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## REFLECTING ON EXPERIENCE FOR LEADERSHIP DEVELOPMENT

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REFLECTING ON EXPERIENCE FOR LEADERSHIP DEVELOPMENT

by

Adrian Y.L. Chan

A DISSERTATION

Presented to the Faculty of

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For the Degree of Doctor of Philosophy

Major: Interdepartmental Area of Business (Management)

Under the Supervision of Professor Fred Luthans

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# REFLECTING ON EXPERIENCE FOR LEADERSHIP DEVELOPMENT

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University of Nebraska, 2010

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This study proposes that being reflective or ruminative about one's leadership experience can have differential effects on one's leadership efficacy, implicit leadership theories and psychological capital. Specifically, through the aid of an event history calendar, conscript military trainees of high and low military experience from a SE Asian military organization were randomly assigned to recall and reflect or ruminate on his past leadership experience. Results show that type of reflection interacts with level of military leadership experience to differentially affect one's leadership efficacy, implicit leadership theories and leadership self-awareness. Reflection triggers produced significantly higher levels of implicit leadership theories under both low and high leadership experience conditions. In the low leadership experience condition, reflection triggers resulted in higher levels of leadership efficacy and leadership self-awareness but was not significant. On the other hand, in the high leadership experience condition, the reflection triggers performed significantly worse than the rumination triggers. Implications for the findings are discussed.

## Dedication

In the course of completing this dissertation, I had to justify for time off from work; fight for funding; navigate the trickiness of getting this dissertation done from across the oceans; fight bureaucracy for access to data; overcome cynicism over the value of this dissertation, first from others, and occasionally, from demons within; learn to read without depth perception as I adapt to being afflicted with Bells Palsy; learn to walk on crutches as I endured though having ACL reconstruction done while in the States; juggle between conflicting role responsibilities as a researcher, academic, military officer, son, husband, father, often not in that order or more often than not, all at once. But to stop here would have been to stay ruminative.

I also had the privilege of experiencing the joys of fatherhood, as I watch my children grown up as true daughters and sons of Nebraska; fret over their adjustment (no playgrounds!) to Singapore; experience the unflagging love and devotion of my wife as she, having gone through the dissertation process years ahead of me, has been honed by that process to be far wiser and infinitely more patient than I could ever be being still in the situation. Most importantly, I dedicate this dissertation to God, for whom nothing which is accomplished by human hands means anything, and anything accomplished by His hands reap infinitely richer rewards, some of which are appreciated now through human eyes, while others can only be redeemed at the appropriate time when our finite wisdom attains His holy foolishness. As such, I dedicate this dissertation to God, my wife and my children.

## **Acknowledgement**

I thank Prof Bruce Avolio for having triggered in me this wonderful madness to pursue a PhD at a time when I was happily settled in my military career. Most jolts are dislocating at the start, but when carefully negotiated, they produce a rich reward. Having worked with Bruce is one such reward.

I thank Prof Fred Luthans for chairing my dissertation committee. My style of working is discomfoting, as I tend to trek into the academic underbrush on my own for long periods without keeping him informed. The best thing about Fred is his wonderful sense of pragmatism that keeps me anchored, and his sense of completion that enables me to pull through and get this done at the moment where it mattered. Without Fred, I'd still be floundering in the underbrush!

I thank Profs Mary Uhl-Bien and Peter Harms. Between them, they weighed in with solid comments to challenge me to greater professional standards. They represent for me the exacting standards that all aspiring scholars should uphold. From them I have learnt that to become the respected members of the academic community that they are, one must sweat the small stuff, must not compromise on the right stuff, and must be made of sterner stuff than all that life can throw at you. Thank you Mary, thank you Peter!

Lastly, I thank Prof Cal Garbin over at the Psychology Dept. He started me on the road to loving research methods and stats that have stood me well, whether it is for this dissertation or for my future endeavors. I hope he continues to spread the love for a long, long time!

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## REFLECTING ON EXPERIENCE FOR LEADERSHIP DEVELOPMENT

*“The cloak of the past is cut from patches of feeling, and sewn with rebus threads. Most of the time, the best we can do is wrap it around ourselves for comfort or drag it behind us as we struggle to go on. But everything has its cause and its meaning. Every life, every love, every action and feeling and thought has its reason and significance; its beginning, and the part it plays in the end. Sometimes we do see. Sometimes, we see the past so clearly, and read the legend of its parts with such acuity, that every stitch of time reveals its purpose, and a kind of message is enfolded in it. Nothing in any life, no matter how well or poorly lived, is wiser than failure or clearer than sorrow. And in the tiny, precious wisdom that they give to us, even those dread and hated enemies, suffering and failure, have their reason and their right to be.”*

- ‘Shantaram’, pg 871-872 (Gregory David Roberts)

CHAPTER 1: INTRODUCTION TO THE DISSERTATION

## REFLECTING ON EXPERIENCE FOR LEADERSHIP DEVELOPMENT

### **Chapter 1: Introduction to the dissertation**

The purpose of this dissertation is to explore how adaptive versus ruminative ways of reflecting on past experience can influence either better or poorer ways of conceptualizing one's leadership, of being more or less well-developed in one's naïve theories about leadership, becoming more or less efficacious regarding one's ability to lead, and higher or lesser levels of psychological capital.

#### **Rationale of current research**

Why should one be concerned about how leaders reflect on past experience? There are several reasons why this research is of value to the leadership development domain.

Firstly, operationalizing leadership experience merely in terms of traditional demographic variables such as tenure and supervisory experience is insufficient. Rather, this dissertation proposes that the value in having these experiences lies in how such experiences are influenced by reflection for better leadership outcomes.

Secondly, while it is intuitive that reflection is important for leadership development, and indeed features in many leadership development efforts, exactly how this reflection is done is left very much to the imagination of the LD practitioner or leader. Does it make a difference if the reflection is ruminative, focused on self, or focused on problem-solving?

In line with the research aims of the present dissertation, there are several related issues that will also be explored. Firstly, what constitutes relevant experience, especially when selecting for leaders who are expected to lead in novel situations with ill-defined problem parameters, e.g. in creative environments or situations with conflicts of interests that are not clear? What experience has developmental potential? In a training context, are the experiences designed by trainers for development interpreted and processed in a similar fashion by the intended trainees?

The second issue concerns the processes by which leaders can reframe past experience for leadership development. The issue of relevant experience is turned on its head – what if experience is controlled while allowing how the experience is processed to vary? Can one generate new leadership insight simply by varying the way these past experiences have been processed?

Obviously, not all the research questions raised above can be adequately addressed in any single study. Nonetheless, these questions provide a peek into the line of inquiry in the research agenda of which this dissertation is a part of. If indeed the way leaders reflect on past experience can make them better leaders, then this in itself is a worthy outcome.

Another potential contribution of this dissertation is to help achieve a better understanding and application of reflection for leadership development. Reflection represents a cost-efficient means of leadership development that promises high return on development (ROD) for organizations. Through reflection, no expensive training investment is needed as the ‘raw materials’ for development is already available and present in the leaders - all it takes is a better way of processing these experiences.

Finally, by reflecting on existing experiences, this dissertation promotes leadership development to be self-sustaining, since these experiences are available to leaders to process at their own pace. In addition, leader selection may be improved with the new insight into how, why and under what conditions leadership experience is useful.

### **Research Aims**

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Insert Figure 1 Here  
-----

Refer to Figure 1. This dissertation seeks to demonstrate empirical linkages between leadership experience, implicit leadership theories, leadership efficacy, self-awareness and psychological capital. Firstly, the literature is reviewed to examine the impact of leadership experience on leadership development and performance, broadly operationalized as encapsulating psychological capital, leadership efficacy, leader self-awareness and leader implicit theories of leadership. An observation derived from this review is that on its own, leadership experience does not adequately explain variations in leadership development and performance. An approach taken by some scholars to address this limitation was to identify situations and moderating variables which help to examine how leadership experience predicts leadership development and performance more adequately. This approach continues to assume a direct causal relationship between type and nature of past leadership experience and future leadership development and performance.

The approach taken by this dissertation is to propose an alternative model that focuses on processes that transform leadership experience. This presumes the mediational

role of reflection between past leadership experience and future leadership development and performance, moderated by different types of reflection.

In this process model, leadership experience provides the raw materials; reflection helps transform the experience into insights. High quality reflections help a leader feel more self-aware and self-confident as a leader. The insights themselves may contribute to greater psychological capacities for future leadership performance.

In addition, this dissertation distinguishes between two types of reflection – adaptive and maladaptive. The terms ‘adaptive’ and ‘maladaptive’ are descriptors derived from the clinical psychology literature (see review section later). The process of adaptive reflection involves a strong focus on the issues, characterized by problem-solving, experiential mindfulness and openness. People engaging in such reflections are hypothesized to be more adaptive in overcoming adversity. The process of maladaptive reflection is more self-focused and ruminative, typically triggered by perceived threats to oneself rather than by an intrinsic curiosity for discovery. Such reflections tend to dwell on the effects or symptoms of a problem on oneself rather than on finding solutions to the problem. People engaging in such reflections are associated in literature with more maladaptive reactions to adversity. In this dissertation, I will refer to adaptive reflection as reflection, while maladaptive reflection is referred to as rumination. Both types of reflection will be referred to as reflective processes.

This dissertation tests the hypotheses that different types of reflection will moderate the effect of leadership experience on leadership development and performance. Proximal outcomes such as leadership efficacy, activations of one’s implicit leadership theory and leader self-awareness (operationalized by quality of leadership

reflection outcomes) are hypothesized to respond differently to different types of reflections while positive psychological states, referred to hereafter as psychological capital, due to it being a positive resource that is built up through repetitions, may be less susceptible to one-off interventions such as those provided in this dissertation.

Finally, while not explicitly manipulated in this dissertation, exploratory analyses will be conducted to examine the role that initial leadership efficacy has on how leaders reflect on experience. It is postulated that low initial leadership efficacy may be more susceptible to maladaptive forms of reflection than high initial leadership efficacy. Hence, within the group in which maladaptive reflection was introduced, participants whose initial leadership efficacy was low may experience in greater measure the signs that the maladaptive trigger has worked.

### **Summary of key research questions**

The key research questions under investigation in this dissertation are:

1. What is the impact of adaptive and maladaptive reflection on one's leadership efficacy, one's implicit leadership theories and leader self-awareness that get activated (operationalized as quality of leadership reflection outcomes), and one's psychological capital?
2. Does higher leadership experience affect the above outcomes differently?

CHAPTER 2: A REVIEW OF THE LITERATURE

## Chapter 2: A review of the literature

*“By three methods we may learn wisdom: First, by reflection, which is noblest; second, by imitation, which is easiest; and third by experience, which is the bitterest.”*

- Quote attributed to Confucius

There are some who say that the practice of leadership is an art (Conger, 1989; De Pree, 2004; Fairhurst & Sarr, 1996). To the extent that art is about the effective application of a body of knowledge, then leadership is in that sense an artful application.

Yet while it may be possible to duplicate masterpieces using technology, leadership episodes are often unique, making it difficult, if not impossible, to replicate in its entirety. More often than not, particularly in high reliability organizations, leaders do not have the luxury of repeating a leadership episode, much less repeat a mistake, in order to (re)learn from it (LaPorte & Consolini, 1991). It is also often the case that leaders are called to perform in difficult or novel situations that require them to act wisely (Robert J. Sternberg, 2003), or to improvise and adapt from experience (Michael D. Mumford & Connelly, 1991). In fact, leadership itself is an adaptive process (DiTomaso & Hooijberg, 1996; Heifetz, 1994).

Evidently, leaders who act wisely will be highly valued. Since wisdom is one of the few personal strengths that increase with age and experience rather than decrease (Baltes & Smith, 1990; Denny, Dew, & Kroupa, 1995), this may explain why when selecting for leaders, recruiters invariably look for experience as a criterion for selection

(B. K. Brown & Campion, 1994). However, surely not all leaders, especially the more junior leaders, come ‘packaged’ with the ‘right’ experience – or do they?

### **The problematic nature of leadership experience**

What is leadership experience? How does it differ from life experience? Why is it important and when is it important? There is intuitive appeal to the notion that leadership experience should play an important role in predicting future leadership development and performance. From a human resource perspective, leadership experience plays a part in job interview success (Tay, Ang, & Dyne, 2006). Yet, as will be seen in the review below, it is not always clear how and when leadership experience is important, or even if the way it has been operationalized actually captures the full breadth of the construct.

As early as 1970, Fred Fiedler concluded from several studies that there was only a low correlation of .12 between supervisory experience and leadership performance (F. E. Fiedler, 1970). Two explanations were put forth by Fiedler to account for this counter-intuitive low correlation. One was methodological – that the low correlation could be due to the narrow construct definition of experience operationalized solely in terms of supervisory tenure in the studies. In other words, not all forms of experience that are useful for predicting performance may have been captured. When the ‘correct’ type of leadership experience is captured, one would expect prediction to improve. For example, when considering the prior experience of baseball coaches, which is experience that is most similar to current job demands faced by the baseball coaches, team success is more reliably predicted (Cannella & Rowe, 1995).

The other explanation offered by Fiedler was theoretical – that there were contingency factors at play which were not taken into account (Fred E. Fiedler, 1972).

For example, when the job situation contains a succession situation, then leader experience is no longer predictive of performance (Pfeffer & Davis-Blake, 1986).

When multiple contingencies are introduced, the situation becomes even more complicated. For example, in a series of field studies that Fiedler conducted, the presence of stress and leader intellectual abilities combined to produce counter-intuitive findings to the role of experience in predicting performance. He found that under low stress, leader experience was negatively correlated with performance, while under high stress, it was positively correlated. Conversely, leader intellectual abilities correlated with performance in the opposite direction under similar stress conditions (F. E. Fiedler, McGuire, & Richardson, 1989).

An interesting twist to the concept of leader experience was provided by Fiedler. Fiedler in his later works where he conceptualized experience as a form of over-learned behavior that takes over higher cognitive processing when cognitive resources are scarce, for example such as in situations of high stress in which limited cognitive resources are available for performance (F. E. Fiedler, 1995, 2002). One way to encourage the development of such over-learned behavior is through training, particularly training that utilizes behavioral modeling which focuses on learning and repetition of desired behaviors (Taylor, Russ-Eft, & Chan, 2005). However, even if the leader possesses the requisite attributes such as experience, intellect and training, other contingency factors such as group climate and communication styles may still act to prevent the experienced leader from performing well (Murphy, Blyth, & Fiedler, 1992).

At the other end of the equation, the nature of the task is also an important factor. When the task criteria are similar to those encountered in one's past experience, then

leadership experience becomes predictive of success (Gabarro, 1987; Locke & Kirkpatrick, 1991). Conversely, when the task criteria are unstructured and ambiguous, leadership competencies, particularly problem-solving skills, rather than the actual experience itself may be more important (Cannella & Rowe, 1995; M. D. Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000). Yet this does not suggest a mutually exclusive set of attributes for leaders – both experience and competencies are important, and are probably mutually reinforcing. Developmentally, experience plays a role in honing these competencies (Copeman, 1971; Lindzey, Holmes, & McCall, 1987). At the same time, it takes specialized competencies such as wisdom to properly utilize experience for novel situations (R.J. Sternberg, 2004).

Hence, the role of leadership experience on performance is contingent on the type of performance needed, and the operating conditions under which the leader is required to function. An implicit assumption that was not challenged was that there was a direct relationship between leadership experience and subsequent performance. As will be seen later, this dissertation proposes an alternative approach of identifying variables that directly and indirectly influence the experience-performance equation.

In any case, the complex interplay of leadership experience and contingent factors was a topic of continuing concern to Fiedler. At one point, it even caused him to remark that “no consistent relationship between experience or job tenure and leadership performance” can be found (Fred Edward Fiedler & Garcia, 1987, p.41).

Given this state of affairs from the contingency perspective, some scholars have turned to a more process-focused explanation for the utility of leadership experience. For example, when previous leadership experience was evaluated for its relevance to current

requirements, it positively predicted performance (Bettin & Kennedy, 1990). When experience was conceptualized in terms of tacit knowledge drawn from learning from daily experiences, it was shown to be predictive of leadership performance in procedural tasks (Hedlund et al., 2003). Underpinning these two studies are meaning-making processes that enable leadership experience to undergo some form of transformation (Mezirow, 2000a). From a learning perspective, experience becomes relevant and useful when lessons are learnt from it and it becomes part of the leader's protocol of actions and understanding of leadership. For lessons to be learnt, experience needs to undergo the dual process of "prehension" (or 'grasping') and transformation (D. A. Kolb, 1984). Experience then becomes raw material upon which one can reflect (Dewey, 1933; Schön, 1983). The role of reflection in experience will be covered in more detail in later sections of the dissertation.

### **Levels of leadership experience**

As a prelude to addressing the above issues, there is a need to first examine the levels by which leadership experience can be conceptualized. At the group level, the leadership experience can be a shared phenomenon with group members. In such situations, leaders can demonstrate learning by virtue of their membership in a larger collective (Edmondson, 1999). Again at the group level, the leadership experience may also be asymmetric – while a common experience is shared, the outputs derived may differ between leaders and other members of the group. One example of such asymmetry can be found in leaders who lead organizations that are themselves exhibiting learning behaviors (Argyris, 1999). Argyris argues that the outputs differ depending on the type of learning that occurs (e.g. single versus double looped). At the individual level, leadership

experiences may be regarded as an ipsative process. For example, the experiential perspective to adult learning assumes a vital interaction between actor and the environment (Malinen, 2000), and that each interaction and impact is unique to the actor. Finally, common to all levels of conceptualization is an intra-personal level perspective.

It is at the intra-personal level that the transformation of experience to knowledge occurs. This dissertation focuses on the nature of these transformative processes for making life experience useful and relevant for leadership development and performance. Through these transformations, knowledge acquired in one aspect of a leader's experience can be made useful for a leadership-related situation.

Using the analogy of the firm, a leader can be described as a 'one-person firm' that can benefit from the transfer of knowledge that occurs between one part of an entity and another part of the same entity that needs it (Argote, 2005; Reagans & McEvily, 2003). Similarly, a leader's past experience, regardless of whether it is directly related to leadership, can provide valuable knowledge that may be transferred to other aspects of the leader's current experience.

Collective learning research adopts a definition of learning that includes asking questions, challenging assumptions, seeking different perspectives, evaluating alternatives, and reflecting on past actions (e.g. Edmondson, 2002; Gibson & Vermeulen, 2003). These aspects of learning are relevant to the group as well as to the individual, and run consistent with a process-focus approach to explaining why experience is useful for performance. A particular focus of this dissertation is on the type of learning behavior known as critical reflection (Dewey, 1933), which will be reviewed in later sections.

The transferability of knowledge in leaders has important consequences for leadership development and performance. Leaders need to be adaptive and continually learning so as to perform well. In fact, it is the uniqueness and adaptive nature of leadership that has led some scholars to contend that leadership occurs only in the face of adaptive challenges or problems (Heifetz, 1994). Yet surprisingly, in spite of its importance, our understanding of how leaders learn and adapt is still largely theoretical (Day, 2000; DiTomaso & Hooijberg, 1996; R. G. Lord & Hall, 2005). For an exception regarding empirical research, see Hirst, Mann, Bain, Pirola-Merlo and Richver (2004). Likewise, the adaptive nature of leadership is not high on one's schema of a leader across many cultures – for example, it is not listed as part of culturally implicit schemas of leadership attributes (House, Hanges, Javidan, Dorfman, & Gupta, 2004).

Given the introductory discussion on leadership experience thus far, one would expect that leaders with greater leadership experience (in temporal terms) should be better developed leaders and perform better than leaders with less experience. The question is: better developed how and performs better in what ways? This dissertation operationalized such development and performance to be associated with leadership efficacy, psychological capital, leader self-awareness, and implicit theories of leadership. Reasons for such an operationalization will be discussed in later sections.

Thus far, an implicit assumption in this discussion is that all forms of leadership experiences be they positive ones or negative ones, are in some ways 'good' experiences. It is obvious how positive experiences directly contribute to future performance. For example, positive experiences give rise to higher efficacy beliefs that in turn predict future performance (Bandura, 1997). (More on efficacy beliefs will be reviewed in a later

section of this chapter). However, it is less clear how negative experiences can be processed in positive ways so that they too become ‘good’ lessons for the leader to have ‘under his/her belt’, metaphorically speaking. The next section of this review explores how reflection is one such mechanism for processing experience.

### **Psychological Capital and Leadership Experience**

Leaders are also followers, or have been followers at some point in their development. Good followers demonstrate good citizenship behaviors, and good followership is a precursor to leadership (R.E. Kelley, 1992; R. E. Kelley, 1998). Recently, a new approach towards positively managing human resources has been championed by Luthans and colleagues (Luthans & Youssef, 2007; Luthans, Youssef, & Avolio, 2007). Termed as positive organizational behavior or POB, Luthans and colleagues defined it as “... the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed and effectively managed for performance improvement.” (Luthans, 2002, pg. 59).

A key feature of this approach is the emphasis on psychological capacities that are measurable and developable, as well as manageable and having demonstrable linkages to performance. The former two attributes are developmental, while the latter two are slanted towards performance. This orientation aligns neatly with leadership development for performance.

What constitute these psychological capacities? Luthans and colleagues articulated inclusion criteria for these psychological capacities that included 1) evidence of a strong theoretical and research foundation, 2) validity 3) relatively unique to the field of organizational behavior, 4) state-like and amenable to development and 5) positively

impacts work performance and satisfaction(Luthans, 2002; Luthans, Avolio, Avey, & Norman, 2007). The final set of capacities that met these inclusion criteria were hope, resilience, optimism, and self-efficacy which have been shown empirically to aggregate to a higher-order factor that Luthans and colleagues have named psychological capital or Psycap (Luthans, Avolio et al., 2007; Luthans & Youssef, 2007).

Psycap refers to “...an individual’s positive psychological state of development and is characterized by 1) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; 2) making a positive attribution (optimism) about succeeding now and in the future; 3) persevering towards goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and 4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success” (Luthans, Youssef et al., 2007, pg. 3).

From the above definition, one can infer that experience is an essential ingredient for Psycap to increase. Efficacy beliefs are strengthened when enactive mastery is achieved in one’s experiences (see later section on efficacy). Attributions on success in current experience can benefit from previous episodes of successful attributions. Likewise, hope and resilience are enhanced with greater experience derived from having previously navigated similar setbacks or obstacles. Because of the developmental orientation of Psycap, it makes sense to advance the following hypothesis proposed in the previous section:

*H1a: The level of Psycap is positively correlated with prior leadership experience.*

## **Leadership Efficacy and Leadership Experience**

What are efficacy beliefs? Efficacy beliefs are important determinants of behavior – they affect choice of action, motivation to enact those behaviors and persistence of effort in the face of adversity (Bandura, 1997). Efficacy beliefs have dimensions of magnitude, strength, and generality (Bandura, 1997). Magnitude reflects the level of task difficulty, while strength reflects the conviction that one can perform at that level of task difficulty. Generality reflects the co-variation of efficacy beliefs across related domains.

Efficacy beliefs are evaluative in nature, consisting of one's assessments of one's own abilities to successfully enact the required behaviors (Bandura, 2001). According to Bandura (1997), efficacy beliefs are initially domain-specific and over time become generalized across domains. For example, an athlete who has been undergoing training for short distance running soon develops efficacy for sprinting as he undergoes success in his training (via enactive mastery). This efficacy is initially specific to the domain of sprinting. As confidence in one's athletic prowess grows, this efficacy in sprinting may over time 'spill over' to performance in track in general (i.e. 'I am good in track. '), or even to the more general domain of athletic ability (i.e. 'I am good in all sports that require speed. ').

Given this understanding of efficacy beliefs, leadership efficacy is defined as one's beliefs in one's abilities to perform as a leader. It is an efficacy belief specific to the domain of leadership. According to Bandura, domain-specific efficacy beliefs such as leadership efficacy can be increased best by enactive mastery, followed by vicarious learning through role models, social persuasion and physiological arousal, of which the

most effective is enactive mastery followed by vicarious learning (Bandura, 2000; Stajkovic & Luthans, 1998).

Based on the above understanding of how efficacy beliefs are developed, one can surmise that the experience of having performed well in a leadership situation will lead to an increase in one's leadership efficacy. This is because performing well in a situation is a powerful form of enactive mastery of the required leadership behaviors. Likewise, recalling past enactments of these successful behaviors is a powerful source of vicarious learning, due to opportunities for reviewing and learning new insights that may contribute to better performance.

On the other hand, when one performs poorly in a leadership situation, there is little enactive mastery afforded, which should lead to poorer efficacy beliefs concerning leadership. When one is asked to recall such poor performances, the mental re-enactment of these performances should similarly confirm one's previous beliefs concerning one's leadership efficacy beliefs. In Bandura's terminology, no re-calibration of efficacy beliefs occur as recall only serves to confirm these beliefs (Bandura, 1997).

*H1b: The level of leadership efficacy is positively correlated with high leadership experience.*

### **Leadership Self-Awareness and Leadership Experience**

What is leadership self-awareness? An important component of self-awareness in a leader is being cognizant of one's identity as a distinct entity from others. Just as the self-aware person is conscious of him or herself as a unique entity and builds a self-concept over a lifetime, the self-aware leader must too be conscious of his or her identity as a leader and be active in developing it over time. Therefore, the content and structure

of one's self-conceptions of leadership and being a leader, which has been referred to by some leadership scholars as the "leader self construct" (Hannah, Woolfolk, & Lord, 2009), has implications for the proposed definition of leader self-awareness. This leader self construct is built from three domains which serve as the focus for what leaders become aware of, that is, their leader portrait, purpose, and paradigm.

**Leader Portrait.** The first component of a leader's self construct is the leader portrait. This domain is made up the leader's perceptions of his/her own characteristics, qualities, and behaviors related to enacting leadership, which is composed of leadership attributes manifested through the leader's behaviors. The leader portrait is basically one's image of oneself as a leader, based on self construal as well as feedback received from other people over time. This aspect of the leader self construct answers questions such as "who am I as a leader" and "what are my strengths as a leader based on self observation and other's opinions".

Roberts and colleagues (Roberts, Dutton, Spreitzer, Heaphy, & Quinn, 2005) introduced the idea of a person's reflected best self portrait that is relevant to this review. Extending on their work, I expand the term portrait to include not only the best views, but also information about when one is not at one's best, and to include self-opinions as well as those opinions reflected from others. To be most effective in certain styles of leadership, leaders need to understand their areas of strength and weakness as perceived by others and from their own self-assessments (Sosik, 2001). Inherent biases exist in self-evaluation (Ashford & Tsui, 1991) yet other's people opinions are not necessarily more accurate. So a full understanding of one's portrait as a leader includes awareness of the

leader's self from multiple points of view, which with more leadership experience, is more likely to be achieved.

Besides views of the self whether at one's best or otherwise, the leader portrait also contains goals for the leader self, such as future ideal, possible, hoped for, or even feared qualities that a leader may be trying to develop or avoid in him/herself (Higgins, 1987; Markus & Nurius, 1986). As leaders participate in more varied leadership episodes, they observe themselves and other people in leader and follower roles, and from these experiences create more self-goals for their leader development.

**Leader Purpose.** The second domain in the leader self-construct is a leader's purpose. Each leader has motives that guide their leadership behavior, in addition to their leader portrait and self-image just discussed. Depending on what a leader believes the purpose of leadership is, the purpose of their own leadership affects their decisions and behaviors as a leader. This content may overlap with a leader's general purpose in life (Sosik & Dworakivsky, 1998).

A leader's general purpose is to create and bring to life a vision of the future. A vision is an image of the future that helps articulate the values, purposes, and identity for followers (Boal & Bryson, 1988). The quality of a leader's articulation of a desired future state affects follower attitudes and ultimately their performance (Kirkpatrick & Locke, 1996). Hence, to be impactful, a leader needs to have high awareness of the content appeal and degree of alignment between his/her own vision vis-à-vis those of his/her followers. When there is alignment between leaders and followers in their values and shared identities, the leader-follower influence mechanisms are reinforced (R.G. Lord & Brown, 2001), particularly for certain leadership styles such as transformational

leadership (Jung & Avolio, 2000), which depicts this process in terms of both personal and social identification. Naturally, this is a process which takes time and with greater leadership experience, should improve over time.

The leader's purpose would contain his/her broader vision and goals that describe the future the leader intends to create. Once the purpose is understood, leaders can communicate this purpose and vision to their constituents, and take actions to manifest it into reality. Again, this requires multiple interactions and long-term relationship building over time.

**Leadership Paradigm.** The third component of the leader self construct is the leadership paradigm used by the leader. Paradigm refers to the operating assumptions regarding leadership particularly regarding the relational aspects or social roles of leadership. Besides personal qualities contained in the leader portrait, and motives contained in the leader purpose, the leadership paradigm contains information regarding the kinds of questions such as, "what assumptions do I have about how effective leadership operates and how quality relationships are built between leaders and followers" and "what principles currently underlie my actions as leader".

A leader's conceptions about the self and their leadership paradigm are embedded in a broader underlying set of assumptions often referred to as a "worldview". Worldviews have been described as frames of reference, paradigms, or lenses (for review, see Koltko-Rivera, 2004), yet all terms refer to a person's core beliefs, values, and assumptions that filter and shape one's personal meaning-making process regarding the underlying nature of people and their social and physical reality (Dweck, Chiu, &

Hong, 1995; Kelly, 1955). It is reasonable to presume that with more experience, such core beliefs and values should be better developed.

Maurer, Weiss, & Barbeite (2003) explain that worldviews are made up of *implicit* assumptions that “create a framework within which the person interprets the world” (p. 108) and thus are closely linked to a leadership paradigm, and may even contain the same assumptions in some cases. For example, Dweck and colleagues’ research suggests that leaders who believe that personality is fixed (which they called an entity perspective) tend to interpret people’s behaviors in terms of traits and dispositions, whereas leaders who view personality as developable (an incremental perspective) tend to take situational factors into account when explaining people’s behavior (Dweck, Hong, & Chiu, 1993). Hence, leaders need to be “self” aware about the paradigm in use to ensure that they are appropriate for the situation at hand in terms of how they guide a leader’s interpretation and actions. They can then consider alternative paradigms and potentially choose and learn to operate under different assumptions, and in this way engage in greater self-regulation depending on the situation (Sosik, Potosky, & Jung, 2002).

Given the above review, the following hypothesis is advanced:

*H1c: The level of leadership self-awareness is positively correlated with high leadership experience.*

### **Implicit Leadership Theories and Leadership Experience**

Implicit theories of leadership are lay theories, naïve theories or mental models that people have of leadership (Foti & Luch, 1992; R. G. Lord, Foti, & De Vader, 1984; R. G. Lord, Foti, & Phillips, 1982). These are essentially ideas that people possess of how

leaders ought to be like and behave (Offerman, Kennedy Jr., & Wirtz, 1994), and may even be extended to one's understanding of how the leadership process ought to be played out.

There is some support for the role that experience plays in shaping one's implicit leadership theories. Firstly, early experience may play a fundamental role in the shaping of these implicit theories. For example, Keller (1999) identified that parental influences may be linked to individual differences in implicit leadership theories. Hunt, Boal and Sorenson (1990) found that early childhood experience partially explained how leadership prototypes are categorized.

In addition, not only does experience shape the nature of these implicit theories, the implicit theories themselves may subsequently shape the perception and sense-making of new experience (Tiffany Keller, 2003). Evidence suggests that the implicit theories of leadership may 1) themselves be a source of manifested leader behavior (Wofford & Goodwin, 1994; Wofford, Goodwin, & Whittington, 1998), 2) influence ratings of observed leadership behaviors (Eden & Leviatan, 1975), and 3) determine the quality of the leader-follower relationship (Engle & Lord, 1997).

One's implicit leadership theories are indicative of the amount of leadership experience accumulated by a person. As one becomes more experienced as a leader, one should have more elaborate theories about how leaders ought to behave and how leadership ought to function. Hence, when asked to articulate their implicit leadership theories, the output from more experienced leaders should be more elaborated and explicit.

*H1d: The quality of implicit leadership theories is positively correlated with prior leadership experience.*

### **Role of self-reflection in transforming leadership experience**

This section of the dissertation discusses the main thrust of this research, which concerns how leadership experience is transformed by reflection. I will introduce the performance and developmental variables of concern, and build the case for the mediating role that critical reflection plays between leadership experience and these outcome variables.

Reflection is useful in terms of its influence with three major aspects of experience – in grasping experience, in transforming experience, and in resolving puzzling aspects of new or old experience (see Figure 2). In the figure, reflection represents the process by which experience is grasped, transformed and applied to new puzzles of practice (arrows 1, 2 & 3). At each stage, learning and therefore development can occur because of reflection. This reflection also occurs after the solution or course of action has been implemented, because the outcomes of the course of action represent new experience that needs to be assimilated (arrow 4).

In the terminology of Argyris and Schon (1978), this last stage constitutes double-looped learning, which has been applied in organizational settings. For example, the US military recognizes this learning and feedback practice as after-action review (AAR). In the Israeli military, after-event reviews (AER) are conducted in which actors are required to provide self-explanations for both successful and failed events that have occurred, followed by data verification and feedback (Ellis & Davidi, 2005). Although not referenced directly in the Israeli model, their implementation of organizational learning

are generally along the same lines of Dewey's grasping and transformation of experience. In the sample for the study, the AAR process employed as part of the training curriculum is typically problem-focused, with a strong emphasis placed by the instructors on problem identification and explanation to trainees on what went wrong.

This dissertation will focus mainly on the transformative action of reflecting on past experience, though in the following review, the use of reflection in all phases of experience will be briefly introduced. In addition, for the purpose of the dissertation, reflection that occurs during action (reflection-in-action) is presumed to occur but will not be manipulated as part of the study design.

What then is reflection? Reflection is a form of critical thinking. Dewey defined reflection as a form of thinking that involves "active, persistent and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it and the further consequences to which it leads." (Dewey, 1933, p.9). Such thinking is not procedural, but holistic, moving beyond mere problem solving to also involving one's intuition, emotion and passion (Greene, 1988). From its early days of conceptualizing reflection as a better way to encourage learning in educational settings by Dewey, it has been extended into the domain of professional learning through Schön's (1983) work on the tacit knowledge of practitioners. Schön posited that reflection can occur for an event that has already occurred (reflection-on-action), for an event that is occurring (reflection-in-action), or for a future event (reflection-for-action). The focus of this dissertation is on reflection-on-action, since we are dealing with how past experience gets transformed through reflection.

Typically the events that trigger reflection are ‘puzzles of practice’ (Munby & Russell, 1990), which is a difficulty, or something irresolvable that has been encountered. A problem, as defined by Newell and Simon (1972) has been encountered by one when “he wants something and does not know immediately what series of actions he can perform to get it.” (p.72). Problems are considered complex when they require “decision processes that have not been encountered in quite the same form and for which no predetermined and explicit set of ordered responses exist” (Mintzberg, Raisinghani, & Theoret, 1976, p.246). However, as will be seen in the review of reflection from a different discipline later in this dissertation, research in clinical and personality psychology typically manipulate reflection and ruminative thinking through raising awareness of self and channeling attention to oneself (e.g. Duval & Wicklund, 1972; Nolen-Hoeksema, 2000).

### **Reflection, experience, experiential learning and learning styles**

Dewey’s conceptualization of reflection as a form of thinking useful for learning had a great influence in shaping later research in learning and experiential learning. For example, Kolb’s work on individual differences in learning styles acknowledges its theoretical debt to Dewey, amongst others such as Piaget and Lewin (D. A. Kolb, 1984). The core essence of reflection lies in meaning-making. Mezirow, building on Bruner’s four modes of meaning-making (Bruner, 1996), claimed that his transformative learning theory adds a fifth dimension of critical self-awareness of one’s tacit assumptions and assessing their relevance for meaning-making (Mezirow, 2000b), of which critical reflection is an integral component of his theory. This has important implications for developing leaders. The ability to reflect on experience is evident in leaders who are

higher in cognitive development (R. Kegan, 1994; Kuhnert & Lewis, 1987). Such leaders demonstrate higher levels of self-awareness and critical reflection and openness to their tacit operating assumptions. From a constructive-developmental framework, Kegan refers to 'meaning-forming' and 'reforming our meaning-forming' as two critical processes for one's development (Robert Kegan, 2000).

Conceptually, these two processes appear to operate within the same space as Kolb's 'grasping' and 'transforming' of experience (D. A. Kolb, 1984). Kolb approaches experience and meaning-making from an individual difference perspective. Kolb's experiential learning theory (ELT) proposes two modes of grasping experiences, concrete experience and abstract conceptualization, and two modes of transforming experience, namely reflective observation and active experimentation. According to his model, experiences form the raw inputs for one to reflect on, which again resonates with Schön's concept of reflection-on-action. Insights are then assimilated into abstract concepts and implications for actions. These outputs can be actively tested and serve to influence the way subsequent new experiences are processed.

At the risk of oversimplification by way of ignoring the iterative nature of these processes, one could suggest that experience is first apprehended, or 'grasped' to use Kolb's terminology. Kolb's use of the term 'transforming experience' can be elaborated further by Kegan's use of the terms 'meaning-making' and 'reforming meaning-making.' Both sets of terminology share similarities with regards to identifying, dissecting and evaluating tacit assumptions regarding one's experience, which are core tenets of Mezirow's transformative learning theory.

From an organizational perspective, the notion of meaning grasping can also be seen in the work of Argyris and Schön (1978). Single-looped learning can be construed as a form of meaning-making by which consequences of actions are evaluated against the initial course of action that produced the consequences. Conversely, double-looped learning goes back to an evaluation of the initial governing variables that led to the course of action – a process which appears then to be a form of reformulation of the meaning-making process. Hence, the previous discussion of multiple levels of conceptualizing experience applies here, since experience is not just an individual level construct as initially assumed by Dewey. Rather, as discussed previously, experience in this instance takes the form of shared discourse, feedback, collective exploration and meaning-making. The collective nature of experience in this regard is the crux of organization learning that is discussed by Argyris and Schön (1978).

If one was to adopt a more social-cognitive perspective, reflection and reflexive action can also be understood when contrasted against routine action (Dewey, 1933). Routine action occurs when one feels that there is a high degree of certainty and stability in one's life, a term which Walter Mischel describes as a "strong psychological situation" (Mischel, 1973). Under such situations, the cues guiding prescribed behaviors are strong, for example, when there is strong tradition, authority, or impulse. When problems are categorized as familiar enough, or when the psychological situation is strong enough, the principle of least effort (Allport, 1954) or some other satisfysing heuristic (Tversky & Kahneman, 1974) comes into play and problem solving in such instances typically adhere to a template or script in some degree. Hence, in order to initiate reflection on past events, one must provide an impetus for reflection to occur – some form of cues need to

be present that causes the recall to deviate from an automated process, to one in which it gets reconstructed into a different perspective based on these cues.

A related point regarding reflection concerns the boundary conditions for reflective action, particularly reflection-in-action. Reflection is not useful when there are good enough pre-existing scripts for actions. This is evidenced by definitions of reflection reviewed earlier, in which a necessary pre-condition is the presence of a 'puzzle of practice' (Munby & Russell, 1990) or a professional dilemma (Schön, 1983). From the perspective of self-regulation theories (Duval & Wicklund, 1972; Martin & Tesser, 1996), reflection is a form of self-directed thought which is initiated when there is a perceived discrepancy between one's current state versus a desired state. When actions are automated, or discrepancies are not perceived, then reflection is not the default mode of thought.

This has important implications for encouraging leaders to reflect more on their leadership experiences. Without sufficient reflection, routine action and non-reflective responses to perceived routine situations can lead to an over-reliance on pre-defined scripts. When this occurs, cognitive miserliness is said to have set in (Fiske & Taylor, 1984), bringing along with it biases and errors in judgment that may have serious leadership performance implications (Moskowitz, 2005). In order for reflection to be initiated, one must first experience a 'puzzles of practice' (Munby & Russell, 1990), or a difficulty or something not immediately irresolvable, or perceive a discrepancy between current versus desired states. These mental states allow one to feel removed from the constraints of a strong psychological situation. Only when this occurs is one prompted to step back to analyze their experience. This stepping back for analysis applies to

experiences that are currently occurring (reflection-in-action), as well as to experiences that have already occurred (reflection-on-action) (Schön, 1983), and is critical for learning (Ellis & Davidi, 2005).

### **Reflection as a trait and as a learning activity**

Thus far, the discussion of the role of reflection in making experience meaningful has not touched on typologies of reflection uncovered by later research. Two typologies will be discussed briefly.

Firstly, unlike the current treatment of reflection as a learning process or an activity, reflective capacity can also be construed as a personality trait. For example, some scholars regard self-reflectiveness together with internal state awareness to comprise private self-consciousness (e.g. Cramer, 2000; Creed & Funder, 1998; Nystedt & Ljungbert, 2002). Others make conceptual distinctions and identify different psychological and behavioral outcomes between different types of reflection, including rumination and experiential mindfulness, amongst others (Nolen-Hoeksema, 2000; Teasdale, 1999; Trapnell & Campbell, 1999). Some of these individual differences can eventually influence the types of preferences one has with regards to how experience is grasped, for example as measured by the Learning Style Inventory (LSI) (A. Y. Kolb & Kolb, 2005). Given that this dissertation adopts a developmental perspective, the activity of reflection is regarded here as being of greater significance than its trait component, although the reflective behaviors, regardless of trait or situational causes, share a similar distinction in terms of adaptive and maladaptive outcomes, as will be reviewed next.

### **Adaptive versus maladaptive forms of reflection**

The traits perspective offers a second typology. This pertains to adaptive versus maladaptive forms of reflection, and is relevant to our treatment of reflection as a developmental activity. For example, Trapnell and Campbell (1999) distinguished between rumination versus self-reflection as different forms of self-attentiveness brought about by different causes. In the former, it is brought about by “perceived threats, losses, or injustice to self” whereas in the latter it is brought about by “curiosity or epistemic interest in the self” (Trapnell & Campbell, 1999, pg 297). In depression research, rumination is defined as “behavior and thoughts that focus one’s attention on one’s depressive symptoms and on the implications of these symptoms.” (Nolen-Hoeksema, 1991, p. 569). Rumination is a maladaptive form of reflection, because it is not only moderately associated with depression but with anxiety as well (Mor & Winquist, 2002).

Rumination is also maladaptive because of a perseveration component in which cognitive resources are taken up with persistent dwelling on aspects of a problem, its symptoms and its causes with no intention towards problem-solving (Nolen-Hoeksema, 1991, 2000). Additionally, rumination is maladaptive when it directs cognitive resources that would have otherwise been useful for problem-solving into a form of abstraction of the problem (Teasdale, 1999; Teasdale et al., 2000). This abstraction takes the form of an extrapolation of the problem in improbable or illogical ways. This is the “Why me?” component of maladaptive reflection. Hence maladaptive reflection is brought about by a perceived threat in the environment, and manifests itself as a persistence to dwell on a problem without any effort to engage in problem-solving, or as a tendency to draw from the problem illogical or improbable implications that further implicates the self.

In Trapnell and Campbell's (1999) distinction, self-reflection is healthy when it arises out of intrinsic curiosity and non-judgmental desire to learn about oneself. Watkins (2004) showed that the non-judgmental mindfulness or openness towards emotional aspects of a negative experience can facilitate emotional processing and recovery from that bad experience. Self-regulation theories suggest that non-judgmental openness to aspects of the self can lead to greater self-awareness and self-knowledge and more effective self-regulation (C. Carver, S. & Scheier, 1982; C. S. Carver & Scheier, 1990). When the same mode of thinking is applied to aspects of a problem encountered, these theories also suggest that problem-solving is facilitated, because they are useful during the fact-gathering phase prior to problem-solving (Martin & Tesser, 1996; Teasdale, 1999).

One may ask exactly how reflective thought is adaptive. Some research suggests there may exist different modes of processing which may be (mal)adaptive in different ways. For example, Teasdale (1999) proposed three mutually exclusive modes of processing that possess distinctive functional properties. At the sensory level, 'mindless emoting' focuses purely on the sensory information, is completely absorbed in the emotional experience. Since this mode contains no conscious reflection at all, it is irrelevant to the current discussion here and will not be elaborated on further.

The next mode of thinking is a conceptual-evaluative processing of discrepancy information, focusing on evaluations of discrepancies between current and desired outcomes (called the comparative-evaluative mode). Note that this form of thinking easily becomes maladaptive when perseveration sets in, because it then becomes similar to ruminative thinking. However, some degree of conceptual-evaluative processing is a

necessary component of problem-solving, which is a characteristic of adaptive reflective thinking.

The utility of these modes of thinking also depends in part on the type of problem-solving being undertaken. Depression research suggest that this mode of thinking appears to hinder concurrent problem-solving (Watkins & Baracaia, 2002), is related to brooding and to the onset of bouts of depression in the future (Treyner, Gonzalez, & Nolen-Hoeksema, 2003).

One possible explanation for its interference with concurrent problem-solving could be due to the expenditure of conscious effort required to maintain this mode of thought. This takes away from limited cognitive resources available for the problem solving task. Also, as shown by the review above, the excessive focus on discrepancies could be related to future depression. If this is true, then it appears that this mode of thinking may be maladaptive when used for concurrent problem-solving, but may have its maladaptive properties mitigated when used in processing of problems that do not conflict with similar usage of cognitive resources, e.g. such as in evaluations of performance of past problems that have already occurred.

The third form of thinking in reflection is experiential-awareness, characterized by non-evaluative, intuitive, in-the-moment awareness of the experience at hand. This mode of thinking shares many similarities with mindfulness (K. W. Brown & Ryan, 2003), of which the most significant commonality is that both emphasize a non-judgmental openness to the current experience. This mode of thinking appears best suited for concurrent problem-solving tasks (Watkins & Baracaia, 2002). One explanation for this could be due to the greater openness to factual information that may be of subsequent

use in problem-solving. A recent experiment concerning the utility of this mode of thinking on subsequent social-problem solving appears to provide indirect support for this explanation (Watkins & Moulds, submitted).

Hence, adaptive reflection is motivated by intrinsic curiosity, characterized by an openness and exploration of the current experience, of staying in the moment, so that the aim of problem-solving may be successfully attained.

### **Ways of invoking reflection**

The traits perspective of reflection describes a behavioral tendency for people to engage in reflective thought. However, reflective thinking has been shown to be amenable to artificial inducement, and is commonly manipulated in psychology research (e.g. Nolen-Hoeksema, 1991; Watkins, 2004). At the individual level, journaling is one form of reflection that originated from its historical roots in the educational praxis and has made its way to leadership development practices (Bolton, 1999; London, 2002). Above the individual level, reflection is also postulated to occur in social interactions, such as in dialogues and peer feedback (Malinen, 2000). In one example, Cameron, Hayes and Wren (2000) utilized community-level reflection to evaluate a nursing and a physio/occupational programs in a medical setting. The role of dialogue in reflection is critical – factors that inhibits or promotes communication, such as the communication medium, in turn impact the quality of communal reflection that occurs (Clyde & Klobas, 2000; Russell & Cohen, 1997).

From a constructive-developmental perspective, leaders who consciously engage in reflection can be expected to become better leaders (Kuhnert & Lewis, 1987). Such leaders are able to articulate a higher level of appreciation for the intricacies of

leadership. Leaders who actively engage in reflective inquiry are more liable to demonstrate what Quinn (2005) terms as the ‘fundamental state of leadership.’ According to Quinn, it is taxing to remain indefinitely in that state. Yet he believes that leaders can be assisted to enter that state, simply by asking the following four reflective questions:

- 1) Am I results centered? (Am I willing to leave my comfort zone to make things happen?)
- 2) Am I internally directed? (Am I behaving according to my values rather than bending to social or political pressures?)
- 3) Am I other focused? (Am I putting the collective good above my own needs?)
- 4) Am I externally open? (Am I receptive to outside stimuli that may signal the need for change?).

From the previous discussion on adaptive reflection, it is clear that the above list of reflective questions suggested by Quinn is adaptive in nature and helpful for development, because it contains elements of problem-focused solving and avoids the ruminative and problem-dwelling components of maladaptive reflection.

Given the above discussion so far, this dissertation advances the following general hypotheses:

*H2a: The relationship between leadership efficacy and leadership experience is moderated by type of reflection triggers.*

*H2b: The relationship between leadership self-awareness and leadership experience is moderated by type of reflection triggers.*

*H2c: The relationship between quality of implicit leadership theories and leadership experience is moderated by type of reflection triggers.*

### **Experience, reflection and leadership efficacy**

Leadership experience is stored in one's memory. More specifically, leadership experience is a form of episodic memory (Tulving, 1972) in which the self is involved in some way as the main leadership actor or part of the cast of actors in the leadership experience. Stored as part of the experience is semantic information concerning oneself as a leader or as part of the leadership process. Both types of information are part of one's declarative knowledge (Winograd, 1972), which is our statements of beliefs about people and things that contribute to our understanding of ourselves and how we relate to and function in the world.

Memory, and more specifically, declarative knowledge, is based on cues for either retrieval or reconstruction, depending on which view of memory one subscribes to (Smith, 1998). Information pertaining to the self that gets recalled along with details about an event can be perception-based (images of oneself) or meaning-based (i.e. organized around ideas or theories one has about oneself) (Kihlstrom & Klein, 1994). Either way, one's ideas about oneself is intricately linked to one's memory for oneself (Klein, 2001).

Hence, with regard to leadership experience, how these experiences get recalled or reconstructed (and the self-information that gets recalled along with the experience) may result in a qualitatively different effect on the self. For example, recalling a leadership experience in which one's semantic information about oneself as a leader is mostly negative may have adverse impact on one's subsequent perceptions of oneself as a leader. Given the previous discussion of how efficacy beliefs are a form of self-evaluation, efficacy beliefs can be influenced by these perceptions because they feed into

one's own evaluations of oneself as a leader. Hence, efficacy beliefs are influenced by the type of reflection that occurs because reflection influences the type of self-information that is made salient. This self-information is then utilized during self-evaluation, which subsequently influences one's efficacy beliefs.

Conversely, if the cues for recall are tweaked, such that from the same leadership experience, only selected bits about oneself as a leader are utilized in the reconstruction of the leadership episode, then the negative effect of the leadership experience on one's perceptions of oneself as a leader may become attenuated, or less severe. Going a step further, one can be prompted to reflect positively on the recall of the experience, such that the beneficial effects get even more accentuated. Hence, reflection can work together with prompted recall to manipulate the way individuals attend to different aspects of one's leadership experience such that the event gets reinterpreted in adaptive or maladaptive ways. Furthermore, one would expect that when recall and reflection are manipulated in the same direction (i.e. recall and reflect on positive aspects of leadership experience), its impact would be greatest.

In this dissertation, due to constraints on the current design, this mode of inquiry will be pursued in which type of recall is always in the same direction of type of reflection being introduced. In addition, the type of leadership experiences under investigation will also be controlled for. These will be common military training experiences. Such training experiences will include being assigned leadership responsibilities and appointments in military exercises. High leadership experience would refer to higher amount of exposure to these common military training activities

undergone. Hence, combining the review on adaptive and maladaptive reflection together with this section's review on efficacy, I propose that:

*H3a: Recalling and reflecting positively on any personal leadership experience increases subsequent leadership efficacy.*

*H3b: Recalling and reflecting negatively on any personal leadership experience decreases subsequent leadership efficacy.*

### **Reflection and Leadership Self-Awareness**

There is a wide range of definitions and operationalizations of the term “self-awareness”, but the common intuitive meaning of the term involves using some concept of oneself to affect one's own behavior (Mulhauser, 1998). Unfortunately, such a broad definition has led to a variety of operational differences and domain specific interpretations. For example, a major stream of research in psychology conceptualized self-awareness as focusing attention on oneself (Duval & Wicklund, 1972; Silvia & Duval, 2001; Wicklund, 1979). Yet such a conceptualization of self-awareness is vastly different from the content knowledge-based conceptualization of self-awareness as ‘knowing oneself’ (Harter, 2002) used by leadership practitioners. Consequently, different effects of self-awareness have been hypothesized. For example, being more self-aware in one sense of the word (i.e. knowing oneself better) is hypothesized to lead to greater perspective-taking, higher ethical conduct, balanced processing, higher levels of development and trust in followers (Gardner, Avolio, Luthans, May, & Walumbwa, 2005).

On the other hand, being more self-aware as defined by some psychologists (i.e. focusing attention on oneself) has at times been cast in a negative light, particularly in

some clinical research (for a review, see Ingram, 1990). Some clinical psychology research have demonstrated self-awareness can be associated with an increase of depressive episodes in depression patients (Pyszczynski & Greenberg, 1987), is correlated with negative affect and reduced well-being in a meta-analytic review (Fejfar & Hoyle, 2000), and has been discussed in the same vein with socially irresponsible behavior (Prentice-Dunn & Rogers, 1989).

In any case, two common elements to the above definitions are that self-awareness either proceeds after or include some form of self-examination, and that the resultant outcome is some form of knowledge change, leading to behavioral regulation. These elements are also processes by which self-reflection is defined. Hence, regardless of which operational meaning of self-awareness is used, it is clear that self-reflection will always be associated with heightened self-awareness. Indeed, self-awareness in leaders is synonymous with personal insight in leaders, with self-reflection and introspection (Dewey, 1933; Schön, 1983) as operating processes through which leaders gain clarity and concordance with respect to their core values, identity, emotions, motives and goals (Avolio, Gardner, Walumbwa, Luthans, & May, 2004; Avolio & Luthans, 2006; Gardner et al., 2005; Luthans & Avolio, 2003). Shamir and Eilam (2005) posited that leaders who are true to themselves need to be in touch with their core essence, and be clear about what defines them as people and as leaders, that is more self-aware.

Given this, I advance that:

*H4a: Recalling and reflecting on past experience results in greater self-awareness.*

Does self-awareness increase depending on the type of self-examination? Earlier, a distinction was made between more adaptive versus maladaptive types of self-examinations. In the former, the self-examination is characterized by focus on problem-solving, while with the more maladaptive type one is more ruminative, more self-focused and dwelling more on the symptoms of the problem rather than on solving the problem. Hence, it is likely that the maladaptive types of self-examinations should result in greater self-awareness rather than the more adaptive types, given the larger focus on the self.

Given this, I advance:

*H4b: Ruminative recall of past experience results in greater self-awareness compared with adaptive recall.*

### **Reflection and Implicit Theories of Leadership**

How does reflection influence the nature of accumulated experiences? Does reflecting on experience provide incremental improvements in one's implicit leadership theories? Building upon the arguments advanced in the previous section regarding the role that reflection has on greater elaboration in one's life story and leadership development, one should also expect reflection to similarly have a positive effect on one's implicit leadership theories.

In addition, because reflection serves a function of making explicit the implicit assumptions, any form of reflection should result in a more elaborate implicit leadership theory being explicated than no reflection at all. However, it is unclear if adaptive and maladaptive reflection exerts differential effects on one's implicit leadership theories. The argument for adaptive reflection having a greater positive effect on implicit leadership theories hinge on the problem-solving nature of adaptive reflection, which

should hypothetically lead to greater clarity of cause-effect linkages in one's implicit leadership theories. On the other hand, ruminative reflection, being by definition focused on one's self, may also trigger greater clarity about one's leadership identity, hence resulting in one's implicit leadership theories being impacted.

Evidence from clinical research in depression suggests that maladaptive reflection is more strongly associated with moods and affect, while any form of rumination results in greater elaboration of one's internal state awareness (Nolen-Hoeksema, 2000; Silvia, 2002). Hence, the type of explication of one's implicit leadership theory may well depend on the nature of reflection that occurs.

Adaptive reflection may result in an explication of implicit leadership theories that are more positive and problem-solving focused, while maladaptive reflection may lead to explications of implicit leadership theories that are more negative and problem-aversive. In other words, the type of reflection primes or sensitizes related aspects of one's implicit leadership theories, i.e. through spreading activation along an associative network (Cantor & Mischel, 1977; Neely, 1977). When this occurs, these aspects of one's implicit leadership theories become more responsive to environmental triggers, such that they attain heightened accessibility (Meyer & Schvandeveltdt, 1971). Hence, following reflection, one should expect that when a leader articulates his/her implicit leadership theory, the output should be dependent on the type of reflection that has occurred.

The priming effect of reflection on heightening accessibility of various aspects of one's implicit leadership theory should also have an impact on the latency response to cue words. This relationship between latency response and priming is even more pronounced when the prime is affect-laden, or highly emotive (Niedenthal, Halberstadt,

& Setterlund, 1997). Likewise, one should expect that when leaders are tasked to make a timed judgment on whether cue words describing leadership are positive or negative in nature, latency response times for cue words that are positive should be shorter than negative words following adaptive reflection. The reason for this is because the type of reflection that has occurred before the task serves as a prime for this lexical decision task, thereby inducing heightened accessibility in different aspects of one's implicit leadership theory.

Regardless of the valence, both types of reflection should lead to more complex and explicit theories of leadership, though it is unclear between the two types of reflection which would have the greater effect. Hence, the following hypothesis posits a more global effect of reflection on elaboration of one's implicit leadership theories, with no further predictions advanced on potential differential effects of different types of reflection:

*H5a: Adaptive reflection results in positive aspects of one's implicit leadership theories becoming more easily explicated.*

*H5b: Maladaptive reflection results in negative aspects of one's implicit leadership theories becoming more easily explicated.*

### **Summary and integration of literature**

This dissertation proposes that different forms of reflection on one's leadership experience can have differential effects on one's leadership efficacy, implicit leadership theories and subsequent leadership performance. Reflecting on a leadership episode occurs at the point of recall of the episode. In this dissertation, both recall and reflection are paired for adaptive or maladaptive purposes. Maladaptive recall and reflection

focuses on the nature of problems encountered, amplifies the implications of problems, and generally causes one to dwell on problems with no intention of moving towards problem-solving. Adaptive recall and reflection, on the other hand, is characterized by experiential mindfulness, which involves a state of suspended judgment while remaining open to allow salient aspects of a problem to emerge. It is focused on problem solving rather than merely ruminating on a problem.

This dissertation postulates that when reflection is adaptive, one's leadership efficacy is raised, one's implicit leadership theories are better explicated and more developed, with positive aspects of one's implicit leadership theories more accessible. When reflection is maladaptive, the processing that occurred may create negative emotional reactions and self-attributions that lower leadership efficacy. When one engages in maladaptive reflection, one's implicit leadership theories are also developed, but the negatively valenced aspects of one's implicit leadership theories are also made more accessible.

## CHAPTER 3: STUDY DESIGN AND METHODOLOGY

### **Chapter 3: Study Design and Methodology**

This chapter provides an overview of the study methodology that was implemented, including information on the participants, study design, procedures and manipulations, and measures.

#### **Research Design**

A three-condition between subjects design was used to evaluate the effect of invoking various forms of self-reflection on one's leadership efficacy, Psycap and implicit theories of leadership.

#### **Sampling Plan and Power Analysis.**

A priori power analysis conducted to estimate the sample size needed to obtain the desired effects revealed that a minimum of 207 participants were needed. Power analysis examines the relationship between four variables: the size of the effect ( $r$ ), the sample size ( $N$ ), the type I error rate ( $\alpha$ ), and the type II error rate ( $\beta$ ) (Freedman, 1982). First, given the relationships seen in the past, a very conservative estimate of the effect size of about .25 was anticipated for each condition. Next, the type I error rate ( $\alpha$ ) of .05 was utilized for the calculation. Last, the type II error rate ( $\beta$ ) is set at .10 so  $1-\beta = .90$ . Given these figures, the freeware GPOWER software program (Erdfelder, Faul, & Buchner, 1996) was used to derive that the sample size required from this power analysis was 69 participants per group. Given that this is a 1x3 study design with 3 cells, the minimum participant required is 207.

## **Participants and Training Context**

321 conscript junior commander trainees organized into 8 training platoons in 2 companies from a junior military leadership school were tracked over an 8-week leadership course. Participants were 18-year old Asian males identified to undergo leadership training as part of their conscription requirement. As part of the leadership potential shortlist process, these trainees have a minimum of junior college/polytechnic education (the US equivalent of senior high school) and demonstrated good leadership potential and leadership performance.

These soldiers have previously undergone 9 weeks of military socialization and basic military training. During the 9 weeks, these soldiers are introduced to basic infantry field craft, fitness, regimentation, weapon handling and shooting. Following the 9-week training, trainees with identified leadership potential embark on an 8-week leadership course which comprise experiential training in military domains such as further weapons training, tactics and signals as well as introduction to leadership. This training prepares them for operational roles leading platoons of men. As part of their development, trainees are introduced to experiential learning techniques such as journaling, conducting and participating in action reviews (AARs). Implicit to these techniques is the expectation that trainees will exercise reflection throughout the training course, although how reflection is actually carried out by the trainees is not monitored by the training school.

## **Pilot Studies**

Two pilot studies were conducted. The first pilot was a qualitative study utilizing randomly selected trainees from a more senior cohort of the same leadership training

course. The second pilot was a quantitative study to establish the reliability of all measures used.

**Pilot Study 1.** This qualitative study had two aims. Firstly, it aimed to establish the type and nature of salient leadership events in the formal training curriculum that generated leadership developmental triggers for trainees. Secondly, from the reflections around these developmental triggers by the trainees, the study aimed to establish the leadership-related content that the reflections revolved around so as to serve as a bottom-up approach towards creating a scale to measure the quality of reflection that occurred during the leadership training course.

A total of 10 trainees were randomly selected from a graduating cohort of the 8-week leadership training course. Each trainee was interviewed by a research intern naïve to the study objective in a one-to-one setting. The research intern had an alternate research objective to understand and collect stories on military socialization that occurred in the training course.

During the interview, each trainee was asked to record his recall of salient events that impacted his leadership development on an event history calendar chart. The interviewer then probed the trainee regarding each event on the calendar for reasons why the event was viewed as impactful. Where the trainee felt that he had learnt something about leadership or about himself as a leader, the researcher registered a trigger as having occurred. Each event may generate more than one developmental trigger. Table 1 tabulates the key events and the percentage of developmental triggers reported by the 10 trainees. From this study, the two events in the training course that generated the highest

proportion of developmental triggers were used as the focal developmental activities in subsequent studies for reflection.

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Insert Table 1 Here  
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Interestingly, for all 10 trainees, all the salient events that were identified as developmentally impactful were tough, somewhat unpleasant events. Examples of such themes included the hardship they suffered or the harsh treatment inflicted on them by their peers or superiors during the field camp. Other examples involved being pushed / pressured to continue beyond one's limit of endurance in a route march exercise, experiencing team conflict and role uncertainties during navigation exercise, being given poor feedback in AARs, or even seeing undesirable leadership behaviors in peers and instructors that trainees resolved not to role-model after. Significantly, there were no positive triggers (e.g. instructor or peer exhibiting exemplary leadership) identified by the trainees. Upon consulting with the commander of the training school, he concurred that training was extremely onerous for the trainees.

As the overall tone of the training environment was quite negative, there were initial concerns that any form of cognitive processing about the events may actually do more harm than good. The fear was that the negative events may result in trainees tending to ruminate rather than reflect positively. In discussing with the trainees from the pilot study, all of them unanimously agreed though that the leadership course was overall beneficial for them. As such, in spite of concerns that reflecting on the events from this

leadership course may trigger negative emotional reactance, I decided to proceed with the study.

As mentioned, a second aim of the study was to establish the nature of the leadership-related content of the reflections that occurred as result of the developmental triggers. These triggers were derived from a thematic analysis of the reflections told by the trainees about their experiences. These reflections were either volunteered by the trainees, or were prompted for by the interviewer as the trainees were relating their stories and experiences. To guide the interviewer, a set of suggested prompts were provided to the interviewer. This is found in Appendix C.

All in all, nearly 5 hours of interview material were recorded by the interviewer. Of these less than 20 min of the recording were usable leadership-related reflections – the remainder of the recordings made were narrations of stories, pauses, clarifications and off-tangent topics. Bearing in mind that the interviewer was naïve to the intent of the study the interviewer was asked what impressions she had about the trainees' socialization experiences. Her main impressions revolved around how trainees became *more aware* of themselves, and how trainees *became better* over time. From this, I derived that self-awareness and self-regulation were two themes that may be pertinent to the reflections by the trainees. In addition, the intern also identified that the most salient characteristics of the leadership-related content from which the trainees either became more self-aware or more self-regulated had to do with the trainees' *values, strengths or weaknesses*.

From discussion with the interviewer, I derived a coding frame for evaluating the 20 min of recorded reflections obtained from this pilot study. The percentage of reflection

statements captured by this coding frame from all the reflection available is about 63% (See Table 2 below). This coding scheme also contributed to the creation of a set of items to measure the quality of reflection outcomes that will be used in the actual study.

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Insert Table 2 Here  
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### **Scale-creation: Quality of Reflection Outcome Scale**

The qualitative study helped identified the nature and focus of reflections that were feasible from the leadership training course. Specifically, it identified that about two thirds of the reflections can be classified as reflections that pertain to being more aware or more self-regulating of one's values, purpose, leader self-image, operating paradigms and assumptions. Since these reflections were triggered by salient events available in the leadership training course, it meant that one can expect trainees to, at some point during the course, be able to provide some level of reflection around 1) his values as a leader, 2) his image of himself as a leader, and 3) his leadership operating paradigms and assumptions. In addition, these reflections could also demonstrate greater self-awareness or greater self-regulation around these three domains.

Given this information, five items per construct were created as an initial bucket pool for a total of 30 items. These 30-items were then subjected to a bucket drill exercise. 2 assistants naïve to the study were separately assigned to sort the 30-items into the 3 by 2 coding frame. Of these, 19 items were correctly assigned to the coding frame by both assistants. The rest of the items were mis-assigned by either one of the assistants. None of the items were completely mis-assigned by both assistants. The 11 mis-assigned items

were then re-evaluated by the assistants together. They achieved agreement on 2 of them. These 2 items were then added back into the pool for a final item count of 21. The next step was to conduct an exploratory factor analysis (EFA) to better understand how the items will perform empirically.

**Pilot Study 2.** The second pilot study involved an EFA for the newly created scale and confirmatory factor analyses (CFA) to examine the reliabilities of the rest of the measures used. This quantitative study utilized 497 trainees from a basic military training school. These trainees are emerging adults, all males aged 18 who are compulsory conscripted enlistees. Their racial composition is consistent with national averages, which are 70% Chinese, 20% Malays and the remainder from other racial groups. This composition is also consistent with the actual study sample to be used later. At time of survey administration, these trainees are approximately midway through their 9-week basic military training and socialization program. Top performing trainees from this program are selected for the leadership training course in the actual study. However, the actual study utilized leadership trainees from 2 cohorts later, thereby avoiding the possibility of trainees having prior exposure to the measures used.

### **Missing data**

The survey was conducted via paper-pencil. As such, it was inevitable that despite on-site checks, there would still be missing entries during survey administration, thereby resulting in missing data. On the whole, the amount of missing data was less than 5% of the entire sample. Of these, 3 participants' had entries that were completely missing. This missing data was interpreted as those participants had no interest in completing the survey. As such, the missing data generated by those participants fell into the category of

systematic missing data termed as missing not at random (NMAR) (Rubin, 1976). As this represented a systematic loss of data, I elected to delete their entries entirely from the database. With the rest of the missing data, there were no discernible patterns to help interpret the reasons for missing data in the dataset. As such, the rest of the data was treated as missing at random (MAR). This missing data was then left to be addressed using maximum likelihood procedures available in the MPLUS software (Muthen & Muhen, 1998). To prevent missing data due to incomplete entries, online surveys were subsequently used with logical checks built in that did not allow for missing entries.

The issue of outliers and normality of the pilot sample was also examined. Details of how skewness and kurtosis as well as how outliers were dealt with can be found in the next chapter. These issues had to be addressed in the pilot sample so that the EFA for the new measure and CFAs on the rest of the measures could be properly executed.

**Exploratory Factor Analyses.** An EFA, like confirmatory factor analysis (CFA), is a method to achieve data reduction parsimoniously. Both are multivariate statistical methods for data reduction for determining the number and nature of common latent factors that will parsimoniously explain the patterns of observed correlations in measured variables (Farbrigar, Wegener, MacCallum, & Strahan, 1999). However, EFA is used for generating theory whereas CFA is used for testing theory. The outcome of an EFA is agnostic to a priori hypotheses that a researcher has in mind. Rather, it is the sole function of the “mechanics and mathematics of the method.” (Kieffer, 1999, pg 77). CFA, on the other hand, cannot proceed without direct intervention from the researcher hypothesizing the underlying structure of the data at hand. As such, when a new scale is

developed, EFA followed by CFA is an essential workflow towards establishing the validity of the scale.

There are several key decisions involved in an EFA. Firstly, the researcher has to determine the number of latent factors that best represent the underlying structure of the data. This is an important determination as over or under-specifying the number of latent factors can result in the introduction of error in significance testing, factor loading reproduction and interpretation (Velicer, Eaton, & Fava, 2000).

Scree plot tests (Catell, 1966), setting the minimum eigen (or Kaiser) values above 1, also known as the K1 rule (Kaiser, 1960), parallel analysis or PA (Horn, 1965) and the use of latent model fitting techniques with maximum likelihood estimation such as those implemented in structural equations modeling software like MPLUS (Muthen & Muhen, 1998) are some ways to assist the researcher in making this determination.

Each method has its weaknesses. For example, the scree plot test is useful and visually intuitive when the latent factors are unambiguous and strong. In instances with multiple weak latent factors, the determination of the cut-off based on the plot becomes increasingly subjective. On the other hand, the K1 rule, though easy to implement, particularly with the use of statistics software packages, has been consistently shown to inaccurately over factor (see Glorfeld, 1995 for overview) to such an extent that some have recommended for its use to be discontinued (e.g. Zwick & Velicer, 1986).

PA involves the use of multiple random generations of datasets with the same dimensions (sample size and number of measured variables) as the original dataset to extract (via principal axis or principal components analysis) and order the eigenvalues, so that the mean and 95<sup>th</sup> percentile of all eigenvalues created can be determined. Several

reviews such as Glorfeld (1995) and Zwick and Velicer (1986) have found PA to be more accurate than the use of the scree plot test or the K1 rule.

In this study, a combination of methods was used including scree plots and the use of maximum likelihood estimation via the MPLUS software to determine the factor structure.

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Insert Table 3 Here  
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Table 3 displays the number of latent factors and the extent to which the data covariance matrix is replicated. From the table, at every level of  $k$ , where  $k$  is the number of latent factors, the chi-sq is significant. This means that a  $k+1$  latent factor solution is feasible. At the 5-factor solution, the chi-sq is still significant. However, no convergence was possible for a 6-factor solution, which means that 5 latent factors is the highest number possible with the dataset.

Having established the number of latent factors possible, the next step was to demonstrate that a 5-factor solution significantly explains the data better than a  $k-1$  solution, i.e. a 4-factor solution. This is done by conducting a chi-sq difference test. From the table, the chi-sq difference test was highly significant, which meant that a 5-factor solution offered significant variance explained over a 4-factor solution. Finally, to establish whether the 5-factor solution was a good fit, its RMSEA value needed to be compared. According to (Hu & Bentler, 1999), RMSEA values below .06 indicate satisfactory model fit. In this instance, the 5-factor solution had an acceptable RMSEA

value of .044, which indicated that it adequately explained the data generated in the pilot study.

The final step in the EFA was to explore the item loadings to each latent factor to determine if the pattern of loadings are aligned with what was intended when the items were created.

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Insert Table 4 Here  
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Table 4 shows that most of the items cluster together as expected. The only ill-performing items were Item 6 which failed to load sufficiently on latent factor 4, or on any latent factor using the norm of .3 as a cut-off, as well as Item 7 which did not load on its intended latent factor 5 but loaded on latent factor 2 instead. In addition, Items 10 and 16 also demonstrated tendencies to cross-load on one other latent factor other over and above its expected latent factor. All in all, the EFA demonstrated that the 21-item scale appeared to perform sufficiently well as expected such that a CFA using another sample is justifiable. Hence, I retained the items to test on a more diverse sample.

**Confirmatory Factor Analyses.** As with subsequent CFAs described throughout other sections of this dissertation, a combinatory rule composed of three fit indices was used to determine the goodness of fit of the CFA model. Firstly, the absolute fit index called the standardized root mean square residual (SRMR) was computed. SRMR values range from zero to one, with zero indicating perfect global fit of the model. Secondly, the comparative fit index (CFI) was computed. CFI compares the target model with a baseline fully identified model. When the target model is as fully identified as the

baseline model, the standardized fit is perfect (i.e. attains a value of 1). The aim of the comparison is to establish parsimony of the target model while maintaining an acceptable level of fit, which is recommended to be no less than 0.95. Third, the root mean square error of approximation (RMSEA) was computed by assessing the degree of population misfit per degrees of freedom, with values closer to zero reflecting better fit and values around 0.05 representing ‘close fit.’ Therefore, using a combinatory rule for maximum likelihood, a Standardized Root Mean Square Residual (SRMR) less than or equal to .08 and *either* a CFI greater than *or* equal to .95 or a RMSEA less than or equal to .06 indicates good fit.

Additionally, where required, the CFA models may be tweaked to improve the fit. This is an iterative process involving one or more of the following steps. To begin, the zero-order correlation of individual items to the latent factor was examined. Items that had correlations lower than .60 were evaluated further on two counts, namely – would it be theoretically justifiable to remove the item from the proposed scale and would removing the item from the scale greatly improve the overall fit of the scale?

Of the remaining items, should further tweaking be required, the modification indices provided by the MPLUS output were used. Modification indices, or Lagrange’s modifiers, provide an indicator of expected change to the overall model fit should the recommended loadings (e.g. cross-loading to another latent factor or being allowed to correlate with other indicators) be freed. In determining whether such cross-loadings should be allowed, first theoretical fit was used as the primary criteria followed by the utility at the time, i.e. whether allowing for the cross-loading would result in a better fit for the sample. For example, in instances where the modification indices recommend

that items on the same subscale be allowed to cross-load on each other, cross-loadings were allowed to occur because it is theoretically justifiable. However, even then, the steps of lifting the restrictions were conducted one at a time.

A more considered judgment was required when items from different subscales or even different latent factors were recommended to correlate with each other. These misspecifications that pertain to the latent factors are reflected in poor SRMR fit indices (Hu and Bentler, 1999). In such instances, one first checks to see if a similar poor fit was also apparent across different samples. Here, the modification indices were used based on the criteria that large indices with small EPCs are indicative of relationships that are particularly susceptible to sample fluctuations.

Next, the actual wording of the items was closely examined to determine if the items could have been misinterpreted. In instances where there were sufficient items, the item was deleted from future analyses to avoid introducing unexplained variances into the models. In cases where there were insufficient items, an item was retained based on considering whether it was theoretically justifiable to allow for the cross-loading to occur.

## **Measures**

**New Measure: Quality of Reflection Outcomes.** A 21-item survey newly created as described in the previous section was used here to measure the extent of leader self-awareness and self-regulation around one's purpose and values, one's leader self-portrait and one's leadership operating paradigms and assumptions. A higher order latent factor reflecting the quality of the reflections around these 1<sup>st</sup> order factors were

postulated. In a smaller pilot study, a CFA of the full 21-item scale did not achieve an acceptable fit. Upon refinement of the items according to the procedure described in the previous section, the reduced 15-item scale achieved an acceptable fit ( $SRMR = 0.04$ ,  $CFI = 0.96$ ,  $RMSEA = 0.04$ ). This factor structure was again replicated with acceptable fit in the actual study sample at Time 1 ( $SRMR = 0.04$ ,  $CFI = 0.97$ ,  $RMSEA = 0.03$ ) and at Time 2 ( $SRMR = 0.04$ ,  $CFI = 0.95$ ,  $RMSEA = 0.05$ ). The reliabilities for this revised scale were Cronbach's alpha ( $\alpha$ ) = .849 (for pilot),  $\alpha = .801$  (for T1) and  $\alpha = .846$  (for T2). The final set of items for this scale, as well as for all other measures used in the dissertation, can be found in Appendix B.

**Generalized Leadership Efficacy.** This is a 22-item experimental scale currently under development by Hannah and colleagues (Hannah, Avolio, Chan, & Mhatre, 2005). The scale was designed to measure a leader's appropriation of his or her role and environment (agency), and the self-schematic efficacy beliefs (confidence) in his or her perceived leadership capabilities to organize the positive psychological capabilities, motivation, means and courses of action required to attain effective, sustainable performance across their leadership domain.

A CFA conducted on the original 22-item scale did not converge on the hypothesized structure using the pilot sample. To achieve convergence, 5 items that did not load highly on any of the latent factors were removed. In addition, some items within the means and action-transformational subscale were allowed to co-vary. This resulted in convergence and adequate fit of ( $SRMR = 0.044$ ,  $CFI = 0.941$ ,  $RMSEA = 0.075$ ). Its reliability was  $\alpha = .944$ . The CFI could have been improved marginally by allowing the subscales of action-means and action-transformational to co-vary. In practical terms,

allowing them to collapse into a single latent factor could have been justified given that that these two latent factors had a very high zero-order correlation of .949. However, I elected to allow these 2 subscales to remain distinct and retested the CFA on the actual study sample before deciding.

The results of the CFAs on the actual study sample demonstrated similar adequate fit at T1 (SRMR = 0.042, CFI = 0.944, RMSEA = 0.064) and good fit at T2 (SRMR = 0.035, CFI = 0.960, RMSEA = 0.059). The reliability of the scale remained high at  $\alpha=.908$  for T1 and  $\alpha=.926$  for T2. On the basis of these results, the reduced 17-item scale was retained.

**Psychological Capital (Psycap).** In the pilot study, CFAs conducted on Psycap were initially not found to fit well. 6 of the items which fit well were particularly sensitive to sample fluctuations (i.e. big modification indices with small EPCs) and were removed from the scale and re-analyzed on the pilot sample with acceptable fit (SRMR = 0.038, CFI = .955, RMSEA = 0.053). In addition, the newly reduced scale was also tested on the actual study and found to be adequate across Time 1 (SRMR = 0.054, CFI = .948, RMSEA = 0.049) and at Time 2 (SRMR = 0.051, CFI = 0.963, RMSEA = 0.049). Overall, the scale reliabilities for the final 18-item set were  $\alpha=.915$  for the pilot sample,  $\alpha=.880$  at Time 1 and  $\alpha=.906$  at Time 2.

**Trait Reflectiveness.** The measure used is the Self-reflection and Insight Scale (Grant, Franklin, & Langford, 2002). This 20-item scale has 12 items measuring self-reflection ("the inspection and evaluation of one's thoughts, feelings and behavior") of which half measured one's need for self-reflection while the other half measured actual engagement in self-reflection and 8 items measuring insight ("the clarity of understanding

of one's thoughts, feelings, and behavior"; Grant et al., 2002, p. 821). Additionally, 7 of the items were negatively worded and had to be reverse-coded as instructed by the authors. It should be noted that one of the items in the scale appeared to be double-barreled ("I'm often aware that I'm having a feeling, but I often don't quite know what").

A CFA conducted based on the 3-factor model validated by the Grant et al. (2002) could not converge. Removal of the 7 negatively worded items allowed the model to converge but the CFA model could not be relied on as the model was non-positive definite. When technical output was requested from the MPLUS program (via the Tech4 subcommand), two of the latent factors (need for reflection and engaging in reflection) were discovered to have correlations greater than 1. This indicated that the two latent factors were so highly correlated that the program could not reliably distinguish between the two. These two latent factors were combined as it made sense that one with high need for reflection should also engage in reflection. However, though the CFA ran successfully with this reduced model, it did not achieve satisfactory fit with the pilot study sample (SRMR = 0.061, CFI = 0.892, RMSEA = 0.096).

Given the difficulty in trying to replicate the 3-factor model proposed by the original authors using the current samples, I explored the possibility that participants may have been responding uniquely to these items in the pilot sample. To do so, an EFA was conducted with on the pilot sample data.

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Insert Table 5 Here  
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As can be observed from the table, the Insight subscale matched perfectly in the EFA with the CFA. It was the Need for Reflection and Engagement in Reflection subscales that were not behaving according to the theoretical structure specified by the authors. In the EFA, these 2 subscales were observed to cluster into 3 latent factors. Secondly, there were 3 items (Item 77 “I frequently examine my feelings”, Item 82 “I have a definite need to understand the way that my mind works” and Item 86 “I often think about the way I feel about things”) that were cross-loading across the other 3 unidentified latent factor. Deconstructing these 3 items, I noted that there were themes of need for reflection (Item 82) and actual engagement in reflection (Item 77) as hypothesized by the authors. However, there were additional subthemes pertaining to the content of the reflection (i.e. emotions and feelings, from Item 86) as well as theorizing about how one’s mind works (Item 82).

Using the above analysis as an initial frame, connections between items that clustered together were explored next around the latent factors in an attempt to identify the nature of these latent factors. It appeared that that F2 captured the essence of both a need for reflection and the actual engagement in reflection. F2 constituted the need for reflection and engagement in reflection scales as proposed by the authors were corroborated by the fact that it contained the largest number of items loading to it.

Looking at the items that loaded highest on F3 (“It is important to me to be able to understand how my thoughts arise”) and F4 (“I frequently examine my feelings”), it appeared that the F3 had to do with theorizing about how one’s mind works and F4 had to do with the reflecting on feelings.

From this pilot study, there was partial success in achieving a factor structure for the trait reflection scale. On the one hand, the insight, need and engagement components in the scale all appeared as proposed by the authors, but with the need and engagement components tending to collapse together. In addition, 2 other factors that pertained to the emotive content of the reflection and the need for theorizing about how one thinks also emerged.

My main take-aways from this EFA was that the insight component was stable, while the need for reflection and actual engagement in reflection component should be merged. Given this partial success, the CFA was repeated with both the actual study sample at T1 and T2, but choosing this time to merge the need for reflection and actual engagement in reflection components as one.

Results of the CFAs with these modifications achieved good fit at Time 1 (SRMR = 0.057, CFI = .960, RMSEA = 0.058) and excellent fit at Time 2 (SRMR = 0.034, CFI = 0.978, RMSEA = 0.046). Given this, subsequent usage of the trait reflection scale at T1 as a covariate utilized the modification of collapsing the Need for reflection with Engagement in reflection. The Cronbach alphas were  $\alpha=.842$  for the pilot sample,  $\alpha=.847$  for the actual sample at Time 1 and  $\alpha=.861$  at Time 2.

**General Self Efficacy.** The New General Self-Efficacy Scale (Chen, Gully, & Eden, 2001) was used to measure general self-efficacy. According to the authors, this 8-item scale has high content validity, being distinct from self-esteem and uni-dimensional in capturing self-efficacy. It was also reported by the authors as having high predictive validity in motivation and work performance and stability across at least two cultural

contexts. Its internal reliability were reported by the authors to be at least  $\alpha = .85$  and above.

In the pilot study, the CFA conducted on generalized self efficacy did not fit well initially (SRMR = 0.300, CFI = .915, RMSEA = 0.144). Upon removal of 2 items (item 88 and item 94) that were sensitive to sample fluctuations, the reduced scale achieved acceptable fit (SRMR = 0.024, CFI = .976, RMSEA = 0.093). In addition, the newly reduced scale was also tested on the actual study sample and its fit was found to be acceptable as well at Time 1 (SRMR = 0.029, CFI = .965, RMSEA = 0.106) and Time 2 (SRMR = 0.029, CFI = 0.962, RMSEA = 0.126), having satisfied Bollen's combinatory rule of either RMSEA or CFI in combination with SRMR within the respective acceptable ranges. The scale could have been further tweaked to improve the RMSEA criteria for model fit. According to Hu and Bentler (1998), the RMSEA is sensitive to omitted loadings. As such, by allowing for cross-loading between two items (item 95 with item 93 from the pilot sample) the model fit improved to SRMR = 0.018, CFI = .989, and more crucially, the RMSEA improved to 0.018. However, including these modifications would have been at the expense of parsimony in the model, which was deemed unnecessary given the use of the scale as a covariate. The final reliabilities of the reduced scale were  $\alpha = .898$  for the pilot sample,  $\alpha = .879$  for the actual sample at Time 1 and  $\alpha = .911$  at Time 2.

**Sentence Completion Exercises: Implicit Theories of Leadership and Leadership Development.** In all three conditions, both the Time 1 and Time 2 surveys ended with a sentence completion exercise to identify the trainee's implicit leadership theories and developmental goal-setting. Two raters (junior leadership instructors with

the training institute) naïve to the objective of the study were recruited to rate the sentences. The raters were asked to provide on a scale of 1 (very poor) to 10 (excellent) their impressions of the leader with regards to his leadership and his motivation to improve himself as a leader.

The implicit leadership theories questions in the sentence completion exercise elicit the trainee's assumptions about how leaders ought to behave (e.g. "To be a leader, one must be...."), what constitutes effective leadership (e.g. "The most effective leader is one who is...."), and perceptions of his own leadership (e.g. "My leadership is characterized by....."). These questions are found in Outcome Measure 1 of Appendix B. These questions were modified from a series of evaluation discussions that formed part of the end-of-course ranking exercise for the trainees. The original discussion questions were ranking questions (e.g. "Rank the following trainees in descending order in terms of 1) behaviors becoming of an officer 2) effective leadership.) The third sentence completion question ("My leadership is characterized by ...") was adapted from a peer appraisal exercise that required team members to rate each other on a set of desired organizational values and behaviors. The two raters have prior experience participating in the end-of-course ranking exercise and peer appraisals from which these sentence completion tasks were modified from. They were also active duty instructors of junior leadership courses. As such, they were deemed subject matter experts suitable for providing evaluations on the quality of these sentence completion tasks.

Evaluations of the each trainee leader's goal-setting were made by the two raters based a goal-setting exercise assigned to the leaders found in Outcome Measure 2 of Appendix B. The exercise included self-ratings by the leaders on the proportions of time

and effort he intended to allocate to self-development, elaborations of his self-development plans, which included rationale and anticipated obstacles. These rubrics were extracted from a separate project in the institute to provide another group of trainees with coaching around an individual development action plan (IDAP). In this project, the rubrics are provided to coaches as a coaching resource to help coaches more effectively facilitate goal-setting in trainees. The two raters have been introduced to the coaching resources. However, this is the first time that the raters were using the rubrics to evaluate the quality of goal-setting. To familiarize the raters to the rubrics, examples of good and bad goal-setting statements from the coaching project were provided.

Inter-rater reliability for the ratings provided by the two raters ranged from .83 to .87. Where ratings differed by more than 2 points on the 10-point scale, the two raters discussed the difference and adjusted their own scores if required. The final tally comprised of a single mean score for each of the goal-setting exercise and the implicit theories sentence completion exercises.

### **Procedure and Manipulation**

At Time 1 (Week 2 of the course), trainees were informed that they will be participating in 2 surveys regarding the quality of training they have received up to that point in time. At Time 2 (Week 8 of the course), prior to the survey, trainees were randomly assigned to one of three conditions – Reflection, Rumination or Control. In each of these conditions, the trainees were asked to describe two key events from the training they have received. These two key training events were previously identified from the qualitative pilot study as formal training activities which provided the highest number of developmental triggers in the training curriculum. Trainees were then

subjected to a 10-minute primer to trigger the various forms of reflection around the two key training events.

**Reflection Manipulation.** In the Reflection condition, trainees were asked to think about how they have benefitted from the training provided by each of the two formal training activities. They were asked to reflect on how the training can be used in their future military postings in the unit to train others, as well as how they can adapt the training to train future trainees in the same course. The aim of these questions was to prompt trainees to engage in adaptive reflection, specifically getting them to focus on the utility of the experience and to demonstrate adaptive problem solving. The questions used to prime the trainees into the abovementioned and subsequent modes of reflection are included in the Appendix.

**Rumination Manipulation.** In the Rumination condition, trainees were asked how the training has inconvenienced them, to detail which aspects of the training most affected their well-being, and to postulate how the training could have turned out even worse for them. This train of questioning was designed to get trainees to become self-absorbed, to engage in extrapolation of negative experiences, both of which are key ingredients of rumination. In both conditions, the trainees wrote down their thoughts in their journals. In order to ensure psychological safety, trainees were assured that their journals were not accessible to the researcher or to the training school.

**Control.** In the Control condition, trainees were told that the researcher would be slightly late. They were then assigned a Sudoku puzzle to complete so as to 'pass the time'. To ensure task motivation, trainees in this condition were told that the one to complete the puzzle the fastest will be given extra time for a break at the canteen at the

end of the day. This Sudoku puzzle required an average of 10 minutes to complete, thereby equalizing the cognitive load of trainees in the Control condition compared to those in the other two conditions who had to engage in the journaling activity. Once the primers were completed, the Time 2 survey was administered to the trainees.

### **Manipulation Checks**

A three-item manipulation check was administered with the trainees from both the basic military training course and the leadership training course at the end of the primer in each condition at Time 2.

**Reflection/Rumination invokes emotional processing.** The first item evaluated the extent to which reflection or rumination about the key training events invoked emotional processing that differed from other forms of pure intellectual activities such as solving Sudoku puzzles such as those experienced by the participants in the control condition. (*How did you feel about the event/activity you were told to think about?* Anchors were 1=*very negative* to 5=*very positive*). Because the events to be recalled and processed were significant milestone events, there should be more emotional reactance demonstrated by participants who were either reflecting or ruminating, compared to those in the control treatment in which cognitive resources were invested in a distraction exercise (Sudoku puzzle). As such, it is expected that any form of processing of the recalled events should result in more emotional reactance compared to the control, with rumination demonstrating more negative reactance than reflection. The means and s.d. for the manipulation check item 1 analysis is found in Table 6.

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A one-way ANOVA revealed a significant difference across the three groups for both the low leadership experience condition,  $F(2, 457)=8.00$ ,  $p<.001$  and the high leadership experience condition,  $F(2, 328)=4.77$ ,  $p=.009$ .

In the low leadership experience condition, planned contrasts revealed that compared to the control, there was a significant difference in the emotional reactance experienced by the trainees who underwent any form of reflection or rumination,  $t(457)=3.22$ ,  $p<.05$ , with the reflection/rumination groups receiving more negative reactance than the control as expected. Likewise, there was also a significant difference in the emotional reactance experienced by the trainees in the rumination versus reflection group  $t(457)= 2.27$ ,  $p<.05$ , with the rumination group being more negative in the reactance than the reflection group as expected.

In the high leadership experience condition, the same pattern repeats itself in the planned contrasts. There was a significant difference in the emotional reactance experienced by trainees who underwent any form of reflection or rumination,  $t(328)=3.08$ ,  $p<.05$ , with the reflection/rumination groups receiving more negative reactance than the control as expected. However, this time round, though the rumination group demonstrated more negative reactance than the reflection group, the difference was not significant  $t(328)=.67$ , n.s, possibly due to the smaller sample sizes in both the reflection and rumination treatment groups.

Regardless, in both low and high leadership experience samples, it was demonstrated that any form of reflecting about the events led to some form of emotional reactance. This reactance is indicative of emotional processing, which meant that the

reflection/rumination manipulations are indeed invoking processing different from the pure cognitive tasks experienced by the control groups in both high and low leadership experience samples.

**Rumination intervention is valid.** Rumination is associated with clinical depression (Nolen-Hoeksema, 2000). The second manipulation check item leverages this effect to determine whether the rumination primer did indeed create a differential effect from the reflection and control primers. The anchors for this item was 1=*Very Depressed*, 3=*Depressed* and 5=*Not depressed at all*. The means and standard deviations for manipulation check item 2 can be found in Table 7.

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Insert Table 7 Here  
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Once again, a one-way ANOVA revealed a significant difference between the groups for the low leadership experience condition,  $F(2,456)=6.32$ ,  $p=.002$ , and for the high leadership experience condition,  $F(2,328)=6.35$ ,  $p=.002$ .

In the low leadership experience condition, planned contrasts revealed that rumination compared to any other form of cognitive activity (i.e. comparing rumination with reflection and control) result in a significantly higher level of reported depressive feelings, as expected,  $t(457)=2.67$ ,  $p<.05$ . This effect is also replicated in the high leadership experience condition  $t(328)=2.88$ ,  $p<.05$ . This lends support demonstrating that the rumination intervention is indeed valid, as it demonstrates depressive self-reports as predicted by literature.

**Reflection intervention is valid.** Reflection is associated with critical thinking and problem-solving, with a focus on positive aspects of an experience, openness and learning from experience (Dewey, 1933). The first manipulation check question examined whether reflection of any kind triggers greater processing of an experience. The second manipulation check question confirms that the direction of the rumination trigger is indeed demonstrating one aspect of rumination which is self-reported depressive feelings. The third and final manipulation is a check on the more distal effect of the reflection manipulation, which is to replicate the effect of higher self-reported feelings of hope that should arise from having engaged in problem-solving modes of thinking compared more ruminative ones. The anchors for this item was 1=*Very Hopeful*, 3=*Hopeful*, and 5=*Not Hopeful at All*. The means and standard deviations for manipulation check item 3 can be found in Table 8.

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 Insert Table 8 Here  
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A one-way ANOVA revealed a significant difference between treatment groups for the low leadership experience condition,  $F(2,451)=13.41$ ,  $p<.001$ , and for the high leadership experience condition,  $F(2,328)=11.69$ ,  $p<.001$ .

In the low leadership experience condition, planned contrasts between reflection against rumination treatment groups revealed a significant difference in self-reported hope, with trainees in the reflection condition reporting higher levels of expressed hope about the events as compared to the rumination condition,  $t(451)=3.18$ ,  $p<.05$ . In the high leadership experience condition, there is no significant difference, possible due to

the reduced cell sample sizes  $t(328)=1.48$ , n.s. Hence, it appeared that while the reflection manipulation was powerful enough to elicit processing of the events in the low leadership experience condition, the effect was not powerful enough to be significantly demonstrated in a reduced cell sample size in the high leadership experience condition.

In summary, the reflection and rumination primers did result in greater emotional (albeit more negative) reactance and higher levels of hope than those in the control. Of the two, the rumination primer also elicited higher levels of self-reported feelings of depression than the reflection primer as expected from literature. This demonstrates the rumination primer to be successful in terms of magnitude of effect created and direction of the effect. The reflection primer performed similarly to the rumination condition in eliciting higher levels of processing of events. However, it was not sufficiently powerful enough to allow the trainees to positively reframe the negative events to engender higher levels of self-reported hope.

**Establishing initial equivalence.** In order to establish initial equivalence, in both the high and low experience samples, trainees at Time 2 were randomly assigned to one of the three conditions. To verify that initial equivalence was established, trainees' quality of reflection outcomes, trait reflectiveness, Psycap, GLE, and general self-efficacy were compared at Time 1. This was verified, with all the scales not significantly different across the three conditions.

## CHAPTER 4: RESULTS

## **Chapter 4: Results**

As a prelude to discussing the specific data analyses and results of hypotheses testing, the workflow for data screening, including dealing with missing data, outliers, and normality is first presented. Following the preliminary analyses, the main analyses and results for each hypothesis are presented. Analyses include correlation analysis, t-tests, ANOVAs, MANOVAs and structural equations modeling. Finally, this chapter concludes with supplemental analysis and a summary of the results.

### **Data Screening**

Before conducting hypothesis testing, the data was entered, cleaned, and prepared for analysis in SPSS. All reverse-scored items were then recoded. Next, an outlier analysis was conducted for items.

### **Outlier Analysis**

Because multivariate analyses can be very sensitive to outliers, or data points that are very different from the rest of the data set, preliminary analyses were conducted to examine the extent of outliers present in the data. Outliers due to data recording or data entry error were eliminated by the use of the online survey system as noted in the previous chapter. However, outliers due to participants responding very differently from the rest still needed to be accounted for. This was particularly important because the online survey system did not allow the respondent to proceed until all entries for any given page was completed, which meant that an unintended consequence could be that the unmotivated respondent may be inclined to provide patterned responses (e.g. enter in

all 1s or all 7s) just to complete the survey. Such patterned responses will also contribute to outliers in the dataset.

To address the issue of outliers, a common rule of thumb of univariate outliers was used where values more than three standard deviations away from the mean were considered an outlier. Through the examination of the frequency distribution of the z-scores for all study variables, the initial extent of univariate outliers were identified. Distortions to multivariate relations due to outliers can be reduced when items are a part of scales. Hence, it was also prudent to check for the extent of outliers at the scale level. At the scale level, a total of 62 of 5,163 data points had z-scores larger than three and consequently 1.2% of the data points were considered outliers. At the item level, 1,074 out of 81,134 data points or 1.32% were outliers.

To correct for outliers, it must first be understood why the outliers occurred. For example, the issue could have been due to attributes of the items, such as their interpretability. On the other hand, outlier responding could also have occurred as an outcome arising from some characteristics of the respondents.

To examine for respondent characteristics associated with outliers, a physical inspection of the dataset itself was conducted to scan for patterned responding across all items. At Time 1, 7 such cases were identified (cases no 123, 164, 165, 195, 233, 267 and 294). At Time 2, 3 cases were identified (cases no 13, 220 and 258). I interpreted these responses as having been induced by lack of motivation at that point in time. Hence, I decided to remove these responses from the dataset and treated these as missing values.

Next, outliers at the scale level that fell 3 standard deviations away from the mean were examined. Again, the focus here was on trying to understand the pattern of response

demonstrated in the entries of all the items in each scale. Several cases stood out as potential unmotivated responding. Cases 168 and 185 scored all 5s and 9s across the quality of reflection outcome scales and the GLE scales at Time 1, while Case 95 demonstrated a similar pattern across the above scales as well as for Psycap. Their entries were deleted and treated as missing. In addition, Case 185 also displayed similar extreme values across the Psycap and Trait reflection scales. Given the propensity for Case 185 to demonstrate extreme responses, its entire Time 1 entries were also deleted.

Aside from these, there were other cases that displayed extreme scores at the scale level. Case 294 entered all 5s for the GLE scale, but the rest of the response appeared normal. For instances like these, the scores for those particular items were deleted so that they could be estimated subsequently using maximum likelihood procedures.

Finally, there were cases which the patterned responding occurred close to the end of the survey. Case 109 appeared to have normal responding until about the final third of the survey, where his responses were all 1s. I interpreted these as ill-considered responses driven by a lack of time and deleted only these entries.

Taking the above actions to address outliers, the issue of univariate outliers was addressed.

## **Normality**

To assess multivariate normality, skewness and kurtosis statistics were examined for each variable. While a normal curve has skewness and kurtosis values of zero, values between +/- two and +/- seven for skewness and kurtosis, respectively, are considered acceptable (Kline, 1998). None of the scale composites from the self-report data had skew or kurtosis values which exceeded these rules of thumb.

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Insert Tables 9-12 Here  
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### **Initial equivalence testing**

To ensure that there was initial equivalence across experimental conditions, participants from the study sample were randomly assigned to one of the three manipulations. To verify that initial equivalence was indeed achieved, a MANOVA of all variables at Time 1 was conducted. None of the variables were significantly different across treatment groups, although trait reflection came closest,  $F(2,318)=2.60$ ,  $p=.076$ . Given this finding and given the fact that trait reflection could influence the effort and quality of reflection across treatment groups, it was included as a covariate in subsequent analyses and modeling.

### **Hypotheses Testing**

Figure 3 depicts the structural relationship between Psycap, GLE and Trait Reflection taken from the high leadership experience sample at Time 1 and the Quality of Reflection outcomes taken at Time 2. It also captures the beta weights of the subscales to the second-order latent factors of Psycap, GLE and Quality of Reflection outcomes. Though the CFI was lower than the cut-off of .950 used in the pilot studies, the overall fit of the model was acceptable (SRMR=.056, CFI=.904, RMSEA=.036) and still within the guidelines suggested by Bollen's combinatory rule of  $SRMR < .08$  and either  $RMSEA < .06$  or  $CFI > .95$ .

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Insert Figure 3 Here  
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The beta weights of the Time 1 latent factors on Quality of Reflection outcomes at Time 2 are all not significant. This again lends support for the success of the manipulation, which is that Quality of Reflection is trigger-dependent rather than state-dependent, i.e. due more to the nature of the reflection triggers than to the characteristics of the person.

### **Hypotheses 1a-1d**

*H1a: The level of Psycap is positively correlated with prior leadership experience.*

*H1b: The level of leadership efficacy is positively correlated with prior leadership experience.*

*H1c: The level of leadership self-awareness is positively correlated with prior leadership experience.*

*H1d: The quality of implicit leadership theories is positively correlated with prior leadership experience.*

What is the effect of leadership experience on the level of Psycap, leadership efficacy, leadership self-awareness and quality of implicit leadership theories? Firstly, an examination of the simple means (refer to Tables 9 & 10) indicate that the differences in means between the two levels of leadership experience are generally in the expected directions. To test for H1a-d, a ONE-WAY ANOVA was conducted to explore the effect of leadership experience on the outcomes of Psycap, GLE, leadership self-awareness and

quality of implicit theories at Time 2 using both the low and high leadership experience samples combined. Of these, Psycap was not significantly different between the high and low leadership groups  $F(1,826)=2.11, p=.147$ . Hence, H1a is not supported.

Leadership efficacy was significantly higher in the sample with higher leadership experience, as predicted by H1b,  $F(1, 826)=14.40, p<.001$ . Leadership self-awareness did not differ significantly between the two groups,  $F(1,826)=1.03, p=.748$ . Hence, H1c is not supported. Finally, the quality of implicit theories was also significantly higher in the group with the higher level of prior leadership experience  $F(1, 713)=7.76, p=.005$ . Hence, H1d is supported.

### **Hypotheses 2a-c**

*H2a: The relationship between leadership efficacy and leadership experience is moderated by type of reflection triggers.*

*H2b: The relationship between leadership self-awareness and leadership experience is moderated by type of reflection triggers.*

*H2c: The relationship between quality of implicit leadership theories and leadership experience is moderated by type of reflection triggers.*

To test for the presence of a moderation effect of rumination vs reflection triggers on the impact of prior leadership experience on leadership efficacy, leadership self-awareness and quality of implicit leadership theories, 3 (reflection, rumination, control) x 2 (low vs high leadership experience) MANCOVA with trait reflection and trait self-efficacy as controls was conducted on the combined low and high leadership experience samples using the data captured at Time 2, and using control variables captured at Time 1. The interaction terms between the predictor (leadership experience) and the moderator

(type of reflection) was examined, with significant interaction terms indicating the presence of moderation.

**Interpreting the MANCOVA results.** For the MANCOVA to be appropriately applied there are three assumptions that need to be met. Firstly, the MANCOVA assumes that the errors are independent of each other across observations and the independent variables in the model. This assumption is valid as the grouping variable of leadership experience was from different samples while the other grouping variable of reflection type was randomly assigned to trainees in both leadership experience levels.

Secondly, MANCOVA also assumes that covariances of dependent variables are constant across cells. This assumption is critical when cell sizes are not uniformly the same, as was the case in this study. The issue is not problematic for the sample with lower leadership experience. However, it was a greater problem for the sample with higher leadership experience. To ascertain the extent of this problem, the MANCOVA was first conducted with the full sample and then repeated with randomly selected trainees from each cell such that cell sizes are equal. The results are similar in pattern. Hence, the full sample analysis will be reported here.

The final assumption of the MANCOVA is that of multivariate normality. This is typically difficult to ensure in practice. Nonetheless, univariate normality was examined and found to be within acceptable ranges.

Given that some of the assumptions of the model may be violated, Pillai's trace will be the reference statistic as it is more robust to such violations (Olsen, 1974). Pillai's trace is a positive-valued statistic, with higher values indicating effects that contribute more to the model. Pillai's trace will also be compared against the Hotelling's trace,

which is the sum of the eigenvalues of the test matrix. It is a positive-valued statistic for which increasing values indicate effects that contribute more to the model. When both Pillai's and Hotelling's traces are small and comparable, it indicates that the effect does not contribute much to the model. Should this happen, further triangulation is derived by looking at the partial eta squared statistic, which reports the "practical" significance of each term, based upon the "ratio" of the variation accounted for by the effect to the sum of the variation accounted for by the effect and the variation left to error.

Given the above background information, the MANCOVA results indicated that the type of reflection by level of prior leadership experience interaction term was significant  $F(6,1540) = 2.66, p=.014, \eta^2 = .01$ . The interaction was significant for leadership efficacy,  $F(2,779)=3.97, p=.02, \eta^2 = .01$  and for leadership self-awareness  $F(2,779)=4.20, p=.02, \eta^2 = .01$ , but not for quality of implicit leadership theories  $F(2,779)=2.60, p=.08, \eta^2 = .01$ . Hence, H2a & b were supported but not H2c.

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 Insert Figure 4-6 Here  
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### **Post-hoc Explorations & Hypotheses 3-5**

In the literature review, the possibility of an interaction of leadership experience and type of reflection triggers was speculated to influence leadership efficacy, leadership self-awareness and quality of implicit leadership theories either positively or negatively. Given this, the effect of reflection triggers was inspected separately post-hoc under conditions of low and high leadership experience. To do this, effects of type of reflection triggers under low and high leadership experience conditions were examined by

employing a ONE-WAY ANOVA with post-hoc comparisons on each low and high experience sample separately. Hypotheses 3 to 5 will also be examined separately under conditions of low and high leadership.

*H3a: Recalling and reflecting positively on any personal leadership experience increases subsequent leadership efficacy.*

*H3b: Recalling and reflecting negatively on any personal leadership experience decreases subsequent leadership efficacy.*

*H4a: Recalling and reflecting on past experience results in greater self-awareness.*

*H4b: Ruminative recall of past experience results in greater self-awareness compared with adaptive recall.*

*H5a: Adaptive reflection results in positive aspects of one's implicit leadership theories becoming more easily explicated.*

*H5b: Maladaptive reflection results in negative aspects of one's implicit leadership theories becoming more easily explicated.*

**Low leadership experience.** Under the low leadership experience condition, the pattern of mean scores across type of reflection triggers were consistent with expectations, which was that one would expect reflection triggers to score highest, followed by control and then rumination. This was true for all the outcomes (see Figures 4-6). In other words, the simple effects of type of reflection triggers on the outcomes were occurring in the expected direction. However, not all the cell mean differences or simple effects were significant. The post-hoc comparisons with Bonferonni correction reveal no significant difference under reflection versus rumination trigger conditions for

leadership efficacy,  $t(494)=1.29$ ,  $p=.20$  and leadership self-awareness  $t(494)=.816$ ,  $p=.42$ . Only the quality of implicit leadership theories differed significantly with it being higher under reflection versus rumination triggers  $t(442)=4.28$ ,  $p<.001$ . Hence, under conditions of low leadership experience, the only support found was for H5a & b.

**High leadership experience.** Under the high leadership experience condition, the pattern of mean scores across type of reflection triggers was again consistent for quality of implicit leadership theories, with it being higher in reflection versus rumination triggers  $t(328)=2.14$ ,  $p=.033$ . Hence, again, support for H5a & b was found.

On the other hand, contrary to expectations, an inspection of the mean scores revealed that it was the rumination rather than the reflection triggers that achieved significantly higher levels of leadership self-awareness  $t(328)=-2.86$ ,  $p=.005$  and leadership efficacy  $t(328)=-2.53$ ,  $p=.012$ . Hence, while there are significant differences across type of reflective trigger conditions, there is no support for H3a & b regarding effect of type of reflection on leadership efficacy and for H4a & b regarding effect of type of reflection on leadership self-awareness.

**Predictors of GLE at Time 2 for high leadership experience.** In addition to testing the hypotheses, it appeared from the qualitative interview data that there was something distinctly different between the responses of the ‘better’ leaders versus the others. Realizing that my own mental models or implicit theories of leadership may be at play in segregating these ‘better’ leaders from the others, I determined that my own implicit theories of leadership contained a huge element of high leadership efficacy for those who came across as good leaders in the interviews. Hence, I decided to explore what other variables may be associated with GLE.

From the datasets available to me to conduct this exploratory analysis, the predictors of GLE at Time 2 were modeled and depicted in Figure 7 below. The model fit was adequate given the complexity of the model (SRMR=.055, CFI=.900, RMSEA=.046). The beta-weights for the paths from Psycap and leadership self-awareness at Time 2 to GLE at Time 2 were both significant at the 95% confidence interval ( $\beta$ =.928 and .790 respectively).

An alternative model was tested in which Psycap mediates the relationship between leadership self-awareness and GLE at Time 2. This represents a more restrictive model on which a chi-sq difference test can be applied. Should the test turn out non-significant, then there is no difference between both models and so the more parsimonious (ie restrictive) model should then be accepted. In this case, the chi-sq difference test was highly significant (chi-sq diff = 7.162, d.f. diff = 1,  $p < .001$ ). Hence, the original model of Psycap and leadership self-awareness being predictors of GLE at Time 2 was accepted instead.

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 Insert Figure 7 Here  
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Using the above comparison methods, I tested several other models using Time 1 predictors against GLE at Time 2. However, these either turned out to either provide much poorer fit or simply failed to converge properly. Hence, it was safe to exclude Time 1 predictors from the final model. Hence, my implicit theories of good leadership, evidenced by high GLE at Time 2, were statistically connected to the level of Psycap and leadership self-awareness. In other words, my experience of encountering ‘good’

leadership during my interviews are likely due to these leaders having a high level of GLE, Psycap, and whose leadership self-awareness are high.

Statistically, the final model was also equivalent to another alternative model in which the leadership self-awareness at Time 2 was the criterion, and in which GLE was a mediator. This model, though theoretically feasible, was too much of an inference to be drawn from a dataset in which both predictors and criterion were not temporally differentiated.

## CHAPTER 5: DISCUSSION

## **Chapter 5: Discussion**

### **Review of Purpose of Dissertation**

This dissertation explored triggering reflective thinking and its impact on variables important for leadership development, such as leadership efficacy, leadership self-awareness, one's implicit leadership theories of leadership and one's psychological capital. Specifically, this dissertation sought to establish whether it was possible to create situational triggers that impacted different types of reflective thinking, and whether these types of micro-interventions were significantly powerful to impact the leadership development variables.

### **Overview of Discussion of Results**

The manipulation checks in the pilot and actual samples confirmed that the triggers successfully replicated the range of ruminative to reflective effects intended for in the dissertation. In both the low and high leadership experience samples, both the reflection and rumination triggers worked as intended, according to the manipulation check items. The relevant literature supporting the choice and outcomes of the manipulation items have been provided in Chapter 3 and will not be repeated here.

In actual use, however, the reflective triggers appeared to have a much weaker effect on leadership efficacy, leadership self-awareness and than that of the ruminative

effects in the sample with higher leadership experience. These results will be discussed as part of the post-hoc analyses.

On the other hand, the reflective effects were stronger than the ruminative effects in the sample with lower leadership experience, suggesting the presence of an interaction between leadership experience and the type of triggers. Though speculated, the presence of a significant interaction effect (Figures 4-6) was not initially part of the literature review and will therefore be discussed in detail.

There are several plausible explanations for leadership experience to interact with the effect of type of triggers. The first type of explanation is along the lines of threats to validity, and will be elaborated when the limitations of the study are examined. The second type of explanation is theoretical in nature and will be elaborated in the section on theoretical contributions.

### **Effect of Leadership Experience: Discussion of Hypotheses 1a-d**

Hypotheses 1a-d explored the correlation of leadership experience with Psycap, leadership efficacy, leadership self-awareness and quality of implicit leadership theories. The analyses revealed that in line with H1b & d, leadership efficacy and quality of implicit leadership theories were positively correlated with leadership experience. The rationale for these has been discussed in Chapter 1 and will not be repeated here. Rather, Psycap, which was also influenced in the expected direction but not significant, and leadership self-awareness, which was not influenced by leadership experience, will be discussed in greater detail.

**Lack of effect on Psycap.** There was an improvement in Psycap with greater leadership experience, except that this was not significant. A possible reason could be

due to the choice of samples used in this dissertation. The low leadership experience and the high leadership experience samples differed from each other by only nine weeks.

Although Psycap has been demonstrated to be improved in micro-interventions (Luthans, Avey, Avolio, Norman, & Combs, 2006), this was not the case here because the training course was not designed to implement Psycap improvement. Nonetheless, because of the relevance of Psycap to leadership development, it is not surprising that here Psycap is improving with more military leadership training albeit not significantly so.

**Lack of effect on leadership self awareness.** Leadership self-awareness was not influenced by leadership experience. This was not a surprising finding on hindsight.

While one may have predicted that more experienced leaders should have demonstrated more leadership self-awareness, again the choice of samples used in this dissertation, with both samples differing by only nine weeks in terms of soldiering and military leadership, would have been too close together to expect any significant differences in leadership self-awareness.

Viewed in another way, this finding indirectly provides support that the state of leadership self-awareness is more amenable to situational triggers. Further support for this is found in the structural equations modeling (refer to Figure 3) in which none of the other psychological variables such as Psycap, leadership efficacy and trait reflection.

### **Interaction of Leadership Experience and Type of Reflection Triggers: Discussion of Hypotheses 2 to 5**

There is a significant interaction between the level of leadership experience and the type of reflection triggers. This interaction was significant for leadership efficacy (H2a) and leadership self-awareness (H2b), and only marginally non-significant for

quality of implicit leadership theories (H2c). These results will be discussed under conditions of low and high leadership experience. (Refer to Figures 4-6).

**Implicit leadership theories.** Reflection triggers produced significantly higher levels of implicit leadership theories under both low and high leadership experience conditions (i.e. H5a & b were supported). The benefit of using reflection triggers is most marked under conditions of low leadership experience, with reflection triggers performing significantly better than rumination triggers. However, with greater leadership experience, the differential effects of types of triggers were no longer as apparent (i.e. H2c marginally unsupported).

The above findings are not surprising. As described in the literature review, implicit leadership theories are knowledge structures. When one is naïve about leadership, one's ideas and assumptions about leadership are less well-formed and hence more amenable to external influence. Reflection triggers, being designed to be thought-provoking, is therefore more likely to have a stronger influence on the expression of ideas of leadership. When leadership experience is high, there is more available stable self-knowledge about oneself as a leader. Hence, rumination, with its self-focused attention, should therefore not fare too badly compared with reflection, as was found here.

**Leadership efficacy.** In both the low and high leadership experience samples, support for H3a & b were not found. In the low leadership experience condition, reflection triggers resulted in higher levels of leadership efficacy but was not significant. On the other hand, in the high leadership experience condition, the reflection triggers performed significantly worse than the rumination triggers. This was a surprising finding.

In the literature review in Chapter 1, I proposed that rumination is counter-productive for concurrent problem-solving because it channels finite cognitive resources from problem-solving to attend to the self. I then predicted that reflection with its problem-focused approach should fare better. In the long run, leaders who reflect rather than ruminate will engage in more problem-solving thinking, which should result in increased leadership efficacy. In this instance however, this train of argument was not sufficiently supported by the data from the low leadership experience group and contrary to the data from the high leadership experience group. Regarding the former, it may be that the reflection triggers were not repeated frequently enough throughout the training course to generate enough leadership efficacies through repeated enactive mastery (Bandura, 1997). This was not the intent, as the dissertation aimed to explore the newer approach to raise leadership efficacy through a micro-intervention of varying the type of reflection trigger, rather than through the already established route of enactive mastery through repeated practice.

Regarding the latter finding of rumination performing better than reflection in the high leadership experience condition, firstly, it must be noted that in spite of this finding, the aim of designing a micro-intervention for triggering higher levels of leadership efficacy is still met, except that the novel finding here is that rumination works better than reflection when leadership experience is high.

Next, there are several possible explanations for why rumination should perform better than reflection in the high leadership condition. First, it was uncovered through the pilot study with this group of trainees that the training environment in the high leadership experience condition was highly arduous and negative. Under such conditions, the focus

of reflection to negative aspects may actually facilitate catharsis and recovery, thereby helping the trainees to deal better with the training and hence achieving enactive mastery.

Second, familiarity with the ruminative over the reflective process may be another reason. The pilot study uncovered that the mode of after-action reviews practiced by the trainees tended to focus on the negative aspects (“what went wrong”) of the experience. The training curriculum in the high leadership experience condition was very intensive and not facilitative of the more novel reflective habits from being assimilated and practiced. Hence, when reflection triggers were introduced during the experiment at the end of the course rather than habituated each time dilemmas occur, trainees are less likely to adapt well as they are less familiar with this form of reflection. Given these background reasons, it is plausible for trainees exposed to the ruminative trigger condition to outperform trainees in the reflection condition.

**Leadership self-awareness.** The pattern of findings for leadership self-awareness is similar to that for leadership efficacy. In both the low and high leadership experience samples, support for H4a & b were not found. In the low leadership experience condition, reflection triggers resulted in higher levels of leadership self-awareness but was not significant. On the other hand, in the high leadership experience condition, the reflection triggers performed significantly worse than the rumination triggers for leadership self-awareness, as was the case for leadership efficacy.

As with the situation for leadership efficacy, familiarity with the rumination process in the high leadership experience may have resulted in the greater potency of the ruminative trigger over the reflection trigger. On the other hand, the focus of the training course may also have played a role.

In the high leadership experience condition, junior leader trainees were trying to acquire the knowledge, skills, abilities and competencies of military leadership. In fact, the training objectives of the course were explicit in the leadership and vocational skills needed, but less so on the leader identity, values and purpose. Hence, it is logical to assume that the focus of after action reviews during training therefore also on skill development, with less time available to touch on the deeper leader identity-development aspects that the scale attempted to capture. Hence, it is possible that with less time and attention on identity development, there was less experienced change for the reflective triggers to activate during the end-of-course intervention.

**Post-Hoc Analyses: Predictors of leadership self-awareness.** Using the datasets firstly from the low leadership experience cohort and then repeated on the high leadership experience cohort, the full structural model was constructed to determine the extent of contribution of psychological constructs such as Psycap and leadership self-awareness toward leadership efficacy (Refer to Figure 7 for final structural model on high leadership experience cohort). The intent of the exploratory analysis was to understand the relative contribution of the new leadership self-awareness construct on leadership efficacy, given the contribution of Psycap. It was heartening to note that firstly, Psycap was uncorrelated with leadership self-awareness, providing assurance of the construct validity of newly constructed leadership self-awareness scale. Secondly, the relative contribution of leadership self-awareness on leadership efficacy was very high ( $\beta=.79$ ) even after taking into account the presence of Psycap. However, more research is needed to refine the reliability and validity of the newly constructed scale before further inferences can be made from this full structural model. Nonetheless, at least for this sample, raising the

leadership self-awareness of trainees, which has been demonstrated to be feasible through the use of reflective triggers, should significantly raise the leadership efficacy of trainees, thereby contributing to the leadership development of these trainees.

### **Potential Limitations**

This dissertation, like most, has limitations that may potentially restrict its internal and external validity. Internal validity refers to the degree in which cause-effect relationships postulated in the study are true. When internal validity is high, experimentally manipulated effects occur as intended by the researcher and are not due to other causes. In other words, observed effects cannot be reasonably explained by other factors. These other factors are also known as threats to validity. The likelihood that such factors threatened the validity of the dissertation should be examined. In this dissertation, the potential threats to internal validity are: climate, effectiveness of the reflection-rumination manipulations, participants' motivation, uneven sample distribution and power, limitations of measurements and method and finally, experimenter bias.

External validity refers to the extent to which results concluded from a study are generalizable to other contexts or population groups. When external validity is high, it is typically because the context or samples employed in the study are highly comparable to other more general contexts or population groups. In this dissertation, the potential threats to external validity are the training context and characteristics of the sample itself.

All threats to validity will be discussed together in the following section.

**Climate.** The single biggest limitation of the dissertation came from the unexpectedly negative training climate uncovered. This negativity manifested itself in how trainees were conditioned to think. Examples of the artifacts of the negative climate

included increased performance-avoid orientations after undergoing training, focus on negative aspects of performance during AARs, high levels of cynicism and perception of double standards in instructors.

**Effectiveness of the reflection-rumination manipulations.** The reflection manipulation was not as powerful as the rumination manipulation. Worse, the reflection manipulation likely interacted with the negative climate to influence the efficacy outcomes in the opposite direction.

**Participants' motivation.** Participants may have had varying levels of motivation to complete the intervention. The training curriculum, as previously mentioned, was very intense. All the surveys and interventions occurred during limited free periods, which typically tended to be just before dinner during evenings. With limited free time, participants may have been distracted and may have found it hard to settle down to a balanced state to respond to the triggers as intended. As the sessions were conducted prior to dinner, they may also have been motivated to complete the study quickly, thereby demonstrating a superficial level of effort that is not congruent with that required by the study, particularly the reflection condition.

Another aspect of participant motivation could have originated from familiarity. The after-action review steps in the rumination condition are more familiar to the trainees than the ones in the reflection condition. This could have translated into higher performance for the rumination condition while the lack of practice in the reflection condition could have suppressed performance.

Given the above, my assessment of the threat to validity due to participants' motivation is high. This therefore implies that there could have been a general

suppression of performance due to potential distraction encountered by participants. Between reflection and rumination, participants could also have under-performed in the reflection condition due to unfamiliarity.

**Uneven Sample Distribution and Power.** A third limitation concerns the uneven distribution of subjects to the rumination and control conditions. I was constrained by training requirements to allocate more subjects to the condition that was expected to receive more benefit. Hence, I allocated extra trainees to the reflection condition. In hindsight, doing so has led to reduced power in the rumination and control conditions.

**Measurement Limitation.** Another limitation relates to the use of new measures as outcome variables. The GLE and Quality of Reflection Outcomes were new measures. While the Psycap scale has more established validity research, it was also relatively new as well. In of themselves, the use of new measures is not a problem if these measures are reliable and valid. In this study, the reliabilities and validities of the measures were acceptable. The issue with the use of new measures is the risk of capitalizing on chance when there is not enough evidence for the robustness of the measures when applied to a different culture, context or sample. This was definitely the case here as all the measures were applied to an entirely new culture and sample.

**Method Limitations.** Next, all the data collected were from survey-based methods or from focus groups. Although objective data, particularly performance data were initially planned for in the dissertation proposal, this was eventually unavailable due to national security issues. Ideally, multiple sources of data should have been ensured to reduce the risk of introducing a method bias to the study.

**Experimenter Bias.** Experimenter bias occurs when participants in a study are influenced by the cues or expectations projected (consciously or otherwise) by the experimenter, or when the experimenter's judgment is influenced by his/her own expectations. In this dissertation, the areas whereby this could have occurred are 1) during survey administration 2) during coding of the qualitative data. To reduce the risk of experimenter bias, survey administration was conducted by assistants who were naïve to the design and intent of the study. During survey administration, they adhered to a script. Secondly, the coding of the qualitative data was conducted by assistants who were similarly naïve to the design and intent of the study. During the coding, the assistants were assigned random piles from all three treatment conditions to score. Despite this, the inter-rater reliability reported remained high. Hence, on the whole, experimenter bias was not assessed to be a significant threat to validity.

**Sample.** The sample used in the study may potentially limit the generalizability of the findings. For example, the subjects were all male emerging adults with high military leadership potential training in a military environment. It remains to be seen if females would manifest different coping and performance in such a similar environment. On the other hand, because the subjects were drawn from a national compulsory conscription cohort, they form a good representation of all males with leadership potential in the country, taking national demographics of race, religion, education into account. Hence, while the sample does not include females, the findings in this dissertation should be applicable to emerging adult males with leadership potential in this country.

**Training Context.** The training context in this dissertation was unique in several ways. Firstly, the training environment was applied to a captive audience. Being

conscripted, trainees in the study had varying levels of motivation to want to lead or to be trained as leaders. This directly impacts the quality of reflection that may be induced in the study.

Secondly, the training context was military in nature. The pervasiveness of the military milieu, such as regimentation, high power-distance between trainees and instructors the military focus, content and application of training presented unique challenges for me to introduce reflective practices. Compared to the military, reflective practices are more prevalent and established in other contexts such as education or business. Hence, reflective practices may come more naturally to these contexts than in the military. This will again directly impact the quality of reflection that may be induced in the study. On the positive side, however, the relationships identified in this study may therefore be a conservative estimate of that which may be uncovered in more natural contexts such as education and business.

### **Recommendations and Implications for Future Research**

**Developmental climate.** Future research should include developmental climate as a variable to be examined further. In this dissertation, it appeared that the operating climate played a role in influencing the impact of the reflective triggers. In a quasi-field experiment, Ellis and Davidi (2005) demonstrated that when after action reviews focused only on failed experiences, soldier performance in field navigation were poorer than when the after action reviews focused on successful experiences as well. The authors attributed the better performance to the inclusion of both successful and failed experiences as part of the after action reviews. However, another plausible explanation may be that the inclusion of both types of experiences may be perceived as a more

developmental climate in play, i.e. one that encourages after action reviews and reflections to occur, and in which emphasis is placed on learning from both positive and negative events.

In this dissertation, the lack of such an emphasis may have reversed the effects of ruminative and reflective triggers on leadership development. So what might constitute a positive or negative developmental climate? In perhaps a more normative climate, trainees engaging in rumination should have performed poorer than trainees engaging in reflection in leveraging on the developmental potential of triggers encountered. Trainees who engage in rumination invest their limited cognitive resources on unproductive thinking such as dwelling on symptoms rather than on solutions. Conversely, trainees that engaged in reflection that is future oriented, problem focused should have derived new insights to problems faced, thereby increasing their leadership efficacy and Psycap.

In a positive climate, the advantages of reflection over rumination should be even more significantly felt. In such a climate, it should be expected that the climate would predispose reflective practices and reflective thought. With institutional investment in resources and time for reflection, those who whittle away their opportunities for reflection and engage in rumination instead should find themselves further afield than those who have been compliant to the climate.

In an oppressive climate, trainees may actually be experiencing leadership-related negativity or even trauma. Examples elicited in the pilot study included trainees observing instances of leaders who failed to walk-the-talk, demonstrated double standards, were poor role-models, and who were disinterested in trainee development. It is outside the scope of this study to understand how such leadership behaviors can be

found in a training institute, though I speculate that instructor burnout may play a large part in it. Nonetheless, when trainees are demanded to demonstrate high standards expected of leaders and yet do not see the same standards in their instructors, this discrepancy may lead to a negative reaction when asked to display any form of leadership they do not see role-modeled in the instructors.

**Competing demands.** Cognitive resources are needed for self-development. Likewise, cognitive resources are also required to maintain harmony within one's internal psyche. In the face of competing demands, it is plausible that resources are more likely to be directed at maintenance rather than at development. Hence, any attempts to trigger development may encounter resistance. Ruminative triggers with its focus on symptoms of the situation at hand may be closer to the catharsis and maintenance that one's battered mind desires. As such, greater utility will be ascribed to ruminative triggers by trainees in the rumination condition.

These observations remain conjectures at this point in time. However, there is sufficient evidence to warrant that future research examine the effect of a developmental climate on reflection and performance.

**Reflective practices and habits.** Another variable to include in future research is actual reflective practices and habits acquired throughout the training course. This was considered but not included in the current study as the focus was on demonstrating the efficacy of micro-interventions introduced at the end of the training course for framing one's reflections on training. One could argue that reflection can occur throughout the entire duration of the training, not just at the end. Hence, including measures of reflective habits and practices done throughout the entire course may have provided a more accurate measure of change to better model the relationships between reflection and its impact on leadership efficacy and Psycap development.

**Developmental readiness and motivation to lead.** Leadership development is onerous, as is engaging in reflective practices. This is particularly so when the environment is not conducive to such practices, or when one is not predisposed to reflection. Hence, one must first be willing and ready for development in order to invest energy and time into one's leadership development. In this study, trait reflection and intermediate outcome measures such as quality of reflection were used to indicate the motivation for reflection that occurred in the study. Motivation for reflection may also be related to one's developmental readiness or one's motivation to lead. In this study, it was not clear if trainees were motivated to develop themselves. Future research could include this variable to help better understand the motivational dynamics behind reflection for development.

### **Theoretical and Practical Contributions**

This dissertation has provided empirical evidence for reflection with leadership efficacy. However, the effect of reflection may not be uniformly beneficial across all

levels of leadership experience. The possible reasons for this interaction between experience and reflection was discussed, of which one potential moderating variable raised for future research was developmental climate.

**Reflection is not enough.** From a practitioner perspective, clearly, it is simplistic to exhort reflection as a toolkit of leadership development without paying attention to the level of leadership development in the leader, as well as attending to the climate of the training milieu. In addition, other leader-related variables that needed to be considered included the leader's personal readiness for development. Finally, attention needs to be paid to encouraging personal habits of reflection in the leader. Habit creation implies that the length of training required may necessarily be long, though the length of each intervention need not be so.

**Distinguishing skill development and identity development.** Another contribution this dissertation has made is to distinguish between leadership skill development objectives versus facilitating psychological transitions in self-identities in training. In this study, the trainees from the high leadership condition clearly emphasized skill development rather than identity development. On the other hand, the training provided to the trainees from the low leadership condition placed more emphasis on identity development since these were civilians newly conscripted into the military. Consequently, the data suggested that the higher quality of leader self-reflections were experienced by those trainees from the low leadership experience condition. On the other hand, although the trainees from the high leadership experience condition became more skilled, they also reported poorer quality of leader self-reflections, presumably because their identity development was not being addressed.

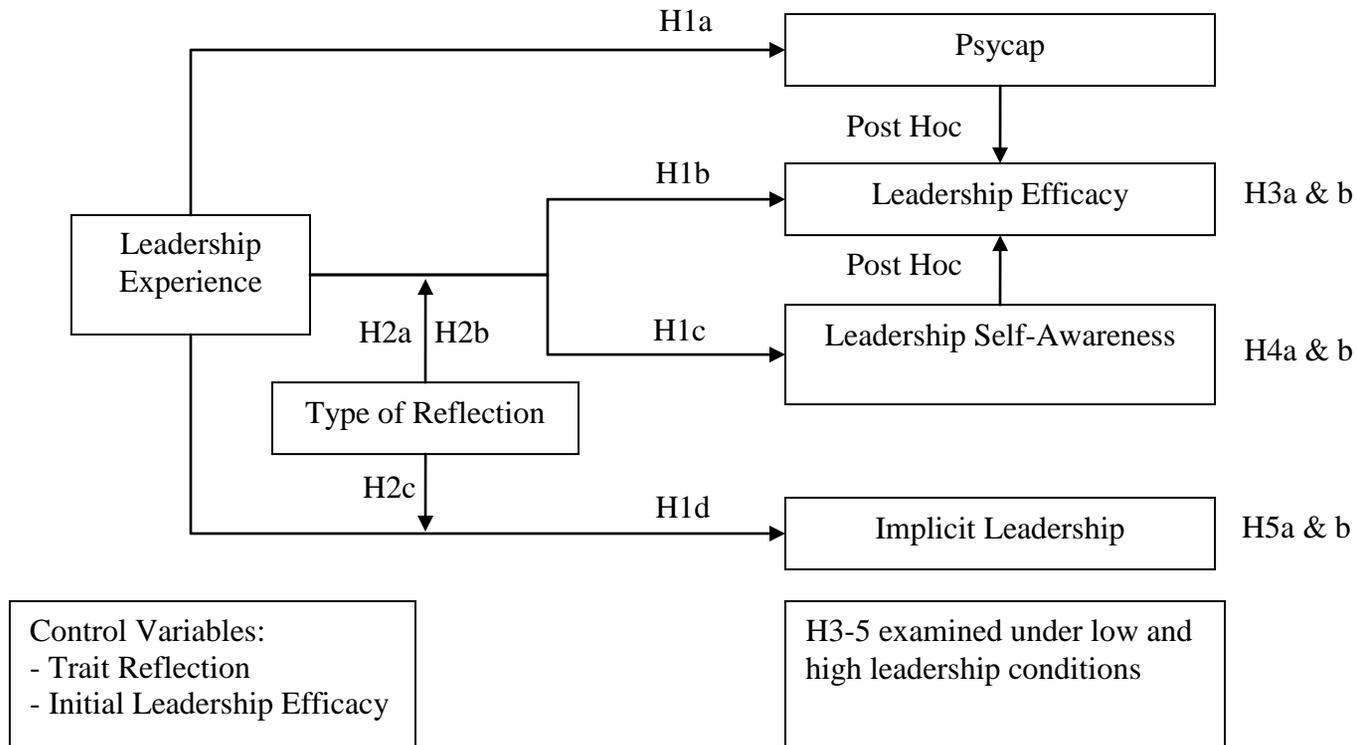
**Motivation and identity.** Leadership development practitioners need to attend to not only ‘will’ and ‘skill’ factors, but also, as shown in this study, identity-transition issues. For example, in an Academy of Management Learning & Education article, Rousseau and McCarthy (2007) provided six principles to help managers become more skillful in making better decisions based on evidence. Practitioners who adapt these principles in managerial development programs will need to further attend to the motivation of manager-trainees to want to apply these principles in real-life. While extrinsic motivators can be provided as carrots for doing so, to trigger intrinsic motivations, one would invariably need to see to the identity-development of these managers.

## **Conclusion**

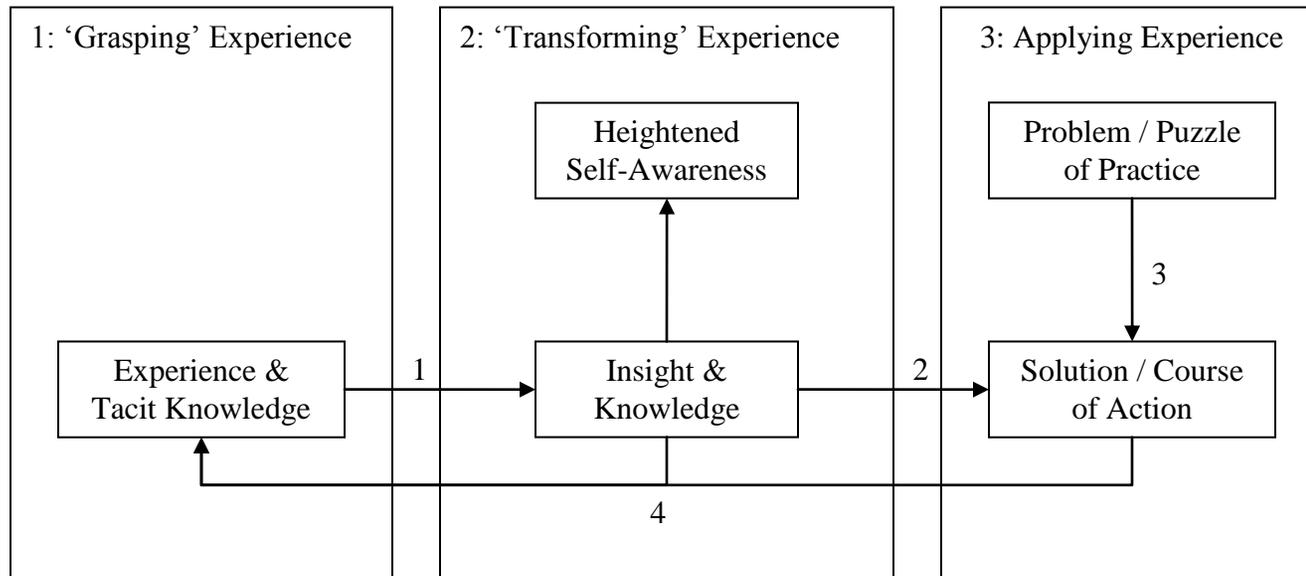
This dissertation seeks to contribute towards closing the scientist-practitioner gap in the area of reflection for leadership development. The oft-used leadership development method of reflection was examined, firstly from two theoretical bases of educational psychology and clinical psychology to derive two types of reflective triggers which were demonstrated to work. Next, the reflective triggers were used in an applied training setting to influence leadership development. In so doing, an unanticipated interaction between level of leadership experience and the type of reflection was uncovered. Nonetheless, empirical evidence was established to successfully link reflection with psychological capital and leadership efficacy.

Figures

Figure 1: Hypothesized Model



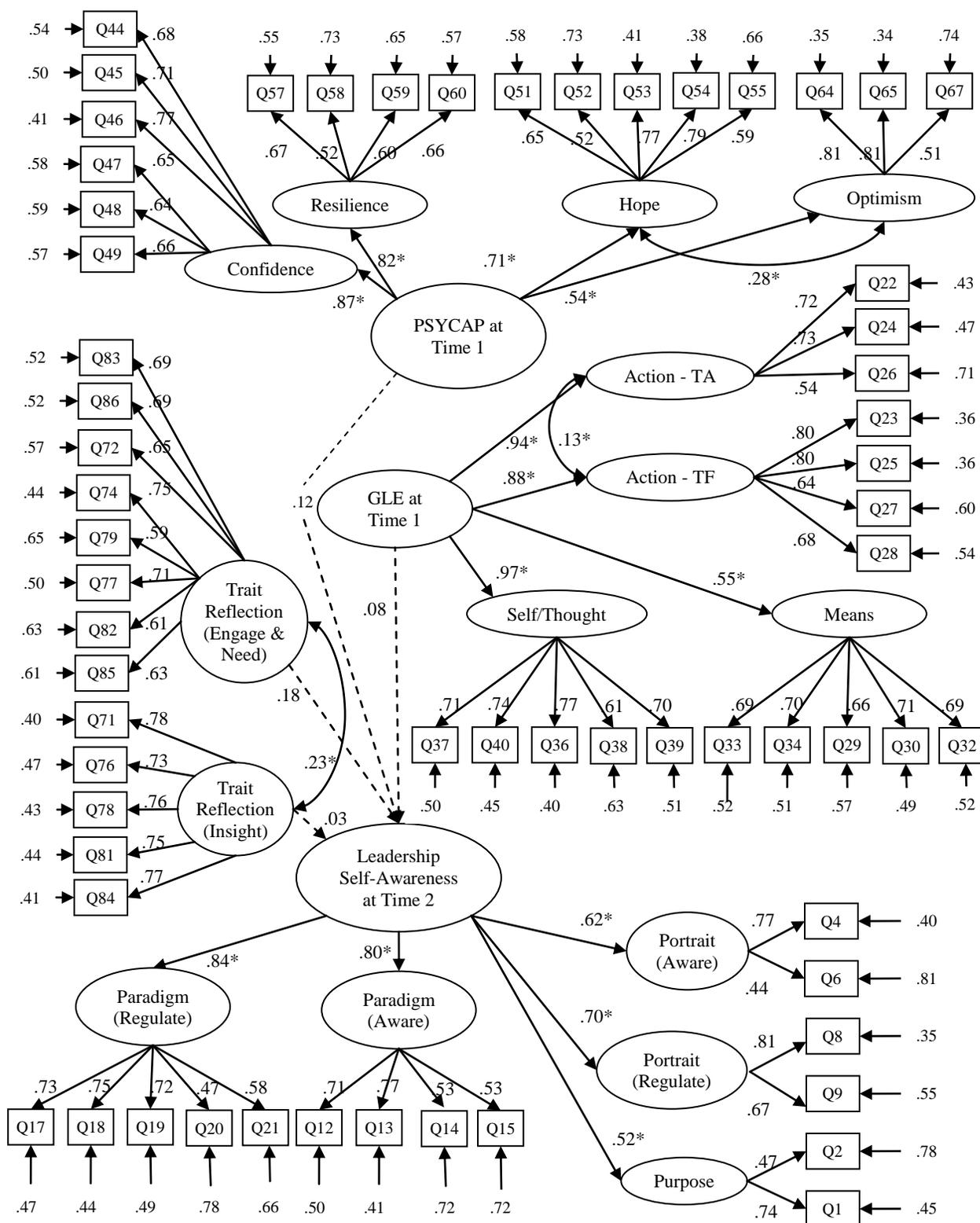
**Figure 2: 3-stage model linking adaptive reflection to experience, development and performance**



\* Numbered Arrows indicate when the process of adaptive reflection occurs

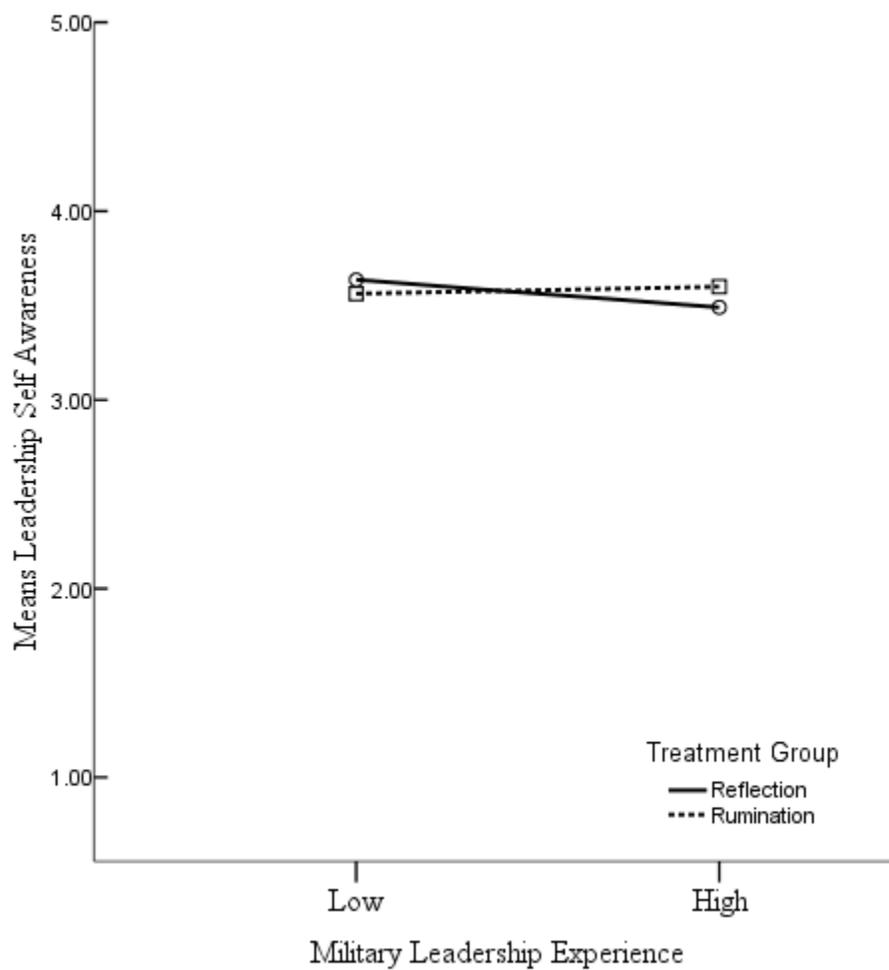
\*\* Boxes 1 & 2 contribute to development while Boxes 2 & 3 contribute to performance

Figure 3: Effect of Time 1 Predictors on Quality of Reflection at Time 2

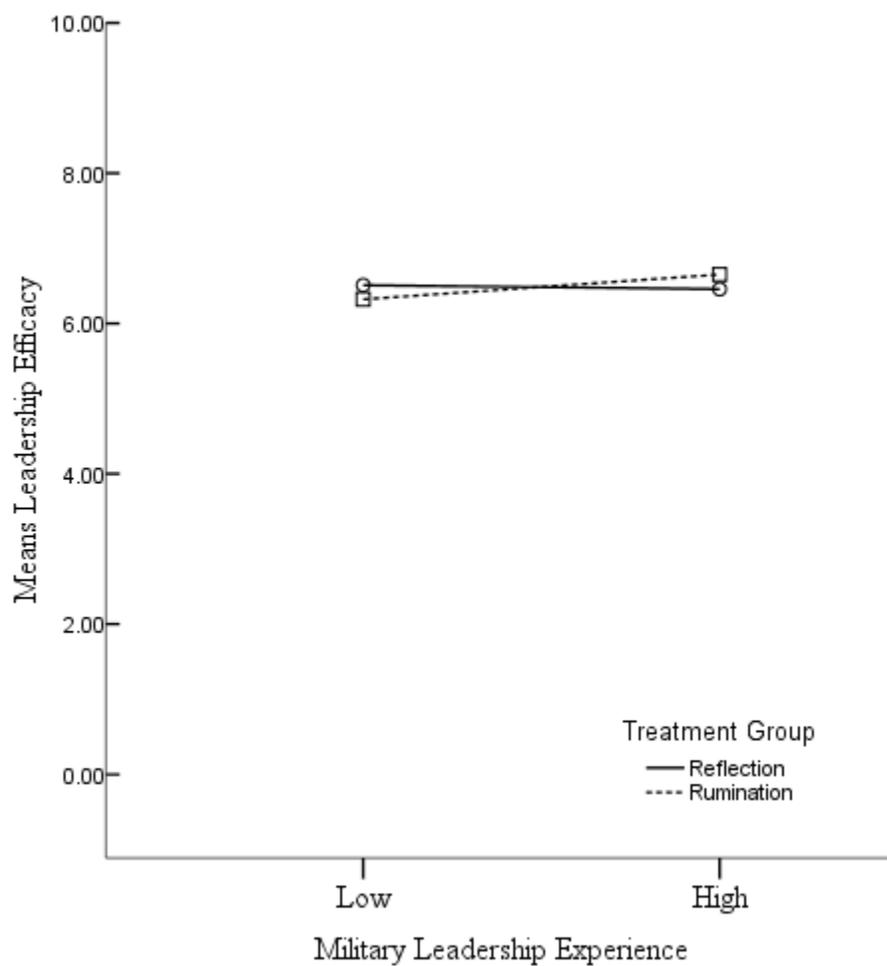


Standardized beta weights as shown above. (Significant beta weights indicated by \*)  
Adequate Model Fit (CFI=.904, RMSEA=.036, SRMR=.056) Indicators of all latent factors are not depicted in the figure.

**Figure 4: Interaction of Military Leadership Experience with Type of Reflection on Leadership Self-Awareness**



**Figure 5: Interaction of Military Leadership Experience with Type of Reflection on Leadership Efficacy**



**Figure 6: Interaction of Leadership Experience with Type of Reflection on Quality of Implicit Leadership Theories**

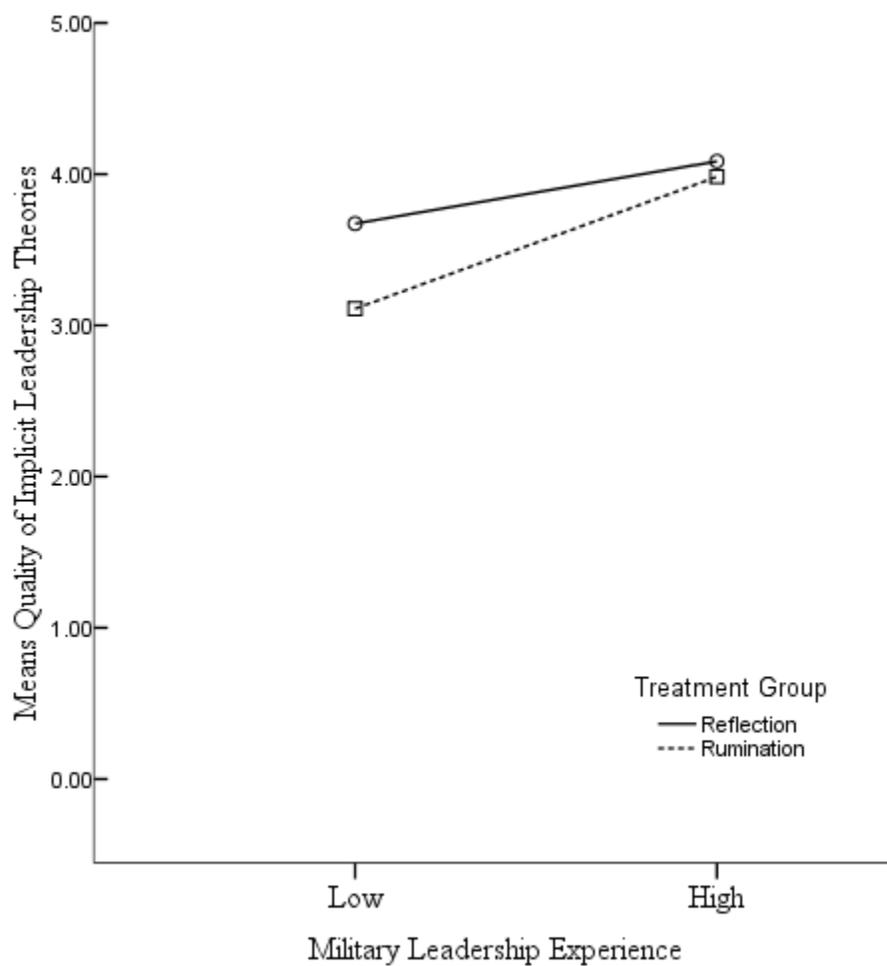
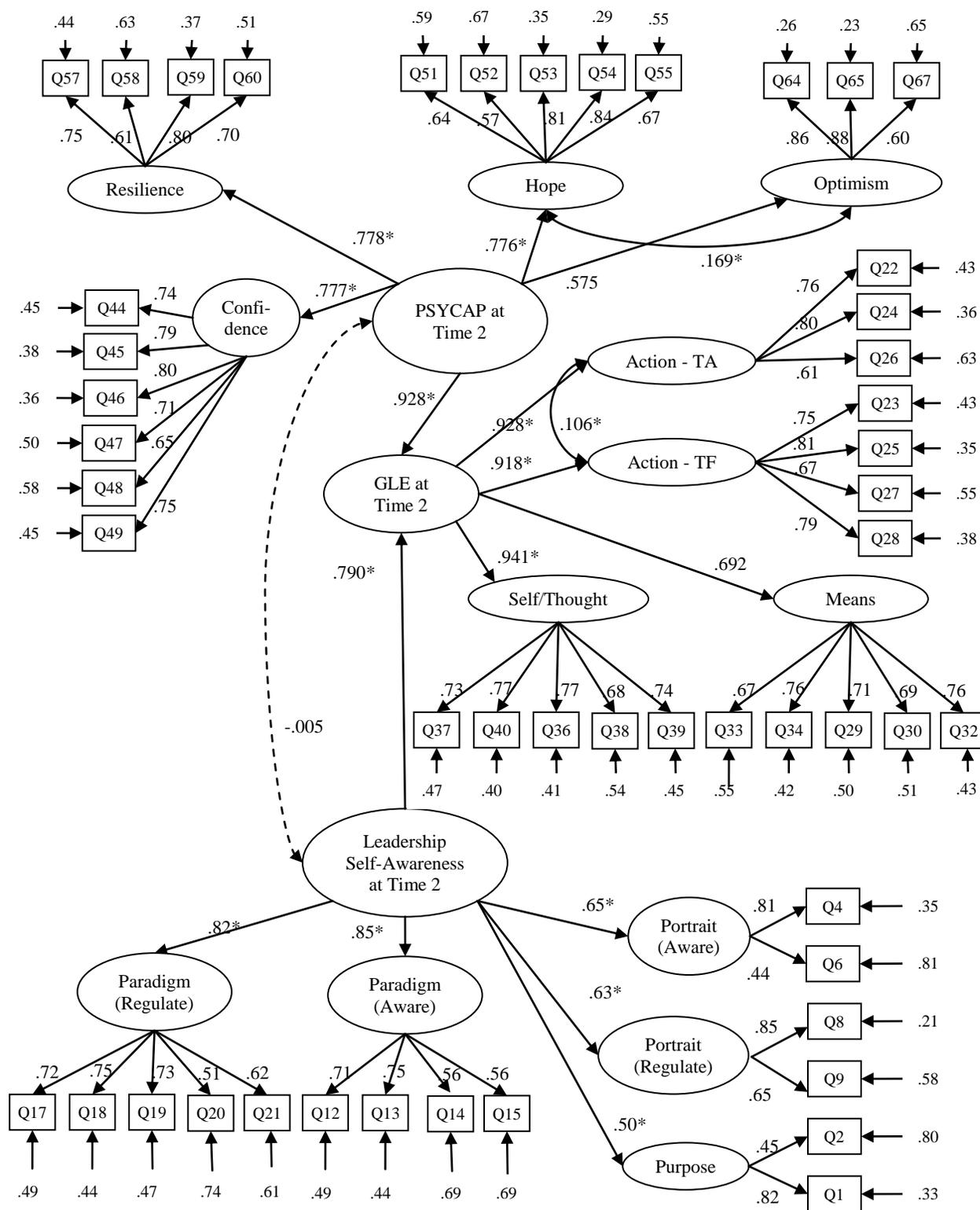


Figure 7: Predictors of Generalized Leadership Efficacy at Time 2



Standardized beta weights as shown above. (Significant beta weights indicated by \*)  
Adequate Model Fit (CFI=.900, RMSEA=.046, SRMR=.055) Indicators of all latent factors are  
not depicted in the figure.

**Tables****Table 1: Events that provide highest proportions of developmental triggers**

Event	% of Developmental Triggers
Route March	35.01
Field Camp	29.22
Navigation Exercise	12.66
1 <sup>st</sup> day in course	5.18
Others	17.93
Total	100.00

**Table 2: Coding Frame for evaluating reflections**

	Self-Awareness	Self-Regulation and Self-monitoring
Leadership Purpose and Values	9%	15%
Leader self-image, self-portrait	14%	6%
Leadership assumptions, operating paradigms	16%	3%
Others (not captured in the coding frame)		37%

**Table 3: EFA results**

Model	Chi Sq	df	sig	RMSEA	RMSEA < .06?	Chi-Sq Diff	df Diff	Chi-Sq Diff Sig
1-factor	909.28	189	<.001	0.089	No	-	-	-
2-factors	632.84	169	<.001	0.076	No	276.44	20	<.0001
3-factors	430.25	150	<.001	0.063	No	202.59	19	<.0001
4-factors	298.73	132	<.001	0.051	Yes	131.52	18	<.0001
5-factors	220.78	115	<.001	0.044	Yes	77.95	17	<.0001
6-factors*	-	-	-	-	-	-	-	-

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\*Did not converge

**Table 4: EFA item loadings for Quality of Reflection Scale in Pilot Sample**

Item	F1	F2	F3	F4	F5
T1Q1	0.508				
T1Q2	0.592				
T1Q3	0.498				
T1Q4				0.448	
T1Q5				0.98	
T1Q7		0.333			
T1Q8					0.549
T1Q9					0.732
T1Q10			0.342		0.321
T1Q11			0.613		
T1Q12			0.717		
T1Q13			0.700		
T1Q14			0.416		
T1Q15			0.524		
T1Q16		0.447	0.431		
T1Q17		0.623			
T1Q18		0.618			
T1Q19		0.733			
T1Q20		0.773			
T1Q21		0.512			

\*Item 6 failed to load on any latent factor. Item-Latent Factor correlation lower than .3 were filtered.

**Table 5: EFA Item Loadings for Trait Reflectiveness Scale in Pilot Sample**

ITEM	F1	F2	F3	F4
T1Q71r I'm often confused about the way that I really feel about things	0.682			
T1Q72 It is important for me to evaluate the things that I do		0.748		
T1Q74 I am very interested in examining what I think about		0.760		
T1Q76 I'm often aware that I'm having a feeling, but I often don't quite know what	0.652	-0.348		
T1Q77 I frequently examine my feelings		0.392	-0.314	0.816
T1Q78r My behavior often puzzles me	0.730			
T1Q79 It is important to me to try to understand what my feelings mean		0.656	-0.339	
T1Q81 Thinking about my thoughts make me more confused	0.729			
T1Q82 I have a definite need to understand the way that my mind works		0.328	-0.418	0.246
T1Q83 I frequently take time to reflect on my thoughts		0.697		
T1Q84r Often I find it difficult to make sense of the way I feel about things	0.738			
T1Q85 It is important to me to be able to understand how my thoughts arise		0.422	-0.759	
T1Q86 I often think about the way I feel about things		0.396	-0.477	0.324

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Item-Latent Factor correlation lower than .3 were filtered.

**Table 6: Descriptive Statistics for Manipulation Check Item 1**

	Low Leadership Experience			High Leadership Experience		
	N	Mean	Sd	N	Mean	Sd
Reflection	148	3.47	.852	167	3.47	.883
Rumination	164	3.25	.868	90	3.39	.817
Control	148	3.63	.794	74	3.80	1.020

**Table 7: Descriptive Statistics for Manipulation Check Item 2**

	Low Leadership Experience			High Leadership Experience		
	N	Mean	Sd	N	Mean	Sd
Reflection	148	4.23	.948	167	4.64	.793
Rumination	163	4.12	.996	90	4.22	1.003
Control	148	4.48	.778	74	4.46	.996

**Table 8: Descriptive Statistics for Manipulation Check Item 3**

	Low Leadership Experience			High Leadership Experience		
	N	Mean	Sd	N	Mean	Sd
Reflection	147	2.99	1.047	167	3.27	1.138
Rumination	160	3.36	1.095	90	3.04	1.038
Control	147	2.76	.894	74	2.49	1.337

**Table 9: Descriptive Statistics for Variables in Basic Military Course Study Sample (Low Leadership Experience)**

Variable	Reflection Group			Rumination Group			Control Group			Overall		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
T2Reflection	180	3.583	.495	167	3.516	.4779	150	3.579	.474	497	3.560	.483
T2GLE	180	6.295	1.323	167	6.183	1.190	150	6.432	1.327	497	6.299	1.282
T2Psyncap	180	4.569	.631	167	4.462	.669	150	4.568	.639	497	4.533	.647
T2TraitR	180	4.318	.763	167	4.466	.687	150	4.595	.676	497	4.451	.720
T2NGSE	180	4.581	.766	167	4.590	.792	150	4.710	.747	497	4.623	.770
T2GOApprch	180	4.631	.740	167	4.754	.958	150	4.796	.757	497	4.722	.826
T2GOAvoid	180	4.214	.724	167	4.394	.749	150	4.398	.727	497	4.330	.737
T2GOLearn	180	4.998	.948	167	5.087	1.019	150	5.193	.861	497	5.087	.949
ILT	180	3.514	1.470	167	2.872	1.065	150	3.205	1.358	497	3.183	1.324

**Table 10: Descriptive Statistics for Variables in Leadership Course Study Sample (High Leadership Experience)**

Variable	Reflection Group			Rumination Group			Control Group			Overall		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
T1Reflection	162	3.566	0.411	79	3.662	0.413	71	3.607	0.385	312	3.600	0.406
T2Reflection	162	3.552	0.435	86	3.711	0.455	71	3.616	0.398	319	3.609	0.437
T1GLE	161	6.453	0.994	80	6.792	1.019	70	6.554	0.988	311	6.563	1.006
T2GLE	162	6.469	1.032	86	6.890	0.968	71	6.669	0.969	319	6.627	1.014
T1Psycap	161	4.604	0.537	81	4.651	0.594	70	4.633	0.535	312	4.623	0.550
T2Psycap	162	4.578	0.569	85	4.730	0.608	71	4.666	0.522	318	4.638	0.572
T1TraitR	161	4.528	0.627	81	4.755	0.620	70	4.630	0.633	312	4.610	0.632
T2TraitR	162	4.578	0.639	85	4.679	0.646	71	4.636	0.634	318	4.618	0.639
T1NGSE	160	4.800	0.666	81	4.858	0.712	70	4.767	0.678	311	4.808	0.679
T2NGSE	162	4.794	0.642	85	4.914	0.719	71	4.873	0.676	318	4.844	0.671
T1GOApprch	160	5.316	0.897	81	5.506	0.859	70	5.389	0.927	311	5.382	0.895
T2GOApprch	162	5.276	0.860	85	5.435	0.894	71	5.454	0.860	318	5.358	0.871

T1GOAvoid	160	4.360	0.973	81	4.634	1.197	70	4.471	0.976	311	4.457	1.039
T2GOAvoid	162	4.389	1.033	85	4.478	1.196	71	4.446	0.891	318	4.426	1.048
T1GOLearn	160	5.298	0.807	81	5.483	0.700	70	5.329	0.733	311	5.353	0.765
T2GOLearn	162	5.210	0.755	85	5.476	0.780	71	5.243	0.814	318	5.288	0.781
T2ILT	162	4.804	1.789	85	4.325	1.653	71	4.541	1.586	318	4.615	1.716

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**Table 11: Skewness and Kurtosis Statistics for Variables in Basic Military Course Study Sample (Low Leadership Experience)**

Variable	Reflection Group		Rumination Group		Control Group		Overall	
	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis
T2Reflection	.330	-.048	-.120	.701	-.609	1.222	-.079	.523
T2GLE	-.312	-.184	-.619	.214	-.811	1.413	-.535	.403
T2Psyncap	-.429	.587	-.530	.013	-.375	.463	-.457	.336
T2TraitR	.375	-.806	-.276	-.185	.007	-.672	.035	-.671
T2NGSE	-.285	-.128	-.811	1.121	-.801	1.752	-.619	.775
T2GOApprch	.314	1.252	-.572	1.021	.118	.485	-.165	1.072
T2GOAvoid	.582	.600	.119	-.120	.405	.366	.360	.167
T2GOLearn	-.360	-.048	-.719	.943	-.287	.417	-.505	.757

**Table 12: Skewness and Kurtosis Statistics for Variables in Leadership Course Study Sample (High Leadership Experience)**

Variable	Reflection Group		Rumination Group		Control Group		Overall	
	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis
T1Reflection	-0.099	0.581	0.367	-0.162	0.500	0.454	0.135	0.404
T2Reflection	0.125	-0.294	0.581	0.091	0.032	-0.444	0.258	-0.050
T1GLE	-0.361	-0.066	-0.365	0.362	-0.812	0.491	-0.431	0.120
T2GLE	-0.168	-0.050	-0.279	-0.542	-0.397	-0.530	-0.256	-0.277
T1Psyncap	-0.337	0.426	-0.363	0.643	-0.344	0.600	-0.336	0.497
T2Psyncap	-0.068	0.048	0.030	-0.546	-0.456	0.779	-0.087	-0.033
T1TraitR	0.232	-0.375	-0.015	-0.532	-0.235	-0.114	0.058	-0.436
T2TraitR	0.125	-0.402	0.150	-0.669	0.103	-0.643	0.126	-0.539
T1NGSE	-0.599	1.647	-0.758	1.086	-0.422	0.616	-0.593	1.151
T2NGSE	-0.008	-0.430	-0.318	-0.556	-0.143	-0.300	-0.115	-0.488
T1GOApprch	-0.099	-0.440	-0.264	-0.004	0.076	-0.234	-0.101	-0.330
T2GOApprch	0.004	0.186	-0.119	-0.312	-0.345	-0.238	-0.099	-0.125

T1GOAvoid	0.292	0.231	-0.032	-0.307	-0.116	-0.166	0.149	-0.042
T2GOAvoid	-0.255	1.119	-0.153	0.306	-0.055	0.041	-0.180	0.754
T1GOLearn	-0.045	-0.112	0.459	-0.329	-0.325	0.841	-0.032	0.107
T2GOLearn	0.157	0.005	0.240	-0.647	0.337	-0.010	0.225	-0.179

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**Table 13: Summary of Hypotheses**

Hypothesis	Analysis	Results
H1a: The level of Psycap is positively correlated with prior leadership experience.	A ONE-WAY ANOVA of level of prior leadership experience on outcomes of Psycap, leadership efficacy, leadership self-awareness and implicit leadership theories	1a & 1c not supported
H1b: The level of leadership efficacy is positively correlated with prior leadership experience.		1b & 1d supported. Higher levels of leadership experience are associated with higher levels of leadership efficacy and quality of implicit leadership theories.
H1c: The level of leadership self-awareness is positively correlated with prior leadership experience.		
H1d: The quality of implicit leadership theories is positively correlated with prior leadership experience.		
H2a: The relationship between leadership efficacy and leadership experience is moderated by type of reflection triggers.	A 3 (reflection, rumination, control) by 2 (low vs high leadership experience) MANCOVA on GLE, SA & implicit leadership (using SPSS GLM) with trait self-efficacy and trait reflection as controls. For this, to explore only the simple effects of leadership experience on the outcomes with the controls present.	H2a & b supported.
H2b: The relationship between leadership self-awareness and leadership experience is moderated by type of reflection triggers.		H2c not supported.
H2c: The relationship between quality of implicit leadership theories and leadership experience is moderated by type of reflection triggers.		Interaction of leadership experience and type of reflection trigger observed for leadership efficacy and leadership self-awareness but not for quality of implicit leadership theories.

H3a: Recalling and reflecting positively on any personal leadership experience increases subsequent leadership efficacy.	A ONE-WAY ANOVA conducted separately on low and high leadership samples for type of reflection triggers on leadership efficacy, leadership self-awareness and implicit leadership theories with post-hoc analyses	Low leadership experience: Not supported. Expected direction but not significant.
H3b: Recalling and reflecting negatively on any personal leadership experience decreases subsequent leadership efficacy.		High leadership experience: Not supported. Significant difference but rumination condition scores higher.
H4a: Recalling and reflecting on past experience results in greater self-awareness.	As above	Low leadership experience: Not supported. Expected direction but not significant.
H4b: Ruminative recall of past experience results in greater self-awareness compared with adaptive recall.		High leadership experience: Not supported. Significant difference but rumination condition scores higher.
H5a: Adaptive reflection results in positive aspects of one's implicit leadership theories becoming more easily explicated.	As above	Supported under both low and high leadership conditions.
H5b: Maladaptive reflection results in negative aspects of one's implicit leadership theories becoming more easily explicated.		

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## Appendices

### Appendix A: Sequence of Activities at Time 1 & 2

Activity	Reflection Gp	Rumination Gp	Control Gp
Intervention	1. 7-item Reflection Exercise: Field Camp**	1. 7-item Rumination  Ex	1. Sudoku puzzle 1 (3x3)  2. Sudoku puzzle 2 (9x9)
Survey	1. 3-item Manipulation check items** 2. 5-item Developmental Goal Setting Exercise* 3. 5-item Implicit Leadership Theory Sentence Completion Ex** 4. 21-item Quality of Reflection Outcome 5. 22-item Generalized Leadership Efficacy 6. 24-item Psychological Capital 7. 20-item Trait Reflectiveness scale* 8. 8-item Generalized Self Efficacy scale* 9. Rated Quality of Goal setting** 10. 4-item Demographics	same	same

\* Only for Time 1      \*\* Only for Time 2

## Appendix B: Measures

### Measure 1: Quality of Reflection

The scale anchors are 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Frequently, 5 = All the time.

- q1 I can cite ways which my personal values reinforces the SAF core values
- q2 I can cite ways that my personal values and the SAF core values are different but still reinforcing
- q3 I can cite challenges where I was forced to choose between my personal values and the SAF core values\*
- q4 I know how others view my strengths as a leader
- q5 I know how others view my weaknesses as a leader\*
- q6 I know where people differ in opinions regarding my leadership actions
- q7 I ask for feedback on my leadership impact on others\*,
- q8 I am conscious of my behavior when leading others
- q9 I control my behavior as a leader in the presence of others
- q10 I consider how my emotions can affect others\*
- q11 I know when to consult with others regarding how best to address challenges\*
- q12 I understand the reasons behind how i behave as a leader
- q13 I know why I feel the way I do as a leader
- q14 I know when I am getting too involved as a leader with directing others
- q15 I know how my feedback impacts the motivation of others
- q16 I know how to adjust my leadership style to energise others to action\*
- q17 I examine whether my reasons for how I behave as a leader are still valid

q18 I consider why I feel the way I do as a leader before I act

q19 I revise the way I look at myself as a leader

q20 I challenge my own firmly held ideas about leadership

q21 I look to adapt how I do things a leader

\* Items removed from further usage after EFA and CFAs



**GLE Scoring Scheme for Subscales:**

Self/Thought—Transactional: Items 37, 40, 41, 42

Self/Thought—Transformational: Items 36, 38, 39, 43

Action—Transactional: Items 22, 24, 26

Action—Transformational: Items 23, 25, 27, 28

Means—Transactional: Items 31, 33, 34

Means—Transformational: Items 29, 30, 32, 35

\* Items removed from further usage after CFAs

### Measure 3: Psycap Scale (4 Components)

#### 1. Job Role Based Self-Efficacy (adapted from Parker, 1998)

1 = not at all confident, 2 = not confident, 3 = somewhat not confident, 4 = somewhat confident, 5 = confident, 6 = very confident

How confident would you feel....

- q44 Analyzing a long-term problem to find a solution?
- q45 Representing your work area in meetings with senior management?
- q46 Contributing to discussions about the company's strategy?
- q47 Helping to set targets/goals in your work area?
- q48 Contacting people outside the company (e.g., suppliers, customers) to discuss problems?
- q49 Presenting information to a group of colleagues?

#### 2. Job Role Based Hope (Adapted from Snyder, 1996)

1 = Strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree

- q50 If I should find myself in a jam at work, I could think of many ways to get out of it.\*
- q51 At the present time, I am energetically pursuing my work goals.
- q52 There are lots of ways around any problem that I am facing now at work.
- q53 Right now I see myself as being pretty successful at work.

q54 I can think of many ways to reach my current work goals.

q55 At this time, I am meeting the work goals that I have set for myself.

3. Job Role Based Resiliency (Adapted from Wagnild, G., & Young, H., 1993).

1 = Strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree

q56 When I have a setback at work, I have trouble recovering from it and moving on.\*

q57 I usually manage difficulties one way or another at work.

q58 I can be “on my own” so to speak at work if I have to.

q59 I usually take stressful things at work in stride.

q60 I can get through difficult times at work because I've experienced difficulty before.

q61 I feel I can handle many things at a time at this job.\*

4. Job Role Based Optimism (Adapted from Scheier and Carver, 1994)

1 = Strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree

q62 When things are uncertain for me at work I usually expect the best.\*

q63 If something can go wrong for me work-wise it will.\*

q64 I always look on the bright side of things regarding my job.

q65 I'm optimistic about what will happen to me in the future as it pertains to work.

q66 In this job, things never work out the way I want them to.\*

q67 I approach this job as if “every cloud has a silver lining”.

\* Items removed from further usage after CFAs

#### Measure 4: Trait Reflectiveness Scale

The scale used is the Self-reflection and Insight Scale (Grant et al., 2002). This 20-item scale has 12 items measuring self-reflection ("the inspection and evaluation of one's thoughts, feelings and behavior") and 8 items measuring insight ("the clarity of understanding of one's thoughts, feelings, and behavior"; Grant et al., 2002, p. 821).

- q68 I don't often think about my thoughts\* (R) (E)
- q69 I am not really interested in analyzing my behavior\* (R) (N)
- q70 I am usually aware of my thoughts\* (I)
- q71 I'm often confused about the way that I really feel about things (R) (I)
- q72 It is important for me to evaluate the things that I do (N)
- q73 I usually have a very clear idea about why I've behaved in a certain way\* (I)
- q74 I am very interested in examining what I think about (N)
- q75 I rarely spend time in self-reflection\* (R) (E)
- q76 I'm often aware that I'm having a feeling, but I often don't quite know what (R) (I)
- q77 I frequently examine my feelings (E)
- q78 My behaviour often puzzles me (R) (I)
- q79 It is important to me to try to understand what my feelings mean (N)
- q80 I don't really think about why I behave in the way that I do\* (R) (E)
- q81 Thinking about my thoughts makes me more confused (R) (I)
- q82 I have a definite need to understand the way that my mind works (N)
- q83 I frequently take time to reflect on my thoughts (E)
- q84 Often I find it difficult to make sense of the way I feel about things (R) (I)

q85 It is important to me to be able to understand how my thoughts arise (N)

q86 I often think about the way I feel about things (E)

q87 I usually know why I feel the way I do (I)

E = Engagement in self-reflection: N = Need for self-reflection: I = Insight: R = Reverse scored

\* These items were excluded from subsequent use after the EFA and CFAs

### **Scoring Instructions**

**The scoring process is very simple. Summed scores are used. There is no scaling or scale transformation required other than basic reverse scoring for four items.**

#### **Step 1.**

**Reverse score those items marked (R).**

An original score of "1" would become "6"; "2" would become "5"; "3" becomes "4" and visa versa.

#### **Step 2.**

**Sum the scores for each subscale**

**Measure 5: New General Self-Efficacy Scale (Chen, Gully & Eden, 2001)**

Anchors are 1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Somewhat Agree, 5 = Agree, 6 = Strongly Agree

q88 I will be able to achieve most of the goals that I have set for myself\*

q89 When facing difficult tasks, I am certain that I will accomplish them

q90 In general, I think that I can obtain outcomes that are important to me

q91 I believe I can succeed at most any endeavor to which I set my mind

q92 I will be able to successfully overcome many challenges

q93 I am confident that I can perform effectively on many different tasks

q94 Compare to other people, I can do most tasks very well\*

q95 Even when things are tough, I can perform quite well

\* These items were removed from further usage after the CFAs.

### **Manipulation Check items**

1. How did you feel about the event/activity you were told to think about?

- 1 – very negative
- 2 – negative
- 3 – neutral
- 4 – positive
- 5 – very positive

2. Your thinking about the event/activity made you feel

- 1 – very depressed
- 2 – quite depressed
- 3 – depressed
- 4 – slightly depressed
- 5 – not depressed at all

1. Your thinking about the event/activity made you feel

- 1 – very hopeful
- 2 – quite hopeful
- 3 – hopeful
- 4 – slightly hopeful
- 5 – not hopeful at all

**Outcome Measure 1: Sentence Completion Exercise (Implicit Leadership****Theory)**

Please complete the phrase below with your own inputs. Please be sure to write clearly. Explain your inputs as if the person who is going to read this does not know anything about leadership at all.

1. To me, leadership is about

2. To be a leader, one must be

3. As a leader, one needs to take into consideration

4. My leadership is characterized by

5. The most effective leader is one who is

**Outcome Measure 2: 5-Item Goal Setting Exercise**

1. If I were to allocate how I spend my free time in future, I would allocate \_\_\_% to developing myself as a leader.

2. My plan to develop myself as a leader is as follows:

3. The reasons why I developed my plan in the above manner is because

4. How much effort will you put to developing yourself as a leader? \_\_\_%

5. The main obstacles I foresee to me improving as a leader are

### Appendix C: Prompts to prime Reflection And Rumination

Reflection Prompts	Rumination Prompts
<ul style="list-style-type: none"> <li>• What were some of the problems you encountered at the field camp?</li> </ul>	<ul style="list-style-type: none"> <li>• What were some of the problems you encountered at the field camp?</li> </ul>
<ul style="list-style-type: none"> <li>• What did you do to resolve the problem?</li> </ul>	<ul style="list-style-type: none"> <li>• Describe how things went wrong.</li> </ul>
<ul style="list-style-type: none"> <li>• What values (if any) were at play that caused the problem?</li> </ul>	<ul style="list-style-type: none"> <li>• What values (if any) were at play that caused the problem?</li> </ul>
<ul style="list-style-type: none"> <li>• What was the most meaningful part of the field camp for you?</li> </ul>	<ul style="list-style-type: none"> <li>• What part of the field camp was out of your comfort zone? i.e. either made you uncomfortable or anxious?</li> </ul>
<ul style="list-style-type: none"> <li>• What was it about the event that made it meaningful for you?</li> </ul>	<ul style="list-style-type: none"> <li>• What limitations did it reveal about yourself as a person and as a leader?</li> </ul>
<ul style="list-style-type: none"> <li>• What did you learn about yourself during the field camp?</li> </ul>	<ul style="list-style-type: none"> <li>• Do you think in future you will be exposed in a similar way again?</li> </ul>
<ul style="list-style-type: none"> <li>• How have your insights make you a better person and a leader?</li> </ul>	<ul style="list-style-type: none"> <li>• Where do you think you need to improve as a person and as a leader?</li> </ul>

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