Is There a Time and Place for Transformational Leadership?

The Daily Impact of Leader Behaviors on Follower Task Performance

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ABSTRACT

Is there a time and place for transformational leadership? The daily impact of leader behaviors on follower task performance

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The purpose of this study was to weigh the value of Transformational Leadership (TFL) and Contingent-Reward Leadership (CRL) behaviors in determining followers' objective task performance. Past empirical evidence has suggested that TFL behaviors were relatively less important for influencing individual task performance in comparison to CRL behaviors. This study was designed to test the boundaries of this empirical conclusion. There were two main goals: 1) to investigate the daily effects of TFL and CRL behaviors on follower task performance given a "chaotic" work context, and 2) to address a temporal issue related to the measurement of TFL and its influence on individual task performance. Daily data were collected from a sample of 46 Canadian tree planters over a period of nine work days. The sample was composed of novice and experienced personnel. The data were hierarchically cross-classified, with days nested within individuals, and individuals nested between leaders. Hierarchical multiple regression and PROCESS moderation analysis results point to short-term effects of CRL and long-term effects of TFL for influencing task performance in both groups. Interestingly, the vision item from the inspirational motivation dimension of TFL demonstrated both a significant daily and lingering association to the task performance of novice and experienced tree planters. Implications of the results for leadership theory and practice are discussed, along with a review of the study strengths and limitations. To conclude, the author offers suggestions for the direction and focus of future leadership research given the changing nature of 21st century work environments.

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"If your actions inspire others to dream more, learn more, do more and become more, you are a leader." -John Quincy Adams

Overall, my journey in academia has been successful; however there were times where that outcome seemed questionable. I had come very close to failing certain subjects, and in some cases, I actually did fail and had to re-take classes. A few of those included English in grade 8, Science in grade 9, as well as Research Methods and Quantitative Methods in CEGEP. This is ironic considering the specialization I ended up pursuing. Looking back, I recognize that if not for the leaders in my life that guided and pushed me to apply myself, I would have never experienced the moments of clarity and inspiration that had occurred during my education. I have come to love those moments, but I know that without the help of my family, partner, friends and certain teachers, I may have never experienced them. Thanks to their influence, I can now say that I was actually able to write a Master's thesis. I feel very grateful for the insights I have gained along the way that have helped me grow.

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INTRODUCTION

When considering the lives of prominent historical figures, (e.g. Jesus, Joan of Arc, Hitler, Martin Luther King Junior), evidence suggests that even just one leader can shape outcomes felt throughout the world, across generations or millennia to follow. The idea that a single individual can have such a vast sphere of influence is beguiling, and for obvious reasons, intriguing. Over the last century, numerous disciplines have been devoted to decoding the science in the art of social influence. Now, with decades of research in the making, there are conceivably more questions than answers regarding a "formula" for effective leadership. The problem, as leadership expert Barbara Kellerman (2012) draws our attention to, is that today "we don't have much better an idea of how to grow good leaders, or of how to stop or at least slow bad leaders, than we did a hundred or even a thousand years ago (p. xiv)". Best practices for effective leadership continue to be a topic of rich debate, both in the fields of academia and management. What has been settled without a doubt however is that leadership does not occur in a vacuum. In other words, the relationships between the antecedents and outcomes of leadership are complex, layered, and intimately connected to contextual phenomena.

The current problem within the field of leadership (as described by Kellerman above) suggests that scholars may be concentrating a disproportionate focus on exploring the effects of various leadership practices, instead of allocating equal importance to investigating and ameliorating leadership development practices. Nevertheless, a natural prerequisite to meaningfully inform leadership training is to understand which leadership approach is effective in a particular context of interest. In this respect, there is still much to be learned.

For this reason, this thesis is another investigative attempt to plug one more piece in the elusive leadership puzzle. It is designed to test empirical conclusions concerning the value of transformational and transactional leadership behaviors in influencing employee task performance. Using longitudinal data, the daily and lingering effects of front-line leader behaviors and contextual factors on follower performance will be determined. It is hoped that a fine-grained, within-person investigation of the everyday and lasting impact of leader behaviors will contribute to a broader discussion regarding where leadership development efforts could be focused going forward into an ever-changing, fast-paced, and seemingly "chaotic" 21st century.

CONTRIBUTIONS

To the Field of Leadership

This study contributes to the literature in three ways. First of all, it is thought that leadership tends to take its effect on followers over a relatively short period of time (Van Dierendonck, Haynes, Borrill, & Stride, 2004). Therefore, this study is designed to examine the proximal effects of transformational and transactional leadership behaviors on follower performance by employing a daily diary survey. Micro-level approaches to the study of leadership are lacking in the literature, and there is a need for the use of analytical designs that can better discern the direct relationship between leadership and follower outcomes (Breevart et al., 2014; Judge & Piccollo, 2004). As it stands, the majority of leadership research is cross-sectional in nature, which is problematic (Kellerman, 2013; Liden, Antonakis, 2009; Porter & Mclaughlin, 2006; Yukl, 2009). Analyses using cross-sectional data taken from different sources, at different time periods, tend to lack the consideration of contextual phenomena that could differentially explain the direct link between the purported cause and effect examined. A daily diary study can be used to study leadership effects at the individual level, and to measure the influence of important daily variables outside of leadership that affect individual follower outcomes in tandem.

Second, there have been studies that analyzed the effects of leadership behaviors on a day-to-day basis for outcomes of employee innovation (Zacher & Wilden, 2014), job satisfaction (Bono, Foldes, Vinson, & Muros, 2007), and engagement (Breevaart et al., 2014; Tims, Bakker, & Xanthopoulou, 2009). Yet, to this author's knowledge, there is no published research that examined the daily effect of leadership behaviors on follower's individual *task* performance. Naturally, task performance is an outcome of interest for organizational behavioral research. Task performance can take the form of any behavior required based on one's formal job description (Borman & Motowidlo, 1993). The problem is that the majority of behavioral research still tends to rely on subjective ratings of follower task performance, or even self-reported ratings, which pose issues of common method bias (for a review, see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For these reasons, this study contributes to the literature by examining how leadership behaviors influence *objective* measures of individual task performance on a daily basis.

Lastly, the third contribution relates to this study's emphasis on understanding the relationship between leadership and individual task performance in context. It has been said that

"leadership and its effectiveness are in large part dependent on the context" (Osborne, Hunt, & Jaush, 2002, p. 797). The problem is that context remains under-measured and underemphasized in the field of leadership (Avolio, 2007; Boal & Hooijberg, 2000; Johns, 2006; Porter & Mclaughlin, 2006; Shamir & Howell, 1999). Therefore, contextual characteristics that describe the present research sample were intentionally considered to inspire and frame the study's hypotheses, methodology and discussion. Ultimately, the emphasis on the context of the sample is included in order to provide further understanding of boundary conditions inherent to the relationship between dimensions of transformational and transactional leadership and individual task performance.

To Practice

> "Answering such questions of —how and —when result in a deeper understanding of the phenomenon or process under investigation, and gives insights into how that understanding can be applied (Hayes, 2012, p. 5)."

In the field, leaders face complex and context-specific challenges. Fortune 500 companies across the globe allocate significant resources to leadership development in their firms in order to ensure leaders successfully meet the demands of their roles (Kellerman, 2012). In the US alone, it is estimated that companies collectively spend approximately between $14-50 billion annually on leadership development, and this number is increasing (Kellerman, 2012; Loew & O'Leonard, 2012). Thus, collaboration between academia and practice is crucial to inform evidence-based decision making in order to bring return on investment for leadership development efforts. On this note, what has been shown is that when leadership training is done out of context, this can ultimately drive failure for leaders in solidifying transferable skills (Gurdjian, Halbeisen, & Lane, 2014). Other failures in leadership development initiatives can also be attributed to inadequate or inaproprite training, driven by theory that did not take the effects of context into account (Gurdjian, Halbeisen, & Lane, 2014). Therefore, it is this author's conclusion that in order to add value for practitioners, more research is needed, and this research must be tailored to offer evidence-based suggestions for effective leadership practices that are context-specific.

As such, this study is designed to determine the applicability of a-contextual meta-analytic results in suggesting optimal leadership practices for influencing follower individual task performance. The ultimate goal is to infer pointed yet generalizable conclusions concerning the daily effects of transformational and transactional leadership behaviors on follower task

performance in work contexts marked my ambiguity, change and especially challenging work conditions.

In terms of the study's external validity, rather than deriving conclusions from an experimental setting with a task carried over a short period of time, this study assessed a task over a longer time lapse in a genuine work setting and considers the influence of contextual variables when examining the influence of leadership. For these reasons, it is hoped that the conclusions from this study may inform practioners in more concrete terms.

LITERATURE REVIEW

Transformational and Transactional Leadership

Arguably, the most prevalent theory of leadership to date was developed by Bernard Bass, in 1985, when he proposed a full range model of leadership. On one end of the spectrum, he contended that leaders are "transformational" when they engage in the following behaviors: act as role models to their followers (idealized influence), provide an inspirational vision for the purpose of work, inspire a sense of confidence in their followers and influence them to believe they can achieve more than they originally thought possible (inspirational motivation), intellectually stimulate them to solve problems for themselves or think creatively (intellectual stimulation), and support their professional development through individualized attention (individualized consideration). Barling (2014) notes that it is not possible for leaders to engage in all four of these behaviors simultaneously *all* the time, but leaders are transformational when they do not miss an opportunity to use the appropriate behavior at the *right* time.

Bass (1985) contended that, independent of context, transformational leadership (TFL) would demonstrate a one-way augmentation effect over the average transactional (managerial, task-oriented) style of leadership. He explained that transactional leadership provides a basis to the relationship between the leader and follower. One transactional leadership style is called contingent reward leadership (CRL), and it has been shown that CRL is the transactional leadership style most related to follower task performance (Schriesheim, Castro, Zhou, and DeChurch, 2006; Vecchio, Justin, & Pearce, 2008). Bass offered that when applying contingent-reward leadership, leaders clarify required performance objectives for subordinates, provide structure, reward those that meet expectations and punish those who do not. Rewards can be tangible, or take the form of

verbal praise or recognition, which has positive effects on follower motivation (Bass, 1985). The second transactional leadership style is called "management-by-exception leadership", in which the leader uses either active or passive corrective actions towards followers when they make mistakes. Finally, at the end of the transactional spectrum is what Bass coined as "laissez-faire" leadership, also understood as the absence of leadership. Bass explains that TFL's advantage over the other styles is that it uniquely inspires subordinates to perform beyond expectations (Bass, 1997). Over the years, empirical evidence has supported Bass's augmentation effect: when transactional leadership is present, transformational leadership contributes to unique additional variance in numerous follower behavioral and attitudinal outcomes (Bass, Avolio, Jung & Berson, 2003; Breevart et al., 2014; Hater & Bass, 1998; Howell & Avolio, 1993; Judge & Piccolo, 2004; Waldman, Bass & Yammarino, 1990).

As within established areas of study such as the field of leadership, important contributions to knowledge are made by investigating the limits of empirically validated theories. By continually pushing the boundaries of what we accept as truth, organizational scholars maintain their scientific due diligence. Although there is a bulk of evidence to support the positive organizational benefits of transformational leadership over the other leadership behaviors in Bass's model, some scholars are skeptical about TFL's universal superiority (Keller, 2006; Van Dierendonck, Haynes, Borrill, & Stride, 2004; Wolfram & Mohr, 2009; Yukl, 1999). For example, research has indicated that an overuse of certain TFL behaviors, such as intellectual stimulation and inspirational motivation (through highly challenging goal expectations), can lead to increases in employee stress, and potentially burnout (Diebig, Bormann, & Rowold, 2016; Yukl, 1999). In addition, it has been shown that TFL is somewhat less effective when enacted by leaders who are "physically, emotionally, and geographically" (Barling, 2014, p. 38) separated from followers, compared to when used by leaders in more proximal work settings (Howell & Hall-Meranda, 1999).

Notably, in a meta-analysis of 25 years of leadership studies, Wang et al. (2011) called attention to the potential limits of TFL's augmentation effect over transactional leadership, specifically in relation to the outcome variable of task performance. When Wang et al. (2011) compared the relative influence of transformational and transactional leadership behaviors on different performance-related constructs, they found that contingent-reward leadership (CRL) was more strongly predictive of follower *task performance* (CRL explained incremental variance in

predicting follower task performance above and beyond TFL). This was a surprising finding that highlighted a boundary condition to Bass's augmentation hypothesis for TFL. Wang et al. (2011) attributed this result to the fact that TFL is more likely to enhance follower attitudes, team achievement, and individual extra-role performance, due to the effects of inspirational motivation and vision for *collective* goal attainment. Comparatively, they suggested that CRL more strongly impacts individual task performance, due to its narrow focus on encouraging follower's *personal* attainment of required task objectives.

THE PRESENT STUDY

According to the literature, it has been confirmed that the value of one leadership style over another is largely dependent on the level of the leader, the work context, and the particular outcome of interest (Avolio, 2010). As proposed by Bass (1997), TFL is proactive and has the potential to inspire the individual to perform *beyond* expectations, while CRL is simply used to direct the individual to meet *bottom-line* performance expectations. However, based on their meta-analysis, Wang et al. (2011) suggest that TFL has a stronger relative impact on individual contextual performance (such as extra-role efforts) and that CRL demonstrates a stronger relative impact on individual task performance (such as number of sales completed). They conclude that the results speak to the practical utility of TFL versus CRL; they suggest to practitioners that transactional styles of leadership would prove more valuable to influence task performance, especially when tasks involve little teamwork.

This author finds this deduction problematic for today's day and age. Demands on the individual employee for adaptive performance, measuring up to high standards, are increasing across companies and organizations worldwide, which are more than ever navigating within contexts marked by ambiguity and change. In this state of affairs, it is hard to believe that transactional contingent-reward behaviors are the more powerful and sustainable "tools" leaders can use to obtain increases in follower task performance reliably, whether followers are acting in teams or independently. This is not to say that contingent-reward leadership behaviors are not actually effective in the way Wang et al. (2011) propose, only that it is perhaps not wise to overlook the potentially more valuable use of transformational leadership to influence individual task performance given certain relevant conditions.

As previously stated, cross-sectional studies that employ data from different sources at different times tend to lack the consideration of contextual phenomena that could differentially explain the link between a purported cause and effect. Thus, it is expected that a closer look at the characteristics of a work sample acting in a "chaotic" environment, as well as a focus on time effects may reveal boundary conditions to Wang et al.'s (2011) conclusions regarding the relative importance of TFL and CRL for predicting individual task performance.

Context and Transformational Leadership

Over half a century ago, situational and contingency theorists raised attention to the need to consider context as a predictor of human behavior (Fieldler, 1967; Lewin, 1947). Since then, there has been a growing emphasis for the consideration of context, and its various forms, in order to improve the overall rigor of organizational research (Avolio, 2007; Boal & Hooijberg, 2000; Johns, 2006; Shamir & Howell, 1999; Tosi, 1991). For example, in 2006, Porter and McLaughlin found that only 16% of over 370 articles in the study of leadership considered context "at least to a moderate extent". According to organizational behavior scholar Johns (2006), "good research tells a story" (p. 391). For this purpose, he encourages academics to share their research as journalists would: there should be an attempt to explain the general *what, who, where, why, and when* heuristics of context inherent to each study. Moreover, to improve the ability of research consumers to understand the broader research picture and the nature of the relationships within it, specific attention must be placed on the meaning of the task, physical, and social variables that contextualize research parameters.

Task and physical context. Research has shown that there are certain work contexts where task demands and environmental flux make followers more responsive to TFL. One is in *crisis* contexts, where there is a dominant sense of an impending threat or "the immediate pressure to improve or perish is palpable" (Osborn, Hunt & Jauch, 2002. p. 809) The other is in what Osborn et al. (2002) term *edge of chaos* contexts, characterized by uncertain future, rapid change, and knowledge-based business. Unlike *crisis* contexts, *edge of chaos* contexts are simply habitually confronted by "dynamism, nonlinearity, and unpredictability" (Osborn et al., 2002, p. 822). There is also a distinction made in the literature between *maximal* versus *typical* work contexts. Similarly to the *crisis* or *edge of chaos* descriptors, *maximal* conditions are described as ripe with intense time pressures, anxiety and unpredictability (Ployhart et al., 2001). Indeed, transformational

leadership has been shown to predict positive organizational outcomes in such contexts (Barling, 2014). The reason for this has to do with how human beings generally feel and respond to uncertainty versus stability.

Generally, stress can be brought on by uncertainty or instability, and it has been proposed that feelings of undue stress move people to become "charisma hungry", in other words, more receptive to TFL's inspirational behaviors (Barling, 2014, p. 86). Leaders' use of TFL help followers develop a compelling, optimistic view of the future, and build confidence in the achievement of positive outcomes despite uncertainty (Barling, 2014). Evidently, this is not only an effect resulting from the transformational leadership of certain historical figures (Martin Luther King Junior, Gandhi...), but we can also observe the effects of TFL in environmental uncertainty manifest in organizational settings. To provide one example, start-up firms are typically pervaded by rapid change and ambiguity due to challenges with innovation and new market establishment. Incidentally, it has been shown that TFL is more strongly associated with meeting net income targets in start-up firms, rather than established firms (Peterson, Walumbwa, Byron, & Myrowitz, 2009). Another study, by Lim and Ployhart (2004), found that TFL was more predictive of military combat team performance when teams were acting in *maximum* versus *typical* performance contexts. Thus, there is evidence in the literature that indicates that TFL may be more effective to influence follower performance in what can be understood as more chaotic contexts.

This being said, it is important to note that contingent-reward leadership behaviors also reduce ambiguity and stress for followers as well: they increase role clarity by providing structure for achieving required performance objectives (Barling, 2014), and role clarity is known as a significant driver of individual performance (Beehr & Glazer, 2005). However, there are social situations of which to be aware where CRL may fall short of impacting individual task performance in comparison to TFL; conditions where structuring or clarifying goals and establishing paths for rewards and punishment may not be enough to significantly drive task performance of an individual follower.

Social context. The task and physical contexts cited above have been noted as favourable for the use of TFL for optimal outcomes. Yet, it is also important to consider the need for leadership of followers, which research has shown can be a socio-psychological condition relevant to the study of leadership (Breevaart, Bakker, Demerouti, Sleebos, & Maduro, 2014).

To begin, on one hand, need for leadership can vary between individuals depending on personality. As such, personality can act as a moderator between leader-follower related outcomes. To illuminate this point, a recent study by Guay and Choi (2015) found that TFL positively offset more neurotic and introverted individuals' tendency to worry, lack confidence and be withdrawn. The results showed that in comparison to other leadership behaviors, TFL influenced more neurotic and introverted followers to perform extra-role efforts. This finding suggests that personality can explain an individual's need for leadership or responsiveness to certain leader behaviors over others. On the other hand, need for leadership can also vary between individuals depending on their level of *work experience*, and this can be explained through a universal human psychological mechanism known as the "motivational hub".

Locke (1991) argued that self-efficacy and goal-setting represent the individual's "motivational hub", or the closest direct link between conscious human thought to action. The effects of the "motivational hub" as a strong determinant of employee performance has been well established in the literature (for examples see: Earley & Lituchy, 1999; Gibbon & Weingart 2001; Locke & Latham, 1990, and Seo & Ilies, 2009). Self-efficacy is defined as the belief, or the confidence an individual has, in their capability to perform a behaviour, or achieve a task, given sufficient effort (Bandura, 1986). Empirical evidence has shown that self-efficacy beliefs are actually a stronger predictor of performance than individual ability levels (Barling, 2014). It has been established that the nature of the relationship between self-efficacy and performance is mediated through personal goal-setting. That is, self-efficacy determines the level of specificity and difficulty of self-set goals, and in general, more specific and challenging goals lead to higher performance (Locke & Latham 2002).

Interestingly, a *time lag* may exist between goal-setting and performance as employees search for effective strategies to perform well on the job (Smith, Locke & Barry, 1990), especially when a task is perceived as novel and complex. In fact, Shea and Howell (2000) found that when participants' level of experience with a task was lower, their self-efficacy was actually more predictive of performance than was goal-setting on its own. These researchers proposed that this may be due to the fact that individuals look to their self-efficacy beliefs to match their goals with what they believe they are capable of achieving, in conditions where they lack experience with a given task or situation. Over time, however, the strength of self-efficacy as a causal influence on

performance decreases (Shea & Howell, 2000). Thus, it is suggested that with experience, individuals rely more on their performance itself as an indicator of their capability, and thereafter, self-efficacy becomes a less reliable predictor of performance than performance itself (Shea & Howell, 2000).

Now, what are the potential links between the "motivational hub", transformational leadership, contingent-reward leadership, and follower task performance? It has been shown that TFL impacts follower performance predominantly through raising follower self-efficacy and intrinsic work motivation (Judge & Picollo, 2004; Kirkpatrick & Locke, 1996; Liao & Chuang, 2007; Shamir et al., 1993). On the other hand, CRL impacts performance primarily by influencing follower goal-setting. Thus, there are different mediating mecanisms at play in the relationships between TFL, CRL and task performance, and these will be important to consider when leading individuals with different levels of work experience.

Time as Context. It is suggested that leadership tends to take effect on followers over a period of time, (Barling, 2014; Bluedorn & Jaussi 2008; Shamir, 2011), and time, the *when* heuristic, can be considered an important determinant of organizational outcomes (Johns, 2006).

Fundamentally, the idea behind a "transformation", which TFL engenders to influence followers to some extent, is that it is time-dependent, or, one could say, it does not happen overnight. Three studies can help demonstrate this point. For one, Dvir, Eden, Avolio and Shamir (2002) found that army personnel's task performance over time was positively predicted by early experiences with TFL behaviors from their platoon leader. Second, a study by Ginnet (1993) on airplane crews showed that when Captains engaged in what can be identified as TFL behaviors in the very first team kickoff meeting, it followed that their crews actually performed better than those whose Captain did not display TFL behaviors. Moreover, it was found that when Captains commented on the crew member composition and strengths [inspirational motivation], and engaged members to discuss the unique potential and challenges in their upcoming flight together [intellectual stimulation], they actually had crews that faired better in performance than others over time. It was concluded that these Captain's early behaviors provided meaning and focus for the crew members' future performance together. Finally, Geyery and Steyrer (1998) investigated the relationship between TFL and transactional leadership behaviors and objective performance measures using personnel from 20 different banks. They found that core TFL behaviors,

comparatively to transactional leadership behaviors, predicted greater long-term branch performance rather than short-term performance. Based on the evidence, the author agrees with Geyery and Steyrer's (1998) conclusion that research should "explicitly take into account the time-frame when analyzing objective performance and formulating hypotheses regarding the effects of leadership" (p. 418).

Based on their extensive meta-analysis Wang et al. (2011) suggest that TFL is not necessarily instrumental for predicting individual task performance compared to CRL, yet the research design that enabled them to derive such a conclusion has limitations. Cross-sectional data simply cannot capture conditions that fuel time effects (Johns, 2006) because the dynamic influence of leader behaviors on follower outcomes are not accurately captured when analyzed between-persons over arbitrary time intervals (Judge & Piccolo, 2004). Thus, there is doubt as to whether cross-sectional effects generalize to outcomes within-persons over time (Shamir, 2011).

Background

For this author's undergraduate research and with subsequent data collection, an investigation was conducted on a sample of 74 piece-workers (tree planters) in Canadian work camps. The result of this initial study informed the direction of the current research. Tree planters represent a unique and promising sample in which to conduct organizational behavioral research, since performance data are objective, and human resource challenges inherent to this demographic are common to many other organizational contexts, e.g., turnover and maximization of employee task performance. The research goal was to investigate characteristics of individuals that could explain task performance (number of trees planted per day). Data were subject to Hierarchical Linear Modeling (HLM) analyses with days nested within individuals, and individuals nested in teams. Interestingly, only a small percentage (13%) of the total variance in the sample's performance resided between individuals. Results demonstrated that most (87%) of the variance in daily performance resided within individuals between days. The current study was designed to investigate some of the factors that may influence tree planters' daily variation in performance, namely, daily mood, work conditions, and perhaps more importantly, leadership.

Hypotheses

In order to test the conclusion put forth by Wang et al. (2011), namely that contingent-reward leadership would prove more valuable than transformational leadership to influence

follower task performance, this thesis is interested in investigating the relative impact of TFL and CRL behaviors on follower task performance in a *chaotic* work context. Piece-workers in a tree planting work environment were selected as a fitting research sample from which to pool for this study's purposes.

As further described in the "Research Setting" section of this thesis, tree planters can be theorized as acting within either a *crisis* or *edge of chaos* environment on a daily basis, depending on their subjective experience. Every day, tree planters are sent to remote clear cuts, and must be prepared to work within any type of land, in any type of weather, which can be extremely variable. Hence, a popular slogan of the tree planting culture is "hurry up and wait", meaning they must be ready for anything, because every day is unpredictable. Tree planters in bush camps work and live in the outdoors, thus they must adapt to rough work conditions, and cope with the presence of wildlife, all while attempting to achieve challenging baseline performance expectations. It can be said that the demands on the individual tree planter are high, and the learning curve is steep in order for novices to become succesful. In the first weeks of work, most novice tree planters experience great difficulty adjusting to the extreme job conditions, and struggle with meeting the physical and mental demands necessary in order to earn salaries above minimum wage. As a result, tree planting companies can lose as much as 10-20% of their novice employees, either by voluntary or forced leave at the start of season.

As previously stated, it has been argued that leadership behaviors do not impact all followers equally (Bass 1985; Conger & Kanungo, 1987; Shamir, House, & Arthur, 1993), and transformational leadership is suggested as a style favourable for *crisis* or *edge of chaos* contexts. Therefore, it is believed that novice tree planters who have no prior experience and must adapt to these challenging work conditions may experience heightened stress and uncertainty that hinder their task performance. According to the literature, and as previously explained, self-efficacy of followers with less work experience may be more predictive of performance than goal-setting (Shea and Howell, 2000). In addition, it has been shown that TFL has a unique positive impact on follower self-efficacy. Thus, the first hypothesis of this study is that the task performance of novice followers should be more positively impacted by TFL behaviors on a daily basis than contingent-reward leadership behaviors.

It is important to note that in their meta-analyses of 87 leadership studies, Judge and Piccolo (2004) found TFL and CRL to be highly correlated ($r = .80$), which suggests a potential difficulty in isolating the foundation of their effects. Nevertheless, Bass (1985) contended that both styles are "distinct, but not mutually exclusive processes" (p. 176), and Wang et al. (2011) demonstrated that both styles explain unique variance in different follower outcomes. This noted, studies have shown that both TFL and CRL have a significant positive impact on task performance (Dvir et al., 2002; Kirckpatrick & Locke, 1996; Locke & Latham 2002; Tims et al., 2011; Wang et al., 2011). Thus, H1 and H2 state that there is an expected positive relationship between daily task performance and both daily TFL and CRL for the entire sample.

H1: Daily TFL will be positively related to followers' daily task performance, and this relationship is expected to be stronger with followers who are novice tree planters.

Conversely, even though experienced tree planters may objectively be acting in a qualitatively *crisis*-like or *edge of chaos* work context, it is possible they do not subjectively feel the same stress associated with the context as their novice counterparts. Having previously worked a full tree planting contract, and decided to return for another, it is assumed that experienced tree planters are more adjusted to the work demands, experience less stress and uncertainty, and therefore may be in less need of, or responsive to, TFL. CRL has been shown to predict individual task performance positively through the mediating mechanism of goal-setting (Wang et al., 2001), and goal-setting has a stronger impact on performance for employees with more work experience (Shea & Howell, 2000). Taken together, it is expected that a stronger relationship will be found between CRL and task performance on a daily basis for experienced tree planters. In other words:

H2: Daily CRL will be positively related to followers' daily task performance, and this relationship is expected to be stronger with followers who are experienced tree planters.

Finally, this study seeks to investigate the possibility that TFL is more influential than CRL for individual task performance over time by conducting a within-person longitudinal

investigation. According to empirical findings suggesting a long-term impact of TFL on follower performance, it is possible that the beginning of a work contract represents a sensitive period for leaders to engage in TFL behaviors, and TFL's effect on task performance may only take shape given a period of time thereafter. Thus, it is expected that TFL behaviors at an earlier point in time will demonstrate a more significant impact than CRL behaviors on follower task performance at a later point in time for the entire sample. To reiterate:

H3: Early measures of TFL will have a more significant and lasting effect than CRL on later measures of task performance for the entire sample.

METHODOLOGY

Research Setting

Participants were recruited from two remote work locations in Northern Ontario, on site at their respective tree planting camps. Both male and female tree planters, with various amounts of tree planting experience, 18 years of age and older, were eligible for participation. Based on the size of both camps, there was a total sample from which to pool of approximately 85 tree planters.

Tree planters generally work in teams of at least two, all the way up to four or five, and anywhere from one to three teams can make up a crew. A leader (or "crew boss") structures the day's work, and oversees each team within their crew throughout the day. They manage the distribution of land between followers, they inform management of how many tree seedlings must be made available to each crew, and they tally their crew's production at the days' end. Leaders check in with members, usually at least twice daily, to ensure all are safe, on task, and they also provide coaching and support as they see fit. In some companies, crews and their leader are very tight knit; that is, their composition does not change. However, in this sample, it was customary for planters to shift frequently between teams and leaders throughout the spring-summer season (mid May to July 1st).

In the organization from which the sample was pooled, planters are assigned to work three to four days in a row at a time, and this is called a work "Shift". Each Shift is interspersed with one day of rest in which planters have the option to go into the nearest town to take advantage of the local facilities, such as the community center for a shower, or the Laundromat to wash their clothes. Work hours generally range from 7am to 5pm, with some exceptions. The sample resided in what is referred to as "bush camps" where time is spent entirely in the outdoors at the mercy of Mother Nature. Planters sleep in their personal tents, and dine together in the main camp "mess tent".

Occasionally, the work conditions are favourable: somewhat sunny, with easier land to move in. Unfortunately, other times, conditions are much more challenging and unpredictable, including all or one of the following: horizontal rain, hail, cold, high heat, hills, swamps, heavy brush, rocks, bugs, bears, etc. It is normal for camp equipment to break down or to not be able to access remote clear-cuts, and therefore planters sometimes have to walk 1-10 km with their gear on before even beginning their workday.

As for production standards, in order to maximize seedling survival rates it is expected that workers strictly follow quality guidelines for *how* and *where* tree seedlings are planted. In Ontario, the piece rate per tree ranges from 10 to 12.5 cents. Novices are expected to average 1000 trees daily by the 3rd Shift, and experienced planters generally average anywhere between 1500-3000 trees planted per day. Bundles of tree seedlings are transported in harnesses with bags that hang around the hipline, and a small shovel spade is used to drive into the ground and expose mineral soil.

Evidently, tree planting is a game of mental and physical endurance. Common knowledge is that the learning curve is steep to become a successful tree planter, earning well over minimum wage. Dropout rates range between 10-20% in the early season, either due to personal decision, injury, or forced leave. The BBC (2016) has cited tree planting as one of the world's toughest jobs, hence it is not for everyone, yet it can be a rewarding experience on many levels. For more reading on the culture and practice of tree planting, refer to *Eating Dirt* (2011) by Canadian author Charlotte Gill.

Research Design

The current study uses a daily diary method to conduct a longitudinal analysis of leadership and task performance. This design was considered an optimal research methodology to test the research hypotheses, while accounting for extraneous variables such as weather, land conditions and mood, which can be evaluated and controlled for in order to isolate the effects of leadership.

A self-report booklet was constructed to assess demographics and participants' daily subjective experience of target variables. The booklet covers the span of nine work days which, given the timing of this data collection, represents 25% of the sample's work contract (total work days includes approximately 36 days). This design was considered an optimal research methodology to understand the impact of leadership at the beginning stages of a work contract, a potentially influential time for newcomers on the job. Since all variables except for task performance are obtained through tree planter self-report, there were two versions of the diary booklet created, each with the same measures, yet presented in a different order. This counterbalancing was conducted to reduce order effect bias in self-reporting (Podsakoff et al., 2003).

Sample

In all, the response rate was favourable, 73 daily diaries were handed out, and 60 were returned upon data collection. Novice tree planters represented 75% (N = 45) of the sample, and women represented 63% (N = 37) of the sample. The two survey versions were distributed approximately evenly within the sample: 60% had Survey A. The sample was split almost evenly between both camps, with a few more participants originating from Camp B (57%). The average age of participants was 19.98 years (*SD* = 1.88); average fitness level reported on a scale of one to seven was 4.74 (*SD* = 1.02); and the average education level attained was between some post-secondary and undergraduate education. Mean number of trees planted per day for the entire sample was 1231.58 (*SD* = 361.59). Each Camp reported working three shifts (Shifts 2-4 of the season), totalling nine days of work, with three days off. The length of days worked in each shift differed between camps in some cases by no more than one day. See Table 1 for a depiction of which days are represented by which shift for both camps.

Procedure

Recruitment took place specifically on a non-work day. Before the commencement of their 2nd Shift, the research packages were handed to participants by the researcher in both camps. This allowed employees enough time to be acclimated to the job environment during Shift 1 before being asked to participate. As an incentive for participation, potential candidates were offered a pair of work gloves and glow sticks (considered popular items for this demographic). They were distributed to all those who identified they sought to participate. The researcher was stationed in the dining area, and notified the group where to meet for those who desired to participate. The research package contained two copies of the consent form (one for the participant to keep and one for the researcher) including the diary booklet, with surveys covering each workday of the span of Shifts 2-4. As the packages were being distributed, each participant was reminded that participation was entirely voluntary and that all information provided was confidential. Each participant was asked to keep one of the two consent forms for their records and complete the diary booklet over the course of Shifts 2-4. Completed booklets were collected at the end of the 4th Shift. Participants who returned their booklets were provided with compensation of five dollars each, and a chance to win $100. There was a draw held in each camp. Receipts were collected for all those who received compensation. Refer to Appendix A for the recruitment script, Appendix B for the consent form, and Appendix C for an excerpt from the

daily diary booklets which includes the full questionnaire (specifically, Appendix C contains the questionnaire for one day, but the questionnaires for all nine days were identical). This study was approved by the University Human Research Ethics Committee (refer to Appendix D for ethics certificate).

Measures

Minor modifications were made to some scale items in order to adapt to the language of tree planters. For example the word "crew boss" replaced the word "leader". All scales can be found in Appendix C.

Demographics. Baseline measures of between-person indicators were included in the entry pages of the survey booklet: age, sex, education, number of years of work experience, number of seasons of tree-planting experience, and fitness level. All subsequent variables were measured daily.

Transformational and contingent reward leadership. Daily TFL and CRL were assessed using a scale adapted and validated by Breevart et al. (2013). It is a shorter version of the traditional Multifactor Leadership Questionnaire (MLQ)-Form 5X (Bass and Avolio, 1995). Each leadership behavior was rated on a five-point Likert scale (1= totally disagree to 5 = totally agree). A high score on these scales reflect a high degree of TFL and CRL displayed by the leader (as perceived by the follower) on the given day.

Five items were used to measure TFL; a sample item is: "Today my leader expressed confidence that goals would be achieved". Two items of the TFL scale measured its subscale dimension of inspirational motivation, and three items referred to either one of the remaining TFL subscales, i.e. idealized influence, individualized consideration, or intellectual stimulation. These four subscales make up the higher-order factor of TFL (Avolio, Bass, & Jung, 1999). Therefore, all items belonging to TFL were combined into one construct. The average internal consistency of the scale was .79.

Three items measured CRL; a sample item is: "Today my leader discussed in specific terms who was responsible for achieving performance targets". Cronbach's alpha for this scale in

Table 1.

Number of Days within Shifts 2,3, and 4 of the Season for Each Camp.

	Camp A	Camp B
	Shift	Shift
Day 1	2	2
Day 2	2	2
Day 3	2	3
Day 4	3	3
Day 5	3	3
Day 6	3	3
Day 7	4	4
Day 8	4	4
Day 9	4	4

this study was .63. A low number of items used to assess a construct can create a downwards bias to Cronbach's alpha (Field, 2009), which may explain the result of lower internal consistency. However, the removal of the cited item above somewhat improved the scale's reliability, to alpha .64, which perhaps suggests a comprehension problem with this particular item. In light of this finding, a "corrected" CRL score was used in all main analyses.

Day-level positive emotions. Positive emotions can lend to "good day effects" in diary studies, where participants' positive mood might contribute to explaining performance changes, and this must be ruled out in order to have more internal validity (Xanthopoulou et al., 2011). Only the subscale that measures positive state emotions of the Positive Affect/Negative Affect Form-X (PANAS-X) scale was used in this study. Participants were instructed to rate on a five-point Likert scale the extent to which a list of ten adjectives portrayed their feelings for the day (1 = very slightly or not at all, to 5 = extremely). A high score on the scale reflects high positive emotions, and a low score reflects low positive emotions. The internal reliability of this scale was .93 in this study.

Work conditions. To measure subjective experience with daily work conditions, participants were required to cite the degree of favorability of the land and weather they experienced for the day. They were instructed to rate their response on a seven-point Likert scale, with anchors ranging from 1= completely unfavorable to 7= completely favorable. A higher score on either Land or Weather items reflects more favorable work conditions.

Individual task performance. In this study task performance was operationalized as number of trees planted daily. Daily objective task performance records were provided by management at the end of the work contracts.

Data Integrity

In total, 11 participants were eliminated for careless responding or for having too much missing data, bringing the sample down to a total of *N* = 49. Careless responding was determined by these indicators: A) if response patterns were questionably overly consistent, by being either non-variable or biased to extremes; and B) if the day and shift numbers provided by the participant did not match the actual number of days and shifts experienced according to their respective camp records. Those with less than 33% (3 out of 9 days) of missing data were retained. There were 7

known data points that were missing yet non-random, where participants were either sick or injured for the day.

Dataset reduction. The dataset was characterized as hierarchically cross-classified, such that not every participant had the same leader for each of the nine work days, yet others shared the same leader on some days. Since the sample was small, this limited the ability to perform robust tests on the data using Hierarchical Linear Modelling (HLM) for cross-classified samples. In an attempt to preserve the nested nature of the data, "fully-nested" datasets were created for analyses by using only data from participants who had the same leader for at least an entire Shift ($N = 47$). Out of the reduced sample, 35 participants were Novice, the remaining were Experienced, bringing the total fully-nested repeated-measures sample size to $N = 421$, i.e. equals approximately 47 participants multiplied by nine days.

Outliers. Preliminary outlier analyses were carried out by standardizing all variables. Task performance had only one significant outlier in the sample with a score greater than 3 standard deviations away from the mean; therefore this participant was removed from the sample (making the total sample $N = 46$). Across nine days, for TFL scores, there were only two significant outliers, yet these outliers were not linked by participant ID, and did not have Cook's distance values that exceeded 1 (Cook & Weisberg, 1982); hence these data were not deleted from analyses. No other outliers were found for the remaining variables, thus remaining data were included and further investigated for outlier properties in the main analyses.

Normality. Values of skewness and kurtosis were investigated for each variable across the nine days of data, and analyzed separately between Novice and Experienced planters. There was evidence of some non-normality per day for both groups, however the Experienced data displayed more significant non-normality, most likely due to small sample size. The central limit theorem implies that if a sample size is large enough there is no need to worry about normality for obtaining optimal parameter estimates, or accurate confidence intervals and significance test statistics (Field, 2009). Therefore, in this study the Experienced sample data ($N =11$), was not large enough to use in regression tests. Furthermore, significance test statistics and confidence intervals computed during regression analyses using Novice sample data ($N = 35$) may be biased due to small sample size. For analyses using the larger repeated-measures datasets ($N = 284$ i.e. daily data observations remaining after listwise deletion from 421; Novice $n = 217$, Experienced $n = 67$) such bias should

be reduced since the sample becomes much larger. Finally, parameter estimates provided in regression and moderation tests in this study are not affected by sample data normality, given the use of the method of least squares, which minimizes error in estimates of model parameters (Gelman & Hill, 2007).

Data Analyses

For this study, HI and H2 were tested first by running hierarchical multiple regression analyses, and then PROCESS moderation analyses. H3 was tested using lag regression analyses. These are described in detail at the end of this section. Before running these tests however, an investigation of possible systematic differences in the data was necessary, as well as tests to justify the aggregation of daily variable scores into average scores.

Tests of systematic differences. A series of preliminary analyses were carried out to test systematic differences between target variables using t-tests in SPSS. Bias accelerated corrected Bootstrapping at the 95th percentile was used in order to obtain more robust estimates of confidence intervals and probability values for the statistical significance of mean differences. Bootstrapping is a function in SPSS that a user can select to perform during certain analyses.

First, there were two notable differences between camps. There was a difference in the number of trees planted between camps, such that the mean daily number of trees planted in Camp A ($M = 1110.77$, $SE= 43.40$), was significantly lower than that of Camp B ($M = 1337.49$, $SE = 34.04$) (t (282) = -4.157, $p < .01$, 95% CI [-334.061 -119.371]). In addition, the variances were unequal between camps for Positive Emotions: Levene's F (44) = 7.782, $p < .01$.

Second, there were several significant differences between Novice and Experienced planters. To begin, variances were unequal regarding daily task performance: Levene's F (282) = 16.27, $p < .01$. Novice planters produced significantly less trees on average per day, $M = 1134.63$, $SE = 25.72$, compared to Experienced planters, $M = 1598.58$, $SE = 65.87$ (t (87) = -6.56, $p < .01$, 95% CI [-604.503, -.323.392]). Specifically, the mean difference in number of trees planted per day between Novice and Experienced planters was $M = 463.95$. In terms of leadership, Novices experienced significantly more daily TFL, $M = 3.43$, $SE = .05$, than those with Experience, $M = 3.08$, $SE = .11$ (t (282) = 3.12, $p < .01$, 95% CI [.132, .585]). There was no mean difference in CRL. Furthermore, Novices reported significantly more positive emotions per day on average, $M = 3.31$, $SE = .06$ (t (282) = 3.16, $p < .01$, 95% CI [.152, .655]) than their counterparts. As for

demographic differences, Novices tended to be significantly younger, $M = 19,66$, $SE = .27$ (t (44) $= -2.15$, $p < .05$, 95% CI [-2.603, -0.083]), and had achieved less advanced levels of education, $M = 3.43$, $SE = .16$ (t (44) $= -2.67$, $p = .01$, 95% CI [-1.481, -0.207]) on average compared to Experienced planters. This being said, tests of hypotheses in this study required regression analyses, which mathematically assume that the variance in the outcome variable is the same at all levels of the predictors (Field, 2009). Since the Levene's test results above demonstrate this to be untrue between Camps, and Novice and Experienced participants, it follows that Work Experience and Camp membership should be included as control (dummy) variables to partial out their differential effects on task performance.

Finally, there were no significant differences in variables of interest when comparing the two versions of the survey.

Data aggregation. The challenge with multi-level research is to determine the most meaningful way to represent individual and group data (Dixon & Cunningham, 2006) in order to maintain the construct validity of the variables of interest (Klein, Conn, Smith & Sorra, 2001). To test the hypotheses, TFL and CRL multiple item scores were averaged together appropriately and represented by a mean daily score for the main analyses. In addition leadership, weather favorability and mood scores were averaged across days and represented by their corresponding average "Shift" score. Remember from Table 1, days 1-9 were nested within Shifts 2-4 of the sample's work contract. For example, a participant from Camp A's rating of TFL from days 1-3 would be averaged into a mean TFL score for Shift 2. Thus for data aggregation, the question was whether participants' daily data varied consistently, and could be meaningfully represented by mean scores. For these purposes, measures of interrater agreement (r_{wg}) of each item rating within each measure (James et al., 1984) were computed. This would help get an understanding of the within-person rate of agreement between item ratings within each construct. Then, these scores could be averaged to obtain the mean rate of agreement for each construct. According to Lebreton and Sentor (2008) r_{wg} values range from 0 (complete lack of agreement) to 1 (complete agreement). TFL, CRL and Positive Emotions were each multi-item constructs, therefore r_{wg} (j) (Lebreton & Sentor, 2008) statistics for these predictors were computed. Results indicated moderate to strong levels of interrater agreement across the sample assuming a random uniform distribution (see Table 2). Thus, there is evidence for justification of aggregating these variables into average "Shift"

scores. In other words, daily data (scores of positive emotions for Days 1-3, for example) could be averaged into Shift scores (represented by an overall Shift 2 score for positive emotions, for example).

To compute the daily r_{wg} (j) values, the researcher followed the formula provided by Lebreton and Sentor (2008) to write as a syntax in SPSS, where the variance of the construct is computed, and then plugged into the formula to obtain the r_{wg} (j) for that construct, assuming a uniform distribution. In this case, the construct variance was calculated as the variance in the construct item ratings over the 9 days of data. To provide an example, the syntax for the r_{wg} (j) of daily TFL assuming a uniform distribution is =(5*(1-TFL_variance/2))/((5*(1-tfl_variance/2)) + tfl_variance/2). The number 5 in this example is used because transformational leadership was measured using 5 items. Then the daily r_{wg} (j) values were aggregated by Shift in order to obtain average Shift r_{wg} (j) values.

As for work conditions, reforestation terrain in Northern Ontario is notoriously variable, for example, within a 5km radius, tree planters can be assigned to cover land including hills, rock, swamp, and/or flat mineral soil. Additionally, planters can experience similar weather conditions differently per day. For example, some could enjoy working in the rain, or in colder conditions, and others not. Also, weather conditions can vary considerably from one day to the next. Therefore, in this study it was affirmed that land and weather should be treated as daily individual difference variables. To be expected, interrater agreement r_{wg} values yielded scores above 1 (See Table 2), indicating that the observed variance in land and weather ratings from each participant day to day are much greater than the expected variance given a uniform distribution, which assumes that all possible values of any variable can occur with equal probability (James et al., 1984). Nevertheless, shift means were considered meaningful as representative of the participant's general favorability of the work conditions they experienced during a particular Shift.

Hierarchical multiple regression analyses. Due to systematic differences and unequal variances between planters with different work experience, all hierarchical multiple regression analyses were ran separately on Novice and Experienced sample data. A general test was conducted for the first set of hypotheses using the fully-nested dataset with scores across the sample's nine work days ($N = 421$ with missing data deleted listwise yielding $N = 284$ [novice n:

Table 2.

Average Interrater Agreement for Leadership, Positive Emotion, Land & Weather

	$r_{wg}(j)$	
1. TFL	.88	
2. CRL	.84	
3. Positive Emotions	.94	
	r_{wg}	
4. Land	2.12	
5. Weather	2.28	

Note. N = 421. *TFL*: transformational leadership, *CRL*: contingent-reward leadership.

217, experienced *n*: 67]). For specific analyses using separate observations of Days 1-9, and Shifts 2-4, only data from Novice participants could be used ($n = 35$); the sample size of Experienced participants was too small ($n = 11$) to yield remotely reliable parameter estimates.

The models included three steps in each analysis: In Step 1, variables of camp, land, weather, and positive emotions were entered in this order. Decisions for this particular sequence were based on results from analyses, suggesting that camp membership followed by land and weather respectively, were more strongly related to task performance. Camp was included as a dummy variable, in order to partial out effects due to camp membership. There was no theoretical purpose to include positive emotions, except as a control variable to isolate the effects of leadership. In Steps 2 and 3, leadership scores were added.

Based on H1, TFL scores were included in Step 2 before CRL scores were included in Step 3. For tests of H2, CRL was entered in Step 2, followed by TFL in Step 3. Lastly, for tests of H3, a lag analysis was performed by regressing Shift 2 leadership scores on task performance from Shift 3 and 4. The structure of the models for the lag tests followed the previous for tests of H1 and H2. Missing data were deleted listwise for all analyses.

Assumption checks. The following paragraphs will detail how assumption checks for regression analyses were tested and highlight violations to be considered in the interpretation of the results.

Sample size. In hierarchical regression tests using novice daily data and shift data separately (N = 35), not enough cases were available per predictor to achieve the standard benchmarks for statistical power in order to be able to infer generalizability of the findings (Field, 2009). In addition, it is warned that small samples of even random data can produce biased R estimates (Field, 2009), therefore the results from the model fit tests using the small novice sample should be interpreted with caution.

Exogeneity of predictors. Although it is impossible to eliminate all sources of measurement error, which hinders causal interpretation, attempts were made in this study to reduce predictor endogeneity (Antonakis et al., 2010). Contextual variables that could differentially explain the effects observed between leadership and task performance such as work experience, camp membership, work conditions and mood were controlled for in the study models.

Outliers. During hierarchical regression tests using the entire sample, influential case

analysis with Cook's distance (Cook & Weisberg, 1982) revealed significant outliers that resided in the experienced sample data, and therefore these cases were eliminated from the repeated measures dataset. With these outliers removed, Cook's distances did not exceed 1, and therefore all observations were included in subsequent tests.

Normally distributed errors. "For beta estimates to be optimal, the residuals in the model should be normally distributed" (Field, 2009, p. 223). In order to check the distribution of errors in each model, Histograms and PP-Plots for standardized residuals were inspected. Residuals in the novice datasets mostly demonstrated normality, with some minor skewing. Residuals in the experienced sample dataset demonstrated the same.

Homogeneity of variance. Significance testing assumes that variance in the outcome variable is the same at all levels of the predictor (Field, 2009). Levene's Test demonstrated that task performance between camps, and novice and experienced participants had unequal variance. Therefore, for significance testing where camp was included as a control variable, and for significance tests using the entire sample data, work experience was also included as a control variable.

Multicollinearity. In order to obtain unique unbiased estimates of coefficients, collinearity between predictors should not surpass $r = .80$, and the average VIF factor should not be greater than one (Field, 2009). These indicators were investigated within the current study models and suggested no serious issues of multicollinearity.

Homoscedasticity. Based on the occurrence of funneling in plots of standardized predicted residuals over standardized residuals, heteroscedasticity, or the inconsistency of variance in residual terms, was present in some hierarchical multiple regression models of this study. The consequences of heteroscedasticity in OLS regression are invalid hypothesis tests or lower statistical power relative to when the homoscedasticity assumption is met (Long & Ervin, 2000).

Independent errors. When residual terms are correlated, confidence intervals and significance tests will be invalid (Field, 2009). Durbin-Watson test statistics were computed in all models, values were never lower than one or more than three, therefore there was no evidence of serious problems with error independence (Field, 2009).

Independence. OLS regression assumes each value of the outcome variable comes from a separate entity (Field, 2009). For tests using the day or shift data separately, this assumption was

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not violated, however for tests using the larger repeated-measures dataset ($N = 284$), this assumption was violated. Repeated-measures data come from a fixed number of entities (or participants) that were measured repeatedly over a period of time. Therefore, it is unavoidable that values of the outcome variable in a repeated-measures dataset will violate the assumption of independence.

Linearity. Regression analyses assume a linear model (Field, 2009), and if there are non-linear relationships modeled as linear, this limits generalizability of findings. Scatterplots of daily data between each predictor and task performance demonstrated no obvious non-linear relationships.

Moderation analyses. The first two hypotheses of this study necessitated simple moderation tests. For this purpose, the modeling tool PROCESS introduced by Hayes (2012) was employed due to its accessibility and advantages in testing interaction effects. For PROCESS analyses, the fully-nested dataset was used with the sample's daily scores across the nine work days ($N = 284$, i.e., the repeating daily data observations remaining after listwise deletion; [Novice $n = 217$, Experienced $n = 67$]). The following paragraphs will provide details of the benefits of using PROCESS as a modeling tool, in comparison to SPSS, according to Hayes (2012).

Chiefly, PROCESS estimates model coefficients using standard OLS assumptions for regression analyses with continuous outcomes. However it also includes functions that help characterize it as a more robust statistical tool. Namely, the HC3 application is a standard error estimator that does not assume homoscedasticity. This ensures that the conclusions made based on the results are not invalidated by the violation of the homoscedasticity assumption, such as with interpretations from hierarchical regression analyses. In addition, PROCESS is automatically set to conduct Bias Accelerated Corrected Bootstrapping at the 95th percentile for all confidence interval and probability values, which ensures that accurate sample estimates are more representative of the population.

For tests of moderation, PROCESS provides the option to automatically mean center interaction variables, which ensures the interpretation of product coefficients within the natural range of the data. Similarly to SPSS output, PROCESS output displays the proportion of the total variance in the outcome uniquely attributable to the interaction, as well as a test of its significance. For dichotomous moderators such as in the present study (work experience), PROCESS "produces

the conditional effects of X (e.g. simple slopes) at each of the two values of the moderator, along with a standard error, t, and p-value" (Hayes, 2012, p. 15). Finally, PROCESS produces data that can be used for a visual depiction of the moderation using the mean centered variables.

RESULTS

Preliminary Results

Before carrying out the tests of hypotheses, a series of bivariate one-way correlation tests using Pearson's coefficient were performed on novice and experienced data separately. The purpose was to obtain an initial understanding of the strength of association between the predictors and outcomes of interest within the sample. The dataset using repeated-measure scores from each participant across nine days were used for the analyses ($N = 284$; $n = 217$ for novice; and $n = 67$ for experienced). Overall, there was evidence of varying degrees of association between all study variables. No predictors were highly correlated with the exception of TFL and CRL. Although this association was strong within both groups, there is not enough evidence to confirm that multicollinearity ($r > .80$) was a serious issue (Field, 2013). According to the literature, higher Pearson's r values are expected between these two dimensions of leadership (Wang et al., 2011). See Tables 3-5 for results, which the following paragraphs detail.

First, land was the predictor most strongly related to daily number of trees planted for both Novice ($r (215) = .40, p < .01$), and Experienced participants ($r (65) = .55, p < .05$), followed by weather: Novice ($r (215) = .37, p < .01$); Experienced ($r (65) = .36. p < .05$). Second, positive emotions were correlated to daily performance for both groups [Novice: $r (215) = .28, p < .01$; Experienced: $r (65) = .35, p < .05$]. Interestingly, land and weather were moderately associated with positive emotions for Novices [land: $r (215) = .36, p < .01$; weather: $r (215) = .43$], but positive emotions of planters with experience were only associated with land, $r (65) = .56, p < .01$, and not weather $r (65) = .14, ns$. As for leadership, TFL and CRL were related to daily performance in both groups [Novice: TFL $r (215) = .18, p < .01$, CRL $r (215) = .17, p < .01$; Experienced: TFL $r = .43, p < .05$, CRL $r (65) = .52, p < .05$].

The findings above lend partial support to H1 and H2, but an investigation into the association between early leadership and later performance was of interest as well (H3). As such, additional Pearson's correlations were computed between early shift's leadership variables and later shift task performance, using only the Novice sample data. As depicted in Table 6, there was evidence of a link between Shift 2 leadership and planter's performance in Shifts 3 and 4.

Table 3.

Means, Standard Deviations, and Correlations of Daily Variables for Each Group

Novice (*n* = 217)	*Mean*	*SD*	1	2	3	4	5	6
1. Trees Planted	1134.63	379.01	−					
2. Land	3.98	1.48	.40**	−				
3. Weather	4.72	1.67	.37**	.38**	−			
4. Positive Emotions	3.31	0.89	.28**	.36**	.43**	−		
5. TFL	3.43	0.81	.18**	.22**	.22**	.21**	−	
6. CRL	3.68	0.85	.17**	.31**	.20**	.25**	.73**	−
Experienced (*n* = 67)								
1. Trees Planted	1577.50	562.67						
2. Land	3.76	1.66	.55*	−				
3.Weather	4.21	1.75	.36*	.34**	−			
4. Positive Emotions	3.06	0.95	.35*	.56**	.14	−		
5. TFL	2.91	3.09	.43*	.25**	.08	.37**	−	
6. CRL	3.71	0.97	.52*	.36**	.19	.31**	.65**	−

Note. N = 284*, TFL*: total mean transformational leadership, *CRL*: total mean contingent-reward leadership, **p* < .05, ** *p* < .01.

Table 4.

Means, Standard Deviations, and Correlations of Daily Variables for the Entire Sample

	Mean	*SD*	1	2	3	4	5	6
1. Trees Planted	1244.08	465.16	–					
2. Land	3.93	1.53	.38**	–				
3. Weather	4.61	1.67	.28**	.37**	–			
4. Positive Emotions	3.21	0.92	.19**	.42**	.37**	–		
5. TFL	3.35	0.83	.15*	.23**	.20**	.27**	–	
6. CRL	3.68	0.85	.25*	.32**	.19**	.26**	.69**	–

Note. N = 284*, TFL*: total mean transformational leadership, *CRL*: total mean contingent-reward leadership, **p* < .05, *** p* < .01.

Table 5.

Mean, Standard Deviations, and Correlations of Novice Shift Variables of Interest

	Mean	*SD*	1	2	3	4	5	6
1. Shift 2 TFL	3.39	0.69	–					
2. Shift 2 CRL	3.78	0.60	.73**	–				
3. Shift 3 TFL	3.51	0.56	.52**	.34*	–			
4. Shift 3 CRL	3.66	0.60	.53**	.40*	.74**	–		
5. Shift 3 Trees	1093.86	269.14	.40*	.42*	.18	.29	–	
6. Shift 4 Trees	1267.06	270.66	.57**	.36*	.20	.30	.82**	–

Note. n = 25, data deleted listwise. *TFL:* shift mean transformational leadership, *CRL*: shift mean contingent-reward leadership, *Trees:* task performance. *p < .05, **p < .01.

Hypotheses Tests

The purpose of the preliminary analyses was to determine the general nature of the association between the predictor variables and task performance for novice and experienced planters. According to those results, there was partial support for the study hypotheses. In order to test the hypotheses in further depth, multiple regression and moderation analyses were conducted. For tests of H1 and H2, the fully nested dataset with scores across the sample's nine work days (N = 284, [novice n: 217, experienced n: 67]) was used. Separate datasets of each Day 1 to 9 using the Novice sample (N = 35) were used as well for further tests of H1 and H2. To test H3, the datasets from novice participants for Shifts 2-4 were used (the sample size of experienced participants was too small (n = 11) to yield remotely reliable parameter estimates). Due to systematic differences and unequal variances between planters with different work experience, all hierarchical multiple regression analyses were ran separately on novice and experienced sample data.

H1 posited that daily TFL would be positively related to followers' daily task performance, and this relationship would be stronger for novice tree planters. Based on multiple regression analysis, with camp, land, weather and positive emotions entered in step 1, TFL entered in step 2, and CRL entered in step 3, there was no evidence for a daily effect between TFL and task performance for novices as expected, $b = 29.10$, *ns* (see Table 6 for results).

In H2, it was hypothesized that daily CRL would be positively related to followers' daily task performance, and this relationship would be stronger for experienced tree planters. Moderation test results suggested partial support for this hypothesis: CRL predicted task performance more strongly for experienced tree planters. See Table 7 for regression results with the experienced sample, and Tables 8 and 9 for moderation test results. In summary, TFL was not a significant predictor of daily trees planted for either group, but CRL was. For novices, there was no evidence of a relationship between daily CRL or TFL and performance, yet for experienced tree planters, every unit increase in CRL predicted an approximately 175 unit increase in daily trees planted, $b = 174.96$, $p < .05$. The moderation model (model number 1, x= daily CRL, y = trees planted, m = work experience) with CRL as a moderator was significant, F (8, 275) = 30.14, $p < .001$, and accounted for 47% of the variance in daily task performance. The interaction between CRL and work experience was significant, $b = 216.75$, $p < .01$, CI [79.16, 353.73]. Camp

membership, land and weather favorability were highly significant ($p < .001$) predictors of daily number of trees planted for the entire sample. Otherwise, positive emotions and TFL were non-significant predictors of daily task performance. The visual depiction in Figure 1 is the slope for CRL predicting mean daily trees planted at each level of work experience. This figure was achieved by following instructions from Hayes (2012) for dichotomous moderators. Mean centered data of the variables provided by the PROCESS moderation analysis output was plugged into an SPSS moderation graphing program to display the figure.

Next, to test H1 and H2 in greater depth, hierarchical multiple regression analyses were carried out separately for each day, using the novice sample data only. Interestingly, there was no significant evidence of daily TFL or CRL effects except for within Day 1 (see Table 10). For Day 1, there was a significant positive effect of CRL on task performance ($b = 264.74$, $p <. 01$), and the inclusion of CRL in the model significantly improved the model's ability to explain Day 1 task performance, $F(1, 24) = 11.15$, $\Delta R^2 = .18$, $p <. 01$.

Finally, H3 stated that early measures of TFL would have a more significant and lasting effect than CRL on later measures of task performance for the entire sample. Preliminary correlational analyses described previously indicated the possibility of a lingering effect of TFL leadership on task performance. In order to test this further, a multiple regression analysis was conducted on novice shift data. It was found that during shift 2, there was evidence that TFL predicted novice task performance, whereas CRL remained a non-significant predictor of shift 2 task performance (see Table 11 for results). This was another indication of not a daily, but of a cumulative time-dependent influence of TFL on task performance. Namely, every unit increase in TFL predicted a mean performance increase of 152.47 trees planted for Novices, $b = 152.47$, $p < .05$, CI [3.30, 301.65]. Once included in the model, TFL helped explain an additional 30% of Shift 2 task performance, $\Delta R^2 = .30$, $F(1, 24) = 4.50$, $p < .05$.

To test H3 in greater depth, a lag analysis was conducted by regressing Shift 2 leadership variables on the performance of novices during Shifts 3 and 4. There was no evidence of Shift 2 leadership predicting Shift 3 performance, however there was some evidence that Shift 2 TFL positively predicted Shift 4 performance (see Tables 12 and 13 for results). Once Shift 2 TFL

Table 6.

Hierarchical Multiple Regression Results: Daily Leadership and Trees Planted by Novices

	b	SE B	B	p
Step 1				
Camp	162.42**	45.37	.21	<.001
Land	64.66**	16.88	.25	<.001
Weather	52.52**	15.31	.23	.001
Positive Emotions	46.03	28.40	.11	.107
Step 2				
TFL	29.10	28.64	.06	.311
Step 3				
CRL	-18.46	39.62	-.04	.642

Note: n = 216. *TFL*: daily mean transformational leadership, *CRL*: daily mean contingent-reward leadership. For Step 1 R^2 = .27**, For Step 2 ΔR^2 = .004, For Step 3 ΔR^2 = .001. **p < .01.

Table 7.

Hierarchical Multiple Regression Results: Daily Leadership and Trees Planted by Experienced

Planters

	b	*SE B*	β	*p*
Step 1				
Camp	310.84**	113.13	.27	.001
Land	138.98**	39.90	.43	.001
Weather	73.30*	31.97	.24	.025
Positive Emotions	62.81	66.22	.11	.347
Step 2				
CRL	184.69**	64.75	.29	.006
Step 3				
TFL	85.58	77.34	.15	.221

Note. n = 67. *TFL*: daily mean transformational leadership, *CRL*: daily mean contingent-reward leadership. For Step 1 R^2 = .42**, For Step 2 ΔR^2 = .07**, For Step 3 ΔR^2 = .01, **p < .01, *p < .05.

Table 8.

Moderation Analysis: Test of H2, with TFL as Moderated by Work Experience

	b	$SE \beta$	p	95% Confidence Interval
Constant	382.24*	157.07	.016	[73.03, 691.45]
Camp	165.74**	48.52	.001	[70.22, 261.26]
Work Experience	517.17**	75.56	<.001	[368.42, 665.93]
Land	77.79**	16.36	<.001	[45.59, 109.99]
Weather	62.78**	14.98	<.001	[33.28, 92.29]
Positive Emotions	30.53	26.68	.254	[-21.99, 83.06]
TFL	36.54	43.21	.398	[-48.52, 121.60]
CRL	20.65	37.69	.584	[-53.54, 94.86]
Work Experience*TFL	133.38	94.63	.160	[-52.93, 319.68]
Conditional Effect of CRL and Work Experiences on Daily Mean Trees Planted				
Novice	4.72	43.39	.913	[-80.67, 90.14]
Experienced	138.10	92.93	.138	[-44.85, 321.05]

Note. $N = 285$. *TFL*: daily mean transformational leadership, *CRL*: daily mean contingent-reward leadership, *Experience*TFL*: interaction between Work Experience and daily mean transformational leadership. $R^2 = .42$, $p < .001$, ΔR^2 due to interaction = .01, $p = .16$, **$p < .01$, *$p < .05$.

Table 9.

Moderation Analysis: Test of H2 with CRL as Moderated by Work Experience

	b	*SE* β	*p*	95% Confidence Interval
Constant	284.41	161.08	.079	[-32.68, 601.51]
Camp	164.94**	47.13	.001	[72.15, 257.73]
Work Experience	519.41**	60.47	<.001	[400.37, 638.48]
Land	77.27**	16.36	<.001	[45.05, 109.50]
Weather	54.17**	13.43	<.001	[27.73, 80.63]
Positive Emotions	38.42	25.73	.136	[-32.68, 601.51]
TFL	55.44	40.56	.173	[-24.41, 135.29]
CRL	16.53	35.41	.641	[53.17, 86.25]
Work Experience*CRL	216.75**	69.57	.002	[79.16, 353.73]
Conditional Effect of CRL and Work Experiences on Daily Mean Trees Planted				
Novice	0.96	43.49	.928	[-84.67, 86.50]
Experienced	174.96*	84.71	.040	[72.15, 257.73]

Note. $N = 284$. *TFL*: daily mean transformational leadership, *CRL*: daily mean contingent-reward leadership, *Experience*CRL*: interaction between Work Experience and daily mean contingent-reward leadership. $R^2 = .47$, $p < .001$, ΔR^2 due to interaction = .03, $p = .002$, **$p < .01$, *$p < .05$.
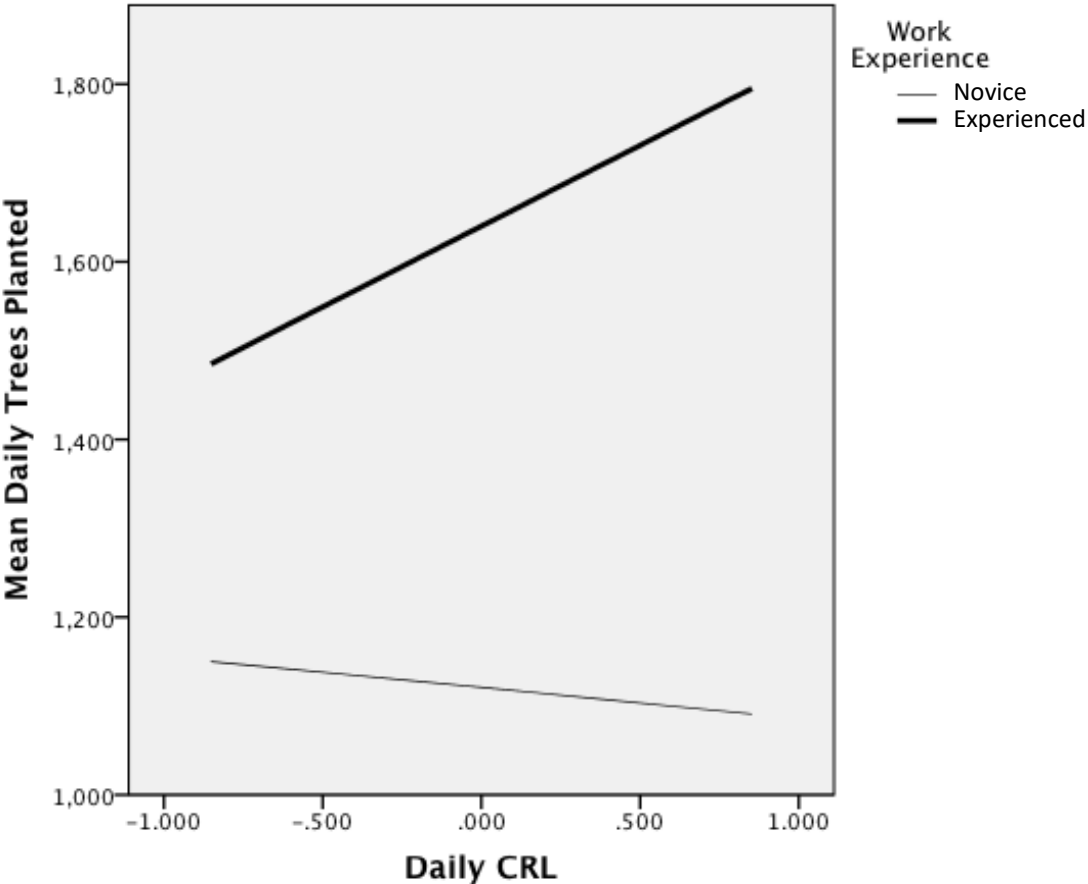
Figure 1. *Depiction of Slopes from Moderation Analysis (Test of H2)*

Table 10.

Hierarchical Multiple Regression Results: Leadership and Day 1 Performance by Novices

	b	$SE\ \beta$	β	p
Step 1				
Camp	308.43*	114.77	.435	.013
Day 1 Land	49.47	42.97	.182	.260
Day 1 Weather	25.62	38.98	.107	.517
Day 1 Positive Emotion	150.18	76.85	.299	.062
Step 2				
Day 1 CRL	264.74**	77.37	.505	.002
Step 3				
Day 1 TFL	-12.90	83.48	-.033	.879

Note: N = 30. Step 1 R^2 = .44, *p* = .005, Step 2 ΔR^2 = .18, *p* = .002, Step 3 ΔR^2 = .000.

CRL: mean contingent-reward leadership. *TFL:* mean transformational leadership, **p < .01, *p < .05.

Table 11.

Hierarchical Multiple Regression Results: Shift 2 Performance by Novices

	b	SE β	β	p	95% Confidence Interval
Step 1					
Camp	171.4	121.03	0.312	.169	[-77.87, 420.68]
Shift 2 Land	58.58	60.63	0.181	.343	[-66.30 183.46]
Shift 2 Weather	45.41	65.35	0.15	.494	[-89.17, 179.99]
Shift 2 Pos Emo	150.35	94.38	0.311	.124	[-44.03, 344.74]
Step 2					
Shift 2 TFL	152.47*	72.28	0.388	.046	[3.30, 301.65]
Step 3					
Shift 2 CRL	98.52	136.2	0.216	.477	[-183.23, 380.26]

Note. $N = 30$. Step 1 $R^2 = .17$, $p = .298$, Step 2 $\Delta R^2 = .30$, $p = .015$, Step 3 $\Delta R^2 = .021$, $p = .407$. *TFL:* mean transformational leadership, *CRL:* mean contingent-reward leadership, *Pos Emo:* mean positive emotions, *$p < .05$.

Table 12.

Hierarchical Multiple Regression Results: Test of H3, Shift 2 Leadership Regressed on

Shift 3 Trees Planted

	b	$SE\ \beta$	β	p
Step 1				
Camp	-85.71	132.67	-.153	.524
Shift 3 Land	87.88	49.73	.357	.089
Shift 3 Weather	98.64	54.34	.457	.081
Shift 3 Positive Emotions	-37.17	76.02	-.087	.629
Step 2				
Shift 2 TFL	73.96	72.39	.182	.317
Step 3				
Shift 2 CRL	114.93	119.99	.245	.348

Note: N = 31. Step 1 R^2 = .35, *p* = .054, Step 2 ΔR^2 = .03, *p* = .317, Step 3 ΔR^2 = .02,

p = .348. *TFL:* mean transformational leadership, *CRL:* mean contingent-reward

leadership.

Table 13.

Hierarchical Multiple Regression Results: Test of H3, Shift 2 Leadership Regressed on Shift 4 Trees Planted

	b	SE β	β	p
Step 1				
Camp	169.31	106.82	.309	.126
Shift 4 Land	99.18	59.31	.373	.107
Shift 4 Weather	38.08	58.73	.144	.523
Shift 4 Positive Emotions	-143.39	74.07	-.36	.065
Step 2				
Shift 2 TFL	132.71	72.08	.341	.079
Step 3				
Shift 2 CRL	-99.77	117.38	-.216	.404

Note: N = 29. Step 1 R^2 = .31, *p* = .054, Step 2 ΔR^2 = .09, *p* = .079, Step 3 ΔR^2 = .02, *p* = .404. *TFL:* mean transformational leadership, *CRL:* mean contingent-reward leadership.

was entered as a predictor, the model explained almost 40% of Shift 4 task performance, although it was only marginally significant, $F (1, 23) = 3.39$, $p > .05$.

Taken together, the results outlined above suggest two patterns in the data regarding TFL and CRL behaviors and tree planter task performance. First, overall there was evidence of a short-term positive effect of CRL: daily CRL was associated to more daily trees planted for experienced planters. Yet for novices, only Day 1 CRL was significantly positively predictive of trees planted on Day 1 (not any other day). Second, there was no evidence that TFL as an entire measure predicted task performance on a daily basis. Yet, there was some indication of a long-term effect of TFL on novice trees planted: Shift 2 TFL significantly predicted Shift 2 task performance, and was also marginally predictive of Shift 4 task performance.

Post-hoc analyses detailed below were conducted in order to further investigate the source of the positive association between TFL and daily task performance for the sample, as well as the origins of TFL's long-term effect on novice task performance.

Post-Hoc Tests

Hierarchical multiple regression tests of each dimension of TFL on daily task performance for novice and experienced planters yielded curious results. First, there was a significant effect of daily vision (an item in the TFL dimension of inspirational motivation) on daily trees planted for novices, (see Table 14 for results). Every unit increase in daily vision predicted an almost 50 unit increase in daily task performance, $b = 45.02$, $p = .02$, CI [6.54, 83.51]. Furthermore, Day 1 vision was a highly significant predictor of Shift 4 trees planted for novices, $b = 123.74$, $p < .01$, CI [47.93, 199.55] (see Table 15 for results). Lastly, for experienced planters, there was a significant effect of daily vision on daily trees planted, $b = 102. 49$, $p < .01$, CI [30.04, 174.84] (see Table 16 for results).

Table 14.

Hierarchical Multiple Regression Results: Daily Vision and Novice Trees Planted

	b	*SE* β	β	*p*	95% Confidence Interval
Step 1					
Camp	162.42**	45.37	.213	<.001	[72.98, 251.86]
Land	64.66**	16.88	.253	<.001	[31.38, 97.93]
Weather	52.52**	15.31	.232	.001	[22.33, 82.71]
Pos Emo	46.04	28.44	.109	.107	[-10.02, 102.10]
Step 2					
Vision	45.02*	19.52	.138	.022	[6.54, 83.51]
Step 3					
CRL	-19.90	30.68	-.045	.517	[-80.40, 40.59]

Note: n = 216. Step 1 R^2 = .27, *p* = .000, Step 2 ΔR^2 = .02, *p* = .022, Step 3 ΔR^2 = .001, *p* = .517; *Pos Emo*: daily mean positive emotions; *CRL:* daily mean contingent-reward leadership; **p < .01, *p < .05.

Table 15.

Hierarchical Multiple Regression Results: Day 1 Vision and Shift 4 Novice Trees Planted

	b	*SE* β	β	p	95% Confidence Interval
Step 1					
Shift 4 Camp	177.75	111.41	.31	.124	[-52.73, 408.27]
Shift 4 Land	92.84	62.04	.35	.148	[-35.49, 221.17]
Shift 4 Weather	59.70	60.40	.23	.333	[-65.26, 184.64]
Shift 4 Pos Emo	-131.56	28.44	-.33	.099	[-289.76, 26.57]
Step 2					
Day 1 Vision	123.74**	19.52	.54	.003	[47.93, ₎99.55]
Step 3					
Shift 4 CRL	-55.80	30.68	-.13	.513	[-230.24, 118.66]

Note. N = 28. Step 1 R^2 = .32, *p* = .058, Step 2 ΔR^2 = .23, *p* = .003, Step 3 ΔR^2 = .01, *p* = .513. *Pos Emo*: positive emotions. *CRL:* mean contingent-reward leadership. **p < .01.

Table 16.

Hierarchical Multiple Regression Analysis: Daily Vision and Experienced Daily Trees

Planted

	b	$SE\ \beta$	β	p	95% Confidence Interval
Step 1					
Camp	310.84**	113.13	.27	.008	[84.68, 536.99]
Land	138.98**	39.90	.43	.001	[59.22, 218.73]
Weather	73.30*	31.98	.24	.025	[9.38, 137.22]
Pos Emo	62.81	66.22	.11	.347	[-69.56, 195.19]
Step 2					
Vision	102.49**	36.23	.28	.006	[30.04, 174.84]
Step 3					
CRL	134.86	68.34	.29	.053	[-1.84, 271.55]

Note: n = 67. Step 1 R^2 = .42, p = .000, Step 2 ΔR^2 = .07, p = .006, Step 3 ΔR^2 = .03, p = .053. *Pos Emo*: positive emotions. *CRL:* daily contingent-reward leadership. ***p* < .01, **p* < .05.

DISCUSSION

Summary of Results

The purpose of this study was to weigh the value of transformational leadership (TFL) and contingent-reward leadership (CRL) behaviors in determining follower objective task performance on a daily basis and over a period of time. Empirical evidence suggests that contingent-reward leadership demonstrates relatively greater influence on individual task performance than transformational leadership (Wang et al., 2011). It is plausible that the nature of the influence of TFL on individual task performance cannot be captured by cross-sectional studies, such as the one that derived this conclusion. Therefore, three hypotheses were tested to explore the boundaries of TFL and CRL's relationship to task performance more contextually. Although the results should be interpreted cautiously, they are encouraging given their robustness despite the small sample size. Since the sample size prevented a rigourous test of the model (i.e., hierarchical cross-classified), collection of more data would be integral to bolster reliability and external validation.

To begin, the first hypothesis was that daily TFL behaviors would be positively related to daily task performance, and it was expected that TFL would more positively impact novice tree planter task performance on a daily basis than would CRL. Unlike their counterparts, novices had no previous opportunity to adapt to the circumstances and arduous demands of tree planting labor. Therefore, novices were assumed to experience greater challenge and uncertainty given the chaotic conditions of the tree planting work environment. According to the literature, it was derived that TFL may better meet the needs of followers under such stressful conditions. Self-efficacy was also discussed as a more influential determinant of performance for newcomers than goal-setting, and since TFL has been shown to have unique impacts on follower self-efficacy, this provided the basis upon which to infer that TFL would be more positively predictive of performance for novice tree planters.

In contrast, the second hypothesis stated that daily contingent-reward leadership behaviors would be positively related to daily task performance, and that CRL would more positively impact experienced tree planter task performance on a daily basis versus transformational leadership. On the one hand, it was expected that experienced personnel

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have less of a need for, or would be less responsive to, TFL due to their increased sense of certainty at work, even within an objectively chaotic environment. On the other hand, empirical evidence has shown that CRL can increase follower goal-setting, and, in turn, goal-setting becomes a stronger predictor of performance when individuals have task experience. Thus, it was posited that CRL would be more influential for experienced tree planters' performance.

Results lend partial support to H1: daily transformational leadership was positively correlated to daily task performance for the entire sample, however there was no evidence that the full measure of TFL determined novice task performance on a daily basis. Instead, only one item from the inspirational motivation dimension of TFL was positively predictive of daily task performance for novices, i.e. vision: "Today my leader emphasized having a collective sense of mission". In fact, every unit increase in ratings of leader's daily vision predicted an almost 50 unit increase in number of trees planted per day for novices. If this relationship generalized to an imaginary sample of $N = 30$ novice tree planters, within a regular spring contract (36 days), the effect would equate to a net increase of 54,000 more trees planted for the organization. Daily vision also predicted a little over a 100 unit increase in number of trees planted per day for experienced participants.

Second, full support was found for H2: daily contingent-reward leadership was positively related to followers' daily task performance, yet this relationship appeared stronger for experienced followers. As the literature suggests, there was a positive association between CRL and task performance for the entire sample. However, there was very limited evidence that daily CRL behaviors influenced the daily task performance of novice tree planters (results showed a positive effect of CRL on novice trees planted only for Day 1). Instead, daily CRL behaviors were more influential for experienced participants, namely a one unit increase in ratings of daily CRL predicted an increase of approximately 175 trees planted per day for experienced followers.

Lastly, partial support was found for H3, which posited that early measures of transformational leadership behaviors would positively predict later measures of task performance. Unfortunately, regression analyses could not be carried out with experienced participant data since the sample size was too small to obtain reliable parameter estimates.

Instead, using novice data, it was found that TFL positively predicted average number of trees planted during the participants' second shift at work. This was the first finding suggesting not a daily, but a time-interval effect of TFL on task performance. Subsequent correlation analyses on novice sample data indicated a moderate association between Shift 2 TFL and later Shift 4 task performance. Further results from lag regression analyses indicated that every unit increase in Shift 2 TFL predicted an almost 125 unit increase in Shift 4 trees planted for novices (although this relationship was statistically marginal). Intriguingly, post-hoc regression results showed that Day 1 vision from the TFL measure had a significant positive impact on novice participant trees planted in Shift 4, i.e. a one unit increase in Day 1 vision predicted an almost 125 unit increase of trees planted in Shift 4.

Interpretation

This study indicates that the task, social, and physical context that characterize the current sample offers boundary conditions to previous empirical conclusions regarding the relative utility of CRL over TFL for influencing individual task performance. As expected, chiefly the findings suggest both short-term and long-term effects of TFL on individual task performance, and these effects differ for newcomers versus experienced personnel acting in chaotic work environments. In this sample, CRL demonstrated a positive daily effect on experienced follower task performance, but not necessarily that of novices, whose task performance was more significantly impacted by TFL rather than CRL on a daily and longitudinal basis. There was also some evidence to indicate that TFL, particularly the behavior of communicating a daily vision, had a long-term impact on performance for both novice and experienced tree planters. By contrast, there was no evidence of a long-term impact of CRL on task performance.

In summary, there are three notions in the literature that can lend to the interpretation and support of these results. The first relates to the differential impacts of TFL as a multi-dimensional construct; the second emphasizes the dynamic and interrelated nature of the motivational hub, work experience, and leadership; and the third suggests a time-sensitive component to follower's cognitive interpretation of TFL, and its subsequent behavioral influence.

Transformational leadership as a multi-dimensional construct. To begin, Van

Knippenberg and Sitkin (2013) cautioned that the field "forego the label of transformational leadership in favor of the study of more clearly defined and empirically distinct aspects of leadership (p. 2)". In this study it was found that the inspirational motivation item of vision had an interesting effect on the performance of novice and experienced planters. Indeed, the literature supports that the four distinct dimensions that make up TFL (i.e. inspirational motivation, intellectual stimulation, idealized influence, and individualized attention) can each have unique impacts on various organizational and follower outcomes (Bass & Riggio, 2006). For example, a recent study by Boies, Fiset and Gill (2015) assigned participants to three distinct leadership conditions in which the outcome variables of interest were objective measures of team task performance and creativity on a building block task. In the first group, participants were introduced to the task by a leader who used inspirational motivation, the second group's leader used intellectual stimulation, and the control group was assigned to an instructor who displayed an absence of leadership. The results showed that teams in the inspirational motivation condition scored higher on task performance, whereas those assigned to the intellectual stimulation condition scored higher on task creativity, and these relationships could be explained through different mediating mechanisms. Thus, this provides support for the results in this study demonstrating a relationship between the inspirational motivation vision item of TFL and tree planter task performance. More broadly though, the question remains as to what the mediating mecanisms could be between TFL, CRL and work experience that could further explain the study results.

   The motivational hub and leadership. The links between the motivational hub and leadership were not analyzed in this study, but the theory provides a plausible basis for the interpretation of results. Shea and Howell (2000) suggests that there is a cyclical nature to the motivational hub, where self-efficacy and performance take turns being relatively stronger determinants of future performance and goal-setting over time, given task experience. As evidenced in the literature, there is reason to believe that TFL and CRL have different effects on newcomer versus experienced follower performance due to their differential effects on self-efficacy and goal-setting. As previously stated, TFL impacts follower performance predominantly by raising follower self-efficacy and intrinsic work motivation (Judge & Picollo, 2004; Kirkpatrick and Locke, 1996; Liao & Chuang, 2007;

Shamir et al., 1993). Conversely, CRL impacts performance primarily by influencing follower goal-setting. The link between self-efficacy and performance is more direct for newcomers, which may explain the results found in this study for the tests of H1. Comparatively, the link between goal-setting and performance becomes stronger for followers given more work experience, and this can explain the results found for tests of H2.

Time and transformational leadership. Geyery and Steyrer (1998) proposed that TFL may be both a performance determinant, and "a perceptual phenomenon that unfolds over time (p. 418)". The idea that TFL behaviors may marinate in follower cognition, and develop meaning and influence over time, offers a way of interpreting the source of the long-term relationship between TFL and task performance. As discussed, there is evidence in the literature and in the current study results to support this finding. However, what remains unclear is why and how this occurs, a question that can be addressed by future research.

Theoretical Implications and Future Research

As described above, this study demonstrated that there may be a temporal dependency between the effect of TFL on individual task performance within persons. Indications of time-effects and TFL on follower outcomes have been shown in the literature. The problem is that the roots of the relationship between TFL, follower outcomes, and time are very much unclear. Therefore, as noted by Geyery and Steyrer (1998), the field would benefit from future research investigating "the relation between performance, transformational leadership, and information processing" (p. 418).

For instance, although the current results need replication for generalizability, it was found that the vision item in the TFL scale ("Today my leader emphasized having a collective sense of mission") had a particularly significant positive daily and long-term association to individual performance. The entire TFL scale did not yield the same results. It is unknown in what ways communicating "a collective sense of mission" motivated followers to higher performance levels. Hence, a good follow-up study, which would address the gaps in the literature presented, would be to conduct a mixed method longitudinal diary study employing qualitative analysis and triangulation of the results with

objective performance data. The broad qualitative research questions could be: which elements of a leader's vision statement are compelling to followers on a daily basis, and how do followers subjectively perceive that this affects their performance over time? As previously mentioned, intervening variables investigated quantitatively could be daily self-efficacy and goal-setting.

Additionally, a future leadership study would add value to the field by examining the influence of different levels of leadership on followers' task performance. As DeChurch et al. (2011) noted, the effects of middle-management leaders on outcomes in organizations is lacking in the literature (usually the focus is at the top or bottom levels of management). Incidentally, in this study there was a strong camp membership effect on tree planter daily task performance. Camp supervisors are known to be instrumental for reinforcing emerging norms and establishing the culture of work performance in tree planting camps. Hence, a follow-up study that would contribute to the literature would be a diary study that examines how front-line leaders and middle-level managers simultaneously influence follower objective task performance through different leadership behaviors. This would contribute to furthering research on the effects of leadership across organizational levels.

Practical Implications

One main take-away for leaders aiming to positively influence follower task performance is to consider the sustainable effect of transformational leadership on top of transactional leadership. The literature supports this study's results that different behaviours of TFL can have unique positive effects on follower task performance in the short- and long-term.

What's more, based on trends in this study, and as evidenced in the literature, in chaotic contexts ripe with ambiguity and job demands especially taxing to the physical and/or psychological energy of followers, leader's use of *framing* behaviors can yield positive impacts on follower task performance over time. Cleavanger and Munyon (2013) describe *framing* as the interpersonal exchange between a leader and follower where the leader uses language and/or symbols to emphasize the broader meaning of work for employees. When leaders frame, they emphasize the importance of work in order to achieve something beyond the mundane scope of bottom-line objectives for the organization.

Generally, this is accomplished by articulating a compelling vision for the day's work as integral to the accomplishment of a wider mission for the group, or the individual. In this way, leaders' use of framing provides followers with greater inspiration and motivation for work. Theoretically, framing parallels vision behaviors from the inspirational motivation dimension of TFL. Thus, practitioners acting in chaotic or ambiguous situations would benefit from understanding the power of framing to influence follower performance on a daily basis and over time.

On a separate note, results from this study indicate that knowledge of the amount of previous work experience of followers may have influenced leaders' approach to leading. For example, novice workers in this study perceived significantly higher ratings of daily mean TFL and CRL behaviors than their experienced counterparts. Conversely, it is interesting to note that leadership effects were related to a greater number of trees planted for experienced rather than novice participants. This may imply that although it is important to devote leadership and coaching resources to newcomers, it is equally valuable for leaders to continually engage experienced employees. This would likely maximize the performance potential of experienced planters, which is presumably greater on average than that of newcomers.

Strengths and Limitations

Data biases. One main strength of this study is the use of objective performance data. Standard measures of performance are often subject to bias based on employee self-reports or supervisor ratings, and this can confound the data (Schneider, 2001), especially in leadership studies where common method variance can inflate the relationship between leadership ratings and performance reports (Podsakoff et al., 2003). However, all other variables in this study were obtained through participant self-report, and therefore there is potential for response biases to be present in the data (Podsakoff et al., 2003).

For this study, the researcher was present in the sample's work environment during recruitment and final collection of the data. Since the researcher was known as an experienced tree planter with relations in the community, there may have been cause for impression management in diary responses. However, steps were taken to reduce pressures

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for impression management, such as reassurance that participant responses would remain confidential and that no personal information would be shared with peers or the employer.

Lastly, to reduce potential order effects in responses, items on the questionnaire were counterbalanced for half of the sample in each camp in the diary booklets that were handed out.

Design. Traditional self-report studies analyze factors that influenced past or future outcomes in relation to the independent variable, whereas daily diary studies measure constructs closer to real time. Thus a main advantage of this daily diary study is the reduction of potential confounding testing effects such as participant cognitive dissonance and retrospective bias (Bolger, Davis, & Rafaeli, 2003; Breevart et al., 2014; Fisher & To, 2012). This diary study was conducted in the field, longitudinally. Hence, this method has appeal over other studies that assess the effects of leadership in fabricated scenarios over short intervals, which raises questions regarding the external validity of the results. Although this study was conducted over a period of 9 work days, it would have been useful to conduct the study over an even longer time lapse. With more longitudinal data, the nature and stability of the relationship between leadership and follower task performance over time may be more thoroughly explored.

Sample size. Unfortunately, many participant data were lost due to careless responding, or perhaps confusion. It seemed that novice tree planters may have misunderstood the difference between the meaning of a day versus a shift in a tree planting context. The researcher had arranged for management to provide general reminders to fill out the survey at the end of every workday, however this method was not reliable. Instead, to avoid confusion and maintain time interval clarity, it would have been better for the survey to be designed so that participants had to indicate the day and time at the beginning of each daily questionnaire before they completed it.

The above-proposed solution may solve an issue in survey design, yet participant motivation may explain compliance problems as well (Green et al., 2006). Although reasonably adequate incentives and compensation were offered, sustained participation in longitudinal diary studies will remain challenging for future research. A remedy to make up for higher than average expected attrition rates would be to recruit from a larger sample for

future research.

A larger sample would also help improve the ability to conduct more appropriate and rigorous Hierarchical Linear Modeling (HLM) analyses given the nature of the data being hierarchically cross-classified (days nested within persons, and persons nested between different leaders). A larger sample size would also provide more power to detect significant effects and improve generalizability of the results, a serious limitation in this study. Attempts were made to improve reliability and validity of the results: the use of nested, large repeated-measures sample data for main analyses; the use of PROCESS for the test of moderation (a more rigorous tool for testing moderation as described in the method section); and the use of confidence intervals which provide indication of where true population parameters would lie 95% of the time if repeated using different samples of the data (Field, 2009).

Leadership measure. In this study, only transformational and contingent reward leadership were assessed, in an effort to reduce participant fatigue and boredom, given the longitudinal design of the study. The other transactional leadership behaviors that form the Full Range Model of Leadership (management-by-exception (MBE) active, and MBE passive) were not included in the daily questionnaire. Empirical evidence has shown that MBE active and passive were not significant predictors of task performance cross-sectionally (Wang, et al., 2009). However, there is some indication by previous research that MBE active may be important in some contexts, for example when safety is important (Bass and Riggio, 2006). As this was not investigated in the current study, future research could test the potential relevance of MBE active and passive for influencing daily task performance with samples in chaotic contexts.

On another note, because the TFL measure of vision was composed of one item, there may be doubts regarding the reliability of the results and conclusions drawn from analyses using this item. Customarily, it is presumed that single-item measures for psychological constructs have serious flaws in research studies, because single-item measures of complex psychological concepts undermine construct validity (Wanous, Reichers, & Hudy, 1997). However, empirical evidence has shown that there are exceptions to the rule: when constructs are perceived as more straightforward than complex in the

minds of respondents, one-item measurements are acceptable (Wanous, Reichers, & Hudy, 1997). Average job satisfaction is an example of one such construct that can be measured reliably with one single-item (Wanous, Reichers, & Hudy, 1997).

It is suggested in the literature that reliable single-item measures are doubly concrete (Bergkvist & Rossiter, 2009), meaning it "has virtually unanimous agreement by raters as to what it is, [and they clearly understand there is] holistically one characteristic being referred to when the attribute is posed" (Rossiter 2002, p. 313). The vision item "Today my leader emphasized the importance of having a collective sense of mission", can be understood as doubly concrete. Here, it is argued that the attribute being posed, i.e. vision, can surely be expressed by leaders in different ways, but the central theme is about conveying a message for a collective sense of mission, and this is concrete. For example, during a day of interaction between leader and follower, it would be straightforward to identify when leaders did, or did not, convey a collective sense of mission. Finally, it is suggested that unreliable scales underestimate relationships between predictors and outcomes (Field, 2009), yet daily vision was significantly related to task performance in both the novice (N=216) and experienced (N=67) samples, with 95% confidence intervals of parameter estimates that did not include 0. Nevertheless, future research could include a standard three-item scale to measure vision and assess the reliabilities of the multi-item versus single-item vision scales. However, as shown with job satisfaction scales, it is possible that the single-item measure will be more robust than the multi-item measure in the end (Wanous, Reichers, & Hudy, 1997).

Conclusion

Imagery and stories of past prominent historical figures continue to uphold the idea that one individual can make an incredible difference in the lives of others. However, the task, social, and physical contextual phenomena that enable individual leaders to achieve great spheres of influence are important to consider.

Apart from the culture and labor of tree planting itself, the basic emotional and cognitive experiences of reforestation workers may be similar to employees in other vocations today. In the 21st century, many organizational contexts mimic that of a "chaotic" environment. For example, there may be threats of rapid change, job security, or work

conditions that instill a more than average sense of uncertainty and challenge for the individual, for example: the military, police force, healthcare organizations, start-up firms, service industries, and even project-based groups such as in the construction, manufacturing, or marketing industries. As supported in the literature, and suggested within the study, practitioners may benefit from understanding how, in such conditions, transactional leadership is necessary for short-term results. Yet, important positive effects of transformational leadership on follower performance may become more evident over the long-term.

Afterword

In the business world, leadership is more than ever considered a strong determinant of success for an organization and its personnel. As a result of globalization, rapid technological change, and new emerging markets, there exists an increased sense of competitiveness among corporate entities, fervently driving home the old adage that one must "lead the pack in order to stay ahead of the game". Taken together with the imminent gap in leadership brought on by a retiring baby boomer generation, a recent study affirms that American companies cite leadership as a very important human capital issue (Deloitte University Press, 2016).

Nevertheless, some scholar's caution against buying into the "romance" of leadership from the top down (Meindl, Ehrlich, & Dukerish, 1985), a harsh contrast to the modern executive zeitgeist. Today at least in the West, it has been suggested that leaders now have less influence than ever before (Kellerman, 2012). Technological advances and globalization have increased the complexity and speed of corporate work. In addition, as Breevaart, Baker, and Demerouti (2014) note: "the timing of work and work spaces (e.g., office, home, train) has become increasingly flexible [...] employees are no longer always under direct supervision" (p. 32). For these reasons, it is said that leaders nowadays require proactive followers to "lead themselves" in their work. Common knowledge is that modern personnel today, leaders and followers alike, simply have more to do in less time, and time is a resource that must be prioritized efficiently. Thus, engaging in daily as opposed to weekly or monthly value-adding leadership practices to drive follower performance may be virtually impossible for the average leader. Evidently, the organizational landscape of the

21st century is changing in a few ways. What these changes suggest is that although top-down transformational leadership behaviors may be especially effective to influence follower task performance in chaotic contexts, more and more employees today worldwide must take being lead into their own hands, at least on a daily basis.

As the trends in the literature and this study allude to, daily TFL and CRL behaviors can have significant short-term and long-term impacts on follower task performance. Yet, beyond leadership, at least in this study, daily work conditions were the most stongly related predictors of task performance for the current study sample. After all, this finding suggests a truth about human organizational behavior that cannot be left unstated: the onus of individual performance lies predominantly in the personal capacity of the individual acting within the contextual conditions that enable or confront them on a daily basis.

As Barbara Kellerman (2012) notes, the pattern of the devolution of power from leaders to followers is slowly propagating worldwide. This being said, going forward, leadership scholars would do well to propel a more bottom-up focus to the study of leadership. Undeniably, an ever more important organizational skill for all individuals, regardless of position or status within an organization, is self-leadership. Self-leadership requires individuals to practice effective self-management (goal-setting, reward and punishment...) and self-initiated transformational leadership habits (constructive inner dialogue, visualization practice...) to influence their performance (Neck & Houghton, 2006). As it stands, self-leadership is an established yet understudied and underemphasized area of research (Neck & Houghton, 2006). Perhaps it is time for the theory and practice of self-leadership to take a more dominant role in academia. An emphasis on the development of training programs for effective daily self-leadership practices, which individuals can follow independently, would surely add value to organizations and their personnel throughout the next generations.

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APPENDICES

Appendix A: Recruitment Script

Hello Fellow Planters,

My name is Tracy and I've been coming back to (*name of company*) camp's in Ontario for 5 years now. I'm currently completing my Masters degree in management at Concordia in Montreal. I'm super grateful for being given access to recruit with you guys because as you can imagine in the management field tree-planters represent a very unique and interesting sample to work with and learn from. Last year I had planters help me achieve my undergraduate thesis in psych, and I got some surprising results. I learnt that personality traits explained very little about people's performance day to day. So this time around I'm really interested in getting a closer look at the daily grind, I'd like to explore what goes on that impacts people's numbers on a daily basis.

I'm looking for the participation of as many planters as possible to complete the daily journal study I've put together. Don't worry the study isn't about writing a personal diary, the journal is already all set up for you and it's basically just a 2 page deal: short survey questions that take about 5-10 minutes to fill out at the end of each workday. It will be asking you to report about the weather, your land, your interaction with your crew boss, what your goal was for the day and how confident you felt about your capability. I've been granted access to the camp performance records to help me with the analysis.

I'm interested in gathering data on sensitive times in the season so you'll notice the booklets are designed to cover days within shifts 2-4. For those who wish to participate, I'll be giving out a pair of work gloves, a glow stick for party night as thank you gifts! I'll be coming back at the end of your 4th shift, and everyone that completed the study will receive $5, and can enter their names into a draw to win $100, with which you can do what you're wonderful tree-planter's heart desires with. Gift packages will be handed out to whoever comes by to pick up a study booklet tonight.

The study package will contain a consent form for you to keep for yourself and fill out for me. I can assure you, your information is safe with me, your personal data will be kept confidential and your anonymity in my report will be strictly maintained. Your responses will be for my eyes only, no one else! As for my report to the company, only group and not individual data will be shared. I will be assigning you an ID number and will be using separate data files for your journal data and your performance records. If you wish to participate feel free to, if not, that's ok. This is in no way mandatory, as well, you can discontinue the study at any time. This will not impact your work in any way!

If you have any questions about anything, or don't understand a survey question, let me know.

Thank you for your time, it's greatly appreciated!

Appendix B: Consent Forms

<u>Informed Consent to Participate in The Study of Tree-Planter Daily Performance Changes</u>

This document states that I agree to participate in the research project of Tracy Rothwell, graduate student of Management at Concordia University, under the supervision of Dr. Kathleen Boies of the Concordia Management department.

A. PURPOSE

I have been informed that the purpose of the study is to understand factors that explain planters' daily variation in performance.

B. PROCEDURES

The present study requires participants to complete a daily survey booklet for the duration of shifts 2-4. The booklets contain 2 survey pages with 20 questions designated to be completed at the end of each workday within each shift. You will be required to identify your name on this consent form, but not within the survey booklet. Your identity, will be kept completely confidential with the researcher, and protected in any publications or presentations.

The survey booklet will begin by asking you to provide some demographic information including your age, sex, economic status, and occupation. Then, you will be asked to complete each daily survey, with a total of 4 possible entries for each shift 2-4. Each entry will only take you approximately 5-10 minutes to complete at the end of your workday.

Please answer all questions prior to submitting the survey. In some instances questions may appear redundant; however they are designed to ensure validity and reliability. Therefore, I ask you to answer ALL questions HONESTLY so that you may help contribute to this research project. Your compliance is greatly appreciated, however you are free to discontinue the study at any time.

C. RISKS AND BENEFITS

There are no anticipated risks associated with your participating in the present study. Your participation will yield many benefits and will further the research being conducted in the field of management. When returning the survey booklet to Tracy upon completing the study, you will be compensated with $5 and encouraged to enter your name into a draw to win $100.

D. CONDITIONS OF PARTICIPATION

I understand that my participation will have no impact on my work whatsoever.

I understand that my individual results will not be shared with my employer.

I understand that I have the right to withdraw from the present study at any time without negative consequence.

I understand that my participation will be kept confidential (i.e. only the researcher will know who I am, and will not disclose that information.)

I understand that the data from this study may be published in academic journals and conferences, without disclosing my identity.

I understand that if any point I feel discomfort from having participated in the study, that I may notify the research team and they will put me into contact with the appropriate resources to address my discomfort.

I understand that the research team will be given access to my performance records.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY. SIGNING THIS FORM CONSTITUTES MY INFORMED CONSENT.

Print Name: _____ Date: _____
(MM/DD/YY)

 Signature: _____

 If at any time you have questions about the proposed research, please contact the study's Principal Investigator Tracy Rothwell, Master's student of management at Concordia University (438-879-8078, rothwell_tracy@live.ca); or Dr. Kathleen Boies at the Management department of Concordia University (kathleen.boies@concordia.ca 514.848.2424 ex. 2902).

 If at any time you have questions about your rights as a research participant, please contact the Manager at Research Ethics Concordia University (514.848.2424 ex. 7481). Should you experience any discomfort related to this research study please feel free to phone 1-866-531-2600. This is a Mental Health Helpline that offers 24 hour free, anonymous and confidential services. They will ask for non-identifying information (like your postal code) to help you find services in your community.

Appendix C: Excerpt From Daily Diary Booklet

TREE PLANTER
DAILY SURVEY BOOKLET

Hey Planter! Thank you so much for agreeing to participate in this study!

🌲 You will find enclosed short surveys for you to **complete at the end of each workday** in **shifts 2, 3 and 4**. Please answer all questions **as honestly and accurately as possible**. There are no right or wrong answers.

🌲 Daily surveys should take no longer than **5-10 minutes** to complete. The first page is a very short survey on basic background information. The rest of the booklet applies to a **total of up to 4 work days** per shift. If a shift happens to be 3 days long, you can fill in up to 3 days, and move to the next shift. If a shift goes longer than 4 days, you don't have to report about the 5th day.

🌲 Remember **not to include your name, but to identify the name of your crewboss** for each day. This is just to help with data analysis, **all identifying information is kept confidential**, names and specific data will not be shared with Brinkman.

🌲 If you happen to have to leave before I come to collect the booklets after shift 4, but would still like to contribute, have a friend hold onto your booklet and hand it in to me. If at any time you want to cancel your participation, that's totally OK too, you can recycle this booklet, no harm done.

Thanks again, I really appreciate your effort to help with this project.

Happy planting☺

BACKGROUND INFORMATION

Please fill in the blank, and tick the box that applies to you.

Age: _____

Sex: ☐ Female   ☐ Male   ☐ Other

Please circle your highest level of education.

1. Some secondary school

2. Secondary school or equivalent

3. Some postsecondary education

4. Some undergraduate education

5. Bachelor's degree

6. Graduate degree or diploma

7. Master's degree

8. Doctoral degree and other

How many years of work experience do you have?

Part-time: ___ years ___ months

Full-time: ___ years ___ months

Contract: ___ years ___ months

What is your tree planting experience? (please circle the best answer):

This is my: 1st   2nd   3rd   4th   5th season

Please circle the number that best corresponds to your fitness level (being 'fit' or 'in shape') at the start of the tree-planting season?

Not at all physically fit → 1   2   3   4   5   6   7 → Very much physically fit

Please rate how favourable the <u>conditions</u> you planted in today <u>could generally be judged</u>:

Completely Unfavorable → 1   2   3   4   5   6   7 → Completely Favorable

LAND: 1 2 3 4 5 6 7   **WEATHER:** 1 2 3 4 5 6 7

Please state the name of your Crewboss today: _____

Please rate the <u>extent to which you agree</u> with the following statements regarding your Crewboss:

Totally Disagree→ 1   2   3   4   5 →Totally Agree

1.	Today, my crewboss expressed confidence that goals would be achieved.	1 2 3 4 5
2.	Today, my crewboss expressed satisfaction when I met expectations.	1 2 3 4 5
3.	Today, my crewboss talked enthusiastically about what needed to be accomplished.	1 2 3 4 5
4.	Today, my crewboss made clear what to expect when performance standards were met.	1 2 3 4 5
5.	Today, my crewboss got me to look at problems from different angles.	1 2 3 4 5
6.	Today, my crewboss helped me develop my strengths.	1 2 3 4 5
7.	Today, my crewboss shared who was specifically responsible for achieving performance targets.	1 2 3 4 5
8.	Today, my crewboss emphasized the importance of having a collective sense of mission.	1 2 3 4 5

Please circle the extent to which you felt confident about the following statements today:

No, not at all → 1   2   3   4   5   6   7→ Yes, highly confident

1.	Today, I felt confident that I could keep both my productivity AND quality up.	1 2 3 4 5 6 7
2.	Today, I felt confident that I could plant well no matter the obstacles I was presented.	1 2 3 4 5 6 7
3.	Today, I felt I could meet the demands of tree planting despite whatever odds were against me.	1 2 3 4 5 6 7

75

Please circle the extent to which you felt the following emotions today:

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. attentive.	1	2	3	4	5
2. strong	1	2	3	4	5
3. inspired.	1	2	3	4	5
4. alert	1	2	3	4	5
5. active.	1	2	3	4	5
6. excited	1	2	3	4	5
7. proud	1	2	3	4	5
8. enthusiastic.	1	2	3	4	5
9. determined.	1	2	3	4	5
10. interested.	1	2	3	4	5

Please circle which statement best corresponds to your planting objective today:

1.   Today, I had a concrete idea of the number of trees I was going to plant.

2.   Today, I mostly sought to make it through the day.

3.   Today, I sought to hit my PB. (personal best)

4.   Today, I strived to do my best, without a number to hit in mind.

Please circle the number that most closely resembles what you set out to plant today:

500.   1000.   1500.   2000.   2500.   3000.   3500.

FINISHED!

Thank you for doing this, your input is greatly appreciated!

Please hold on to the booklet and return it to me (Tracy) when I come back after Shift 4.

I will be giving you each 5$ compensation and a chance to win $100 in return for your effort.

Appendix D: Ethics approval certificate

Concordia

UNIVERSITÉ / UNIVERSITY

CERTIFICATION OF ETHICAL ACCEPTABILITY
FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Tracy Rothwell

Department: Faculty of Arts and Science\Psychology

Agency: N/A

Title of Project: The Moderating Effects of Person-Group Fit on the Relationship Between Work Motivation and Productivity

Certification Number: 30001225

Valid From: April 17, 2015   to: April 16, 2016

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

_____

Dr. James Pfaus, Chair, University Human Research Ethics Committee