFI = .738, and RMSEA = .086. Fit indices were improved (but not strong) for the two-dimension model ($\chi^2/df = 1.645$, NFI = .748, CFI = .875, and RMSEA = .060). The same procedure was followed whereby unidimensional and two-factor models of ROTL and Consideration were compared. Again, the unidimensional model ($\chi^2/df = 3.702$, NFI = .775, CFI = .725, and RMSEA = .123) did

not fit the data as well as the two-dimension model: $\chi^2/df = 2.384$, NFI = .826, CFI = .887, and RMSEA = .088. In sum, the results of these CFAs indicate that the measures are best conceptualized as measuring distinct latent constructs.

Table 5

Fit Statistics for One-, Two-, and Three-Factor Models

	Model (5)	Chi Square	DF	Chi-square/df	NFI	CFI	RMSEA
1.	One-factor	86.6	35	2.475	.812	.873	.091
2.	Two-factor*	36.9	34	1.087	.920	.933	.022
3.	Three-factor	30.8	32	.963	.933	1.000	.000

*Hypothesized model. N = 181. NFI = normed fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.

Table 6

Correlations Among Measured Variables in Study 3

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. TOTL	3.53	.70	1.00													
2. ROTL	3.57	.77	.50**	1.00												
3. Age	19.56	2.50	-.05	.07	1.00											
4. Gender	1.63	.48	.09	-.05	-.03	1.00										
5. Social Desirability	1.47	.25	-.04	-.04	-.09	.01	1.00									
6. Initiation of Structure	3.47	.52	.43**	.25**	-.00	.16*	-.09	1.00								
7. Consideration	3.67	.64	.24**	.56**	.06	.11	-.02	.37**	1.00							
8. Production Emphasis	3.09	.54	.57**	.38**	.04	.14	-.10	.69**	.28**	1.00						
9. Servant Leadership	4.80	1.38	.25**	.50**	.02	.15	-.07	.26**	.67**	.29**	1.00					
10. Transactional Leadership	4.66	1.07	.23**	.56**	.02	.14	-.02	.24**	.60**	.24**	.59**	1.00				
11. Laissez-Faire Leadership	2.12	.90	.03	-.06	-.05	-.05	-.00	-.22**	-.35**	.08	-.14	-.24**	1.00			
12. Time Management	3.66	.63	.47**	.49**	-.01	.06	.02	.59**	.49**	.54**	.42**	.38**	-.30**	1.00		
13. Liking	3.91	.94	.11	.43**	-.05	.05	-.03	.09	.63**	.06	.65**	.57**	-.26**	.26**	1.00	
14. Micro Management	2.85	.81	.22**	-.05	-.06	-.05	-.02	.19*	-.36**	.32**	-.13	-.19**	.39**	.09	-.31**	1.00

* indicates significance at $p < .05$, ** indicates significance at $p < .01$; Analysis was at the individual level; N = 181

Chapter 6

Study 4(a): CFA

Method

Participants and Procedure. Data were obtained from 305 undergraduate students at a large, northeastern state university. Participants were recruited from seven different classes in which students were working on team based class projects. These included two civil engineering classes (ENG1, ENG2), one hotel and restaurant management class (HRIM), one psychology class (PSYCH), one class in security and risk analysis (SRA), one horticulture class (HORT), and one communications class (COMM). The amount of time teams had to complete their projects ranged from one and a half months to the entire fall semester. The team tasks involved varied from class to class and are summarized in Table 7.

Participants from all classes completed the survey during class hours except for PSYCH and SRA, who completed the survey outside of class hours and returned their copies to their instructor the following class period. Extra credit was only provided to participants from these two classes to provide an incentive for them to return their surveys. In order to match team members together, participants were asked to provide their own name along with the names of their team members on the first page of the survey. This page was later removed from the remainder of the survey to ensure confidentiality. Respondents completed the survey in about 15 minutes.

The total sample of 305 was 56 % male; 89% Caucasian, 2% African American/Black, 4% Asian, .3% American Indian, and 4% were listed as “other.” The sample included 10% sophomores, 45% juniors, and 45% seniors with a mean age of 21.22 (SD = 1.22). The entire individual level sample was utilized for the CFA analyses.

Assigned and Emergent Leadership. While teams from HRIM, ENG1, and ENG2 each had an assigned team leader, the remaining classes had emergent team leaders. According to Firestone and colleagues, whether a leader is assigned or emergent may be “unimportant in comparison to the behaviors of the leader” (Firestone, Lichtman, & Colamonosca, 1975, p. 347). Further, several researchers have argued that the importance of emergent leaders in facilitating task completion is similar to that of assigned leaders (Stodgill, 1974; Taggar, Hackett, & Saha, 1999). In order to utilize emergent leadership in the current study, it was critical to determine two things: a) if a leader had emerged in each team, and b) whether or not members agreed who the emergent leader was. Therefore, all participants were asked to identify their “team leader,” whether that leader was a “formally assigned leader, or if there was no assigned leader, someone who informally took charge of leadership responsibilities.” Questions on the survey regarded the individual whom participants identified as their “team leader.”

Measures. *Team temporal leadership* was measured using the 10 item TTLS developed, refined, and validated in the current project. The task and relationship dimensions exhibited internal consistency reliabilities of $\alpha = .77$ and $\alpha = .79$, respectively.

Analyses

CFAs were conducted utilizing the full individual level dataset ($N = 305$). A CFA was conducted to determine if the factor structure from Study 3 would be replicated in a new sample. As in Study 3, the hypothesized two dimensional model was compared with two alternate models: a unidimensional model and a three dimensional model which included task, consideration, and positive reward factors. CFAs were also conducted to replicate the results from Study 3 which supported the discriminant validity of the TTLS dimensions with initiation of structure and consideration.

Results

Results of the CFAs, which were conducted utilizing the full individual level dataset ($N = 305$) are presented in Table 8. The first model specified all ten items onto a single team temporal leadership factor. The single factor model exhibited a mediocre fit to the data: $\chi^2/df = 3.209$, $NFI = .887$, $CFI = .919$, and $RMSEA = .085$. The hypothesized two dimensional model revealed a somewhat better fit: $\chi^2/df = 2.364$, $NFI = .919$, $CFI = .951$, and $RMSEA = .067$. The factors exhibited a correlation of $r = .66$ ($p < .01$), and the task ($\alpha = .77$) and relationship ($\alpha = .79$) dimensions each exhibited adequate reliability. Finally, the three dimensional model was tested and the fit indices indicated a similarly strong fit to the data: $\chi^2/df = 1.555$, $NFI = .950$, $CFI = .981$, and $RMSEA = .043$. Although adequate reliability was found for the positive reward dimension ($\alpha = .80$), the consideration dimension ($\alpha = .62$) again had low reliability. Therefore, while the three dimension model demonstrated similar fit statistics to the hypothesized model as in Study

3, the hypothesized model was superior in terms parsimony. A summary of item loadings and fit indices from Studies 3 and 4 can be found in Table 9.

Next a CFA was conducted to replicate Study 3 findings that TOTL and ROTL assess different latent constructs than initiation of structure and consideration, respectively. Results for the unidimensional model (TOTL & initiation of structure) indicated a mediocre fit to the data: $\chi^2/df = 3.057$, NFI = .826, CFI = .876, and RMSEA = .082. Indices showed marginal improvement for the hypothesized model: $\chi^2/df = 2.764$, NFI = .844, CFI = .894, and RMSEA = .076. Results for the unidimensional model of ROTL and consideration indicated a poor fit to the data: $\chi^2/df = 8.233$, NFI = .563, CFI = .587, and RMSEA = .154. The fit indices were improved for the hypothesized model ($\chi^2/df = 6.020$, NFI = .701, CFI = .732, and RMSEA = .12), suggesting that ROTL and consideration may best be conceptualized as distinct constructs.

Table 7.

Description of Sample

	Class	Task	Number of Teams	Mean Grade	Duration of Project	Emergent or Assigned Leader?
1.	HRIM	Formed a marketable theme then developed, produced, and evaluated an authentic dining experience	9	86.0	Semester long	Assigned
2.	ENG1	Developed blueprints for the construction of an academic building	7	88.7	1 ½ Months	Assigned
3.	ENG2	Determined all costs and income associated with the construction of an office building from its inception.	14	91.0	1 ½ Months	Assigned
4.	PSYCH	Created items for an attitude scale, and then collected and analyzed the data using the scale that they created.	9	NA	1 ½ Moths	Emergent
5.	SRA	Performed analysis of critical steps in developing an information security framework for a large organization.	10	NA	Semester long	Emergent
6.	HORT	Researched a topic related to landscape contracting and presented results to class.	3	86.0	1 ½ Months	Emergent
7.	COMM	Developed a research question, collected data, analyzed/interpreted data, reported results.	13	90.5	Semester long	Emergent

HRIM: Hotel, Restaurant, and Institution Management; ENG: Civil Engineering; PSYCH: Psychology; SRA: Security and Risk Analysis; HORT: Horticulture; COMM: Communications.

Table 8.

Fit Statistics for One-, Two-, and Three-Factor Models

	Model (5)	Chi Square	DF	Chi-square/df	NFI	CFI	RMSEA
1.	One-factor	112.3	35	3.209	.887	.919	.085
2.	Two-factor*	80.4	34	2.364	.919	.951	.067
3.	Three-factor	49.8	32	1.555	.950	.981	.043

*Hypothesized model. N = 181. NFI = normed fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.

Table 9.

<u>Items and item loadings from CFAs</u>				
To what extent does your team leader...	Dimension	Study 3	Study 4	
pay personal compliments to team members who get their work done?	relationship	.67	.72	
provide encouragement to the team when time is limited?	relationship	.77	.71	
provide support to team members who fall behind schedule?	relationship	.58	.66	
praise team members for completing work on time?	relationship	.72	.71	
consider team members' opinions in decisions regarding the team's use of time?	relationship	.51	.47	
pace the team so that work is finished on time?	task	.47	.53	
urge members to adjust their pace in order to coordinate their work?	task	.64	.60	
prepare and build in time for contingencies, problems, and emerging issues?	task	.67	.69	
see to it that members make efficient use of their time?	task	.67	.69	
urge members to finish subtasks on time?	task	.46	.66	
NFI		.920	.919	
CFI		.993	.951	
RMSEA		.022	.067	

Note. Standardized item loadings reported for CFA.

Chapter 7

Study 4(b): Team Level Criterion-Related Validity Study

Method

Participants and Procedure. A subset of the sample from Study 4(a) was utilized to test team level criterion related validity. Some participants were removed from the dataset before aggregating to the team level for two reasons. First, only teams in which at least two-thirds of their members completed the survey and identified the same “team leader” were included. Precedent for the two-thirds cut-off level has been set by other researchers (e.g. Harrison, Price, Gavin, & Florey, 2002). Second, members of retained teams who identified a “team leader” other than the team’s consensus leader were removed from the data set before aggregation. Therefore, 223 participants remained for aggregation of the data to the team level. These participants were organized into 65 teams ranging in size from 3 to 8, with a mean team size of 4.88. The sample was 59.6% male and had an average age of 21.2. Data was aggregated using a direct consensus model whereby the mean of individual responses within each team was calculated (Chan, 1998).

Measures. *Team temporal leadership* was measured using the 10 item TTLS developed, refined, and validated in the current project. TOTL ($\alpha = .77$) ROTL ($\alpha = .80$) each exhibited adequate internal consistency reliability in the subset of data used in Study 4 (b).

Willingness to follow the leader was measured using a six item scale developed by Hunter, Pesin, Bedell-Avers, & Waples (in press). Responses were given on a five point scale ranging from 1 (agree) to 5 (disagree). Examples of questions in the scale include “I would like to work with this leader on future projects,” and “I would enjoy working with this leader.” Internal consistency reliability for the measure was strong ($\alpha = .92$).

Perceived Leader Effectiveness was assessed with a five item measure adapted and modified from Loughry, Ohland, and Moore (2007) with choices ranging from 1 (strongly agree) to 5 (strongly disagree). Sample items include “My team leader helped my group complete its work on time,” and “My team leader helped this team plan and organize its work.” Internal consistency reliability for these items in the team sample was strong ($\alpha = .92$).

Initiation of Structure and *Consideration* were assessed using the LBDQ XII (Stodgill, 1963). This measure was described in Study 3 of the current project. However, the full 10 item measure of consideration was utilized in the current sample. Internal consistency reliability in the team sample was adequate for each dimension; Initiation of Structure exhibited a Cronbach’s alpha of $\alpha = .80$ and consideration exhibited an alpha of $\alpha = .85$.

Team Performance was assessed using the grade each team was assigned by their instructor for their class project. Grade data was available from only five of the seven classes from which the sample was drawn (ENG1, ENG2, HORT, HRIM, and COMM), resulting in a sample size of 46 teams for analyses regarding team grades. Assigned on a

100 point scale, the mean grade was 89.21 (SD = 4.07) with a minimum grade of 82 and a maximum grade of 100.

Control variables were included in the regression analysis to limit error variance due to extraneous factors. Due to its potential influence on team outcomes (Steiner, 1972), team size was controlled for in the regressions for Hypothesis 16 and 17. Additionally, the regression testing Hypothesis 18 controlled for class in order to limit differences in project grades due to the sample's being drawn from different courses.

Correlational Analyses and Results

The correlation matrix of team level variables in Study 4(b) can be found in Table 10. Hypothesis 13 predicted that willingness to follow the leader would be positively related to a) TOTL and b) ROTL. In support of this hypothesis, *willingness to follow the leader* was significantly correlated with a) TOTL ($r = .71, p < .01$) and b) ROTL ($r = .74, p < .01$). Results were also supportive of Hypothesis 14, which predicted that perceived leader effectiveness would be positively related to each dimension of the TTLS. Indeed, TOTL's correlation with perceived effectiveness was $r = .79 (p < .01)$, while ROTL's was $r = .74 (p < .01)$. Although the correlations predicted by Hypotheses 13 and 14 were significant and in the predicted direction, they were stronger than expected. Hypothesis 15 predicted that *team performance*, as measured by team grades, would be positively related to a) TOTL and b) ROTL. As shown in table 10, this hypothesis was not supported for either TOTL ($r = .03, ns$) or ROTL ($r = .08, ns$). Neither TOTL nor ROTL exhibited notable significant correlations with any demographic variables.

Multiple Regression Analyses and Results

Analyses. Hypotheses 16, 17, and 18 predicted the incremental criterion related validities of TOTL and ROTL on willingness to follow, perceived leader effectiveness, and team performance, respectively. The hypotheses predicted that TOTL and ROTL would explain variance in each dependent variable above that accounted for by initiation of structure and consideration. For Hypotheses 16 and 17 (a): team size was added in the first step of the analysis as a control. Initiation of structure and consideration were added into the second step of the regression, ROTL was entered in the third step, and TOTL was entered in the final step. The hierarchical regressions for hypotheses 16 and 17 (b) were the same as for 18 and 19 (a) except that the third step was TOTL and the final step was ROTL. In the regression testing Hypothesis 18 a), class was entered first as a control variable. Due to the categorical nature of the variable, dummy variables were used so it could be included in the regression equation. As grade data was collected from five classes, four dummy variables were coded using ENG2 as the reference group. Initiation of structure and consideration were entered in the second step, ROTL was the third step entered into the regression and TOTL was the final variable entered. The regression for Hypothesis 18 (b) was the same as 18 (a) except the second step was TOTL and the third step was ROTL.

It should be noted that a number of correlations between measured variables were higher in the team level data in Study 4(b) compared to the individual level data in Study 3. Most notably, the correlations between TOTL and ROTL ($r = .72, p < .01$), initiation of structure and TOTL ($r = .74, p < .05$), and that between consideration and ROTL ($r =$

.63, $p < .05$) were high. High zero-order correlations may be indicative of multicollinearity, which can render a clear interpretation of results not possible (Pedhazur and Schmelkin, 1991). Although VIF and tolerance indices did not indicate multicollinearity to be a problem in the current regressions, interpretation of the results should take into consideration the magnitude of the aforementioned correlations.

Results. Hypotheses 16 (a), 17 (a), and 18 (a) predicted that TOTL would explain incremental variance above initiation of structure and consideration in willingness to follow the leader, perceived leader effectiveness, and team performance, respectively. Results for regressions in which TOTL was entered last can be found in Table 11. First, team size ($\beta = -.15, p < .05$), consideration ($\beta = .40, p < .01$), ROTL ($\beta = .30, p < .01$), and TOTL ($\beta = .25, p < .05$) were each significant predictors of willingness to follow. Initiation of Structure was a significant predictor in step two ($\beta = .29, p < .01$) and a marginally significant predictor in step three ($\beta = .14, p < .10$), but its beta weight dropped to .02 (*ns*) in step 4. The addition of TOTL at step four increased the R^2 from .73 to .75. This finding provides evidence of TOTL's incremental validity above initiation of structure and consideration as predicted by Hypothesis 16 (a). Second, initiation of structure ($\beta = .23, p < .05$) ROTL ($\beta = .26, p < .05$) and TOTL ($\beta = .34, p < .05$) were each significant predictors of the perceived leader effectiveness dependent variable. When TOTL was entered in the final step, the R^2 increased from .68 to .72. Thus, this finding provides evidence in support of Hypothesis 17 (a), which predicted that TOTL would exhibit incremental validity above initiation of structure and consideration in predicting perceived leader effectiveness. Third, for the team performance dependent

variable, class explained 26% of the variance when it was entered in step one ($F = 3.58$ (4, 41); $p < .05$). No leadership variables were significant predictors of team performance in the regression. In sum, the results lend support for Hypotheses 16 (a) and 17 (a) while Hypothesis 18 (a) was not supported.

Hypotheses 16 (b), 17 (b), and 18 (b) predicted that ROTL would explain incremental variance above initiation of structure and consideration in willingness to follow the leader, perceived leader effectiveness, and team performance, respectively. Results for regressions in which ROTL was entered last can be found in Table 12. Regarding Hypothesis 16 (b), team size ($\beta = -.15, p < .05$), consideration ($\beta = .40, p < .01$), TOTL ($\beta = .25, p < .05$), and ROTL ($\beta = .30, p < .01$) were all significant predictors of willingness to follow. Although initiation of structure was a significant predictor at step two ($\beta = .29, p < .01$), its beta weight dropped to .04 (*ns*) when TOTL was entered in step three. Discrepancies between the size and direction of beta weights and zero-order correlations when new IVs are added into regression equations are often indicative of suppression effects (Tzelgov & Henik, 1991), which in some cases indicate the presence of multicollinearity (Cohen et al., 2003). This possibility will be more fully addressed in the discussion section. When ROTL was added to the regression for willingness to follow at step three, R^2 improved from .71 to .75. Second, in support of Hypothesis 17 (b), initiation of structure ($\beta = .23, p < .05$), TOTL ($\beta = .34, p < .05$) and ROTL ($\beta = .26, p < .05$) were each significant predictors of the perceived leader effectiveness variable. As predicted, R^2 significantly improved from .69 to .72 when ROTL was entered in the final step of the regression. Finally, contrary to Hypothesis 18 (b) neither TOTL ($\beta = .08, ns$) or ROTL ($\beta = .00, ns$) were significant predictors of team performance, and ROTL's

entry in the final step of the regression provided no incremental explanation of variance in the dependent variable. Rather, only class explained significant variance in team performance ($R^2 = .26$; $F = 3.58 (4, 41)$; $p < .05$) in any of the regression's steps. In summary, results are supportive of Hypotheses 16 and 17 (b) but not Hypothesis 18 (b).

Table 10.

Correlations Among Measured Variables

	N	M	SD	1	2	3	4	5	6	7	8
1. TOTL	65	3.30	.55	1.00							
2. ROTL	65	3.29	.52	.72**	1.00						
3. Initiation of Structure	65	3.59	.48	.74**	.54**	1.00					
4. Consideration	65	3.89	.49	.54**	.63**	.33**	1.00				
5. Perceived Effectiveness	65	3.92	.54	.79**	.74**	.67**	.60**	1.00			
6. Willingness to Follow	65	3.89	.67	.71**	.74**	.50**	.75**	.81**	1.00		
7. Grade	46	89.21	4.07	.03	.08	-.03	.10	-.01	.09	1.00	
8. Team Size	65	4.88	1.31	-.11	-.03	.02	-.17	-.05	-.25*	-.43**	1.00

* indicates significance at $p < .05$, ** indicates significance at $p < .01$

Table 11

Hierarchical regressions with TOTL entered last

Independent Variables	Model ¹			
	1	2	3	4
<u>Willingness to Follow^a</u>				
Team Size	-.25*	-.14	-.17*	-.15*
Consideration		.64**	.43**	.40**
Initiation of Structure		.29**	.14	.02
ROTL			.39**	.30**
TOTL				.25*
F	4.30*	38.67**	40.45**	35.05**
R ²	.06	.66	.73	.75
ΔR ²	.06*	.59**	.07**	.02*
<u>Perceived Leader Effectiveness^a</u>				
Team Size	-.05	.03	.01	.03
Consideration		.43**	.23*	.18
Initiation of Structure		.53**	.39**	.23*
ROTL			.39**	.26*
TOTL				.34*
F	.16	31.87**	32.22**	29.64**
R ²	.00	.61	.68	.72
ΔR ²	.00	.61**	.07**	.03*
<u>Team Performance^b</u>				
COMM	-.05	-.14	-.13	-.13
HORT	-.31*	-.37*	-.36*	-.38*
GANNON	-.20	-.24	-.23	-.22
HRIM	-.49**	-.66**	-.66**	-.67**
Consideration		-.19	-.20	-.21
Initiation of Structure		.27	.25	.32
ROTL			.03	.07
TOTL				-.12
F	3.58*	2.72*	2.27*	1.96
R ²	.26	.30	.30	.30
ΔR ²	.26*	.04	.00	.00

¹Standardized regression coefficients reported^a N = 64^b N = 46

* P < .05

Table 12

Hierarchical regressions with ROTL entered last

Independent Variables	Model ¹			
	1	2	3	4
<u>Willingness to Follow^a</u>				
Team Size	-.25*	-.14	-.12	-.15*
Consideration		.64**	.51**	.40**
Initiation of Structure		.29**	.04	.02
TOTL			.40**	.25*
ROTL				.30**
F	4.30*	38.67**	37.33**	35.05**
R ²	.06	.66	.71	.75
ΔR ²	.06*	.59**	.06**	.04**
<u>Perceived Leader Effectiveness^a</u>				
Team Size	-.05	.03	.05	.03
Consideration		.43**	.28**	.18
Initiation of Structure		.53**	.24*	.23*
TOTL			.47**	.34*
ROTL				.26*
F	.16	31.87**	33.17**	29.64
R ²	.00	.61	.69	.72
ΔR ²	.00	.61**	.08**	.03*
<u>Team Performance^b</u>				
COMM	-.05	-.14	-.14	-.13
HORT	-.31*	-.37*	-.39*	-.38*
GANNON	-.20	-.24	-.24	-.22
HRIM	-.49**	-.66**	-.67**	-.67**
Consideration		-.19	-.18	-.21
Initiation of Structure		.27	.33	.32
TOTL			-.08	-.12
ROTL				.07
F	3.58*	2.72*	2.29*	1.96
R ²	.26	.30	.30	.30
ΔR ²	.26*	.04	.00	.00

¹Standardized regression coefficients reported^a N = 64^b N = 46

* P < .05

** P < .05

Chapter 8

Discussion

The purposes of the present study were to expand the conceptualization of team temporal leadership to include a relationship oriented dimension, develop a scale to reflect its multidimensional conceptualization, and provide psychometric validity evidence for that scale. Task and relationship items were written to capture the behaviors associated with TOTL (scheduling, synchronizing, and allocating temporal resources) and ROTL (time referenced conflict management, positive reward, and consideration behaviors). As recommended in the psychometric literature (Ghiselli et al, 1981; Hinkin, 1998; Nunnally & Bernstein, 1994), the items were subjected to systematic procedures of validation and reduction including a content analysis, factor analyses, convergent/discriminant validity analyses, and an examination of incremental prediction. The resulting scale consisted of 10 items (five items each for the TOTL and ROTL dimensions).

CFA results indicated that the two dimensional model of team temporal leadership (task and relationship orientations) was stable over two separate samples. In each sample, the two dimensional model exhibited a stronger fit to the data than the unidimensional model. Although the three dimensional model's fit was similar to that of the two dimensional model, its subscales exhibited poor reliabilities and the two dimensional model was superior in terms of parsimony and theoretical meaningfulness. In addition to supporting the scale's two dimensional structure, CFAs in Study 3 also

supported the discriminant validity of TOTL compared to initiation of structure and ROTL compared to consideration.

TOTL and ROTL each exhibited unique patterns of relationships with correlates that were consistent with predictions. In addition to exhibiting non-significant correlations with all measured characteristics of the rater (age, gender, social desirability), correlations with other leadership measures were generally as expected. TOTL correlated more highly with the task oriented dimension initiation of structure while ROTL correlated more highly with the relationship oriented consideration dimension. Furthermore, TOTL and ROTL exhibited predictable patterns of relationships with servant leadership, contingent reward, and time management. Correlations with liking, micro management, and laissez-faire leadership suggested that the TTLS does not suffer from a “liking” bias and seems to be viewed positively by subordinates. The consistent patterns of relationships with other variables in Study 3 provided evidence for the construct validity of team temporal leadership.

The present research also sought to examine team temporal leadership’s ability to account for variance in leadership outcomes above that accounted for by existing measures. Team level TOTL and ROTL each explained incremental variance in willingness to follow and perceived leader effectiveness after controlling for team size, initiation of structure, consideration, and the effects of the other TTLS dimension. In addition to providing support for a distinction between the related constructs, the regression results highlight the potential importance of team temporal leadership to future research.

Explanations for Unexpected Results

The results of the EFA indicated a one factor structure for the team temporal leadership items. Although this finding contradicted the expected factor structure, the two dimensional structure of team temporal leadership was upheld for two reasons. First, the sample size used for the EFA did not approach the recommended 150 observations necessary to obtain an accurate solution (Guadagnoli & Velicer, 1988). Second, the two dimensional model achieved a superior fit to the unidimensional model in two CFAs conducted in separate samples which were each of more appropriate size for the analyses conducted. Given the greater precision with which CFA is able to evaluate measurement models (Hinkin, 1995), these results provide strong evidence for team temporal leadership's two factor structure.

Support for TOTL's discriminant validity with respect to initiation of structure was inconsistent. Although the correlation in the individual level data from Study 3 was not strong enough to suggest redundancy between initiation of structure and TOTL, the measures were highly correlated in Study 4(b). While data from the CFA in study 3 supported a distinction between the constructs, the CFA in study 4(a) indicated a high degree of overlap between the constructs. Regression results showing that TOTL explained incremental variance in subjective leadership outcomes above initiation of structure provide support for the distinctness and importance of TOTL. Although multicollinearity is sometimes a problem when regression analyses are conducted in data sets in which independent variables are highly correlated (Cohen, Cohen, West, & Aiken, 2003), neither tolerance nor VIF indices approached "rule of thumb" levels for the

presence of multicollinearity in Study 4(b). Furthermore, initiation of structure's standard error saw only a small increase when TOTL was entered into each of the regressions.

Although this evidence suggests that multicollinearity was not a major cause for concern in the current study, initiation of structure's beta weight was greatly reduced when TOTL was introduced as the third step in the regression equation for willingness to follow. Such discrepancies between the sizes of beta weights when new IVs are entered into regression equations are indicative of suppression effects, which sometimes result from multicollinearity (Tzelgov & Henik, 1991). Researchers have argued that it may actually be more difficult for independent variables suffering from multicollinearity to explain incremental variance in dependent variables because they are accounting for the same variance (Cohen et al., 2003). Therefore, TOTL's explanation of incremental variance in willingness to follow would stand as even greater evidence for the importance of TOTL if the suppression effect was in fact a result of the presence of multicollinearity. Construct validation of team temporal leadership is an ongoing process, and future research should continue to investigate the distinction between TOTL and initiation of structure.

Results failed to reveal a significant relationship between either dimension of team temporal leadership and team performance. Several factors may have contributed to the lack of significant results. First, restricted variance in grades may have attenuated effects that otherwise would have been found. The mean grade across classes was 89.21 (SD 4.07) and there were very few teams rated as low-performing. In fact, the lowest grade received by any team was 82. Thus, there was little variance in team performance for team temporal leadership to explain. The fact that initiation of structure and

consideration, which previous research has found to predict objective performance (Judge et al., 2004), also failed to predict team performance lends support to this view.

Second, team temporal leadership is only one aspect of team leadership. An extensive meta-analysis of team leadership by Burke and colleagues (2006) displayed that aspects of leadership not measured in the current study such as transformational leadership, empowerment, and motivational leadership all contributed to team performance outcomes. Though not measured, a leader's sense making, problem solving, and monitoring of team member performance may also contribute to leadership's influence on objective team performance (Morgeson et al., 2009).

A third possible explanation for the failure to find a relationship between team temporal leadership and team performance regards the mismatch between a narrow predictor and a broad criterion. The importance of finding a theoretical match in specificity between the independent and dependent variables in a given research question has received considerable attention in the personality literature (Mohammed & Schwall, 2009; Smith & Schneider, 2004). Team temporal leadership is a narrow predictor, including only temporally referenced leadership behaviors. On the other hand, team grade is a broad criterion, as teams are graded on aspects of the project such as quality and presentation in addition to timeliness. Perhaps team temporal leadership would have displayed a greater relationship to a time referenced performance outcome such as adherence to schedules. Given the relationship between team temporal leadership and subjective as well as objective performance demonstrated by Mohammed & Nadkarni (in press), along with the promising incremental effects team temporal leadership exerted on

subjective leadership outcomes in the current work, future research should re-examine team temporal leadership's effect on objective performance in new samples.

Theoretical and Practical Considerations

The current study has several theoretical implications. First, the present study contributes to new research that incorporates time into the study of team leadership. Although team researchers converge on the view of time as a critical issue (Eisenhardt, 2004, McGrath & Tschan, 2004, Mohammed, Hamilton, & Lim, 2009), time has been neglected in teams research (Kozlowski & Bell, 2003). Time has also been ignored in research on leadership (Bluedorn & Jaussi, 2008), a critical factor in the success of organizational teams (Zaccaro et al. 2001). Building on the work of Mohammed and Nadkarni (in press), the current study answered the need for researchers to examine the intersection of time, teams, and leadership. In so doing, it furthers work towards understanding time's role in team leadership.

Second, the current research showed that team temporal leadership includes an additional relationship oriented dimension that was not included in the previous conceptualization. The two factor structure was stable in CFAs conducted in two separate samples, and ROTL explained incremental variance in willingness to follow the leader and perceived leader effectiveness above TOTL. The addition of ROTL is commensurate not only with traditional leadership research (Judge et al., 2004), but also with the functional approach to team leadership which emphasizes that leadership must meet needs regarding both taskwork and teamwork (Burke et al., 2006; Mathieu et al., 2008).

Finally, the study provides a measurement for future researchers to continue to examine team temporal leadership's role in effective team leadership. According to Clark and Watson (1995), soundness of factor structure and construct validity (as demonstrated through a scale's nomological network) are central to its utility. The TTLS demonstrated a stable factor structure and a predictable pattern of relationships with other constructs. Therefore, the TTLS shows promise as a tool to help future researchers capture temporal elements of leadership, which have been largely ignored in past leadership research (Bluedorn & Jaussi, 2008; Hunter et al., 2007).

The current study also has practical implications regarding the training and development of team leaders. Given team temporal leadership's relationships with perceived leader effectiveness and willingness to follow the leader in the current study, organizations should encourage team leaders to engage in behaviors characteristic of both TOTL and ROTL. Leader development programs should strive to increase awareness of temporal individual differences and the importance of being vigilant in managing temporal conflicts that arise. As suggested by Halbesleben and colleagues (2003), mere awareness of differing time personalities amongst subordinates may improve a leader's ability to positively influence outcomes. Finally, the TTLS could be used for both self and subordinate assessment in 360 feedback programs, or for pre-and post testing in leader development programs.

Limitations and Directions for Future Research

There were a high number of “not applicable” (NA) responses to conflict items in Study 2, which resulted in the decision to remove conflict items from further analysis. The number of NA responses may have stemmed from the nature of the participants’ experience working in teams. The majority of teams referenced by participants regarded class projects or student extracurricular activities. Moreover, most participants referred to teams in which they were no longer members. According to De Dreu (2010), conflict cannot occur unless team members are dependent on each other for the achievement of tasks. The teams may have had more meetings earlier in the semester and then worked more independently after work was split up and roles were increasingly specialized later in their projects. Indeed, this pattern has been observed in a number of studies of temporary, task focused teams such as those about which most participants completed this survey (Denison, Hart, & Kahn, 1996; Levesque, Wilson, & Wholey, 2001). Perhaps conflict would have been more salient if the survey was completed earlier in the teams’ lifespan rather than after the teams had dissolved.

Although items specifically written to sample the conflict portion of the construct were removed, the remaining ROTL items also referenced behaviors related to reducing conflict over temporal interests. According to Kaufman and colleagues (1991), one way to reduce conflict over temporal matters is to assign tasks based on individual preferences for how time is used. Although conceptualized as a consideration behavior, considering team member’s opinions in decisions regarding the use of time also contributes to reducing temporal conflict within the team. Therefore, it is believed that the current

measure does not completely ignore the content area of conflict within ROTL.

Nonetheless, future research may assess the value of the dropped conflict specific items in field samples.

Another limitation of the present work was its exclusive use of student samples for all phases of the scale's validation. Study 4(b) utilized teams performing a task that had personally relevant consequences to the members (grades). However, future research should cross-validate the TTLS using teams working in an organizational context. Organizational contexts may increase the importance of both TOTL and ROTL in contributing to team performance. First, organizational teams may experience higher levels of interdependence, increasing the need for leaders to engage in behaviors that help pace and coordinate the team to complete work on time (Horwitz, 2005). High levels of interdependence have been shown to heighten the influence of leadership on team performance (Burke et al., 2006). Furthermore, items regarding conflict management behaviors may prove to be more applicable in such contexts, especially if teams are highly interdependent throughout the course of the project. Second, organizational teams often work on projects that take more than the two or three months available to class project teams. This introduces greater ambiguity regarding when tasks need to be completed. Faced with greater uncertainty, the team's performance may increasingly depend on the extent to which the team leader schedules and synchronizes its work. Moreover, an extended period of time working on a project would provide a greater opportunity for conflict over differing time preferences to surface, providing a more appropriate setting for the validation of conflict specific items. In sum, both TOTL and ROTL are likely to be increasingly important contributors to team performance in

organizational contexts, which may also provide more fruitful contexts for the validation of conflict items.

Future research should examine the extent to which team temporal leadership generalizes in cross cultural studies. Numerous researchers have theorized about the different ways in which cultures conceptualize time (e.g. Graham, 1981; Lakoff & Johnson, 1980; Kelly & McGrath, 1986). For example, clock time, defined by the clock and the calendar, is the dominant conceptualization of time in western cultures (Bluedorn & Jaussi, 2008). In contrast, other cultures have a greater emphasis on “event time,” which is defined in terms of meaningful events (Bluedorn & Denhardt, 1988). According to Bluedorn and Jaussi (2008), pacing and speed are predominantly a clock time phenomenon. Given the central role of pacing in the conceptualization of team temporal leadership, future research should validate the scale in cultures in which the conceptualization of time is predominantly event-driven. This would help meet recent calls for social scientists to avoid the “intellectual straightjacket” of clock time (Davies, 1995, p. 17) and determine if team temporal leadership’s nomological network would look different in non-western cultures.

Another opportunity for future research surrounds the question of whether team temporal leadership can be predicted based on personality or other individual characteristics of the leader. Time urgency, a stable individual difference in attention to the passage of time (Landy, Rastegary, Thayer, and Colvin, 1991), may prove fruitful in such an examination. Morgeson & Derue (2006) found that the greater the urgency of an issue, the more structuring behaviors team leaders displayed. As leaders high in time urgency will impose their own urgency onto tasks, they may tend to exhibit more of the

structuring behaviors characteristic of TOTL. Intolerance for ambiguity, defined as “the tendency to perceive ambiguous situations as sources of threat” (Budner, 1962, p.29), is another stable individual difference which may relate to a leader’s team temporal leadership. Bluedorn and Jaussi (2008) theorized that leaders who are not tolerant of ambiguity are more likely to prefer working with deadlines and schedules in order to induce structure and reduce ambiguity. As deadlines and schedules are key aspects of team temporal leadership, leaders high in intolerance of ambiguity may prove to exhibit more temporal leadership behaviors.

Finally, future research should provide further criterion related validity evidence for the TTLS using a variety of leadership outcomes. For example, studies could examine team temporal leadership’s impact on creative performance. Halbesleben and colleagues (2003) described how leader behaviors like synchronization and recognizing individual differences amongst followers could result in higher levels of innovation. Furthermore, Pinto and Prescott (1988) found that adherence to schedules related to innovation success. Therefore, future research may benefit by examining the possible effects of TOTL and ROTL on team creative performance. Additionally, conflict could be examined as a behavioral outcome of team temporal leadership. Both TOTL and ROTL might be expected to reduce intra-team relationship conflict that results from diversity of temporal individual differences. Mohammed and Nadkarni’s (in press) finding that TOTL moderated relationships between temporal individual difference diversity and team performance suggested that TOTL may reduce such conflict. However, relationship conflict was not measured in the study. Future work could help determine the mechanisms by which team temporal leadership exerted the moderating effects found by

Mohammed and Nadkarni (in press). Furthermore, ROTL may reduce the occurrence of conflict that results when team members who prefer to complete their work near the end of task cycles are instead assigned to tasks that must be completed at the beginning.

Previous work by Mohammed and Angell (2004) showed that effective team processes weakened the negative effect of time urgency diversity on relationship conflict, but the study did not examine the effects of team temporal leadership. Given previous research on related concepts, research on team temporal leadership's effect on relationship conflict may be a fruitful avenue for future research.

Conclusion

In response to calls from teams and leadership researchers for a greater emphasis on time, the present study refined and validated a measure that fills the void at the intersection of time, teams, and leadership. Based on results of the current effort, the TTLS shows promise as a tool for future investigations of team leadership. It is hoped that the evidence regarding the measure's psychometric validity will encourage future researchers to continue to investigate time's role in both effective leadership and team performance.

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Appendix A: Initial Item Pool

Task Oriented Team Temporal Leadership Items

Scheduling

1. To what extent does your project leader remind members of important deadlines? *
2. To what extent does your team leader urge members to finish subtasks on time? *
3. To what extent does your project leader set milestones to measure progress on the project?*
4. To what extent does your team leader clearly articulate schedules for task completion?
5. To what extent does your team leader emphasize the importance of meeting deadlines?
6. To what extent does your team leader set deadlines for completing tasks?

Synchronization

1. To what extent does your team leader keep members informed of other team member's progress on the project?
2. To what extent does your team leader provide members feedback regarding their pace of work?
3. To what extent does your team leader see to it that team members coordinate their work?
4. To what extent does your team leader urge members to adjust their pace in order to coordinate their work?
5. To what extent does your team leader pace the team so that work is finished on time? *
6. To what extent does your team leader effectively coordinate the team to meet deadlines? *

Allocation of temporal resources

1. To what extent does your team leader see to it that members make efficient use of their time at work?
2. To what extent does your team leader make sure team members have enough time for important tasks?
3. To what extent does your team leader effectively provide team members enough time to complete their most important tasks?
4. To what extent does your team leader prioritize tasks and allocate time to each task? *
5. To what extent does your team leader prepare and build in time for contingencies, problems, and emerging issues? *

**Items marked with an asterisk were included in Mohammed & Nadkarni's (in press) measure.*

Relationship Oriented Team Temporal Leadership Items**Conflict**

1. To what extent does your team leader help team members settle conflicts regarding the pace of work?
2. To what extent does your team leader help members settle differences about how much time to allot for performing particular tasks?
3. To what extent does your team leader effectively facilitate collaboration between team members who prefer to work at different speeds?
4. To what extent does your team leader let team members know when other members prefer to work at a different pace than they do?
5. To what extent does your team leader understand differences amongst team members with regards to how much time they need to accomplish tasks?
6. To what extent does your team leader help team members collaborate when they have different preferences regarding when particular tasks need to be done?

Positive reward

1. To what extent does your team leader ensure that team members are recognized for completing work by the deadline?
2. To what extent does your team leader give team members credit for meeting deadlines?
3. To what extent does your team leader give team members recognition for coordinating work with other team members?
4. To what extent does your team leader express appreciation when team members make efficient use of their time?
5. To what extent does your team leader express appreciation when the team stays on schedule?
6. To what extent does your team leader verbally recognize team members when they make efficient use of their time?
7. To what extent does your team leader praise you for completing work on time?
8. To what extent does your team leader pay personal compliments to team members who get their work done on time?

Consideration

1. To what extent does your team leader display a willingness to change the schedule to accommodate team member preferences?
2. To what extent does your team leader make himself/herself available to team members as deadlines draw near?

3. To what extent does your team leader display a willingness to adjust the pace of work to meet team members' preferences?
4. To what extent does your team leader show flexibility in the amount of time devoted to projects?
5. To what extent does your team leader provide support to team members who are behind schedule?
6. To what extent does your team leader encourage team members when the deadline draws near?
7. To what extent does your team leader listen to suggestions concerning how much time is needed for tasks assigned to the team?
8. To what extent does your team leader provide encouragement when the team approaches deadlines?
9. To what extent does your team leader consult with team members before setting deadlines?
10. To what extent does your team leader express confidence in team member's abilities to complete work on time?
11. To what extent does your team leader consult the team before creating schedules?

Appendix B: Q-Sort Task

Task/Relationship Team Temporal Leadership

The following measure is intended to provide an assessment of two dimensions of a team leader's emphasis on time related issues, referred to as "Team Temporal Leadership." Team temporal leadership is defined as "leader behaviors that aid in structuring, coordinating, and managing the pacing of task accomplishment within the team." Descriptions of each dimension are provided at the top of each page. Please match each item with its appropriate dimension by entering in the corresponding letter (**T/R/ND**) next to each item. If an item doesn't appear to fit any dimension, enter **ND** in the space provided. Please return the completed Q-sort to me. Thanks!

Dimensions

1. **Task-Oriented Team Temporal Leadership (T):** Directive leader behaviors that aid in structuring, coordinating, and managing the pacing of task accomplishment within the team. This involves providing temporal structure for team activities. Associated behaviors include: scheduling, synchronizing, and allocating time.
2. **Relationship-Oriented Team Temporal Leadership (R):** Supportive leader behaviors that show respect and appreciation for the time related problems faced by team members. Associated behaviors include managing conflict over time-related issues, recognizing subordinates for reaching temporally relevant goals, and involving team member preferences in decision making about the team's use of time.

"To what extent does your TEAM LEADER..."

T/R/ND

- ___ display a willingness to change the schedule to accommodate team member preferences?
- ___ provide support to team members who are behind schedule?
- ___ remind members of important deadlines?
- ___ provide encouragement when the team approaches deadlines?
- ___ urge members to finish subtasks on time?
- ___ set milestones to measure progress on the project?
- ___ understand differences amongst team members with regards to how much time they need to accomplish tasks?
- ___ consult with team members before setting deadlines?
- ___ clearly articulate schedules for task completion?
- ___ make himself or herself available to team members as deadlines draw near?
- ___ help team members collaborate when they have different preferences regarding when particular tasks need to be done?
- ___ encourage team members when the deadline draws near?
- ___ emphasize the importance of meeting deadlines?
- ___ let team members know when other members prefer to work at a different pace than they do?
- ___ keep members informed of other team member's progress on the project?
- ___ effectively facilitate collaboration between team members who prefer to work at different speeds?

Dimensions

1. **Task-Oriented Team Temporal Leadership (T):** Directive leader behaviors that aid in structuring, coordinating, and managing the pacing of task accomplishment within the team. This involves providing temporal structure for team activities. Associated behaviors include: scheduling, synchronizing, and allocating time.
2. **Relationship-Oriented Team Temporal Leadership (R):** Supportive leader behaviors that show respect and appreciation for the time related problems faced by team members. Associated behaviors include managing conflict over time-related issues, recognizing subordinates for reaching temporally relevant goals, and involving team member preferences in decision making about the team's use of time.

"To what extent does your TEAM LEADER..."

T/R/ND

- ___ prepare and build in time for contingencies, problems, and emerging issues?
- ___ provide members feedback regarding their pace of work on tasks?
- ___ express appreciation when the team stays on schedule?
- ___ see to it that team members coordinate their work?
- ___ show flexibility in the amount of time devoted to tasks?
- ___ pace the team so that work is finished on time?
- ___ effectively coordinate the team to meet deadlines?
- ___ praise you for completing work on time?
- ___ pay personal compliments to team members who get their work done on time?
- ___ see to it that members make efficient use of their time?
- ___ give team members credit for meeting deadlines?
- ___ give team members recognition for coordinating work with other team members?
- ___ help team members settle conflicts regarding their pace of work?
- ___ express confidence in team member's abilities to complete work on time?
- ___ make sure team members have enough time for important tasks?
- ___ verbally recognize team members when they make efficient use of their time?
- ___ help members settle differences about how much time to allot for performing particular tasks?
- ___ ensure that team members are recognized for completing work by the deadline?
- ___ consult the team before creating schedules?
- ___ effectively provide team members enough time to complete their most important tasks?
- ___ listen to suggestions concerning how much time is needed for tasks assigned to the team?
- ___ prioritize tasks and allocate time to each task?
- ___ urge members to adjust their pace in order to coordinate their work?
- ___ display a willingness to adjust the pace of work to meet team members' preferences?
- ___ set deadlines for completing tasks?
- ___ express appreciation when team members make efficient use of their time?

Appendix C: Correlates

Demographics

1. Age
2. Gender: M/F

Social Desirability

Measured on a true/false scale

1. I sometimes feel resentful when I don't get my way. (R)
2. On a few occasions, I have given up doing something because I thought too little of my ability. (R)
3. There have been times when I felt like rebelling against people in authority even though I knew they were right. (R)
4. No matter who I talk to, I'm always a good listener.
5. I can remember "playing sick" to get out of something. (R)
6. There have been occasions when I took advantage of something. (R)
7. I'm always willing to admit it when I make a mistake.
8. I sometimes try to get even, rather than forgive and forget. (R)
9. When I don't know something I don't at all mind admitting it.
10. There have been times when I was quite jealous of the good fortune of others. (R)
11. I have almost never felt the urge to tell someone off.
12. I am sometimes irritated by people who ask favors of me. (R)
13. I have never deliberately said something that hurt someone's feelings.

Initiation of Structure (Stodgill, 1963)

Measured on a 5 point scale where 1= never and 5 = always

1. Lets group members know what is expected of them.
2. Encourages the use of uniform procedures.
3. Tries out his/her ideas in the group.
4. Makes his/her attitudes clear to the group.
5. Decides what shall be done and how it shall be done.
6. Assigns group members to particular tasks.
7. Makes sure that his/her part in the group is understood b the group members.
8. Schedules the work to be done.
9. Maintains definite standards of performance.
10. Asks that group members follow standard rules and regulations.

Consideration (Stodgill, 1963)

Measured on a 5 point scale where 1= never and 5 = always

1. Is friendly and approachable.
2. Does little things to make it pleasant to be a member of the group.
3. Puts suggestions made by the group into operation.
4. Treats all group members as his/her equals.
5. Gives advance notice of changes.

6. Keeps to him/herself. (R)
7. Looks out for the personal welfare of group members.
8. Is willing to make changes.
9. Refuses to explain his/her actions.
10. Acts without consulting the group. (R)

Production Emphasis (Stodgill, 1963)

Measured on a 5 point scale where 1= never and 5 = always

1. Encourages overtime work.
2. Stresses being ahead of competing groups.
3. Needles members for greater effort.
4. Keeps the work moving at a rapid pace.
5. Pushes for increased production.
6. Asks the members to work harder.
7. Permits the members to take it easy in their work. (R)
8. Drives hard when there is a job to be done.
9. Urges the group to beat its previous record.
10. Keeps the group working up to capacity.

Contingent Reward (Podsakoff et al., 1990)

Scored on a 7 point scale where 1=strongly disagree and 7=strongly agree

1. Always gives me a positive feedback when I perform well.
2. Gives me special recognition when my work is very good.
3. Commends me when I do a better than average job.
4. Personally compliments me when I do outstanding work.
5. Frequently does not acknowledge my good performance. (R)

Servant Leadership (Liden et al., 2008)

Measured on a 1-7 scale where 1=strongly disagree and 7=strongly agree

1. I would seek help from my team leader if I had a personal problem
2. My team leader cares about my personal well-being
3. My team leader takes time to talk to me on a personal level
4. My tem leader can recognize when I'm down without asking me.

Laissez-Faire Leadership (MIQ 5x, Bass & Avolio, 2000)

Measured on a 1-5 scale where 1= never and 5 = frequently, if not always
 MLQ © 1995 Bruce Avolio and Bernard Bass.

Time Management (Peeters & Rutte, 2005)

Measured on a 5 point scale where 1= seldom true and 5 = very often true.

1. My team leader feels in control of time.
2. My team leader reviews activities.
3. My team leader breaks down tasks.
4. My team leader sets short term goals.

5. My team leader sets deadlines.
6. My team leader increases task efficiency.
7. My team leader sets priorities.
8. My team leader reviews goals.
9. My team leader completes priority tasks.
10. My team leader schedules time daily.

Micro-Management

Measured on a 1-5 scale where 1=strongly disagree and 5= strongly agree

1. My team leader pays excessive attention to minor details of the team's work.
2. My team leader manages the team with excessive control over details of the work.
3. My team leader does not give other members the chance to make decisions about details of task completion.

Liking (Wayne & Ferris, 1990)

Measured on a 1-5 scale where 1=strongly disagree and 5= strongly agree

4. I like my team leader very much as a person
5. I think my team leader would make a good friend.

Willingness to Follow (from Hunter, Pesin, Bedell-Avers, & Wapels, in press)

Measured on a 1-5 scale where 1=strongly disagree and 5= strongly agree

1. I would like to work with this leader on future projects.
2. I would be willing to serve under this leader.
3. I would enjoy working with this leader.
4. If given the choice, I would rather not work with this leader (R).
5. I would be unhappy if I was required to work with this leader (R).
6. I would request to work with this leader.

Perceived Leader Effectiveness (adapted from Loughry, Ohland, & Moore, 2007)

Measured on a 1-5 scale where 1=strongly disagree and 5= strongly agree

1. Overall, my team leader was effective.
2. My team leader helped my group complete its work on time.
3. My team leader exerted a great deal of effort in leading this project.
4. My team leader helped this team produce high quality work.
5. My team leader helped this team plan and organize its work.

Appendix D: Final Scale

To what extent does (did) your *team leader*...?

A	B	C	D	E
Not at All		a Moderate Amount		a Great Deal

- ...provide support to team members who are behind schedule?
- ...provide encouragement when the team approaches deadlines?
- ...urge members to finish subtasks on time?
- ...prepare and build in time for contingencies, problems, and emerging issues?
- ...pace the team so that work is finished on time?
- ...praise team members for completing work on time?
- ...pay personal compliments to team members who get their work done on time?
- ...see to it that members make efficient use of their time?
- ...urge members to adjust their pace in order to coordinate their work?
- ...consider team members' opinions in decisions regarding the team's use of time?