Leader self-development: An emerging strategy for building leadership capacity

by

Mathias J. Simmons

B.S., Northwestern State University of Louisiana, 2011
M.S., Kansas State University, 2015

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Psychological Sciences
College of Arts and Sciences

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Abstract

Leader self-development is being pushed by organizations today as a practical and cost-efficient strategy to develop leadership skills. However, the research on leader self-development is still sparse and there are questions that should be answered before much stock can be placed in self-development as a viable means to increase leadership capacity. This research attempts to address these questions in several ways. First, the first study outlines a theory and process to create a scale that measures the quality of self-development activities that leaders engage in. Furthermore, a nomological network is examined with dispositional constructs that were and were not be related to the quality of leader self-development activities. The results from these scale development efforts were generally positive with the exception of the challenge dimension of quality. Second, the second study builds on previous literature by examining the interactive effect of leader self-development quality and quantity in predicting leader effectiveness and finds that quality appears to play the more important role. Finally, the second study also addresses the lack of research examining situational factors that may affect leader self-development quality. This study found that transformational leadership was related to the quality of leader self-development activities and that quality mediated the relationship between transformational leadership and effectiveness. Overall, this research addresses several gaps in the leader self-development literature and creates a foundation for future research to build on.

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Leader self-development is being pushed by organizations today as a practical and cost-efficient strategy to develop leadership skills. However, the research on leader self-development is still sparse and there are questions that should be answered before much stock can be placed in self-development as a viable means to increase leadership capacity. This research attempts to address these questions in several ways. First, the first study outlines a theory and process to create a scale that measures the quality of self-development activities that leaders engage in. Furthermore, a nomological network is examined with dispositional constructs that were and were not be related to the quality of leader self-development activities. The results from these scale development efforts were generally positive with the exception of the challenge dimension of quality. Second, the second study builds on previous literature by examining the interactive effect of leader self-development quality and quantity in predicting leader effectiveness and finds that quality appears to play the more important role. Finally, the second study also addresses the lack of research examining situational factors that may affect leader self-development quality. This study found that transformational leadership was related to the quality of leader self-development activities and that quality mediated the relationship between transformational leadership and effectiveness. Overall, this research addresses several gaps in the leader self-development literature and creates a foundation for future research to build on.

Table of Contents

List of Figures

List of Tables

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Chapter 1 - General Introduction

Organizations and employees today operate in an environment of constant change. In fact, in today's world of work it is commonly understood that organizations cannot rest on what they did in the past, but they constantly need to disrupt themselves before another competitor disrupts their industry and business for them (Ottinger, 2013). In response to these challenges, organizations and employees need to be dynamic and adaptable to perform well consistently (Pulakos, Arad, Donovan, & Plamondon, 2000). One of the more famous examples of this phenomenon today is what is currently going on with the telecom giant AT&T. While AT&T was built as a traditional telephone company, the future of AT&T is directed more toward the internet and the Cloud (Donovan & Benko, 2016; Hardy, 2016). This shift in strategy requires employees to have a very different skillset and the company has publicly acknowledged that workers need to develop these skills or they will find their future career opportunities at AT&T to be severely constrained or even non-existent (Donovan & Benko, 2016; Hardy, 2016).

One of the adaptations that organizations are making to address these challenges is placing more of an emphasis on informal learning and development programs. With the increasing changes in the workplace, organizations are discovering that formal training programs do not adequately solve all of their employee development needs. For example, several researchers have suggested only 10% of employee development occurs through formal channels (McCall, Lombardo, & Morrison, 1988; Tannenbaum, 1997). While previous research on learning and development has focused predominantly on formal training programs (see Noe, Clarke, & Klein, 2014; Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012), researchers are starting to see the value of informal learning and development (Day, Fleenor, Atwater, Sturm, & McKee, 2014; Tannenbaum, Beard, McNall, & Salas, 2010).

One area where the increased emphasis on informal development has also taken hold is in the field of leader development. Leader development programs have primarily relied on formal training interventions such as classroom training and job rotation programs to increase the leadership capacity of individual leaders. However, there are many different ways to develop a person's leadership capacity and recent trends in research and practice have emphasized areas outside of traditional leader development training courses. For example, researchers have investigated how things like challenging job experiences (e.g. DeRue & Wellman, 2009; Dragoni, Tesluk, Russel, & Oh, 2009), reflection (e.g. DeRue, Nahrgang, Hollenbeck, & Workman, 2012), and mentorship (e.g. Lester, Hannah, Harms, Vogelsang, & Avolio, 2011) can contribute to the growth of someone's leadership capacity.

One particularly interesting form of informal leader development is leader self-development. Leader self-development refers to activities that leaders take upon themselves in order to develop their leadership capacity (Boyce, Zaccaro, & Wisecarver, 2010). This form of development is probably the most informal because it is a proactive behavior on the part of individual leaders and can occur without any investment from the organizations where leaders work. Thus, leader self-development has been dubbed as a cost-efficient alternative to formal training programs that can be used to develop leadership capacity within organizations (Reichard & Johnson, 2011).

Clarifying the Nature of Leader Self-Development

To develop a clear picture of what leader self-development is and is not, it is necessary to clarify two different terms: leader development and self-development. Leader development is defined as any activity or experience that serves to develop an individual leader's leadership skills (Day et al., 2014; Day, 2000). While the terms leader development and leadership

development are often used synonymously, leadership scholars often make distinctions between the two (Day et al., 2014; McCauley, Van Velsor, & Ruderman, 2010). Leadership development is a broader term in that it focuses on all of the factors involved in the leadership process (e.g. a team leader, individual contributors on the team, the team climate) and not just the individual leaders (McCauley et al., 2010b). Since self-development is focused on the individual leader themselves, the narrower term leader development will be used to describe self-development activities that leaders undertake to increase their leadership capacity.

While leader development is just a subset of leadership development, there are still many ways leader development can occur (McCauley, Kanaga, & Lafferty, 2010). One way that leaders can develop their leadership skills is by participating in developmental relationships (e.g. Rock & Garavan, 2006). Another method that can be used is to give leaders developmental assignments and experiences (e.g. DeRue & Wellman, 2009; Dragoni, Tesluk, Russel, & Oh, 2009). A third method that can enhance a leaders' leadership skill is through formal training programs (e.g. Barling, Weber, & Kelloway, 1996; Mullen & Kelloway, 2009). A fourth method for developing leaders is through feedback intensive processes such as 360-degree performance appraisals (e.g. Seifert, Yukl, & McDonald, 2003; Seifert & Yukl, 2010). This list is not meant to comprehensive, but rather illustrate the fact that there are many methods and approaches that can be used to develop a leader's leadership skills.

Another approach to develop a person's leadership capacity is through leader self-development (e.g. Reichard & Johnson, 2011). One of the key points in the definition of leader self-development is that it is a form of self-development where the responsibility to initiate and continue the activity lies solely with the individual (Ellinger, 2004). In this regard, self-development is best thought of as a proactive behavior (Parker, Bindl, & Strauss, 2010). Thus,

any activity that is required by the organization, leader's supervisor, or any entity outside of the leader does not qualify as leader self-development. The second key point in the definition of leader self-development is that the developmental activities have to be designed to increase the leader's leadership capacity. Based upon these two points, it is easy to see there is some overlap between leader self-development and other forms of leader development. For example, if a leader takes the initiative to find a mentor within the organization, does this qualify as leader self-development or a developmental relationship? Based upon the definition that is used in the literature, the answer is that it is both leader self-development and a developmental relationship. Thus, leader self-development can encompass many different forms of development as long as the leader takes the initiative to start and sustain the activity and the activity is meant to increase the leader's leadership capacity (Boyce et al., 2010; Orvis & Ratwani, 2010).

While the perceived practical benefits of leader self-development have the potential to be profound, the literature is still in its infancy and there is much that is still left to be discovered by researchers. One of these gaps is determining the importance of the quantity of self-development activities a leader engages in and the quality of those same activities for developing leadership skills. The quantity of self-development activities that leaders engage in is the sheer amount or frequency of those activities. Quality, on the other hand, deals with the qualitative components of those activities such as how challenging they were and how well they were designed to build leadership-specific skills. While logic suggests that these two factors may work in tandem to develop leadership skills, previous literature has only examined quantity (Boyce et al., 2010) and quality (Orvis & Ratwani, 2010) separately. There is a need to examine the effects of quantity and quality at the same time in order to know what is necessary for leaders to best develop their leadership capacity. One practical challenge to addressing this gap is there is currently not a

scale to measure leader self-development quality. Previous research on leader self-development quality was conducted using a qualitative coding strategy (e.g. Orvis & Ratwani, 2010). While this strategy was appropriate for the purposes of previous studies, it is time-intensive, and an easier way to measure quality would help advance leader self-development research.

Another noticeable gap in the literature is the lack of research that has examined situational characteristics, such as an organization's climate or leadership, which can encourage leader self-development. As self-development is inherently an individual phenomena, past empirical research on leader self-development has heavily focused on individual characteristics that make someone more likely to self-develop (Boyce et al., 2010; Langkamer, 2008), while very little attention has been paid to situational characteristics that may encourage leader self-development (Reichard & Johnson, 2011). This is an important gap to fill due to the practical implications that come along with knowing what organizations can do to encourage their leaders to take the initiative to self-develop.

The current research attempts to address these gaps in the literature with two different studies. The aim of the first study is to develop and validate a scale that measures the quality of leader self-development activities. Specifically, this study reviews the previous literature on leader self-development quality and discusses the specific steps that would be taken to develop a self-report scale. The purpose of the second study is to examine the effects of leader self-development quantity and quality together and to examine situational characteristics that may lead to quality leader self-development. Specifically, the current research examines the interactive nature of leader self-development quality and quantity in predicting leader effectiveness. Furthermore, the concept of transformational leadership is introduced as a

situational characteristic that may have some influence on the quality of self-development

activities leader's engage in

Chapter 2 - Study 1- Development of the Leader Self-Development

Quality Scale

Self-development has emerged as an important concept for leader development theory and practice. However, for researchers and practitioners to truly advance the leader self-development field, a scale is needed that can easily capture the quality of self-development activities leaders are engaging in. In this study, the dimensions that characterize the quality of leader self-development activities are defined and a scale-development process to create a scale to measure these dimensions is outlined.

Quality of Leader Self-Development

The quality of developmental activities has been recognized in various literatures as an important antecedent of employee development through those developmental activities. In the developmental experiences literature, it is recognized that not all experiences are equal in terms of their potential to develop leaders. For example, work conducted by McCauley and colleagues suggests that there are 15 different aspects of experiences, such as working with a difficult boss or having unfamiliar responsibilities, which separate challenging experiences that have the potential to develop leadership skills from those that do not (McCauley, Ruderman, Ohlott, & Morrow, 1994). A study by DeRue and Wellman (2009) has taken this a step further and found that the challenge of experiences has a curvilinear relationship with leader skill development. Specifically, leaders developed more from challenging experiences, but there was a point where these experiences can be too challenging and show diminishing returns. Related evidence comes from work conducted by the Center for Creative Leadership. In their research, Center for Creative Leadership employees have found that the best developmental activities are

7

challenging, allow employees to assess themselves, and provide support for the employee to successfully complete the activity (McCauley et al., 2010b).

The quality of activities has also been shown to be important to the more specific field of leader self-development as well. This point is showcased by two dissertations (Langkamer, 2008; Orvis, 2007) that were later described in an article published by Orvis and Ratwani (2010) about how to evaluate leader self-development. The central focus of the two dissertations was the quality of leader self-development activities. Both dissertations measured the quality of leader self-development activities by having leaders list all the leader self-development activities they completed during a certain time period, then they had the leaders describe one of those activities in detail, and finally they had trained raters evaluate the described activities on certain dimensions of effective leader self-development. Also, both studies were interested in the relationship between quality leader self-development and leader effectiveness. Orvis (2007) found that certain aspects of quality self-development were related to subsequent performance appraisal scores when controlling for the previous year's performance appraisal scores. Langkamer (2008) also found a link between certain aspects of quality leader self-development and leader effectiveness in a multilevel marketing organization. Langkamer's (2008) study suggested that engaging in effective leader self-development is positively related to scores on a measure of adaptive performance and the amount of sales within the leader's team. Therefore, it appears that leader self-development quality is an important construct to study in the leadership literature.

While these studies reinforce the importance of leader self-development quality, there is room to contribute to this literature by developing another way to measure leader self-development quality. As stated earlier, the current approach to evaluating the quality of leader

self-development activities is to leaders list all of the self-development activities that they performed within a given timeframe and then have trained researchers go through these lists and give each leader a rating on the different dimensions of quality. While this approach is useful, it does have certain pitfalls. The first is the amount of resources that it requires. Since activities need to be rated every time a leader develops a list, it requires a continual investment of time to adopt this measurement strategy. Also, it may be unrealistic to expect organizations or researchers to have this amount of resources to invest in the first place. The second pitfall is that it seems to produce inconsistent reliability in measurement. While the intraclass correlations (ICC) in Orvis' (2007) study was sufficient, the ICCs in Langkamer's (2008) study varied widely across the different dimensions and was unacceptably low in some cases (ICC (2, 1) ranged from .63-.89; LeBreton & Senter, 2008). Because of this, one objective of the current research is to use the framework of leader self-development quality proposed by previous researchers (Langkamer, 2008; Orvis & Ratwani, 2010; Orvis, 2007) to develop a scale to measure leader self-development quality. The following paragraphs outline the framework for leader self-development quality as described by Orvis & Ratwani (2010). This framework will be used to develop the items for the leader self-development quality scale and is outlined in Table 1.

The first characteristic of high quality leader self-development activities is content relevancy. Content relevancy is defined as the extent to which leader self-development activities directly address skills that are important for being a leader (Orvis & Ratwani, 2010). The training literature has stressed the importance of needs analysis for a very long time, and content relevancy is one large reason for that (Goldstein & Ford, 2001). For example, it is unlikely that training or development will be effective at improving job performance if a person never uses the skills they learn in training back on the job. There are multiple approaches that could be used to

measure content relevancy for leader self-development activities. One option is to have supervisors list the developmental needs of leaders and capture whether the self-development activities leaders undertake are intended to develop those needs. Another approach is to use leadership taxonomies to define what important leadership behaviors are and then develop items around these behaviors. Within this approach, researchers can either use published leadership taxonomies (e.g. Yukl, Gordon, & Taber, 2002; Yukl 2012) or organizational leadership competency models if the research is being conducted in a single organization. Since the U.S. Army has an extensive background in leadership research and practice and the long-term goal of this program of research is to extend to the Army, the decision was made to use the Army's leadership competency model. The Army's leadership competency model consists of three meta-competencies that are further defined by ten sub-competencies (Department of the Army, 2012). The first meta-competency is "Leads" and consists of leading others, building trust, extending influence beyond chain of command, leading by example, and communicating. The second meta-competency is "Develops" and consists of creating a positive environment/fostering esprit de corps, preparing oneself, developing others, and stewarding the profession. The last meta-competency is "Achieves" and consists of only one sub-competency: getting results. Based on this model of effective leadership behavior, survey items can be developed to measure if self-development activities are intended to improve a leader's capability on the specific competencies that the Army deems important for effective leadership.

The second dimension of leader self-development quality identified by Orvis and Ratwani (2010) is learner engagement. Learner engagement is comprised of two sub-dimensions: practice and progress evaluation information. Practice is the degree that self-development activities require the leader to be actively involved and apply the skills they are

learning rather than passively listening or watching. Progress evaluation information is more often referred to as feedback and refers to the degree that the self-development activities provide information to the leader about their current level of performance and how much they have improved. Practice is important for skill development because practice allows leaders to make errors and fine-tune their behaviors for future situations (Salas et al., 2012). On the other hand, having progress evaluation information in development activities is important because it helps leaders self-evaluate and determine if they should stick with current learning strategies or adopt new ones (McCauley et al., 2010b).

The third dimension of leader self-development quality proposed by Orvis and Ratwani (2010) is challenge. Challenging activities refer to activities that stretch the leaders' skills and abilities and require them to exert effort in order to do well. Challenge is important for skill development because challenging experiences stretch skills beyond our current capabilities and require novel ways of thinking to solve different problems (DeRue & Wellman, 2009; McCauley et al., 1994; McCauley et al., 2010b). On the other hand, activities that are not challenging are unlikely to cause leaders to grow and develop because leaders can successfully perform these activities without having to use new ways of thinking and behaving.

The fourth dimension of leader self-development quality outlined by Orvis and Ratwani (2010) is structure. Structure is the degree that an activity imposes limits to how fast leaders can go through an activity and to what degree they can determine the sequencing of material. The opposite of structure is learner control where leaders are in complete control over how fast to go through the material and in what order. Structure has been shown to be an important instructional design attribute to consider because of the differential effects that structure has on learning for different people. Previous research suggests that structure is beneficial for

individuals with lower cognitive ability because it provides a roadmap for them to follow. However, structure can be detrimental to learning for people with higher cognitive ability (for a review on learner control, see DeRouin, Fritzsche, & Salas, 2004). There is some evidence to suggest that leadership role occupancy is associated with intelligence (e.g. Judge, Colbert, & Ilies, 2004; Li, Arvey, & Song, 2011). However, this line of research has come to the conclusion that the link between intelligence and leadership is not near as strong as what was believed (Judge et al., 2004). Therefore, it is not entirely clear if structure in leader self-development will be a positive, negative, or moderating characteristic. These possibilities will be assessed in this research.

The final dimension outlined by Orvis and Ratwani (2010) is experiential variety. Experiential variety is defined as the extent to which leaders engage in qualitatively different self-development activities. For example, a leader who reads a book and goes to a conference exhibits more experiential variety than a leader that reads two books. Experiential variety is important for self-development because leaders with a wide-variety of experiences develop a more complex way of thinking and behaving (Dragoni, Oh, Vankatwyk, & Tesluk, 2011). These complex ways of thinking and behaving are vital for leaders to perform well in their roles because they face very complex demands that are often novel and ambiguous (Denison, Hooijberg, & Quinn, 1995).

While all of these dimensions are thought to contribute to the developmental quality of leader self-development activities, they are not predicted to be redundant or very strongly related. In fact, it is possible that some of the dimensions may even interact when predicting certain outcomes. The clearest example of this is in regards to the content relevancy dimension. A self-development activity could very well be targeted to improve important leadership

Table 1. Summary of the dimensions of quality leader self-development

Leader Self-Development Quality Dimension	Definition	Example Items
Content relevancy	The degree to which self-development activities address important leadership behaviors.	"These activities were intended to help me learn how to build trust with my followers."
Learner engagement		
1) Practice	The degree to which the activity requires the leader to be actively involved, rather than just watching or listening to the content.	"These activities required me to practice."
2) Progress evaluation information	The degree that the activity provides feedback on the leader's current level and how much progress has been made in developing a certain skill.	"I understood my strengths and weaknesses because of the feedback that I received in these activities."
Challenge	The degree to which the activity is demanding and requires effort on the part of the leader.	"I had to exert effort to complete these activities."
Structure	The degree to which a self-development activity has a pre-determined pace, hierarchical structure, and sequence of material for the leader.	"These activities were structured."
Experiential variety	The degree to which all of the self-development activities that a leader engages in differ qualitatively from one another.	"I engaged in a wide variety of activities."

capabilities, but at the same time be very low in terms of learner engagement because no

feedback is provided and there are not any practice opportunities. An example of this might be a

lecture on leadership in which students are given leadership information without any practical

exercises to apply what they are learning. Based on the arguments provided earlier, an activity

or set of activities like this would be less impactful on a leader's development when compared to

activities that are high in both content relevancy and learner engagement. Because of the fact

that the dimensions may not be strongly related and could even interact with one another, the

scale will not be treated as a composite. Instead, it will be treated as a scale that measures five

related, but distinct, dimensions.

One important part of the scale development process is to examine the validity of the

proposed scale by forming a nomological network of other constructs that theoretically should

and should not relate to the quality of self-development activities that leaders participate in. This

step in the scale development process is critical to evaluate and confirm what construct the scale

is actually measuring (Campbell & Fiske, 1959; Hinkin, 1995; Messick, 1995).

Based on previous literature, several constructs were identified that should be related to

the quality of leader self-development activities that an individual engages in. One construct

likely to be related to the quality of self-development activities leaders engage in are the core

self-evaluations of the leader. Core self-evaluations (CSEs) refer to the basic beliefs that a

person holds about themselves and is thought to be comprised of locus of control, generalized

self-efficacy, self-esteem, and emotional stability (Judge, Erez, Bono, & Thoresen, 2003). Locus

of control refers to a person's beliefs of whether the causes of events in their life are due to their

own actions or some external factor (Rotter, 1966). Generalized self-efficacy refers to a person's

beliefs of their capability to perform well across different situations (Locke, McClear, & Knight,

1996). Self-esteem refers to the inherent worth that someone sees in themselves as a person

(Harter, 1990). Finally, emotional stability refers to the tendency to view situations positively

and be confident (Judge & Bono, 2001). CSEs should be positively related to leader self-

development quality because of the challenging experiences that people with more positive

beliefs about themselves take on and the increased amount of effort that they exert (Erez & Judge, 2001; Judge, Bono, & Locke, 2000).

Another individual characteristic that may be linked to participating in quality self-development activities is learning goal orientation. Goal orientation is defined as a pattern of cognition and action that results from pursuing a certain type of goal in an achievement situation (DeShon & Gillespie, 2005). One category of goals that individuals can have in achievement situations is learning goals. Learning goals are goals where the objective is to learn a new skill or gain knowledge, while the objective of performance goals is to perform at their best or avoid performing poorly (Grant & Dweck, 2003). Individuals with higher learning goal orientations tend to pursue more challenging experiences (Dragoni et al., 2009; Elliott & Dweck, 1988), invest more effort into learning situations (VandeWalle, Cron, & Slocum, 2001), perform better in environments with less formal learning structure (Schmidt & Ford, 2003), and seek more feedback to help them develop their competence (VandeWalle & Cummings, 1997). All of these tendencies should encourage leaders with higher learning goal orientations to engage in higher quality leader self-development activities.

A third construct that is likely to be connected to the quality of leader self-development activities leaders engage in is self-efficacy for self-development. While self-efficacy for self-development is likely related to the self-efficacy component of a person's core self-evaluations, the construct is unique because it specifically refers to a person's beliefs that they will do well in self-development activities rather than a person's general belief that they can perform well across a wide variety of activities (Maurer, Weiss, & Barbeite, 2003). Self-efficacy for self-development should be related to the quality of leader self-development activities that a leader engages in for a variety of reasons. First, those with higher self-efficacy tend to exert more effort

on tasks which should result in increased practice and learner engagement (Bandura, 1977). Second, individuals with higher self-efficacy view themselves as more capable of performing in a given context and thus they set more challenging goals for themselves and engage in more demanding experiences (Betz & Hackett, 1983; Locke & Latham, 1990). In self-development activities, this should result in leaders with higher self-efficacy for self-development selecting more challenging self-development activities to engage in.

Finally, another construct that should be connected to quality leader self-development is leadership self-efficacy. Leadership self-efficacy is defined as an individual's belief in their capability to lead others and fulfill whatever roles are necessary in that capacity (Quigley, 2013). Leadership self-efficacy plays an important role in an individual's motivation to lead (Chan & Drasgow, 2001). Individuals who feel like they can effectively lead others should be more inclined to want leadership responsibilities than individuals who do not feel like they can effectively lead other people. Furthermore, individuals who are motivated to be in leadership positions should be more proactive in developing themselves as a leader than individuals who have no desire to be in a leadership position. Because of this, leadership self-efficacy has been dubbed as an indicator of leader development (Day & Dragoni, 2015) and should be related to the quality of self-development activities leaders undertake.

Based upon the arguments presented in the previous paragraphs, four hypotheses are put forth to examine the construct validity of the self-development quality scale. Specifically, these hypotheses will test whether the self-development quality scale is related to measures of other constructs that it should be theoretically related to.

Hypothesis 1: There will be a positive relationship between core self-evaluations and the quality of self-development activities that leaders engage in.

16

Hypothesis 2: There will be a positive relationship between learning goal-orientation and the quality of self-development activities that leaders engage in.

Hypothesis 3: There will be a positive relationship between self-efficacy for self-development and the quality of self-development activities that leaders engage in.

Hypothesis 4: There will be a positive relationship between leadership self-efficacy and the quality of self-development activities that leaders engage in.

Another method for establishing the validity of a scale is to examine the relationship of the scale with measures of other constructs which should be unrelated to the construct that the scale under development is supposed to measure (Hinkin, 1995; Messick, 1995). One of these potential constructs is the personality trait agreeableness. Agreeableness is a personality trait that is characterized by a tendency to be trusting, compliant to other's requests, caring, altruistic, and cooperative (Costa & McCrae, 1992). The conceptual link between agreeableness and self-development quality is ambiguous. Personality traits are related to different behaviors (such as self-development) through the motivational and self-regulatory processes that they induce (Kanfer, Wanberg, & Kantrowitz, 2001; Oswald & Hough, 2011). Since agreeableness is characterized by cooperation, individuals high in agreeableness will have goals to cooperate with others while individuals low in agreeableness will have goals to not cooperate with others. It seems unlikely that having goals to cooperate or not would have any bearing on the quality of self-development activities that leader's choose to engage in. This notion has been supported empirically with evidence that agreeableness is unrelated to a person's motivation to learn (Major, Turner, & Fletcher, 2006).

A second construct that could possibly be unrelated to quality leader self-development is extraversion. Extraversion is the tendency for individuals to like other people, prefer being in

groups, be assertive, be active, and prefer excitement (Costa & McCrae, 1992). The facets of extraversion can be separated into two different categories: facets that refer to energy and activity, and facets that refer to liking social situations. The facets of extraversion that refer to energy and activity (i.e. assertiveness, activity, excitement seeking, and positive emotions) may very well be related to leader self-development quality because people high on these facets will have the energy to engage more in their activities, seek out new and interesting experiences, and have the confidence to try more challenging things. However, it is unlikely that the social aspects of extraversion will be related to quality leader self-development activities. Individuals high on these facets like being around other people and tend to speak up in group situations. It is unlikely that leaders who exhibit these tendencies will be more likely to engage in self-development activities that are more content relevant, engaging, challenging, unstructured, or various than leaders who are less warm towards others and more reserved in groups. Again, this logic is backed by empirical evidence that suggests the warmth and gregariousness facets of extraversion are unrelated to motivation to learn (Major et al., 2006).

Again, the following hypotheses are put forth based upon the arguments in the previous section. These hypotheses are designed to examine the construct validity of the self-development quality scale as were the previous hypotheses. However, these hypotheses do so by examining whether the self-development quality scale diverges from other measures and is unrelated to measures of constructs that it should be theoretically unrelated to.

Hypothesis 5: There will be a nonsignificant relationship between agreeableness and the quality of self-development activities that leaders engage in.

Hypothesis 6: There will be a nonsignificant relationship between a) warmth and b) gregariousness with the quality of self-development activities that leaders engage in.

Method

Sample and Procedure

Before data was collected from participants, the leader self-development quality items were first checked to ensure that they are face valid (DeVellis, 2012; Hinkin, 1995). To help ensure that the proposed items measure the intended constructs, they were reviewed by six subject matter experts (SMEs). The SMEs were researchers with PhDs in various areas of psychology and who have extensive experience researching leadership related topics. The SMEs were asked to provide feedback on the items and to also complete a sorting task. Specifically, for each item, SMEs were asked to categorize the item into one of the five dimensions of leader self-development quality or respond that the item was ambiguous and did not fit into a specific dimension. Furthermore, the SMEs were asked to judge the quality of each item by rating the extent that they believed the items will measure the intended constructs. Two criteria were used to determine which items to include in the development study. First, items had to be placed into the same dimension by all six SMEs. Second, the goal was include 30 items in the development study. From the items that were left, the items with the lowest quality ratings were excluded to get to a final total of 30. This list can be found in Appendix A.

The sample for this study consisted of employees in leadership/management positions and was recruited through Qualtrics survey panels. Participants who participate on these panels are screened upfront and compensated to respond to online surveys. For this particular study, participants came from one of Qualtrics business leadership panels. This means that Qualtrics had verified that the potential participants for this study are currently in a position where they are leading people for their job prior to the participants ever being invited to participate in the online survey.

During the data collection process, several precautions were taken to try and ensure that only quality data was included in the analyses. First, screening items were put into the survey to ensure that participants were currently in a management role (e.g. "Do you currently supervise a team?") and that they were paying attention throughout the survey (e.g. "Please choose somewhat disagree"). Only participants that responded appropriately were included in the final sample. Second, the amount of time participants took to complete the survey was also considered. The criteria that Qualtrics uses to determine if someone should be excluded based on not taking enough time is to use 1/3 of the median time it takes participants to complete the survey during the soft launch phase of the project. The last precaution that was taken was screening for participants who straight-lined through the survey (i.e. chose mainly one response option) and also screening for participants who provided gibberish text replies (e.g. "ljsdj"). These precautions are in-line with best practices to try and get the highest quality data from online sources (DeSimone, Harms, & DeSimone, 2015).

While the preceding precautions were taken to try and maximize the likelihood of obtaining high quality data, several steps were also taken after responses were collected to clean the dataset. First, the data was screened for missing responses on important study variables. After screening, it was found that 15 participants were missing more than 5% of their data. Furthermore, 24 participants did not report engaging in any self-development. These participants were excluded from further analyses which brought the total sample size down to 452. After these exclusions, no participant was missing more than 5% of their data and no study variable was missing more than 2% of responses. Expectation maximization (EM) procedures were used to estimate the remaining missing data (Tabachnick & Fidell, 2007)

After screening for missing data, the sample was split. 250 leaders were used in the development sample for the initial analyses of the scale and 202 leaders were held back from initial analyses in case the initial scale development efforts were unsuccessful. If this happened, exploratory analyses would be conducted on the scale and the holdout sample would be used to confirm the validity of those changes.

The demographic information collected suggests that the sample was very diverse (see Table 2). Leaders indicated being in a variety of roles (e.g. managers, lead bank tellers, directors, etc.) and industries (e.g. retail, finance, real estate, non-profits, etc.). The average leader that participated in this study was 38.26 years old (SD = 10.72), female (n = 297, 65.7% of sample), worked 45.54 hours on average every week (SD = 12.63), and was married (n = 259, 57.3% of sample).

Table 2. Summary of demographic information for Study 1

Variable	N	*M*	*SD*	% of responses
Age	444	38.26	10.72	
Dependents living at home	442	1.12	1.28	
Average hours worked per week	404	45.54	12.63	
Gender	452			
Female	297			65.7
Male	155			34.3
Marital Status	451			
Single, never married	139			30.8
Married	259			57.3
Divorced	40			8.8
Widowed	7			1.5
Separated	6			1.3
Size of team	452			
Less than 5	108			23.9
5-10	132			29.2
11-15	62			13.7
16-20	50			11.1
More than 20	100			22.1

Measures

All of the scales for this development study are summarized here. However, the interested reader can view the individual scale items in Appendix A.

Leader Self-Development Quality. The quality of self-development activities that leaders participate in was measured with a two-part scale. First, leaders were given direction as to what a leader self-development activity is and then given a list of common types of self-development activities. They were then asked to list all of the leader self-development activities that they participated in within the last year. After they completed this list, leaders were also asked to choose which of the activities they thought had the most impact on their development as a leader. After they completed this activity, leaders were presented survey items that intend to measure the developmental quality of the set of activities and the most impactful activity that they listed previously. The same items were presented in both cases, but participants did not respond to experiential variety items when responding about the most impactful activity.

Core Self-Evaluations. Core self-evaluations were measured using the Core Self-Evaluations Scale (Judge et al., 2003). This scale contains 12 items and the developers have provided evidence of its reliability and validity across several different samples (Judge et al., 2003). The reliability coefficient for the current study was $\alpha = .83$.

Learning Goal Orientation. Learning goal orientation was measured using VandeWalle's (1997) five item trait learning goal orientation scale ($\alpha = .79$). This learning goal orientation scale was designed specifically to be used in work settings and is a nice fit for the current study.

Self-Efficacy for Self-Development. Self-efficacy for self-development was measured by adapting the three item absolute self-efficacy for development scale to tap into self-

development activities instead of development activities in general (Maurer, Mitchell, & Barbeite, 2002; Maurer et al., 2003; Orvis, 2007). For example, the item "I can increase my job knowledge or skills beyond their current levels by performing development activities" was changed to "I can increase my job knowledge or skills beyond their current levels by performing *self-*development activities." The reliability of this scale for the current study was α = .54

Agreeableness and the facets of Extraversion. Agreeableness (α = .80) and the warmth (α = .66)/gregariousness (α = .72) facets of extraversion were measured using scales developed by Goldberg (1992) and Johnson (2014) using the International Personality Item Pool (IPIP). Agreeableness was measured using Goldberg's (1992) 10-item mini-marker scale, while warmth and gregariousness were measured using two, four-item facet scales created by Johnson (2014).

Leadership efficacy. Leadership efficacy was measured using Quigley's (2013) five item leadership efficacy scale (α = .87). Items for this study were adapted to refer to the leader's efficacy in general rather than their efficacy to lead a specific team. For example, the item "I have a high degree of confidence in my ability to steer *this* team in a successful direction" was changed to "I have a high degree of confidence in my ability to steer *a* team in a successful direction."

Demographics. Demographic variables of interest for this study (see Table 2 for statistics) include variables about the participant themselves including their gender and age. Other variables of interest are related to the participants' family lives including their marital status and how many dependents they have living at home. The final category of demographic variables included more work-oriented variables such as how many hours participants work per week on their core job responsibilities, their job title, the industry they work in, and the size of team that they manage.

Results

Data analysis proceeded in several phases. First, item analyses were conducted to examine the scale prior to more extensive analyses. Second, the factor structure of the scale was examined to see whether or not the internal structure of the scale matches the structure suggested by the theoretical foundation. Finally, the validity of the self-development quality scale was further assessed by testing the hypotheses. All of the aforementioned phases of data analysis proceeded by examining participant responses about their whole set of self-development activities and also about the self-development activity they listed as having the most impact.

Item analyses were conducted to examine the self-development quality scale in more detail. The item mean, standard deviation, and item-total correlations were calculated and examined for any irregularities such as exceptionally low/high means, extremely low variability, and small item-total correlation (Crocker & Algina, 1986). These statistics are displayed in Tables 3 and 4. Table 3 displays the statistics for the items that were used to measure the quality of the whole set of leader self-development activities. Table 4 displays the item statistics for the items that were used to measure the quality of the leader self-development activity that leaders listed as most impactful. After examining these statistics, it appears that two items in particular performed poorly. It appears that participants had difficulty dealing with the negatively worded nature of items 4 and 6 for learner engagement as evidenced by the weak, and sometimes negative, correlations that they had with the rest of the learner engagement items. Therefore, these items will no longer be included in any analyses moving forward.

Table 3. Results from item analyses for the whole set of leader self-development activities

Item	M	SD	Item-Total Correlation
Challenge			
1. I had to exert effort to complete these activities.	3.67	1.15	.53
2. These activities put me out of my comfort zone.	3.22	1.39	.44
3. I had to redo or get help in order to perform some of the activities because of how difficult they were.	2.86	1.32	.53
4. These activities required me to try hard in order to complete them and do well.	3.83	1.06	.42
Structure			
1. These activities were structured.	3.74	1.14	.75
2. These activities had a set structure for what was going to be covered.	3.69	1.14	.71
3. These activities had a set structure for how much time would be spent on each step of the activity.	3.48	1.24	.71
4. These activities had a defined series of steps to go through to complete the activity.	3.64	1.19	.68
Learner Engagement			
1. The feedback that I received in these activities allowed me to see how far I had progressed in developing a certain skill.	3.96	0.97	.62
2. I understood my strengths and weaknesses because of the feedback that I received in these activities.	4.00	0.97	.53
3. It was normal to be assessed on my learning or skill in these activities.	3.69	1.08	.42
4. It was unusual for me to receive feedback on my strengths and weaknesses in these activities.	3.01	1.24	.14
5. I had many opportunities to practice what I was learning as part of these activities.	4.06	0.99	.60
6. In these activities, I took in information without having to apply it.	2.61	1.18	-.17
7. In these activities, I applied what I was learning as I was learning it.	4.24	0.78	.52
8. These activities required me to practice.	3.90	1.09	.43
Experiential Variety			
1. I engaged in a wide variety of activities.	4.02	0.97	.61
2. Some of the types of activities that I engaged in were very different from each other.	3.84	1.03	.61
3. These activities were presented in a variety of ways.	3.97	0.99	.67
4. The method through which information was conveyed in these activities (e.g. books, lectures, experience, etc.) varied from activity to activity.	3.89	1.07	.65
Content Relevancy			

1. These activities were intended to help me learn how to lead (motivate, inspire, and influence) followers.	4.33	0.86	.73
2. These activities were intended to help me learn how to build trust with my followers.	4.24	0.97	.71
3. These activities were intended to help me learn how to influence people beyond my direct control.	3.97	1.06	.65
4. These activities were intended to help me learn how to lead by example.	4.35	0.90	.72
5. These activities were intended to help me learn how to communicate effectively.	4.38	0.91	.71
6. These activities were intended to help me learn how to foster a positive climate (teamwork, cohesion, cooperation, and loyalty) in my team.	4.24	0.95	.77
7. These activities were intended to help me learn how to develop my capabilities to stay prepared for demands that I will face as a leader.	4.18	0.97	.69
8. These activities were intended to help me learn how to facilitate ongoing development within my team.	4.16	0.98	.76
9. These activities were intended to help me learn how to become a better professional	4.39	0.87	.68
10. These activities were intended to help me learn how to manage my team in order to achieve organizational goals.	4.25	0.93	.74

Table 4. Results from item analyses for the most impactful leader self-development activity

Item	*M*	*SD*	Item-Total Correlation
Challenge			
1. I had to exert effort to complete this activity.	3.75	1.09	.51
2. This activity put me out of my comfort zone.	3.28	1.40	.41
3. I had to redo or get help in order to perform some of the activity because of how difficult it was.	2.92	1.28	.50
4. This activity required me to try hard in order to complete it and do well.	3.90	1.08	.53
Structure			
1. This activity was structured.	3.84	1.15	.69
2. This activity had a set structure for what was going to be covered.	3.73	1.21	.58
3. This activity had a set structure for how much time would be spent on each step of the activity.	3.55	1.25	.55
4. This activity had a defined series of steps to go through to complete the activity.	3.77	1.15	.62
Learner Engagement			

1. The feedback that I received in this activity allowed me to see how far I had progressed in developing a certain skill.	4.01	0.96	.54
2. I understood my strengths and weaknesses because of the feedback that I received in this activity.	3.98	0.98	.61
3. It was normal to be assessed on my learning or skill in this activity.	3.69	1.11	.47
4. It was unusual for me to receive feedback on my strengths and weaknesses in this activity.	3.03	1.28	.00
5. I had many opportunities to practice what I was learning as part of this activity.	4.08	0.94	.57
6. In this activity, I took in information without having to apply it.	2.60	1.21	-.18
7. In this activity, I applied what I was learning as I was learning it.	4.21	0.81	.60
8. This activity required me to practice.	3.90	1.05	.38
Content Relevancy			
1. This activity was intended to help me learn how to lead (motivate, inspire, and influence) followers to achieve organizational objectives.	4.32	0.85	.77
2. This activity was intended to help me learn how to build trust with my followers.	4.29	0.86	.76
3. This activity was intended to help me learn how to influence people beyond my direct control.	4.03	0.96	.59
4. This activity was intended to help me learn how to lead by example.	4.43	0.69	.67
5. This activity was intended to help me learn how to communicate effectively.	4.39	0.86	.77
6. This activity was intended to help me learn how to foster a positive climate (teamwork, cohesion, cooperation, and loyalty) in my team.	4.32	0.84	.81
7. This activity was intended to help me learn how to develop my capabilities to stay prepared for demands that I will face as a leader.	4.31	0.81	.73
8. This activity was intended to help me learn how to facilitate ongoing development within my team.	4.25	0.91	.77
9. This activity was intended to help me learn how to become a better professional	4.40	0.78	.75
10. This activity was intended to help me learn how to manage my team in order to achieve organizational goals.	4.30	0.82	.75

The second step of the analysis involved examining the internal factor structure of the scale. Since there is an a priori theory regarding the factor structure of the quality of leader-self development activities (Orvis & Ratwani, 2010), confirmatory factor analysis was used instead of exploratory factor analysis. Prior to running the analysis, the data was screened in accordance with the assumptions of structural equation modeling. As part of this process, 33 participants were found to be outliers and were excluded from further analysis resulting in a sample of 217 leaders. These 33 participants were a combination of univariate and multivariate outliers. Univariate outliers were tested for by converting item responses to z-scores and examining the data for z-scores greater than +/- 3.30 (Tabachnick & Fidell, 2007). Multivariate outliers were screened for by putting the variables into a regression equation and computing Malhanobis distance for each participant (Tabachnick & Fidell, 2007).

A five-factor model for the items about the whole set of leader self-development activities was specified in AMOS according to the arguments and data presented earlier (see Figure 1). This model was estimated using maximum likelihood estimation. While the χ^2 test suggests that the model does not fit the data, this is not taken as fatal because this test is generally thought of as oversensitive when dealing with large samples (Byrne, 2010). The other model fit statistics suggest that the model provides a good, but not exceptional fit to the data ($\chi^2_{(340)} = 591.78$, $p < .05$; CFI = .905; RMSEA = .059; Hu & Bentler, 1999; MacCallum, Browne, & Sugawara, 1996). Furthermore, all of the indicators displayed a significant, positive loading onto its proposed factor. These results suggest the five-factor conceptualization of leader self-development quality that had been previously outlined is supported by the data. Furthermore, the fit of this model was compared to a one-factor model. The one-factor model had a worse fit ($\chi^2_{(350)} = 1110.18$, $p < .05$; CFI = .719; RMSEA = .100), which provides more support for the utility

Figure 1. Confirmatory factor analysis model for measuring leader self-development quality of a set of activities
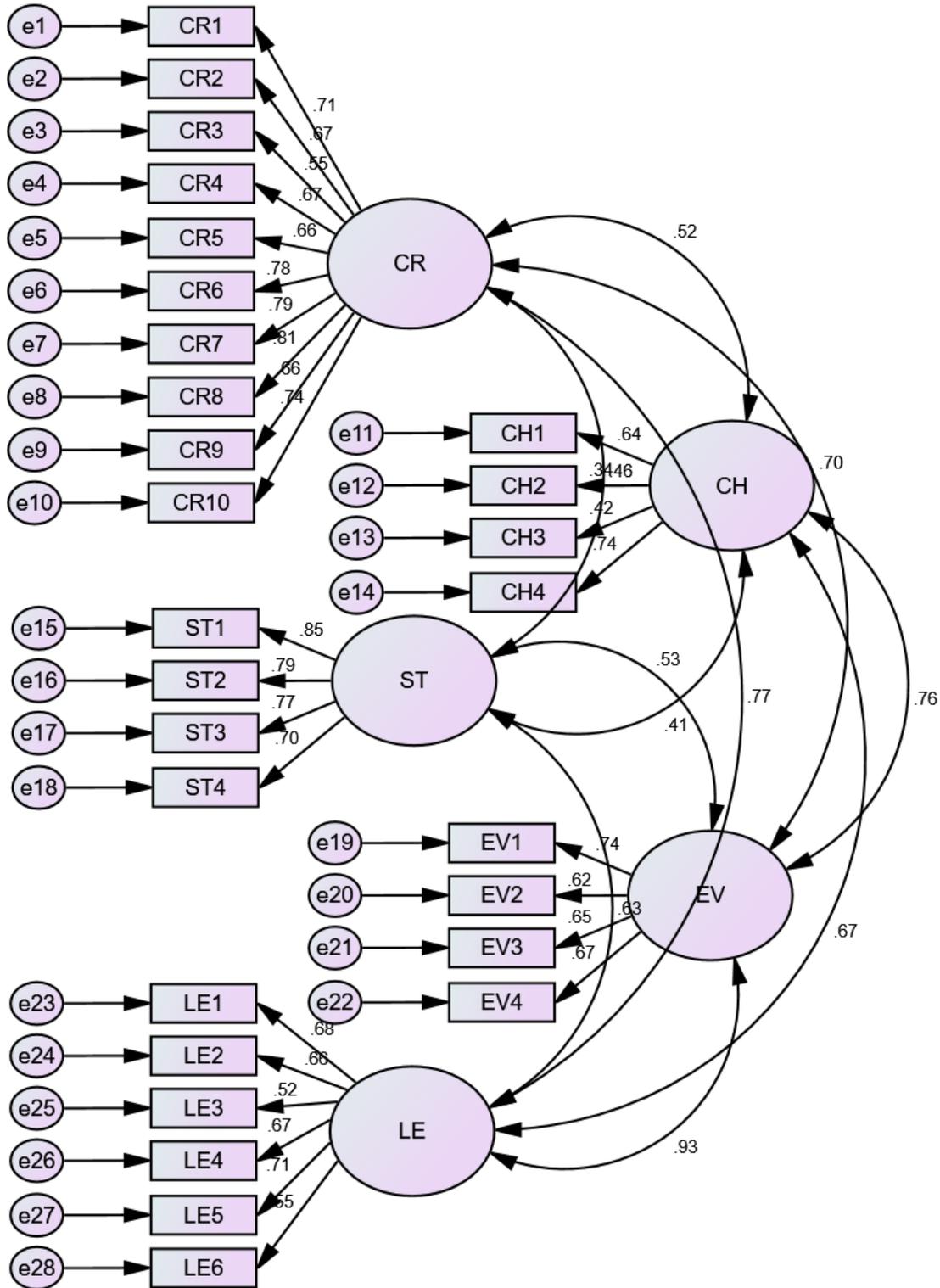
of the five-factor model. Furthermore, the five-factor model was confirmed on the holdout sample and the results suggested that the model fit well in the holdout sample as well ($\chi^2_{(340)}$ = 594.52, $p < .05$; CFI = .918; RMSEA = .061).

A four-factor model was also specified in AMOS for the items about the most impactful leader self-development activity (see Figure 2). Again, the χ^2 test suggests that the model does not fit the data, but other fit statistics suggest the model provides a good fit ($\chi^2_{(246)}$ = 363.77, $p <$ .05; CFI = .954; RMSEA = .047; Hu & Bentler, 1999; MacCallum et al., 1996). Furthermore, this model fit the data better than a single-factor model ($\chi^2_{(252)}$ = 1068.81, $p < .05$; CFI = .684; RMSEA = .122) which provides additional support for the current conceptualization of leader self-development quality. Again, these results were confirmed in the holdout sample. The results from the holdout sample in this case were not as good, but still suggested that the four-factor model provided an adequate fit to the data ($\chi^2_{(246)}$ = 363.77, $p < .05$; CFI = .903; RMSEA = .079).

After the dimensions were supported by the confirmatory factor analyses, reliability analyses were conducted for each of the factors. For the items measuring the quality of the whole set of leader self-development activities, most of the dimensions exhibited acceptable levels of reliability (Challenge, α = .66; Structure, α = .86; Learner Engagement, α = .79; Experiential Variety, α = .77; Content Relevancy, α = .91). The set of items that measure the quality of the most impactful self-development activity demonstrated adequate reliability as well (Challenge, α = .64; Structure, α = .90; Learner Engagement, α = .82; Content Relevancy, α = .92). Since the alpha coefficient for the challenge dimension was slightly lower than the commonly cited .70 rule of thumb (Nunnaly & Bernstein, 1994), the item statistics were examined to see if the alpha

Figure 2. Confirmatory factor analysis mode for measuring leader self-development quality for the most impactful activity
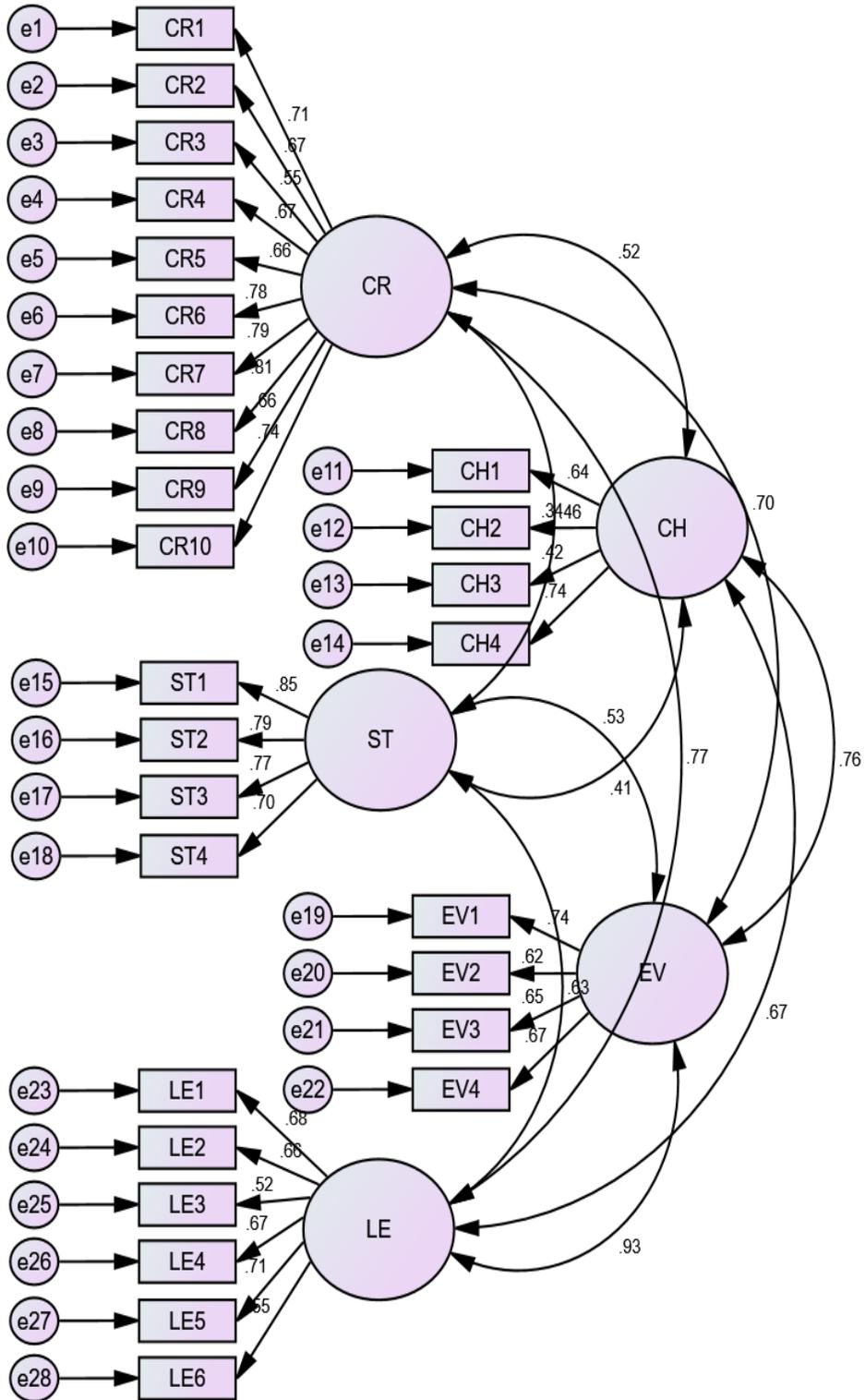
level could be significantly improved. However, the results suggested that this approach would not improve the reliability.

The final step of data analysis involved testing the hypotheses for convergent and divergent validity. Hypotheses were tested by computing correlation coefficients and examining the direction, strength, and significance of these coefficients (see Table 5). This examination produced several insights. First of all, the vast majority of coefficients were significant, even very modest ones (e.g. r = .13). This is likely the result from having a large sample size (n = 217). For this reason, more weight will be given to the strength and direction of coefficients when interpreting the results of significant correlation coefficients. The second insight is that the correlation matrix generally conforms to a pattern that is expected based off of the hypotheses. That is, the dimensions of leader self-development quality tended to be more strongly correlated with the proposed convergent constructs than they were with the divergent constructs of agreeableness, warmth, and gregariousness. The notable exception to this pattern is seen with the challenge dimension which was largely unrelated to all of the dispositional measures and even negatively related to core self-evaluations. The third insight that emerged from examining the correlation matrix is that the matrix exhibits a strong pattern that is similar to a multimethod-multitrait approach (Campbell & Fiske, 1959). That is the correlation coefficients between two different measures of the same dimension (e.g. challenge for the whole set of activities and challenge of the most impactful activity; $r = .76$) were far stronger than correlations between two different dimensions using the same measurement method (e.g. challenge for the whole set of activities and structure for the whole set of activities; $r = .22$). This provides additional evidence for the validity of the scale and suggests that method effects had little influence on participant responses to the quality scale.

Table 5. Correlations between Study 1 variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. CH for set	3.51	0.82	---														
2. ST for set	3.79	0.89	**.22**	---													
3. LE for set	4.10	0.60	**.39**	**.55**	---												
4. EV for set	4.07	0.67	**.45**	**.43**	**.71**	---											
5. CR for set	4.40	0.52	**.29**	**.40**	**.63**	**.58**	---										
6. CH for impact	3.59	0.79	**.76**	**.21**	**.32**	**.32**	**.22**	---									
7. ST for impact	3.88	0.91	**.18**	**.83**	**.46**	**.35**	**.37**	**.23**	---								
8. LE for impact	4.08	0.61	**.43**	**.54**	**.80**	**.60**	**.61**	**.38**	**.55**	---							
9. CR for impact	4.40	0.53	**.23**	**.47**	**.59**	**.55**	**.83**	**.21**	**.37**	**.62**	---						
10. LGO	4.22	0.56	.11	**.19**	**.47**	**.44**	**.48**	**.16**	**.28**	**.48**	**.52**	---					
11. Agreeable	4.00	0.62	-.11	.12	**.18**	**.25**	**.33**	-.07	.12	**.19**	**.35**	**.44**	---				
12. Warmth	3.77	0.79	-.07	.02	**.13**	.20	**.26**	-.07	.06	**.17**	**.24**	**.37**	**.62**	---			
13. Gregarious	3.33	0.93	-.05	.05	**.17**	.13	**.24**	.01	.11	**.16**	**.22**	**.34**	**.44**	**.69**	---		
14. CSE	3.77	0.64	**-.17**	.07	**.29**	**.30**	**.32**	**-.21**	.09	**.27**	**.32**	**.46**	**.47**	**.61**	**.51**	---	
15. LSE	4.38	0.55	.13	**.33**	**.44**	**.48**	**.63**	.11	**.35**	**.47**	**.60**	**.56**	**.54**	**.50**	**.43**	**.55**	---
16. SESD	4.16	0.58	.11	.12	**.33**	**.36**	**.43**	**.17**	**.14**	**.33**	**.46**	**.59**	**.33**	**.25**	**.25**	**.29**	**.45**

Bold values indicate *p* < .05

CH = Challenge; ST = Structure; LE = Learner Engagement; EV = Experiential Variety; CR = Content Relevancy;
LGO = Learning Goal Orientation; CSE = Core Self-Evaluations; LSE = Leadership self-efficacy; SESD = Self-efficacy for self-development

Study 1 Discussion

Organizations are facing ever-increasing changes due to new technologies and ways of operating

(O'Toole & Lawler, 2006). As a result, employees face the need to be nimbler than ever to face

these changing demands. As a result of this, leader self-development is a topic that is becoming

more interesting theoretically and practically. However, there are still gaps in our knowledge

about leader self-development. This study attempted to address those gaps by creating a scale

that will allow researchers, leaders, and organizations to assess the quality of self-development

activities that leaders are engaging in.

Overall, the results of this research tend to suggest this study has accomplished this aim.

The results suggest that most of the scales developed provide a reliable and valid method of

measuring the quality of leader self-development activities. First, the results suggest that the

scale has a factor structure consistent with the dimensions of challenge, structure, learner

engagement, experiential variety, and content relevancy as introduced by Orvis and Ratwani

(2010). This result not only provides evidence for the factor structure of the scale, but also

provides support for Orvis and Ratwani's five dimension theory of leader self-development

quality. Second, reliability analyses indicated that the scale reliably measured every dimension

except for the challenge dimension. Finally, correlations among the scale dimensions and the

hypothesized variables provided further evidence for the validity of the scale and were mostly

supportive of the divergent and convergent hypotheses.

The main deviation from these encouraging results was in regards to the challenge

dimension of leader self-development quality. This dimension did not show the same levels of

reliability (α = .66 and .64) and would be considered borderline unreliable according to

commonly cited rules of thumb (e.g. Nunnaly and Bernstein, 1994). Furthermore, the measures

of challenge were largely unrelated to the other study constructs. Challenge only had a significant negative relationship with core self-evaluations, and the direction of this relationship was counter to what was hypothesized. While the low coefficient alphas are not necessarily a problem in themselves since alpha underestimates internal consistency in short scales (Cortina, 1993), it appears that low reliability might have been a problem in this study since challenge was unrelated to the dispositional constructs that were hypothesized to be related to challenge. The data collections for the first and second study overlapped some, so no changes to the scale could be made to try and improve upon the scale. However, the reliability and validity of the challenge dimension will be of special interest in the second study in order to decide what to do with this part of the scale moving forward.

A limitation of this study related to the low reliability of the challenge dimension is the low reliabilities of other scales included in the study as well. Specifically, self-efficacy for self-development ($\alpha = .54$) and warmth ($\alpha = .66$) also demonstrated fairly low reliability. This is a problem because a scale cannot be valid if it is not reliable and these low reliabilities may have masked relationships that actually exist. For example, the construct of challenge may very well be related to the construct of self-efficacy for self-development. However, this result may not have appeared in this study because these constructs were measured in such a way that contained a lot of measurement error and prevented that relationship from occurring.

While the results from this study are generally encouraging, there are still many unanswered questions in the area of leader self-development. For example, how do situational factors affect leader self-development quality? Past research on the proposed antecedents of leader self-development has focused exclusively on dispositional factors and has ignored situational influences (Boyce et al., 2010; Langkamer, 2008; Orvis, 2007; Orvis & Ratwani,

2010). Another unanswered question is what is the relative importance of the quality of leader

self-development activities versus how much leader self-development someone performs?

Again, past research has exclusively focused on one or the other (Boyce et al., 2010; Orvis &

Ratwani, 2010). These unanswered questions are the focus of the second study.

Chapter 3 - Study 2- Further Validation of the Leader Self-Development Quality Scale

While the purpose of the first study was to create a scale to measure the quality of leader self-development activities leaders are engaging in, the purpose of the second study was to further validate the scale and use it to advance our understanding of leader self-development. Specifically, the scale was used to examine the relative importance of the quantity and quality of self-development activities leaders engage in. Further, the scale developed in the first study was used to examine the role of transformational leadership as a situational characteristic that has the potential to influence the quality of self-development activities that leaders engage in.

Quality vs. Quantity of Leader Self-Development

While the preceding discussion has focused on leader self-development quality, the discussion now becomes more complex to reflect on how leader self-development quality may interact with the quantity of self-development activities that leaders engage in to predict leader effectiveness.

There are multiple reasons why engaging in higher quality leader self-development activities should be related to gains in leader effectiveness while leaders who engage in lower quality leader self-development may not see these gains. First of all, higher quality activities are content relevant, meaning that they are intended to improve important leadership skills. Engaging in content relevant leader self-development activities is similar to engaging in training programs that were designed on the basis of a good needs analysis. These activities and programs will result in better learning and development because they are targeted to develop skills that are in need of improvement (Salas et al., 2012). Second, activities that require learners to be engaged in the process are more likely to develop leadership skills than activities that do

not. Specifically, practice and feedback have been identified again and again as two of the most important instructional design attributes because they allow learners to make mistakes in a controlled environment and adapt their approach based on feedback (Salas & Cannon-Bowers, 2001; Salas et al., 2012). Leaders who engage in challenging tasks are also likely to see gains in effectiveness as well because they are stretching themselves beyond what they are currently comfortable with and having to learn novel ways of doing things in order to perform at a higher level (DeRue & Wellman, 2009; Dragoni et al., 2009; McCauley et al., 1994; McCauley et al., 2010b). Finally, leaders that engage in a wider variety of activities are also likely to see gains in effectiveness. Leaders work in an ambiguous, complex, and rapidly changing environment (Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000). Engaging in a wide variety of self-development activities should help leaders handle these complex demands because leaders have the opportunity to practice changing their perspectives across situations and further engrain the learning into their mental models. These benefits can then be used by leaders to help them perform optimally in different situations that they encounter.

The notion that leader self-development quality is related to leader effectiveness is not new. As mentioned earlier, aspects of self-development quality have been found to be associated with increased leader effectiveness such as adaptive performance and increases in performance ratings (Orvis & Ratwani, 2010). However, the contribution of this study is that a more complex relationship between self-development quality, self-development quantity, and leader effectiveness is being examined.

Based on these arguments, the following hypothesis is proposed:

Hypothesis 1: The quality of leader self-development activities that leaders engage in will be positively related to leader effectiveness.

While engaging in quality leader self-development activities is likely to result in increased leader effectiveness, this relationship likely depends on other factors as well. One of these factors may be the quantity of self-development activities that leaders engage in. Leader self-development quantity is the extent to which leaders actually engage in self-development activities (Boyce et al., 2010). Quantity is inherently different from quality because it represents the frequency that leaders engage in self-development, while quality represents the qualitative characteristics that separate self-development activities that have good potential to develop leader skills from those that are less suited to develop a person's leadership capacity.

The relationship between self-development quality and leader effectiveness likely depends on the quantity of self-development they engage in because of the number of opportunities they have to let the benefits of high-quality activities build on one another. For example, when leaders engage in a low amount of self-development, there will probably be a positive relationship between quality and effectiveness because leaders who engage in a few high quality activities will probably see greater gains than leaders who engage in a few activities that are not worthwhile. However, when leaders engage in more self-development, this relationship is likely much stronger. When leaders engage in a lot of poor quality self-development activities, they will likely see similar gains as those leaders who performed less poor quality self-development because these activities are not well-suited to build leadership capacity. However, when leaders engage in a lot of high quality self-development, then they are giving themselves the opportunity to let the benefits of high-quality activities build on each other and result in more developmental growth as a leader. Therefore, the relationship between quality and effectiveness should be positive regardless of whether leaders engage in a low or high quantity of self-

development. However, the relationship should be stronger when leaders engage in more self-development because they have more opportunities to benefit from high quality activities.

Therefore, the following hypothesis is put forth to be tested:

Hypothesis 2: The relationship between leader self-development quality and leader effectiveness is moderated by the quantity of self-development activities that leaders participate in such that the relationship is stronger when leaders engage in a high quantity of self-development activities.

The Role of Transformational Leadership

As stated earlier, one of the gaps in leader self-development research is the lack of research on situational characteristics that may influence leader self-development. One situational characteristic that has the potential to influence an employee's self-development is their leader. Leaders have a profound influence on the people that they lead and can help shape their attitudes (Arnold, Turner, Barling, Kelloway, & McKee, 2007), the goals they pursue (Bono & Judge, 2003), and the behaviors they perform (Piccolo & Colquitt, 2006). One of the most influential leadership frameworks to be introduced in the leadership literature is transformational leadership (Barling, Christie, & Hoption, 2011). In this study, it is argued that the transformational behaviors of a leader's leader are linked to the quality of self-development activities that the leader participates in.

Transformational leadership is a leadership style that goes beyond exchange relationships and motivates followers to achieve more than what they thought was possible (Bass, 1998). Previous research suggests that there are four different dimensions of transformational leadership: intellectual stimulation, individualized consideration, inspirational motivation, and idealized influence (Bass, 1998). Intellectual stimulation refers to leader behaviors that cause

followers to challenge assumptions, take risks, and make followers think for themselves. Individualized consideration refers to when leaders treat employees as separate people, spend time attending to each individuals' needs and concerns, and spend time mentoring employees. Inspirational motivation occurs when leaders hold followers to high standards to achieve an inspiring and appealing vision. Finally, idealized influence refers to leader behaviors that make them appear to be good role models and set an example for their employees to follow.

The rationale for why transformational leaders may influence their followers to engage in quality leader self-development is best demonstrated by a study conducted by Dvir, Eden, Avolio, and Shamir (2002). These authors conducted a 6-month field experiment to examine the effect that transformational leadership training has on their followers' skill development. They found that transformational leaders influence their followers' development through boosting their self-efficacy, motivating them to put forth extra effort, and encouraging them to think for themselves. If these findings are applied to the current research, then it is plausible that transformational leaders will get followers to participate in more challenging and engaging activities because they will have a higher self-efficacy and put forth more effort. Furthermore, if followers take responsibility for thinking about their development then they will likely choose activities that are relevant to their work as leaders and engage in activities where they control what they learn.

Based on these arguments, the following hypothesis is proposed:

Hypothesis 3: Transformational leadership has an indirect positive effect on leader effectiveness through the influence on leader self-development quality. This relationship is moderated by the quantity of self-development such that the relationship is weaker when quantity is low and stronger when quantity is high.

Figure 3. Hypothesized study model

Method
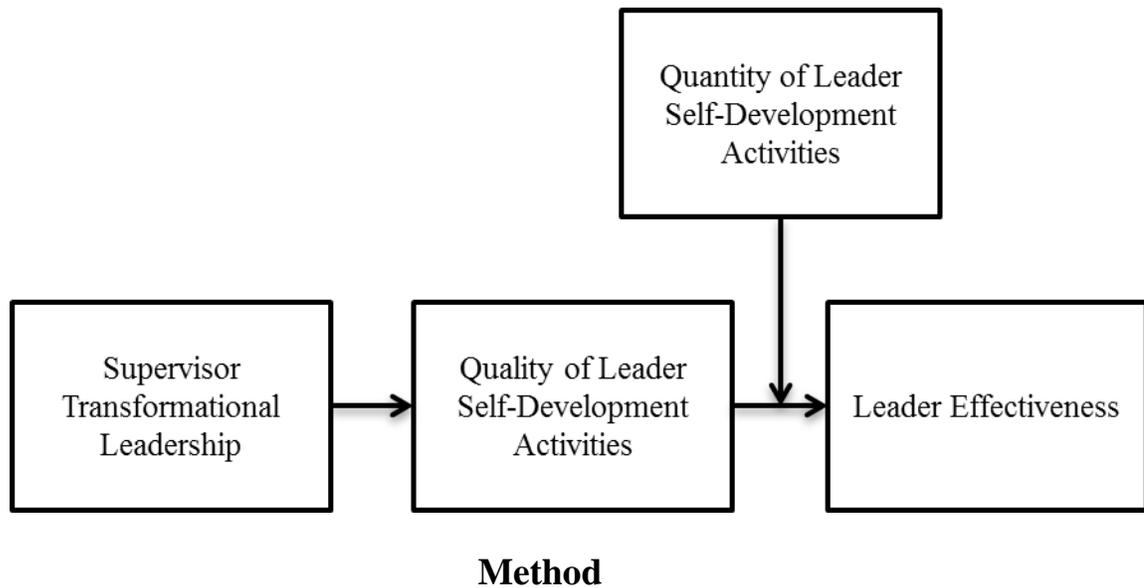
Sample and Procedure

As was the case for the first study, the sample for the second study consisted of

employees in leadership/management positions and was recruited through Qualtrics survey

panels. Again, several precautions were taken to maximize the odds that only quality data was

included in the analyses. First, screening items were put into the survey to ensure that

participants were currently in a management role (e.g. "Do you currently supervise a team?") and

that they were paying attention throughout the survey (e.g. "Please choose somewhat disagree").

Only participants that responded appropriately were included in the final sample. Second, the

amount of time participants took to complete the survey was also considered. The criteria that

Qualtrics uses to determine if someone should be excluded based on not taking enough time is to

use 1/3 of the median time it takes participants to complete the survey during the soft launch

phase of the project. The last precaution that was taken was screening for participants who

straight-lined through the survey (i.e. chose mainly one response option) and also screening for

participants who provided gibberish text replies (e.g. "ljsdj"). These precautions are in-line with best practices to try and get the highest quality data from online sources (DeSimone et al., 2015).

Again, in addition to the external methods used to try and prevent poor quality responses from being analyzed, methods were also employed to clean the data once participants had made it through the screening phase. To do this, the data was screened for missing responses. As part of this analysis, 14 participants were excluded because of the amount of data they were missing. Furthermore, 12 participants were excluded because they did not report engaging in leader self-development. This brought the total sample size down to 223.

As was the case for Study 1, the demographic information suggests that the sample had diverse experiences (see Table 6). Leaders indicated being in a variety of roles (e.g. managers, vice presidents, program directors, etc.) and industries (e.g. pharmaceuticals, construction, retail, etc.). The average leader that participated in this study was 38.52 years old (SD = 11.30), female (n = 139, 66.2% of sample), worked 43.51 hours on average every week (SD = 10.49), and was married (n = 123, 58.6% of sample).

Measures

The following sections contain general information about the self-report scales used in this study. The items for the scales (except those from the MLQ) can be found Appendix B.

Transformational Leadership. Leaders will rate their supervisors on transformational leadership using the Multifactor Leadership Questionnaire (MLQ; Avolio & Bass, 1995). The MLQ contains four subscales to measure the four dimensions of transformational leadership consistent with transformational leadership theory (Avolio & Bass, 1995; Bass, 1990). These subscales are often highly correlated (Bycio, Hackett, & Allen, 1995). Therefore, the scales were aggregated together for an overall transformational leadership score as is consistent with past

Table 6. Summary of demographic information for Study 2

Variable	N	*M*	*SD*	% of responses
Age	208	38.52	11.30	
Dependents living at home	203	1.08	1.16	
Average hours worked per week	189	43.51	10.49	
Gender	210			
Female	139			66.2
Male	71			33.8
Marital Status	208			
Single, never married	57			27.1
Married	123			58.6
Divorced	20			9.5
Widowed	5			2.4
Separated	3			1.4
Size of team	210			
Less than 5	49			23.3
5-10	68			32.4
11-15	28			13.3
16-20	36			17.1
More than 20	29			13.8

research (e.g. Bono & Anderson, 2005; Courtright, Colbert, & Choi, 2014, Piccolo & Colquitt, 2006). Sample items include, "My supervisor talks optimistically about the future," and "My supervisor acts in a way that builds my respect." Responses range from 1 (*Not at all*) to 5 (*Frequently, if not always*). The reliability of this scale in the current study was $\alpha = .94$.

Leader Self-Development Quality. Leader self-development quality was measured using the scale developed in the first study of this research. Again, leaders listed all of the self-development activities that they had performed over the past year and also chose which activity they thought had the most impact on their development as a leader. After this step, leaders responded to two sets of survey items. The first set was intended to measure the developmental quality of the whole set of activities that they listed and included the dimensions of challenge ($\alpha = .72$), structure ($\alpha = .86$), learner engagement ($\alpha = .83$), experiential variety ($\alpha = .79$), and content relevancy ($\alpha = .93$). The second set included the same items (except for the experiential

variety items), but was adapted to measure the developmental quality of the most impactful activity they listed.

Leader Self-Development Quantity.   The quantity of leader self-development activities that leaders engaged in was measured in several ways. The first method was by asking the participants to report how much time they had spent engaging in leader self-development. For the whole set of activities, leaders were asked to estimate how much time they spent on average engaging in self-development activities every week. For the most impactful activity, leaders were asked to estimate how much time they had devoted to that specific activity. The second method that was used to ascertain quantity for the whole set of leader self-development activities was to count the number of self-development activities that each leader listed

   Leader Effectiveness.   Leader effectiveness was measured using the extra effort and effectiveness self-report scales from the MLQ (Avolio & Bass, 1995). Example items included "I increase others' willingness to try harder" and "I am effective in meeting others' job-related needs." Responses range from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*).   The reliability for this scale in the current study was $\alpha = .89$.

   Demographics.   The demographic variables collected in this study are the same as what was collected in the first study. The demographic variables of interest for this study are gender, age, marital status, dependents living at home, hours worked per week, their job title, the industry they work in, and the size of team that they manage.

Results

   As mentioned in the method section, one of the first things done to the data was to screen it for missing responses. The data screening revealed that the quantity variable for the most impactful self-development activity was missing a large percentage of data (26%). Since this

was the only quantity variable for the most impactful leader self-development activity, additional exploratory analyses were conducted to determine how to handle the situation. Correlation coefficients were examined between the dimensions of quality measured for the whole set of self-development activities and those measured for the most impactful activity. This analysis revealed that the dimensions had very strong relationships with one another (e.g. $r = .90$ for the two measures of content relevancy; see Table 7). This also happened in Study 1. These high correlation coefficients may indicate that the two different methods for measuring leader self-development quality may be somewhat redundant. Because of this and since the only quantity variable for the most impactful activity is missing a significant amount of data, the decision was made to only include measures about the whole set of self-development activities in further analyses. Finally, there was a small amount of missing data spread across the dataset after these steps. This missing data was estimated using EM procedures and put into the dataset (Tabachnick & Fidell, 2007)

Table 7. Correlations between leader self-development quality variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Challenge for set	3.39	0.90	---								
2. Structure for set	3.59	1.01	**.45**	---							
3. LE for set	3.91	0.80	**.59**	**.68**	---						
4. EV for set	3.91	0.82	**.52**	**.59**	**.72**	---					
5. CR for set	4.28	0.71	**.35**	**.44**	**.69**	**.61**	---				
6. Challenge for impact	3.48	0.97	**.75**	**.37**	**.52**	**.38**	**.34**	---			
7. Structure for impact	3.68	1.04	**.32**	**.78**	**.59**	**.50**	**.40**	**.37**	---		
8. LE for impact	3.96	0.82	**.47**	**.53**	**.76**	**.60**	**.70**	**.56**	**.60**	---	
9. CR for impact	4.27	0.75	**.34**	**.41**	**.66**	**.57**	**.90**	**.33**	**.40**	**.72**	---

Bold values indicate *p* < .05
LE = Learner Engagement; EV = Experiential Variety; CR = Content Relevancy

Prior to running the regression analyses, the data was further screened for outliers and to examine the assumptions of multiple regression. In this process, 13 leaders were found to be outliers and were excluded from the analysis bringing the total sample size down to 210.

Univariate outliers were tested for by converting item responses to z-scores and examining the data for z-scores greater than +/- 3.30 (Tabachnick & Fidell, 2007). Multivariate outliers were screened for by putting the variables into a regression equation and computing Malhanobis distance for each participant (Tabachnick & Fidell, 2007). The assumptions of normality, linearity, homoscedasticity, absence of multicollinearity, and absence of outliers in the solution were examined from the residual plots and collinearity statistics produced during the actual analyses (Tabachnick & Fidell, 2007). The means, standard deviations, and correlations of the study variables are shown in Table 8.

Table 8. Correlations between Study 2 variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Number of activities	3.14	1.97	---								
2. Hours on SD per week	23.05	26.44	**.15**	---							
3. Challenge for set	3.46	0.84	.11	**.28**	---						
4. Structure for set	3.64	0.94	.10	**.33**	**.34**	---					
5. LE for set	4.00	0.66	.10	**.27**	**.48**	**.60**	---				
6. EV for set	4.00	0.67	**.15**	**.21**	**.40**	**.46**	**.57**	---			
7. CR for set	4.36	0.53	.12	.03	**.16**	**.32**	**.56**	**.43**	---		
8. TL	3.73	0.70	.03	**.27**	**.31**	**.45**	**.50**	**.34**	**.36**	---	
9. Leader Effectiveness	4.32	0.50	**.18**	.04	.06	**.25**	**.42**	**.35**	**.67**	**.39**	---

Bold values indicate *p* < .05
LE = Learner Engagement; EV = Experiential Variety; CR = Content Relevancy;
TL = Transformational Leadership

Due to the moderation hypotheses, all predictor variables were centered prior to the regression analyses to prevent issues with multicollinearity (Aiken & West, 1991). After centering, two regression analyses were carried out to test Hypotheses 1 and 2. The first regression analysis used the number of self-development activities as the quantity variable, while the second analysis used the number of hours per week that respondents reported engaging in leader self-development. For both analyses, the quantity variable was entered in the first step of the regression. In the second step, the dimensions of quality were entered. This order was chosen to test the incremental validity of the quality dimensions over quantity. Finally, the

interaction terms between the quantity variable and each dimension of leader self-development

quality were added into the model. The results of these analyses are shown in Tables 9 and 10.

Table 9. Regression analysis testing Hypotheses 1 and 2 with the number of SD activities as the quantity variable

Predictor	R^2	ΔR^2	B	Std Error	β
Step 1	**.03**	**.03**			
Number of activities			**.04**	.02	**.18**
Step 2	**.47**	**.44**			
Number of activities			.02	.01	.09
Challenge for set			**-.07**	.04	**-.12**
Structure for set			.00	.04	.00
LE for set			.07	.06	.09
EV for set			.06	.05	.08
CR for set			**.56**	.06	**.59**
Step 3	**.48**	.01			
Number of activities			.02	.01	.08
Challenge for set			-.06	.04	-.11
Structure for set			.01	.04	.01
LE for set			.06	.06	.08
EV for set			.05	.05	.07
CR for set			**.54**	.06	**.57**
Number x Challenge			.01	.02	.02
Number x Structure			-.01	.02	-.03
Number x LE			.01	.04	.03
Number x EV			.00	.03	.01
Number x CR			-.06	.04	-.12

Note: **Bolded** items indicate $p < .05$.
LE = Learner Engagement; EV = Experiential Variety; CR = Content Relevancy

In order to test Hypothesis 1, the R^2 and ΔR^2 values for step 2 of the analyses were

examined. These values suggest that the dimensions of leader self-development quality as a set

were predictive of leader effectiveness above and beyond the quantity variables (R^2s = .47 and

.46; ΔR^2s = .44 and .46; all values $p < .05$). The correlation matrix (see Table 6) suggests that all

of the dimensions of leader self-development quality were predictive of leader effectiveness at

the zero-order level. However, the individual regression weights were examined to see the

relative contribution of each variable in predicting leader effectiveness. This analysis revealed

Table 10. Regression analysis testing Hypotheses 1 and 2 with the hours of SD per week as the quantity variable

| Predictor	R^2	ΔR^2	B	Std Error	β
Step 1	.00	.00			
SD hours per week			.00	.00	.04
Step 2	**.46**	**.46**			
SD hours per week			.00	.00	.00
Challenge for set			-.07	.04	-.12
Structure for set			.00	.04	.00
LE for set			.06	.06	.08
EV for set			.07	.05	.09
CR for set			**.57**	.06	**.60**
Step 3	**.51**	**.04**			
SD hours per week			.00	.00	-.13
Challenge for set			-.08	.04	-.14
Structure for set			.04	.04	.08
LE for set			.05	.06	.06
EV for set			.12	.05	.15
CR for set			**.50**	.06	**.53**
Hours x Challenge			.00	.00	.09
Hours x Structure			**.01**	.00	**.22**
Hours x LE			.00	.00	-.16
Hours x EV			.01	.00	.17
Hours x CR			.00	.00	-.07

Note: **Bolded** items indicate $p < .05$.
SD = Self-development; LE = Learner Engagement; EV = Experiential Variety; CR = Content Relevancy

that when all of the dimensions are entered into the regression equation, only content relevancy and challenge are significantly predictive of leader effectiveness. When controlling for the quantity of self-development and the other quality dimensions, content relevancy exhibited a significant positive relationship with leader effectiveness in both analyses (βs = .59 and .53, $p <$ .05). On the other hand, challenge exhibited a suppression effect under the same conditions and had a significant negative relationship with leader effectiveness in the first regression analysis (β = -.12, $p < .05$). This is counter to challenge's significantly positive zero-order relationship with leader effectiveness and is likely the result of its inter-correlations with other study variables

even though the results of data screening did not suggest any overly high levels of multicollinearity. Overall, these results are mostly supportive of Hypothesis 1 with the exception of the challenge dimension.

The second hypothesis was tested by examining the significance of the interaction terms entered into step 3 of the regression analyses (see Table 9 and 10). Overall, the results were largely non-significant which suggests that hypothesis 2 is not supported. The only significant interaction in predicting leader effectiveness was between the dimension of structure and the number of hours leaders spent doing self-development every week ($\beta = .22$, $p < .05$). Figure 2 displays the pattern of this interaction. When leaders spent a lower number of hours per week engaged in self-development, structure had a non-significant negative relationship with leader effectiveness ($\beta = -.15$, $p > .05$). However, when leaders spent a larger number of hours on self-development, structure had a significantly positive relationship with leadership effectiveness ($\beta = .31$, $p < .05$). While this finding is interesting, it should be treated tentatively because it did not emerge in the other analysis.

Figure 4

Interaction between structure and number of hours in predicting leader effectiveness
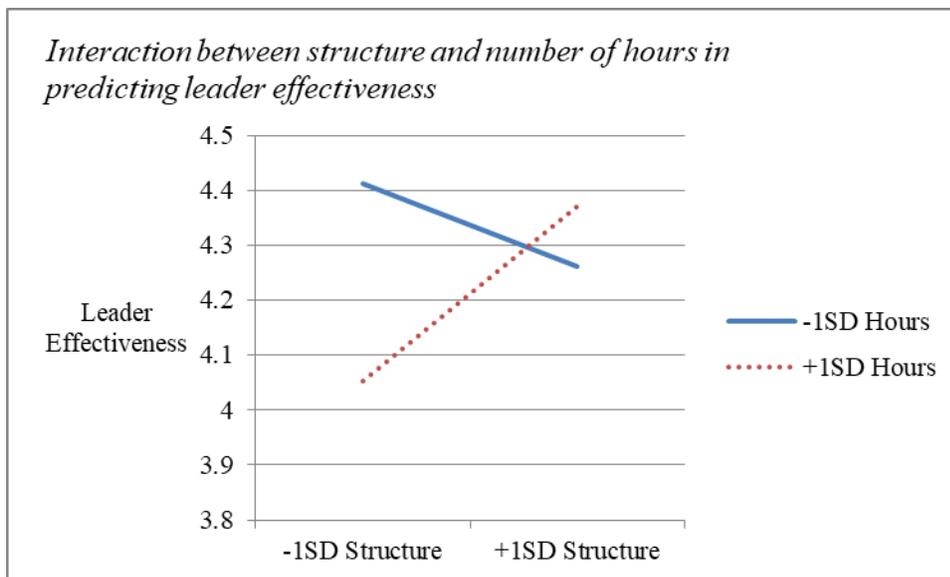
Since Hypothesis 3 built off of Hypothesis 2, the lack of support for moderation means that the moderation portion of Hypothesis 3 was not supported as well. However, the mediation part of Hypothesis 3 was still of interest and regression was used to test whether the dimensions of self-development quality mediated the relationship between transformational leadership and leader effectiveness. In order to test this multiple mediation model, the INDIRECT macro developed by Preacher and Hayes (2008) for SPSS was used. This macro allows the user to test for mediation using either the product-of-coefficients or bootstrapping strategy. Since bootstrapping is the superior method in most cases for assessing multiple mediation (Preacher & Hayes, 2008), attention will focused on the bootstrapping results for interpreting this analysis. All bootstrapping results were based off of 1,000 bootstrap samples. For this model, transformational leadership was entered as the predictor, the five dimensions of quality were entered as mediators, and leader effectiveness was entered as the outcome variable. The results of this analysis can be seen in Table 11. The results of this analysis suggest that the dimensions of leader self-development quality as a set do mediate the relationship between transformational leadership. The 95% confidence interval for the total indirect effect does not contain 0 (.0514, .2306). This provides support for the mediation portion of Hypothesis 3. This effect was further probed by examining which of the dimensions of quality were driving this effect. Again, upon examining the bootstrapped 95% confidence intervals, it appears that challenge (-.0669, -.0077) and content relevancy (.0737, .2288) were the only unique mediators because their confidence intervals did not contain 0. The regression weights were examined to assess the specific directions of the effects (see Table 12). Challenge negatively mediated the relationship such that it was positively predicted by transformational leadership ($B = .37$, $p < .05$), but then in turn had a negative relationship with leader effectiveness ($B = -.08$, $p < .05$). Again, this finding in

Table 11. Indirect effect of transformational leadership on leader effectiveness through the dimensions of leader self-development quality

	Point Estimate	*SE*	Bootstrap Estimate	BC 95% CI	
				Lower	Upper
Total	.1416	.0458	.1441	.0514	.2306
Challenge	-.0290	.0146	-.0292	-.0669	-.0077
Structure	-.0122	.0236	-.0103	-.0580	.0371
Learner Engagement	.0145	.0324	.0141	-.0453	.0784
Experiential Variety	.0210	.0178	.0206	-.0104	.0594
Content Relevancy	.1473	.0383	.1489	.0737	.2288

BC = Bias corrected; 1,000 bootstrap samples

Table 12. Regression coefficients for multiple mediation

Variable	TL to Quality			Quality to Effectiveness		
	Coefficient	SE	t	Coefficient	SE	t
Challenge	**.37**	.08	**4.68**	**-.08**	.04	**-2.21**
Structure	**.60**	.08	**7.29**	-.02	.04	-0.58
Learner Engagement	**.47**	.06	**8.29**	.03	.06	0.50
Experiential Variety	**.33**	.06	**5.25**	.06	.06	1.33
Content Relevancy	**.27**	.05	**5.53**	**.54**	.06	**9.08**

Bold values indicate *p* < .05
TL = Transformational Leadership

regards to challenge is in the opposite direction of what was hypothesized. On the other hand, content relevancy positively mediated the relationship such that transformational leadership was positively related to content relevancy (*B* = .27, *p* < .05) and content relevancy was positively related to leader effectiveness (*B* = .54, *p* < .05). Overall, Hypothesis 3 was partially supported.

Study 2 Discussion

As stated in the introduction, leader self-development research has great strides to make in order to know if leader self-development as a practice is a viable strategy and how its utility to develop leaders can be maximized. This study is a step in that direction and tried to answer questions

such as what aspects of leader self-development are the most important for developing effective leaders? And do situational factors, such as a leader's leader, play a role in the quality of leader self-development activities that leaders engage in? Examining these questions contributed to the literature on leader self-development in several ways and produced several notable insights.

The first contribution that this study made was that it shed some light on the relationship between leader self-development quantity and quality in predicting leader effectiveness. Overall, the results from this study suggest the quality of leader self-development activities plays a more important role than the sheer amount of leader self-development activities that leaders engage in. This finding has significant implications for both leadership researchers and leaders themselves. First of all, researchers should consider this when designing their research. Previous research in the field of self-development has predominantly concerned itself with examining the factors that are related to employees engaging in more self-development without considering the quality of these activities (e.g. Boyce et al., 2010; Maurer, Lippstreu & Judge, 2008). The point here is not to dismiss consideration of quantity in self-development research. On the contrary, researching quantity is extremely important because leaders cannot improve from self-development if they do not engage in it at all. However, the findings from this study suggest that researchers should give more thought in the future to studying self-development quality. Second, this finding has practical implications for leaders that use self-development as a strategy to develop as a leader. The fact that leader self-development quality seems to be more strongly related to leader effectiveness than self-development quantity means that leaders with a lack of free time do not have to worry about trying to engage in as much self-development as they possibly can. Instead, the results from this study suggest that leaders should take a more thoughtful approach and

ensure that they are engaging in high quality leader self-development activities, particularly those that are specifically designed to improve important leadership skills.

Another interesting finding for this study was the role of structure in predicting leader effectiveness. It was previously noted in the introduction to Study 1 that structure is an important instructional design attribute that people tend to respond differently to. In a self-development context, structure takes on a unique meaning not found in other learning related areas because by definition leaders get to choose what specific self-development activities they undertake. Therefore, leader self-development is unstructured until a leader engages in a specific activity. Once they choose an activity, then the activities can vary in the amount of structure that is present. Because of these unique conditions, it was unclear in the context of leader self-development if structure would be beneficial, detrimental, or either depending on other factors. The results from the present study suggest that structure may be beneficial for leader self-development activities, but the positive effect of structure might depend on other factors. Structure was positively related to leader effectiveness at the zero-order level, but not when it was included in a regression analysis along with the other dimensions of quality. Furthermore, the relationship between structure and leader effectiveness was found to depend on the number of hours that leaders reported engaging in self-development on a weekly basis. When leaders reported not spending much time on self-development on a weekly basis, structure was unrelated to leader effectiveness. However, when leaders reported spending more time on self-development every week, structure was positively related to leader effectiveness. This finding should be treated as tentative because it did not emerge with a different measure of quantity. However, these findings tend to suggest that structure tends to beneficial dimension of quality and may have a moderating impact.

Finally, another insight from this research was that the effect of transformational leadership on leader effectiveness was mediated by the dimensions of leader self-development quality. More specifically, it appeared from this analysis that the dimensions of challenge and content relevancy were the main contributors of this mediation effect when accounting for the other dimensions of quality. Although the effect of challenge was in the opposite direction of what was hypothesized again. More discussion will be given the challenge dimension of the scale in the general discussion. The finding that leader self-development quality mediates the relationship between transformational leadership and leader effectiveness should not be surprising given that transformational leadership has been linked with follower development in the past (e.g. Dvir et al., 2002). However, these findings still contribute to the literature because these are the first findings that suggest leader self-development quality can be influenced by something other than dispositional constructs.

Chapter 4 - General Discussion

The results of Study 1 and 2 individually have largely been discussed in their respective discussion sections. The discussion here turns to the results across both studies and what that means for the leader self-development quality scale that was put forth in this research. Afterwards, limitations of the studies and future directions will be discussed.

The main objective of this research was to create a reliable and valid self-report scale to measure the quality of leader self-development activities that leaders engage in. The results from both studies suggest this objective was mostly accomplished. As detailed already in the discussions for the specific studies, most of the dimensions exhibited sufficient levels of reliability and most of the results from item, factor, correlational, and regression analyses support the validity the scale. Overall, these results provide strong initial support for the utility of most of the scale and for the self-report method as being a viable alternative to Orvis & Ratwani's (2010) qualitative coding strategy for measuring leader self-development quality.

With this being said, the problems with the challenge dimension of the scale should not be overlooked. The scale was found to be unreliable in Study 1 and borderline unreliable in Study 2 if the .70 rule of thumb for alpha is used as the standard (Nunnaly & Bernstein, 1994). Furthermore, the measure of challenge was mostly unrelated to all of the constructs that it was hypothesized to be positively related to. In the cases where a significant relationship was found, it was often in the opposite direction of what was hypothesized or weak in magnitude. The exception to this pattern was that challenge was included in the confirmatory factor analysis models in Study 1 that suggested the five dimensions provided a good fit to the data and the positive relationship found between transformational leadership and challenge in Study 2. When synthesizing all of this evidence, it is not clear if the measure of challenge developed here is

actually a valid measure of challenge. For this reason, the scale should not be used in future research without further development and testing.

In these future efforts, a good place to start would be revisiting the conceptualization and definition of challenge as it relates to self-development activities. The definition of challenge used in this study was the degree that an activity is difficult and makes a leader exert effort in order to complete an activity. This conceptualization comes from research that is largely focused on the challenge of on-the-job experiences (e.g. DeRue & Wellman, 2009). While self-development can include on-the-job experiences, leaders also listed other non-performance based activities such as networking and reading. The concept of "being difficult" does not apply the same way to these activities as it does to on-the-job assignments that contain a performance aspect. Therefore, a good start for future research would be developing a conceptualization of challenge that applies equally as well to performance based activities (e.g. on-the-job assignments, training, college courses) and non-performance based activities (e.g. professional reading, networking, conferences). This change should result in a conceptualization that more accurately depicts challenge in a self-development context and would hopefully result in a more reliable and valid measure.

The issues with the challenge dimension also bring up challenges to the measurement of self-development quality and quantity in general. One of the main challenges when evaluating leader self-development is the extremely broad scope that this construct has. As stated earlier, leader self-development could encompass any form of leader development as long as it is initiated by the individual leader (Orvis & Ratwani, 2010). The data from this research suggests broad scope is not merely a definitional issue, but it reflected in the self-development of real-life leaders. Leaders listed engaging in an extremely wide variety of activities when asked to list

their self-development. This represents a challenge for the measurement of self-development

quality because each of the dimensions may not be as applicable to one type of activity as they

are others. This was already discussed as a potential reason for why the results for challenge

were not positive, but it could apply to other dimensions as well. For example, the learner

engagement dimension is thought to be comprised of a practice and feedback component.

However, there are self-development activities that do not lend themselves to practice

opportunities or feedback (e.g. reading), but are commonly thought of as important for

development.   So while the scales in this study are important and shown to be predictive of

leader effectiveness, researchers should take in mind that they are taking a very broad

perspective if the examine self-development in this manner. This is fine if their goals are to

examine self-development as a whole. However, if they are interested in examining more

specific questions, they should take a finer-grain approach.

Limitations and Future Directions

While this research had several interesting findings, the results and conclusions should be

interpreted in light of some limitations. The first limitation is in regards to the self-report nature

of the research. One of the concerns with this type of design is that it can result in common-

method bias, or relationships between variables being inflated because the data was collected the

same way. While there are researchers who argue that the effects of common-method bias are

often overstated (Spector, 2006), there are some things about this research that suggest common

method bias may not have had a strong influence. The primary reason from this research that

suggests common method bias was not prevalent is that there were variables measured with a

common method that are not related. If common method bias was prevalent in the data then all

variables measured in the same way should have a relationship due to the common method.

58

However, this was simply not the case in this research as several self-report variables were not related even with the large study samples. While common-method bias may not have been a serious problem in the current study, future research should still try to improve upon the efforts here and use multiple methods to collect data. One of the most obvious opportunities to build on these studies in future research would be to use a more objective method to measure leader effectiveness than the self-report method that was used here. There are many measures of leader effectiveness (see Hiller, DeChurch, Murase & Doty, 2011) like performance ratings or ratings on developmental 360° assessments which are more objective in nature that should be considered in future research. Self-report ratings of leader effectiveness are almost non-existent outside of research contexts, so using more objective measures would help build a business case for self-development as well as alleviate the potential confounding effect of common-method bias.

Another limitation that should be noted is the cross-sectional nature of the research. Because the research is cross-sectional, none of the results should be interpreted causally. The danger of making this mistake with the current research is most likely to happen when interpreting the mediation analysis because mediation is often thought to represent a causal process. In light of this, the results of the current study do not suggest that transformational leadership causes followers to engage in quality self-development activities that either detract (in the case of challenge) or enhance (in the case of content relevancy) their effectiveness as leaders. The results only suggest that this pattern is possible based on the data. Future research could improve on the current effort by using more longitudinal methods that increase the amount of confidence that can be put into causal statements.

While these limitations must be taken into account and there are problems with the challenge dimension that must be addressed, the results of this research have sparked some ideas

for research that could be fruitful in the future. One of these future directions is diving deeper into how people view self-development. One of the challenges of evaluating self-development that became clear in this research is that people have different views on what self-development means to them. For example, some people have a very integrated view of self-development and believe that self-development is part of their job and something they engage in on a regular basis. On the other hand, some people view self-development as something that happens outside of their work and relates to engaging in some type of event (ex. taking a course). This makes the evaluation of self-development very difficult because individuals did not have a common conceptualization of the construct. While this is a challenge, it presents a very interesting research opportunity if these differences in views can be captured and quantified. It would be very interesting to see what effect those differences in views have on different outcomes. For example, do people who think self-development refers to some event grow as much as others who think self-development is more integrated into their work and career? Are their performance differences between the two? These are just some of the many questions that could be asked in future research.

Another potential direction that future research could take is by taking a longer view of self-development than the current research took. In these studies, leaders were asked about their self-development over the past year. However, this time frame is extremely short when we consider that leader development occurs over the course of a leader's entire life (Day, 2011). Therefore, it might be beneficial to take a longer view and ask leaders about self-development experiences throughout their entire life. Furthermore, taking a longer view and potentially tracking the development of leaders over time would provide a more solid ground for future researchers to make causal conclusions on.

Finally, there are a plethora of strategies and methods for developing leaders in the field of leadership development but very little research that integrates these methods and examines more than one at a time. For example, there are studies that suggest that challenging experiences are the most effective ways to develop leaders (McCall, Lombardo, & Morrison, 1988) and studies that suggest leadership training is effective (Collins & Holton, 2004), but little research that integrates the two to offer guidance on what strategies are most effective in different situations. Future research and practice would be well served by taken a more integrated approach to researching leader development.

Conclusion

As one old proverb put it "The only constant is change." This is as true today as when it was first said, and organizations realize it. There is constant pressure for organizations and employees today to shift, change, and adapt to thrive in the marketplace. Due to this, organizations are looking to push learning and development to more informal sources that can be used to quickly meet these changing needs (Tannenbaum et al., 2010). One of these informal learning strategies is leader self-development. As a whole, the current research takes a deeper dive into this strategy by taking the initial step of creating a scale to measure the quality of leader self-development activities, finding evidence to suggest that the quality of activities is more important than the amount of activities for effective leadership, and by finding evidence that transformational leadership is related to engaging in quality leader self-development activities.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions* Sage
    Publications, Inc, Thousand Oaks, CA.

Arnold, A. K., Turner, N., Barling, J., Kelloway, K. E., & McKee, C. M. (2007). Transformational
    leadership and psychological well-being: The mediating role of meaningful work. *Journal of*
    Occupational Health Psychology, 12(3), 193–203.

Avolio, B. J., & Bass, B. M. (1995) *Multifactor Leadership Questionnaire Form 5x-Short.* Palo Alto,
    CA. Mind Garden.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological*
    Review, 84, 191–215.

Barling, J., Christie, A., & Hoption, C. (2011). Leadership. In S. Zedeck (Ed.), *APA handbook of*
    industrial and organizational psychology (vol. 1., pp. 183–240). Washington, DC: American
    Psychological Association.

Barling, J., Weber, T., & Kelloway, E. K. (1996). Effects of transformational leadership training on
    attitudinal and financial outcomes: A field experiment. *Journal of Applied Psychology*, 81(6),
    827–832. doi:10.1037//0021-9010.81.6.827

Bass, B. M. (1998). *Transformational leadership: Industrial, military, and educational impact*.
    Mahwah, NJ: Eribaum.

Betz, N. E., & Hackett, G. (1983). The relationship of mathematics self-efficacy expectations to the
    selection of science-based college majors. *Journal of Vocational Behavior*, 23, 329–345.

Bono, J. E., & Anderson, M. H. (2005). The advice and influence networks of transformational leaders.
    Journal of Applied Psychology, 90, 1306-1314.

Bono, J. E., & Judge, T. A. (2003). Self-concordance at work: Toward understanding the motivational

effects of transformational leaders. *Academy of Management Journal*, 46(5), 554–571.

Boyce, L. A., Zaccaro, S. J., & Wisecarver, M. Z. (2010). Propensity for self-development of leadership

attributes: Understanding, predicting, and supporting performance of leader self-development.

The Leadership Quarterly, 21(1), 159–178. doi:10.1016/j.leaqua.2009.10.012

Bycio, P., Hackett, R. D., & Allen, J. S. (1995). Further assessments of Bass's (1985) conceptualization

of transactional and transformational leadership. *Journal of Applied Psychology*, *80*, 468-478.

Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and

programming* (2nd ed.) Routledge/Taylor & Francis Group, New York, NY.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-

multimethod matrix. *Psychological Bulletin*, 56(2), 81–105. doi:10.1037/h0046016

Chan, K. Y., & Drasgow, F. (2001). Toward a theory of individual differences and leadership:

Understanding the motivation to lead. *Journal of Applied Psychology*, 86, 481-498.

Collins, D. B., & Holton, E. F. (2004). The effectiveness of managerial leadership development

programs: A meta-analysis of studies from 1982 to 2001. *Human Resource Development

Quarterly, 15*(2), 217-248.

Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of

Applied Psychology*, *78*(1), 98−104.

Courtright, S. H., Colbert, A. E., & Choi, D. (2014) Fired up or burned out? How developmental

challenge differentially impacts leader behavior. *Journal of Applied Psychology, 99*(4), 681-696.

Costa, P. T., & McCrae, R. R. (1992). *NEO-PI-R and NEO-FFI professional manual*. Odessa, FL:

Psychological Assessment Resources.

Crocker, L., & Algina, J. (1986). *Introduction to classical and modern test theory*. New York: Holt, Rinehart, and Winston.

Day, D. V. (2000). Leadership development: A review in context. *The Leadership Quarterly*, 11(4), 581–613. doi:10.1016/S1048-9843(00)00061-8

Day, D. V. (2011). Integrative perspectives on longitudinal investigations of leader development: From childhood through adulthood. *The Leadership Quarterly, 22*(3), 561-571.

Day, D. V., & Dragoni, L. (2015). Leadership development: An outcome-oriented review based on time and levels of analyses. *The Annual Review of Organizational Psychology and Organizational Behavior*, 2, 133-156.

Day, D. V., Fleenor, J. W., Atwater, L. E., Sturm, R. E., & McKee, R. A. (2014). Advances in leader and leadership development: A review of 25 years of research and theory. *The Leadership Quarterly*, 25(1), 63–82. doi:10.1016/j.leaqua.2013.11.004

Denison, D. R., Hooijberg, R., & Quinn, R. E. (1995). Paradox and performance: Toward a theory of behavioral complexity in managerial leadership. *Organization Science*, 6(5), 524–540.

Department of the Army. (2012) *Army Doctrine Publication 6-22, Army Leadership.* Washington, D.C.: Headquarters, Department of the Army.

DeRouin, R. E., Fritzsche, B. A., & Salas, E. (2004). Optimizing e-learning: Research-based guidelines for learner-controlled training. *Human Resource Management*, 43(2-3), 147–162. doi:10.1002/hrm.20012

DeRue, D. S., Nahrgang, J. D., Hollenbeck, J. R., & Workman, K. (2012). A quasi-experimental study of after-event reviews and leadership development. *Journal of Applied Psychology*, 97(5), 997-1015.

DeRue, D. S., & Wellman, N. (2009). Developing leaders via experience: The role of developmental

challenge, learning orientation, and feedback availability. *Journal of Applied Psychology*, 94(4),

859–875. doi:10.1037/a0015317

DeShon, R. P., & Gillespie, J. Z. (2005). A motivated action theory account of goal orientation. *Journal*

of Applied Psychology, 90(6), 1096–1127. doi:10.1037/0021-9010.90.6.1096

DeSimone, J. A., Harms, P. D., & DeSimone, A. J. (2015). Best practice recommendations for data

screening. *Journal of Organizational Behavior*, 36, 171–181.

DeVellis, R. F. (2012). *Scale development: Theory and applications* (3rd ed.) Thousand Oaks, CA:

SAGE Publications, Inc.

Donovan, J., & Benko, C. (2016). AT&T's talent overhaul. *Harvard Business Review.* Retrieved

September 26, 2016, from https://hbr.org/2016/10/atts-talent-overhaul.

Dragoni, L., Oh, I.-S., Vankatwyk, P., & Tesluk, P. E. (2011). Developing executive leaders: The

relative contribution of cognitive ability, personality, and the accumulation of work experience in

predicting strategic thinking competency. *Personnel Psychology*, 64, 829–864.

Dragoni, L., Tesluk, P. E., Russel, J. E. A., & Oh, I.-S. (2009). Understanding managerial development:

Integrating developmental assignments, learning orientation, and access to developmental

opportunities in predicting managerial competencies. *Academy of Management Journal*, 52(4),

731–743.

Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (2002). Impact of transformational leadership on

follower development and performance: A field experiment. *The Academy of Management*

Journal, 45(4), 735–744.

Ellinger, A. D. (2004). The concept of self-directed learning and its implications for human resource development. *Advances in Developing Human Resources*, 6(2), 158–177. doi:10.1177/1523422304263327

Elliott, E. S., & Dweck, C. S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology*, 54(1), 5–12. doi:10.1037/0022-3514.54.1.5

Erez, A., & Judge, T. A. (2001). Relationship of core self-evaluations to goal setting, motivation, and performance. *Journal of Applied Psychology*, 86(6), 1270–1279. doi:10.1037/0021-9010.86.6.1270

Goldstein, I. L., & Ford, K. (2001). *Training in organizations: Needs assessment, development, and evaluation* (4th ed.). Cengage Learning.

Grant, H., & Dweck, C. S. (2003). Clarifying achievement goals and their impact. *Journal of Personality and Social Psychology*, 95(3), 541–553. doi:10.1037/0022-3514.85.3.541

Hardy, Q. (2016). Gearing up for the cloud, AT&T tells its workers: Adapt, or else. *The New York Times*. Retrieved May 10, 2016, from http://www.nytimes.com/2016/02/14/technology/gearing-up-for-the-cloud-att-tells-its-workers-adapt-or-else.html?_r=0.

Harter, S. (1990). Causes, correlates, and the functional role of global self-worth: A life span perspective. In Sternberg, R. J., & Kolligan, J. Jr. (Eds.), *Competence considered* (p. 67-97). New Haven: Yale University Press.

Hiller, N. J., DeChurch, L. A., Murase, T., & Doty, D. (2011). Searching for Outcomes of Leadership: A 25-Year Review. *Journal of Management*, 37(4), 1137–1177. doi:10.1177/0149206310393520

Hinkin, T. R. (1995). A review of scale development practices in the study of organizations. *Journal of Management*, 21(5), 967–988. doi:10.1016/0149-2063(95)90050-0

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.

Johnson, J. A. (2014). Measuring thirty facets of the Five Factor Model with a 120-item public domain inventory: Development of the IPIP-NEO-120. *Journal of Research in Personality*, 51, 78–89. doi:10.1016/j.jrp.2014.05.003

Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluation traits−self-esteem, generalized self-efficacy, locus of control, and Emotional Stability−with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology, 86*, 80-92.

Judge, T. A., Bono, J. E., & Locke, E. A. (2000). Personality and job satisfaction: The mediating role of job characteristics. *Journal of Applied Psychology*, 85(2), 237–249. doi:10.1037//0021-9010.85.2.237

Judge, T. A., Colbert, A. E., & Ilies, R. (2004). Intelligence and leadership: A quantitative review and test of theoretical propositions. *Journal of Applied Psychology*, 89(3), 542–552. doi:10.1037/0021-9010.89.3.542

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2003). The core self-evaluations scale: Development of a measure. *Personnel Psychology*, 56(2), 303–331. doi:10.1111/j.1744-6570.2003.tb00152.x

Kanfer, R., Wanberg, C. R., & Kantrowitz, T. M. (2001). Job search and employment: A personality-motivational analysis and meta-analytic review. *Journal of Applied Psychology*, 86(5), 837–855. doi:10.1037/0021-9010.86.5.837

Langkamer, K. L. (2008). *Development of a nomological net surrounding leader self-development*. George Mason University: Unpublished doctoral dissertation.

LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 Questions About Interrater Reliability and Interrater Agreement. *Organizational Research Methods*, 11(4), 815–852. doi:10.1177/1094428106296642

Lester, P. B., Hannah, S. T., Harms, P. D., Vogelsang, G. R., & Avolio, B. J. (2011) Mentoring impact on leader efficacy development: A field experiment. *Academy of Management Learning and Education*, 10(3), 409-429.

Li, W., Arvey, R. D., & Song, Z. (2011). The influence of general mental ability, self-esteem and family socioeconomic status on leadership role occupancy and leader advancement: The moderating role of gender. *The Leadership Quarterly*, 22(3), 520–534. doi:10.1016/j.leaqua.2011.04.009

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice Hall.

Locke, E. A., McClear, K., & Knight, D. (1996). Self-esteem and work. *International Review of Industrial/Organizational Psychology, 11*, 1-32.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149. doi:10.1037/1082-989X.1.2.130

Major, D. A., Turner, J. E., & Fletcher, T. D. (2006). Linking proactive personality and the Big Five to motivation to learn and development activity. *Journal of Applied Psychology*, 91(4), 927–935. doi:10.1037/0021-9010.91.4.927

Maurer, T. J., Lippstreu, M., & Judge, T. A. (2008). Structural model of employee involvement in skill development activity: The role of individual differences. *Journal of Vocational Behavior, 72*(3), 336-350.

Maurer, T. J., Mitchell, D. R. D., & Barbeite, F. G. (2002). Predictors of attitudes toward a 360-degree

    feedback system and involvement in post-feedback management development activity. *Journal*

    of Occupational and Organizational Psychology, 75(1), 87–107. doi:10.1348/096317902167667

Maurer, T. J., Weiss, E. M., & Barbeite, F. G. (2003). A model of involvement in work-related learning

    and development activity: The effects of individual, situational, motivational, and age variables.

    Journal of Applied Psychology, 88(4), 707–724. doi:10.1037/0021-9010.88.4.707

McCall, M. W., Lombardo, M. M., & Morrison, A. M. (1988). *The lessons of experience: How*

    successful executives develop on the job. Lexington, MA: Lexington Books.

McCauley, C. D., Kanaga, K., & Lafferty, K. (2010). Leader development systems. In E. Van Velsor, C.

    D. McCauley, & M. Ruderman (Eds.), *The Center for Creative Leadership: Handbook of*

    leadership development (3rd ed., pp. 29–61). Jossey-Bass.

McCauley, C. D., Ruderman, M. N., Ohlott, P. J., & Morrow, J. E. (1994). Assessing the developmental

    components of managerial jobs. *Journal of Applied Psychology*, 79(4), 544–560.

    doi:10.1037/0021-9010.79.4.544

McCauley, C. D., Van Velsor, E., & Ruderman, M. (2010). Introduction: Our view of leadership

    development. In E. Van Velsor, C. D. McCauley, & M. Ruderman (Eds.), *The Center for*

    Creative Leadership: Handbook of leadership development (3rd ed., pp. 1–26). Jossey-Bass.

Messick, S. (1995). Validity of Psychological Assessment: Validation of inferences from persons'

    responses and performances as scientific inquiry into score meaning. *American Psychologist*,

    50(9), 741–749.

Mullen, J. E., & Kelloway, E. K. (2009). Safety leadership: A longitudinal study of the effects of

    transformational leadership on safety outcomes. *Journal of Occupational and Organizational*

    Psychology, 82(2), 253–272. doi:10.1348/096317908X325313

Mumford, M. D., Zaccaro, S. J., Harding, F. D., Jacobs, T. O., & Fleishman, E. A. (2000). Leadership skills for a changing world: Solving complex social problems. *Leadership & Organization Development Journal*, 11(1), 11–35.

Noe, R. A., Clarke, A. D. M., & Klein, H. J. (2014). Learning in the Twenty-First-Century Workplace. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 245–275. doi:10.1146/annurev-orgpsych-031413-091321

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

O'Toole, J., & Lawler, E. E. (2006). *The new American workplace*. New York, NY: Palgrave MacMillan.

Orvis, K. A. (2007). *Supervisory performance feedback as a catalyst for high quality employee self-development*. George Mason University: Unpublished doctoral dissertation.

Orvis, K. A., & Ratwani, K. L. (2010). Leader self-development: A contemporary context for leader development evaluation. *The Leadership Quarterly*, 21(4), 657–674. doi:10.1016/j.leaqua.2010.06.008

Oswald, F. L., & Hough, L. M. (2011). Personality and its assessment in organizations: Theoretical and empirical developments. In S. Zedeck (Ed.), *APA handbook of industrial and organizational psychology*, Vol. 2: Selecting and developing members for the organization (pp. 153–184). Washington, DC: American Psychological Association.

Ottinger, R. (2013). Disrupt or be disrupted. *Forbes*. Retrieved May 10, 2016, from http://www.forbes.com/sites/johnkotter/2013/04/03/how-to-lead-through-business-disruption/#3f06892070b6

Parker, S. K., Bindl, U. K., & Strauss, K. (2010). Making things happen: A model of proactive motivation. *Journal of Management,* 36(4), 827-856. doi:10.1177/0149206310363732

Piccolo, R. F., & Colquitt, J. A. (2006). Transformational leadership and job behaviors: The mediating role of core job characteristics. *Academy of Management Journal*, 49(2), 327–340.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879-891.

Pulakos, E. D., Arad, S., Donovan, M. A., & Plamondon, K. E. (2000). Adaptability in the workplace: Development of a taxonomy of adaptive performance. *Journal of Applied Psychology*, 85(4), 612–624. doi:10.1037//0021-9010.85.4.612

Quigley, N. R. (2013). A longitudinal, multilevel study of leadership efficacy development in MBA teams. *Academy of Management Learning & Education*, 12(4), 579-602.

Reichard, R. J., & Johnson, S. K. (2011). Leader self-development as organizational strategy. *The Leadership Quarterly*, 22(1), 33–42. doi:10.1016/j.leaqua.2010.12.005

Rock, A. D., & Garavan, T. N. (2006). Reconceptualizing developmental relationships. *Human Resource Development Review*, 5(3), 330–354. doi:10.1177/1534484306290227

Rotter. J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*.

Salas, E., & Cannon-Bowers, J. A. (2001). The science of training: a decade of progress. *Annual Review of Psychology*, 52, 471–499. doi:10.1146/annurev.psych.52.1.471

Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2012). The science of training and development in organizations: What matters in practice. *Psychological Science in the Public Interest*, 13(2), 74–101. doi:10.1177/1529100612436661

Schmidt, A. M., & Ford, J. K. (2003). Learning within a learner control training environment: The

    interactive effects of goal orientation and metacognitive instruction on learning outcomes.

    Personnel Psychology, 56(2), 405–429. doi:10.1111/j.1744-6570.2003.tb00156.x

Seifert, C. F., & Yukl, G. (2010). Effects of repeated multi-source feedback on the influence behavior

    and effectiveness of managers: A field experiment. *The Leadership Quarterly*, 21(5), 856–866.

    doi:10.1016/j.leaqua.2010.07.012

Seifert, C. F., Yukl, G., & McDonald, R. A. (2003). Effects of multisource feedback and a feedback

    facilitator on the influence behavior of managers toward subordinates. *Journal of Applied*

    Psychology, 88(3), 561–569. doi:10.1037/0021-9010.88.3.561

Spector, P. E. (2006). Method variance in organizational research: Truth or urban

    legend? *Organizational Research Methods, 9*(2), 221-232.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Allyn & Bacon.

Tannenbaum, S. I. (1997). Enhancing continuous learning: Diagnostic findings from multiple

    companies. *Human Resource Management*, 36(4), 437–453.

Tannenbaum, S. I., Beard, R. J., McNall, L. A., & Salas, E. (2010). Informal learning and development

    in organizations. In S. W. J. Kozlowski & E. Salas (Eds.), *Learning, training, and development*

    in organizations (pp. 303–331). New York, NY: Routledge/Taylor & Francis Group.

VandeWalle, D. (1997). Development and validation of a work domain goal orientation instrument.

    Educational and Psychological Measurement, 57(6), 995–1015. doi:10.1177/1056492611432802

VandeWalle, D., Cron, W. L., & Slocum, J. W. (2001). The role of goal orientation following

    performance feedback. *Journal of Applied Psychology*, 86(4), 629–640. doi:10.1037/0021-

    9010.86.4.629

VandeWalle, D., & Cummings, L. L. (1997). A test of the influence of goal orientation on the feedback-seeking process. *Journal of Applied Psychology*, 82(3), 390–400.

Yukl, G. (2012). Effective leadership behavior: What we know and what questions need more attention. *Academy of Management Perspectives*, 26(4), 66–85.

Yukl, G., Gordon, A., & Taber, T. (2002). A hierarchical taxonomy of leadership behavior: Integrating a half century of behavior research. *Journal of Leadership and Organizational Studies*, 9(1), 15–32. doi:10.1177/107179190200900102

Appendix A - Scales for Study 1

Leader Self-Development Quality Items-

Instructions-

In this section, we want to learn about your participation in self-development activities. A self-development activity is a **<u>voluntary</u>** activity that you deliberately performed for the purpose of learning something new for your job or improving your job skills or knowledge. Self-development activities are **<u>NOT mandatory or required</u>** by your organization or supervisor, but are instead initiated by **<u>you</u>**.

<u>Leader</u> self-development activities are self-development activities that are meant to develop skills that are important in your role as a leader. Your job requires you to continually lead; think about what skills you need to do this. Any activity that you engage in to further those skills would be considered leader self-development. To help you get started, we have provided a list of common categories of leader self-development. The list includes: professional reading, skill development (e.g. communication skills), networking, conferences/seminars/professional meetings, college courses, continuing education courses, and work assignments. This list is not meant to be exhaustive, but rather give you some ideas to get started.

Think back over the past year, we are interested in any deliberate, yet voluntary effort you made to develop **<u>leadership skills</u>** that will be helpful for your job. In the space provided below, please list all of the **<u>leader self-development activities</u>** that you participated in during this time period. For each activity, first use the options in the table below to indicate what kind of self-development you performed. Then, provide more details to give us a better idea of what you did specifically. For example, if you indicate the activity was "Professional reading," please tell us what you read.

Type of activity-	Details-
The list of different activities from the above paragraph will be here for them to choose from.	

1. During the past year, how many hours (on average) would you say you spent on **leader** self-development every week?

2. Across all of the activities that you just listed, which one would you say has had the most **impact** on your development as a leader?

    a. Why did you choose this specific activity

    b. From start to finish, how many total hours did you spend on this activity?

Next, we would like you to respond to some survey items about the **whole set** of leader self-development activities that you listed. Please use the scale provided (5-point scale; Strongly Disagree—Strongly Agree) to indicate how strongly you agree or disagree with the following statements.

Content Relevancy-
These activities were intended to help me learn how to…

1. …lead (motivate, inspire, and influence) followers to achieve organizational objectives.
2. …build trust with my followers.
3. …influence people beyond my direct control.
4. …lead by example.
5. …communicate effectively.
6. …foster a positive climate (teamwork, cohesion, cooperation, and loyalty) in my team.
7. …develop my capabilities to stay prepared for demands that I will face as a leader.
8. …facilitate ongoing development within my team.
9. …manage my team in order to achieve organizational goals.
10. …be a better professional

Challenge-
11. I usually have to exert effort to complete these activities.

12. The activities that I engaged in required me to try hard in order to complete them and do well.
13. The activities that I engaged in put me out of my comfort zone.
14. I had to redo or get help in order to perform some of the activities because of how difficult they were.

Learner Engagement-
15. These activities required me to practice a lot.
16. In the activities that I engaged in, I generally just took in information without having to apply it (R).
17. In the activities that I engaged in, I applied what I was learning as I was learning it.
18. I had many opportunities to practice what I was learning in these activities.
19. It was fairly normal to be assessed on my learning or skill in the activities that I was engaged in.
20. I understood my strengths and weaknesses because of the feedback that I received in these activities.
21. The feedback that I received in these activities allowed me to see how far I had progressed in developing a certain skill.
22. It was unusual for me to receive feedback on my strengths and weaknesses in these activities(R).

Structure-
23. The activities that I engaged generally had a set structure for how much time would be spent on each step of the activity.
24. The activities that I engaged in usually had a defined series of steps to go through to complete the activity.
25. The activities that I engaged in generally had a set structure for what was going to be covered.
26. The activities that I engaged in were usually very structured.

Experiential Variety-
27. I engaged in a wide variety of activities.
28. Some of the activities that I engaged in were very different from each other.
29. The activities that I engaged in were presented in a variety of ways.
30. The method through which information was conveyed in these activities (ex. books, lectures, experience, etc.) usually varied from activity to activity.

Next, we would like you to respond to another set of survey items concerning the leader self-development activity you listed above as **having the most impact on your development as a leader**. Please use the provided 5-point scale (Strongly disagree to strongly agree) to indicate how strongly you disagree or agree with the following statements.

Content Relevancy-
This activity was intended to help me learn how to…

1. …lead (motivate, inspire, and influence) followers to achieve organizational objectives.
2. …build trust with my followers.
3. …influence people beyond my direct control.
4. …lead by example.
5. …communicate effectively.
6. …foster a positive climate (teamwork, cohesion, cooperation, and loyalty) in my team.
7. …develop my capabilities to stay prepared for demands that I will face as a leader.
8. …facilitate ongoing development within my team.
9. …manage my team in order to achieve organizational goals.
10. …be a better professional

Challenge-
1. I had to exert effort to complete this activity.
2. This activity put me out of my comfort zone.
3. I had to redo or get help in order to perform some of the activity because of how difficult it was.
4. This activity required me to try hard in order to complete it and do well.

Learner Engagement-
1. The feedback that I received in this activity allowed me to see how far I had progressed in developing a certain skill.
2. I understood my strengths and weaknesses because of the feedback that I received in this activity.
3. It was normal to be assessed on my learning or skill in this activity.
4. I had many opportunities to practice what I was learning as part of this activity.
5. It was unusual for me to receive feedback on my strengths and weaknesses in this activity. (R)
6. In this activity, I took in information without having to apply it. (R)
7. In this activity, I applied what I was learning as I was learning it.
8. This activity required me to practice.

Structure-
9. This activity was structured.
10. This activity had a set structure for what was going to be covered.
11. This activity had a set structure for how much time would be spent on each step of the activity.
12. This activity had a defined series of steps to go through to complete the activity.

Core Self-Evaluations (Judge et al., 2003)-

1. I am confident I get the success I deserve in life.
2. Sometimes I feel depressed (R).
3. When I try, I generally succeed.
4. Sometimes when I fail I feel worthless (R).
5. I complete tasks successfully.
6. Sometimes, I do not feel in control of my work (R)
7. Overall, I am satisfied with myself.
8. I am filled with doubts about my competence (R).
9. I determine what will happen in my life.
10. I do not feel in control of my success in my career (R).
11. I am capable of coping with most of my problems.
12. There are times when things look pretty bleak and hopeless to me (R).

Leadership Efficacy (Quigley, 2013)-

1. I have a high degree of confidence in my ability to steer a team in a successful direction.
2. I have a high degree of confidence in my ability to get a team to develop viable strategies.
3. I have a high degree of confidence in my ability to inspire others on a team to be motivated to do well.
4. I have a high degree of confidence in my ability to build a team's sense of spirit and cohesiveness.
5. I have a high degree of confidence in my ability to get the people on a team to be excited about working together.

Learning Goal Orientation (VandeWalle, 1997)-

1. I am willing to select a challenging work assignment that I can learn a lot from.
2. I often look for opportunities to develop new skills and knowledge.
3. I enjoy challenging and difficult tasks at work where I'll learn new skills.
4. For me, development of my work ability is important enough to take risks.
5. I prefer to work in situations that require a high level of ability and talent.

Self-Efficacy for Self-Development (Maurer et al., 2002, 2003; Orvis, 2007)-

1. I can increase my job knowledge or skills beyond their current levels by performing self-development activities.
2. My performance on the job could be improved by participating in self-development activities
3. I feel confident in my ability to successfully improve my job knowledge or skills by performing self-development activities.

Agreeableness (Goldberg, 1992)-

1. I am interested in people.
2. I sympathize with others' feelings.
3. I am not really interested in others (R).
4. I have a soft heart.
5. I insult people (R).
6. I take time out for others.
7. I feel others' emotions.
8. I am not interested in other people's problems (R).
9. I make people feel at ease.
10. I feel little concern for others (R).

Warmth and Gregariousness facets of Extraversion (Johnson, 2014)-

Warmth-

1. Make friends easily
2. Feel comfortable around people
3. Avoid contact with others (R)
4. Keep others at a distance (R)

Gregariousness-

1. Love large parties
2. Talk to a lot of different people at parties
3. Prefer to be alone (R)
4. Avoid crowds (R)

Demographics-

1. What is your gender?:   Male   Female
2. What is your age?: _____
3. Rank: _____
4. What is your current marital status?:
   a. Single
   b. Currently Married
   c. Separated/Divorced/Widowed
5. How many dependents under the age of 18 lived with you at home during the past year?_____
6. How many hours a week did you work on average during the past year? _____
7. What is your current job title?
8. What type of industry do you work in?
9. Do you currently supervise a team?
How many people are on the team that you manage?

Appendix B - Scales for Study 2

Transformational Leadership (Avolio & Bass, 1995) – Items not included because of proprietary nature of scale

Leader Self-Development Quality-

- Used the scale developed in Study 1

Leader Self-Development Quantity-

1. During the past year, how many hours (on average) would you say you spent on leader self-development every week?
2. From start to finish, how many hours did you spend on this activity (referring to the activity they listed as the one having the most impact on their development)?

Leader Effectiveness (Avolio & Bass, 1995) – Items not included because of proprietary nature of scale

Demographics-

1. What is your gender?:   Male   Female
2. What is your age?: _____
3. Rank: _____
4. What is your current marital status?:
    a. Single
    b. Currently Married
    c. Separated/Divorced/Widowed
5. How many dependents under the age of 18 lived with you at home during the past year?____
6. How many hours a week did you work on average during the past year? _____
7. What is your current job title?
8. What type of industry do you work in?
9. Do you currently supervise a team?
10. How many people are on the team that you manage?