The Relationship Between Self-complexity and Leadership Behaviors: A Dual Mediation Model

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A Dual Mediation Model

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This thesis is presented for the degree of Doctor of Philosophy of Durham University

DURHAM UNIVERSITY BUSINESS SCHOOL

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DECLARATION

I hereby declare that this Ph.D. thesis entitled "**The Relationship Between Self-complexity and Leadership Behaviors: A Dual Mediation Model**" was carried out by me for the degree of Doctor of Philosophy in Management under the guidance and supervision of Prof Olga Epitropaki and Prof Yanjun Guan, Durham University Business School, Durham University, United Kingdom.

For the present thesis, which I am submitting to Durham University Business School, no degree or diploma or distinction has been conferred on me before, either in this or in any other university.

Han-Lin Hu

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DEDICATION

I would love to give huge thanks to my supervisors: Prof Olga Epitropaki and Prof Yanjun Guan for their advice, efforts, and encouragement, without which this thesis would not have been possible. I would also like to thank Prof Robert Lord and Dr. Qin Zhou for their suggestions during the first- and second-year Student Annual Progress Review.

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ABSTRACT

The importance of self-complexity on leadership has been discussed by several theoretical studies. The present research draws upon Linville's (1985, 1987) social cognitive perspective of self-complexity, which is defined as a *function of two things: the number of aspects that one uses to cognitively organize knowledge about the self, and the degree of relatedness of these aspects*" (Linville, 1985, p. 97), to serve as one of the limited empirical studies that examine its associations with leadership behaviors. To assess self-complexity, I develop a measurement that focuses on capturing the structure of the self at the role level and adopt the pairwise comparison method to enrich our understanding of self-complexity. In addition, I also draw upon self-control and goal shielding theories to examine the psychological factors such as time and centrality in self-complexity.

Regarding leadership behaviors, I studied two often-seen leadership behaviors in the current research. For positive leadership behavior, I study servant leadership, which refers to "*an (1) other-oriented approach to leadership (2) manifested through one-on-one prioritizing of follower individual needs and interests, (3) and outward reorienting of their concern for self towards concern for others within the organization and larger community*" (Eva, Robin, Sendjaya, Van Dierendonck, & Liden, 2019, p.114). For the negative leadership behavior, I study abusive supervision, which is defined as "*subordinates' perceptions of the extent to which supervisors engage in the sustained display of hostile verbal and nonverbal behaviors, excluding physical contact*" (Tepper, 2000, p.178).

To study the associations between self-complexity and leadership behaviors, I employ two different perspectives: Self-control and cognitive theories. From the self-control perspective, I adopt self-control and conservation of resource theories to examine the indirect associations

between self-complexity and leadership behaviors via ego depletion, which is defined as "*a state in which the self does not have all the resources it has normally*" (Baumeister & Vohs, 2007, p.116). From the cognitive perspective, I employ cognitive theories to examine the indirect associations between self-complexity and leadership behaviors via cognitive flexibility, which is defined as "*the ability of individuals to restructure knowledge in multiple different ways depending on changing situational demands*" (Gino & Ariely, 2012, p.446).

Four studies were conducted in the current research. The results in Study 1 (U.K. sample, N = 179) showed that the number of self-aspects and the degree of overlap among self-aspects were negatively associated with ego depletion and were positively associated with cognitive flexibility. Moreover, ego-depleted leaders were found to be more likely to behave abusively toward their followers, whereas cognitively flexible leaders were found to be less likely to abuse their followers. Regarding the psychological factors, results in Study 1 showed that the relationship between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion was weaker when the time was short rather than high. The results in Study 2 (Taiwan sample, N = 332) also showed that the degree of overlap among self-aspects was negatively associated with ego depletion and positively associated with cognitive flexibility. Nevertheless, the number of self-aspects was not found to be negatively associated with ego depletion nor positively associated with cognitive flexibility. Study 2 also showed similar findings regarding leadership behaviors; ego depletion was positively associated with abusive supervision, and cognitive flexibility was negatively associated with abusive supervision.

Study 3 specifically focused on testing the differences between the traditional pen and paper trait sorting task (N = 98) and the newly introduced method of measuring self-complexity

(N = 110) and on examining the positive leadership behavior (i.e., servant leadership) in the current research model. The results in Study 3 showed that both methods had similar findings to Studies 1 and 2. However, the newly introduced method that measures the structure of the self at the role level seems to be a better approach than Linville's free-response format in predicting ego depletion and cognitive flexibility. In addition, ego-depleted leaders were not found to be less likely to display servant leadership in the workplace, and cognitively flexible leaders were found to be more likely to display servant leadership behaviors in the workplace. The results in Study 4 (N = 144 leaders and N = 450 followers) showed that the number of self-aspects and the degree of overlap among self-aspects were negatively associated with ego depletion and were positively associated with cognitive flexibility. Moreover, ego-depleted leaders were more likely to be perceived as abusive supervisors, and cognitively flexible leaders were less likely to be perceived as abusive supervisors and more likely to be perceived as servant leadership by their followers.

CHAPTER 1: INTRODUCTION

1.1 The purpose of this thesis

In the last few decades, the study of self has evolved both conceptually and empirically. The concept of self was originally conceptualized as a unitary construct (Allport, 1955; Rogers, 1951; Wylie, 1974). Inspired by the early works of James (1890), Kelly (1955), and Mead (1934), researchers (e.g., Baumeister, 1998; Linville & Carlston, 1994; Markus, 1977; Markus & Wurf, 1987) suggested that the self is better conceived as multifaceted and context dependent. One useful approach to examine both the representation and the implication of the multifaceted self is Linville's (1985, 1987) social-cognitive model of self-complexity, which is defined as the "*function of two things: the number of aspects that one uses to cognitively organize knowledge about the self, and the degree of relatedness of these aspects*" (Linville, 1985, p. 97).

Leadership scholars (e.g., Hannah, Eggers, & Jennings, 2008; Hannah, Woolfolk, & Lord, 2009; Lord & Hall, 2005; Lord, Hannah, & Jennings, 2011) have proposed several theoretical works in discussing how one's self-construct is related to leadership. For instance, Hannah, Woolfolk, and Lord (2009), Lord and Hall (2005), and Lord, Hannah, and Jennings (2011) suggested that self-structures provide the frameworks for building, organizing, and implementing leadership skills. However, the empirical study that specifically examines the association between the structure of the self and leadership behaviors is limited (see Hannah, Balthazard, Waldman, Jennings, & Thatcher, 2013 for exception). With this regard, I aim to fulfill this research gap by studying how self-complexity, as well as its components (i.e., number of self-aspects and degree of overlap among self-aspects), are associated with leadership behaviors such as abusive supervision and servant leadership in the present research.

To understand this association more systematically and comprehensively, I first draw upon the self-control theory to examine the relationship between self-complexity and ego depletion, which refers to "*a state in which the self does not have all the resources it has normally*" (Baumeister & Vohs, 2007, p.116). I then draw upon the conservation of resource (COR) theory to examine the relationships between one's cognitive capacity for self-regulation and leadership behaviors in the first mediation path. Moreover, self-complexity provides rich insights into how individuals structure their social roles and how individuals organize those knowledge, skills, abilities, expectations, goals and values, and self-regulatory systems associated with each role (Lord & Hall, 2005; Lord, Hannah, & Jennings, 2011). I adopted the cognitive approach in the second mediation path to investigate how leaders' self-structure will affect their cognitive flexibility and leadership behaviors in the workplace.

1.2 Research gaps and contributions of this thesis

First, the present research serves as one of the limited empirical studies that examine the association between self-complexity and leadership behaviors. Prior research, such as Hannah et al., (2013), has employed both psychological and neurological approaches and found that military leaders who score high in the leader self-complexity (LSC) are more adaptable across contexts and role demands. To investigate whether similar findings can also be replicated with a broader scope of leadership roles in the workplace, I conducted three cross-sectional studies and one time-lagged organizational study in the current research to examine the association between self-complexity and leadership behaviors.

Second, McConnell and associates (2005) suggested that existing studies on self-complexity had overlooked the psychological factor in each self-aspect; I draw upon literature in

multiple identities (e.g., Brook, Garcia, & Fleming, 2008; Hall, Hall, Galinsky, & Phillips, 2019; Ramarajan, 2014; Reitzes & Murtran, 1994; Rothbard, 2001; Settles, 2004) and goal shielding theory (Shah, Friedman, & Kruglanski, 2002) to examine how the differences in time and centrality (also known as identity importance in some studies) in self-complexity will affect individuals' ego depletion and cognitive flexibility at the first stage of the mediation path.

Third, in their review study, McConnell and Strain (2007) noted that most research attention regarding the self-concept literature to date has disproportionally focused on the self-content and overlooked the self-structure. Accordingly, I employed the literature on multiple-identity theory (e.g., Hall, Hall, Galinsky, & Phillips, 2019; Ramarajan, 2014) to develop an analogous measure to Linville's (1985) trait sorting task. This newly introduced measure specifically focuses on measuring the structure of the self at the role level, allows participants to conduct it online, and shows a stronger ability to predict those theoretically related variables in the present research.

Fourth, several self-complexity researchers (e.g., Constantino, Wilson, Horowitz, & Pinel 2006; Pilarska & Suchanska, 2015; Rafaeli-Mor, Gotlib, & Revelle, 1999; Rafaeli & Hiller, 2010; Rafaeli-Mor & Steinberg, 2002) have noted that the majority of existing studies regarding self-complexity has faultily adopted the *H* statistic (Attneave, 1959; Scott, 1969) in measuring self-complexity. While these significant issues have been acknowledged and statistically proven in several studies (e.g., Pilarska & Suchanska, 2015; Rafaeli-Mor, Gotlib, & Revelle, 1999) that the single composite measure of *H* statistic is not suitable for the hierarchical, categorical approach in the self-complexity, is highly sensitive to the valence of the traits that researchers employed in their studies, and is inconsistent with Linville's (1985) original concept, self-complexity researchers still wildly employ this measurement in their studies. With this regard, I

responded to their urge by employing a more psychometrically sound component measurement developed by Rafaeli-Mor, Gotlib, and Revelle (1999) to allow the current research to pay closer attention to both components and the interaction effect of the number of self-aspects and the degree of overlap among self-aspects to provide a more balanced view in the self-complexity literature.

Overall, three cross-sectional studies (one in the U.K. (N = 179) and two in Taiwan (N = 332) and (N = 207) respectively), and one time-lagged organizational study in Taiwan (N = 144 leaders and N = 450 followers) were conducted to examine the model described above. Drawing upon the self-complexity literature, I first revealed that the interaction effect of the number of self-aspects and degree of overlap among self-aspects itself did not predict ego depletion and cognitive flexibility; however, its components (i.e., number of self-aspects and degree of overlap among self-aspects) played significant roles in predicting ego depletion and cognitive flexibility, which would further relate to followers' perception regarding their managers' leadership behaviors in the workplace. Moreover, the results of the overlap in the present research consistently challenge the self-complexity literature and offer novel insights in that the higher degree of overlap among self-aspects was found to be more beneficial to one's psychological well-being and cognitive flexibility. In addition, the results in Study 3 showed that this newly developed approach for measuring self-complexity has a stronger predictive ability than Linville's (1985) original free-response format to predict one's psychological well-being and cognitive flexibility.

Finally, the present research is intended to make a number of contributions to literature and managerial practice. First, the present research adopted two different theoretical approaches and served as one of the limited empirical studies that specifically examined the association

between self-complexity and managers' leadership behaviors in the workplace. Second, the current research introduced a newly developed approach to measuring self-complexity that focuses on the role level and employed a more suitable measurement to systematically investigate the components of self-complexity and the interaction effect of those components that are conceptually more closely related to Linville's (1985, 1987) original social-cognitive model of self-complexity. Finally, from the practical perspective, the current research includes two often-seen leadership behaviors in the workplace, allowing organizations to target the most relevant interventions to managerial practitioners for which they will be most efficacious.

1.3 Outline of the thesis

Chapter 2 will provide a brief literature review of each variable in the present research. As the present research sheds the spotlight on self-complexity, I will focus on those different models, measurements, and findings in the self-complexity literature. Chapter 3 will be the conceptual framework and hypothesis development to discuss the associations between each variable in the current research. As the present research contains four studies, Chapters 4 to 7 will provide the research methodology, sample characteristics, measures and statistical methods, empirical findings, and summary for each corresponding study. Chapter 8 is the general discussion chapter that will include the summaries of four studies, theoretical and practical implications, and limitations and future directions. Appendix A will provide the approved ethics form from the Durham University research ethics committee and Appendix B includes the measurement materials that have been utilized in the current research.

Chapter 2: LITERATURE REVIEW

2.1 Self-Complexity

2.1.1 Different Models in Self-complexity Literature

After reviewing the existing literature regarding self-complexity, Rafaeli and colleagues (e.g., Rafaeli & Hiller, 2010; Rafaeli-Mor & Steinberg, 2002) showed the same frustration as Steufert and Streufert (1987) in cognitive complexity and concluded that the self-complexity research inherited the complex legacy of cognitive complexity studies; researchers in the field often proposed several models that share no consensual definition. Specifically, the terminology of complexity was inconsistently employed across various studies. It sometimes refers to the elemental feature of differentiation (i.e., the extent to which those multiple distinct elements are comprised in a cognitive domain, Crocket, 1965); at other times, it was being used to describe the elemental feature of integration (i.e., the extent to which of interrelatedness, coherence, or unity of a cognitive domain), and other times it refers to the mixture of both differentiation and integration (Zajonc, 1960). In other words, each self-complexity model was operationalized very differently and often failed to speak clearly to one another, making it hard to generalize one's theory to another's conceptualization. As such, I will briefly review those self-complexity models and how they were operationalized in measuring self-complexity below.

Anderson (1992), for example, drew upon Zajonc's (1960) cognitive complexity work to study self-complexity in two indices: Differentiation and centrality. To capture how primary school students organize their self-relevant information, Anderson first asked the subjects to generate self-descriptive phrases; a trained experimenter then categorized those phrases into hierarchical groups and examined which traits were related. In this study, the differentiation index reflects the number of different categories (e.g., athletic competence, scholastic

competence, and social acceptance) that children composed their self-schema, and the centrality index refers to the extent to which those categories are organized around an issue. Stein (1994) also employed Zajonc's (1960) card-sorting method to study self-complexity, but she examined the complexity of the self-schema in two properties: Differentiation and unity. In this study, the differentiation index refers to the number of attributes included in the self-schema, and the unity index refers to the degree of dependence among the attributes included in the schema (see Stein, 1994, p.168 for the calculation of unity). Based on her framework, Stein (1994) suggested that high self-complexity individuals are those individuals who possess several independent attributes in their self-schemas, whereas low self-complexity individuals are those individuals whose self-schemas comprised few highly interdependent attributes.

Woolfolk and his associates (e.g., Woolfolk et al., 1999; Woolfolk, Novalany, Gara, & Allen, 1995) and Rosenberg (1977) borrowed the hierarchical classes clustering algorithm (HICLAS, de Boeck & Rosenberg, 1988) method from the network theory. The HICLAS method represents the structure of cognitions by categorizing subjects' responses into classes or clusters based on patterns of the co-occurrence of attributes within descriptions of others and of the self. In HICLAS, respondents were first instructed to describe their important others (e.g., mother, father, and significant others) and their less important acquaintances, then asked to describe 11 various aspects of themselves such as "*how I am with my mother*," "*me as I actually am*," and "*me as I ideally would like to be*." Participants were asked to describe each target self-aspect with a minimum number of characteristics before all the descriptions were combined into a randomized list; they were then required to rate each of the self-aspect that they provided based on a 2-point scale ranging from 0 = "*the item does not apply at all*" to 2 = "*the item applies to a great degree of the given person or self*." Following the procedure mentioned above, trained

experimenters received a two-way matric of attributes (a varying number of free-response characteristics generated by the subject) by targets (20 self-aspects and significant others) to examine self-complexity. Based on their findings that positive self-complexity was not associated with depression or low self-esteem, but negative self-complexity was found to be positively associated with depression or low self-esteem, Gara et al., (1993) and Woolfolk et al., (1995, 1999) reminded researchers to pay closer attention to partition self-complexity into positive and negative constructs.

Unlike Zajonc's (1960) card sorting and Rosenberg's (1977) HICLAS methods that measure self-complexity implicitly, the self-report self-complexity inventory (SCI) is an explicit measurement that has often been employed to examine the extent to which those self-aspects are integrated. The SCI draws upon the orthogenetic principle (Werner, 1948, 1957) and suggests that the development initiates from a state that is global undifferentiation to increasing specificity then to the ultimate state of integration and consolidation. Developmental psychologists (e.g., Evans, 1994; Evans & Seaman, 2000; Harter, 1982; Marsh, 1989; Marsh, Barnes, Cairns, & Tidman, 1984; Marsh & Shavelson, 1985) agreed with this developmental view by showing that young children tend to have a simple, global, and undifferentiated positive self-concepts and their ability to recognize and identify domains of self-aspect begin around the age of 7-8 years old to help them overcome the anxiety resulted from maturation. With differences in time and the extensiveness of self-relevant experiences, individual differences in the structure and the content of the self-aspects emerge.

Among those different self-complexity models, Linville's (1985, 1987) social-cognitive model of self-complexity has caught the most attention from social and clinical psychologists and sociologists for several reasons. First, Linville's (1985, 1987) self-complexity model has

been unique in bringing together the cognitive structure tradition of Bieri (1955) and Scott's (1969) work and translating James's (1980) "*the self as known*" into a more modern social-cognitive approach of the declarative knowledge that we have about ourselves. Second, Linville's (1985, 1987) self-complexity model has generated the most extensive body of research. Specifically, researchers have employed her initial descriptive works to address a wide range of psychological well-being outcomes such as self-esteem (Campbell, Chew, & Scratchley, 1991), depression (Brown & Rafaeli, 2007; Linville, 1987), coping in everyday life (Campbell, Chew, & Scratchley, 1991; Cohen, Pane, & Smith, 1997; Constantino, Wilson, & Horowitz, 2006; Miller, Omens, & Delvadia, 1991), coping with mood following trauma (Morgan & Janoff-Bulman, 1994), escape from self (Dixon & Baumeister, 1991), narcissistic personality (Rhodewalt & Morf, 1995), and response following domestic violence (Steinberg, Pineles, Gardner, & Mineka, 2013) (for reviews, see Campbell, Assanand, & Paula, 2003; Koch & Shepperd, 2004; Rafaeli & Hiller, 2010; Rafaeli & Steinberg, 2002). For these reasons, I will specifically focus on Linville's (1985, 1987) social-cognitive model of self-complexity in the current research.

Linville's (1985, 1987) social-cognitive model of self-complexity is based on four assumptions: "(1) *The self is cognitively represented in terms of multiple aspects*, (2) *Self-aspects vary in the affect associated with them*, (3) *People differ in the degree of complexity of their self-representation*, and (4) *Overall affect and self-appraisal are a function of the affect and self-appraisal associated with different aspects of the self*." According to these assumptions, Linville proposed that self-complexity contains two components: Differentiation and overlap. In this model, differentiation refers to the number of self-aspects or social roles that people feel are meaningful to them, whereas the overlap refers to the degree of overlap among the traits in

describing those self-aspects. Operating together, high self-complexity individuals are those people who possess a greater number of self-aspects (i.e., a person's cognitive representation of the self) and maintain a greater distinction among those self-aspects. In contrast, low self-complexity individuals are those people who possess few numbers of self-aspects and share more traits or attributes in common in describing those self-aspects.

Moreover, Linville (1985) provided two underlying processes in explaining how one's complex cognitive representation of self can help to cope with both positive and negative events effectively: Spillover and buffering processes. Specifically, the spillover process depicts that high self-complexity individuals are more able to stem the flow of affective spillover because feedback about a particular self-aspect does not share common attributes with other self-aspects, and the self-aspect implicated by the feedback represents only a small proportion of their overall self-concept. Several studies (e.g., Dixon & Baumeister, 1991; Linville, 1985; Niedenthal, Setterlund, & Wherry, 1992; Renaud & McConnell, 2002) have successfully found that high self-complex individuals fare better in maintaining a positive self-view and are less susceptible to extreme affective reactions following negative events than low self-complexity individuals.

On the other hand, the stress-buffering process suggests that when people engage in self-affirming, they preserve their global self-esteem following a threat to one self-relevant area by looking to positive qualities in other self-relevant areas. Namely, the stress-buffering process suggests that high self-complexity individuals are more capable of confining negative thoughts and feelings to spill over to other unrelated self-aspects, and they can employ the greater proportion of positive thoughts and feelings in their self-representation to buffer against those negative implications. As such, the stress-buffering process benefits self-complex individuals to

experience less affective extremity in response to stress and both positive and negative feedback or events.

To support her affective extremity hypothesis, Linville has employed two experimental studies and found evidence to support her predictions. Specifically, Linville (1985, Study 1) demonstrated that low self-complexity undergraduate students experienced more negative affect and lower self-evaluation following failure feedback. In the 2-week diary study, Linville (1985, Study 2) found that low self-complexity undergraduate students were not more positive or more negative in their moods; instead, they experienced higher affective variability. According to these findings, Linville adapted the adage and advised people, "*Don't put all your eggs in one cognitive basket*." To expand her self-complexity model, Linville (1987) conducted a 2-week prospective study and found that the Time 1 self-complexity buffers the effects of stressful events on both depressive and somatic symptoms at Time 1 and on the incidence of several stress-related illnesses such as flu, aches, and cramps at Time 2. Therefore, she argued that self-complexity indeed buffers people from the potentially adverse effects of negative life events.

However, several studies (e.g., Emmos & King, 1989; Gara, Woolfolk, Cohen, & Goldston, 1993; Halberstadt, Niedenthal, & Setterlund, 1996; Hershberger, 1990; Jordan & Cole, 1996; Koenig 1989; Woolfolk, Novalany, Gara, Allen, & Polino, 1995, study 1) have failed to find evidence to support the view that high self-complexity individuals fare better in psychological well-being, adjustment, or resilience. The inconsistent findings stem from variations in the measurement of self-complexity. The different measurement arises from disagreement over the definition of self-complexity, and the various definitions apparently result from theoretical disagreement about how to conceptualize the structure of self-knowledge (Koch

& Shepperd, 2004). As I have addressed different models in the self-complexity literature above, I will focus on those different approaches to measuring self-complexity in the next sector.

2.1.2 Measurement of Self-complexity

To measure the social-cognitive model of self-complexity, Linville (1985, 1987) employed the trait-sorting task that is similar to Scott's (1969) approach to measuring cognitive complexity. Several existing studies, to date, have been consistent with Linville's (1985, 1987) trait-sorting task and adopted the *H* statistic (Attneave, 1959; Scott, 1969) in measuring self-complexity. Specifically, Linville's trait-sorting task contains 33 randomly ordered index cards, each containing the name of one trait (e.g., "*outgoing*", "*lazy*", and "*rebellious*") to represent a wide range of positive/negative dimensions that participants use to think about themselves. Moreover, participants will be asked to think about themselves and to sort those traits into groups, depending on which traits they think to belong together or on any meaningful basis. The trait-sorting task is based on participants' subjective opinions; therefore, there is no right or wrong answer, they can form as few or as many groups as they wish, and the same trait can be placed in multiple categories. After participants have done the task, the self-complexity will be calculated by using the *H* statistic (Scott, 1962, 1969), which captures both the number of self-aspects (i.e., groups) and the redundancy of attributes across the self-aspects.

$$H = \log_2 n - (\sum \mathrm{i}\, \mathbf{n_i log_2 n_i})/\boldsymbol{n}$$

In this equation, the n refers to the total number of features (i.e., 33 in Linville's studies), whereas the n_i denotes the number of features that appear in a particular group combination. An example for using the *H* statistic in calculating self-complexity can be:

Step 1 - Labeled each self-aspect

Leader/manager (Group A): honest, assertive, competitive, impulsive, helpful, emotional

Friend (Group B): honest, humorous, outgoing, playful, happy, helpful

Son/daughter (Group C): honest, lazy, humorous, outgoing, emotional, happy

Step 2 - Relabeled each group

Group A: assertive, competitive, impulsive

Group B: playful

Group C: lazy

Group AB: helpful

Group AC: emotional

Group BC: humorous, outgoing, happy

Group ABC: honest

Step 3 - These traits were then applied to the *H* statistic formula:

$$H = 5.04439 - (1/33)[(22)(\log_2 22) + (3)(\log_2 3) + (1)(\log_2 1) + (1)(\log_2 1) + (1)(\log_2 1) + (1)(\log_2 1) + (3)(\log_2 3) + (1)(\log_2 1)]$$

$$= 5.04439 - (.030303)\,(107.6172706)$$

$$= 1.783263849$$

Note that the quantity (22) ($\log_2 22$) comes from the 22 traits that were available for use but went unused in Linville's 33-item trait list. Moreover, the quantity (3) ($\log_2 3$) is from the three traits used only to describe Group A, and so on. In addition, although honest may connote different constructs, it is regarded as a single independent dimension in the *H* statistic.

Accordingly, the *H* statistic can be interpreted as the minimal number of independent binary attributes underlying a person's feature sort about the self. In other words, the greater the number of self-aspects created and the less redundant the features used in creating these self-aspects, the greater the self-complexity score.

However, several studies (e.g., Pilarska & Suchanska, 2015; Rafaeli-Mor et al., 1999; Rafaeli-Mor & Steinberg, 2002) have found that this single composite measure of self-complexity is problematic for several reasons. First, the measure of the *H* index was originally introduced to the information theory (Attneave, 1959) and was first employed by Scott (1969) in psychology to capture the nature of describing dimensionality within multidimensional models of knowledge structures. In other words, the *H* index is best suited for multidimensional models such as cognitive complexity, whereas Linville's (1985, 1987) social-cognitive model of self-complexity is based on the hierarchical, categorical approach to self-schema.

Second, the single composite measure of *H* index has been constantly found to counter Linville's (1985, 1987) definition. In her definition, Linville (1985) defined high self-complexity individuals are people who possess a greater number of self-aspects (i.e., a person's cognitive representation of the self) and maintain a greater distinction among those self-aspects, whereas low self-complexity individuals are characterized to possess few self-aspects and share more attributes in common. According to this definition, the result of the *H* index is supposed to be positively associated with the component measure of the number of self-aspects (NASPECTS) and negatively associated with the degree of overlap among self-aspects (OL). In Pilarska and Suchanska, (2015) and Rafaeli-Mor et al's., (1999) studies, they have successfully found that the results of *H* index were moderately to strongly positively associated with the number of self-aspects ($r = .71$, $p < .001$) and ($r = .56$, $p < .001$) respectively, however, the results of *H* index

were moderately positive associated with the overlap ($r = .24$, $p < .01$) and ($r = .33$, $p < .001$) respectively. Therefore, the single composite measure of *H* index may not be an appropriate method for measuring self-complexity.

Third, although Scott (1962, 1969) has shown that the *H* statistic is reliable and does not dependent on the content of the attributes in measuring cognitive complexity, this may not apply when being adopted to measure self-complexity. Specifically, in the worst split-half approach (Revelle, 1979) for establishing internal consistency, Rafaeli-Mor and colleagues have demonstrated that the *H* statistic was decent in the random splitting ($r = .85$ - $.88$) but was not significantly different from zero in the valenced splitting ($r = .17$). In other words, the result of *H* statistic in measuring self-complexity will be strongly affected by the valence of the traits that researchers employed. However, this issue is problematic because if the valence of the traits, a feature of studies in the content of self-concept, will affect the self-structure, we can no longer treat self-complexity as a purely structural variable (McConnell & Strain, 2007). Although it may be argued that Linville's 33-item trait list, which comprised of 21 positively valenced and 12 negatively valenced traits, is similar to the ratio of positive to negative self-statements observed in the automatic thoughts of a normal population (Kendall & Hollon, 1981; Schwartz, 1986), researchers tend to avoid this potential issue and employ more balanced trait lists such as Shower's (1992) 40-item trait list (20 positively valenced traits and 20 negatively valenced traits) that was originally developed to measure self-concept compartmentalization and Rafaeli-Mor and his colleagues' 44 item trait list (23 positively valenced traits and 21 negatively valenced traits).

To avoid those issues mentioned above, I did not employ the *H* statistic to measure self-complexity. Rather, I first drew upon the literature on multiple-identity theory (e.g., Hall, Hall,

Galinsky, & Phillips, 2019; Ramarajan, 2014) to develop an analogous measure to Linville's (1985) trait sorting task, but this newly introduced method specifically focuses on measuring the structure of the self at the role level and is compatible for participants to conduct it online. Regarding the traits that have been employed in the online trait sorting task, I adopted more balanced valence traits (23 positively to 21 negatively valenced traits) developed by Rafaeli-Mor et al. (1999) and employed their pair-wise comparison approach to calculate the number of self-aspects and degree of overlap among those self-aspects.

Specifically, I first provided yes/no questions to ask participants whether those provided social roles across different levels are meaningful to them. These provided social roles include (1) leadership and followership related (e.g., leader/manager, and follower/subordinate), (2) individual level (e.g., athlete and hobbyist), (3) dyadic level (e.g., spouse/partner, son/daughter, parent, sibling, and friend), (4) collective level (e.g., community/charity and religion member), and (5) three optional self-aspects for participants to add if they perceived that they have other meaningful social roles that have not been mentioned above. Once participants have selected "yes" on those meaningful roles to them, they were then instructed to choose from the 44-item traits, which consisted of 23 positively valenced and 21 negatively valenced adjectives, to best help them to describe those selected meaningful roles (Rafaeli-Mor, Gotlib, & Revelle, 1999). To calculate the number of self-aspects and degree of overlap among those self-aspects, I followed the pair-wise comparison formula introduced by Rafaeli-Mor, Gotlib, and Revelle (1999) and exported the data to the calculation program (i.e., Google Colab – Python) that my colleague and I developed and has been repeatedly tested to ensure its accuracy. In this approach, the number of self-aspects (NASPECTS) refers to the quantity measure of how many meaningful

roles that participants selected, and the degree of overlap among self-aspects (OL) was calculated as:

$$OL = (\sum_i(\sum_j C_{ij})/T_i)/n*(n-1)$$

In this equation, C is the number of common features in 2 aspects, T is the total number of features in the referent aspect, n is the number of aspects in the person's sort, and i and j vary from 1 to n (i and j unequal). By using the same example mentioned above, I will briefly demonstrate the calculation of pair-wise comparison below:

Step 1 – Calculate the number of self-aspects

Leader/manager (Group A): honest, assertive, competitive, impulsive, helpful, emotional

Friend (Group B): honest, humorous, outgoing, playful, happy, helpful

Son/daughter (Group C): honest, lazy, humorous, outgoing, emotional, happy

Participant has indicated 3 self-aspects that are meaningful to his/her self-construct. Thus, the number of self-aspects in this example is therefore 3.

Step 2 - Calculate the pair-wise comparisons

There are (3*2) pair-wise comparisons: AB, AC, BA, BC, CA, CB.

Step 3 - The respective pair-wise overlap is 2/6, 2/6, 2/6, 4/6, 2/6, 4/6. The average of degree of overlap among self-aspects is 0.3888.

As demonstrated above, the two-component measures of self-complexity seem to be more systematic and provide more insights than the single-component measure of *H* statistic in

examining the role of each component in self-complexity. Accordingly, I will follow Rafaeli-Mor, Gotlib, and Revelle (1999) and Pilarska and Suchanska's (2015) suggestions to employ this more insightful measurement in the present research.

2.1.3 Self-complexity and Leadership

Leadership scholars (e.g., Hannah, Eggers, & Jennings, 2008; Hannah, Woolfolk, & Lord, 2009; Lord & Hall, 2005; Lord, Hannah, & Jennings, 2011) have proposed a series of theoretical frameworks in discussing how self-complexity has critical implications on leadership effectiveness. Specifically, Lord, Hannah, and Jennings (2011) maintained that the self serves as an interface between the surface-level observable traits and behaviors that leaders exhibit the deeper metacognitive structures that enable leaders to construct a sophisticated understanding of situations and that drive a broad repertoire of thoughts and behaviors associated with leading. Therefore, in addition to general cognitive complexity, affective complexity, and social complexity, they suggested that self-complexity is one of the essential intraindividual domains of requisite complexity to help leaders to perceive, understand, and respond to the complexity dynamics in their social and organizational environments. Moreover, Hannah, Woolfolk, and Lord (2009) have proposed a process-oriented theoretical framework to explain how the complex, positive self-construct can help to produce positive and effective leadership. The central tenet of their theory suggests that the complex, positive self-construct is essential in activating different patterns of cognitive-affective processing system (CAPS), which is critical in facilitating refined, situation-specific application of leadership skills.

Compared to the research attention that has been devoted to those theoretical studies, the research attention on empirically examining the association between self-complexity and

leadership behaviors is limited. To date, Hannah and his colleagues' (2013) work serves as the only empirical study that specifically examines self-complexity and leadership behavior. In this work, they have employed both psychological and neurological approaches and found that military leaders who score high in the leader self-complexity (LSC) are more adaptable across contexts and role demands and that the lower level of electroencephalogram (EEG) coherence in the alpha frequency range in the frontal lobes was also associated with greater adaptive decision making.

2.2 Ego Depletion

Since Linville (1985, 1987) proposed her seminal works, researchers have been long interested in the SC-well-being association, which will be addressed in more detail in the next chapter. Among those SC-well-being associations, the association between self-complexity and ego depletion has been neglected. As such, I aim to extend Linville's (1985, 1987) social-cognitive model of self-complexity to examine its association with ego depletion in the current research.

Ego depletion is defined as "*a state in which the self does not have all the resources it has normally*" (Baumeister & Vohs, 2007, p.116). The self-control theory (Baumeister, Heatherton & Tice, 1994) helps to explain how we are able to resist temptation, suppress unwanted thoughts, force ourselves to concentrate, persist in difficult tasks, change impulses, and get into or out of some emotion across our lifespan. The tenet of the self-control theory is that people have a finite pool of self-regulatory resources to exert self-control. Thus, people will experience a temporary state of ego depletion when those self-regulatory resources are drained, and those self-regulatory resources will be replenished after rest.

The self-control theory relates to evolutionary pressures. Animals, for instance, are required to choose between exploitation and exploration for food gathering. On the one hand, exploration provides squirrels with potential opportunities to discover trees that produce more nuts than their much-frequented tree, but they have to enact self-control strategies for delayed gratification and endure the inherent risk of being disappointed. On the other hand, exploitation is a more conservative behavior that provides squirrels immediate rewards, but the environment rarely stays the same as time moves on. For human beings, in order to coexist with others, we may need to restrain or override our natural desires, habitual behaviors, urge, or emotions that may interfere with our long-term interests (Baumeister, DeWall, Ciarocco, & Twenge, 2005; Mischel, 1973). Self-regulation is thus helpful and perhaps vital for human beings to be socially accepted (Heatherton & Vohs, 2000). It is important to note that not all our behaviors are planful, conscious, and deliberately controlled by the self. Rather, most human behaviors are hugely influenced by automatic or nonconscious processes (Bargh, 1994, 1997). Nonetheless, the self-control process may be critical for our long-term health, happiness, and success, whereupon we are not affordable to overlook those conscious guided self-control processes.

Based on the previous works of Baumeister, Heatherton, and Tice (1994), Baumeister and Vohs (2007) refined the self-control theory and introduced four ingredients in the self-regulation process. The first ingredient is the self-regulation standard. Self-regulation is the process in which individuals attempt to inhibit those unwanted urges to acquire control of the incipient response. In other words, a clear and well-defined standard in self-regulation is essential to regulate and change one's behavior to follow the rules, match ideals, or pursue goals. The ingredient of the self-regulation standard is also consistent with Higgins' (1987) suggestion that ambiguous, uncertain, inconsistent, or conflicting standards in self-regulation may alter

individuals' emotional reactions and behavioral processes. Therefore, without a clear and well-defined self-regulatory standard, it will be more difficult for an individual to conduct self-regulatory effectively.

The second ingredient in the self-regulation process is monitoring. The self-control theory is closely related to several control theories, such as Carver and Scheier's (1981) feedback-loop theory and Miller, Galanter, and Pribram's (1960) "TOTE" unit by suggesting that the goal-directed behavior is the result of two processes: The "*operate*" and "*test*" mechanisms. As be the case with thermostats, finding a favorite temperature by operating the furnace and testing to see whether it is warm enough, control theories suggest that people approach goals by performing goal-oriented behaviors and testing to the standard to see whether their goals are met. If the monitoring process finds the self fails short of bringing into line with the standard, then a further self-regulation process will be initiated. Once further tests confirm that the self has met the standard, the self-regulatory monitoring will then be terminated. Accordingly, without the monitoring process, it is difficult for us to keep self-regulatory progress on track.

The third ingredient in the self-regulation process is strength, which is also known as willpower. Self-control theory suggests that people have a limited pool of regulatory resources to exert self-control, and one's ability to engage in self-control waxes and wanes across time and circumstances. Accordingly, several researchers (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven & Baumeister, 2000; Vohs & Heatherton, 2000) argued that the capacity for self-regulation operates in a similar way as muscular strength or energy resource that will become temporarily depleted and create the state of ego depletion after being used and will be replenished after rest. Several studies have demonstrated that engaging in effortful activities such as controlling or suppressing thoughts, concentrating, and decision-making may diminish an

individual's self-regulatory resources and may lead one to experience mental fatigue and be less able to control his/her behavioral responses to stressful situations until the resources are recovered. People in the ego-depleted state were found to be less persistent on discouraging, frustrating, or intellectual tasks (Baumeister et al., 1998; Schmeichel, Vohs, & Baumeister, 2003), more prone to consume excessively alcoholic beverages (Muraven, Collins, & Neinhaus, 2002), less able to cope with adversity thoughts (Gailliot, Schmeichel, & Baumeister, 2006), and more likely to break their diet (Vohs & Heatherton, 2001). Accordingly, it is difficult, if not impossible, for us to regulate the self effectively without strong willpower.

The fourth ingredient in the self-regulation process is motivation, which refers to the extent to which people are determined to achieve their goals or meet the standard. Baumeister and Vohs (2007) suggested that even if the standards are clear, monitoring is fully effective, and the person's self-regulatory resources are abundant, the lack of strong commitment to achieve the goal or meet the specific standard may still lead to the self-regulation processes to fail.

It is important to note that the terminology of ingredients implies that some of them are essential for effective self-regulation, but these four ingredients may be substituted or compensated. For example, alcoholic beverages are found to be especially powerful in impairing one's ability to monitor their behavior, leading intoxicated individuals to be more likely to say or do something inappropriate (Hull, 1981). Nevertheless, if the self-regulation motivation is high – perhaps his manager or client unexpectedly showed up – he may still be able to regulate their behaviors to align with the standard.

2.3 Cognitive Flexibility

As discussed above, the number of self-aspects helps to reflect the richness of social roles that an individual cognitively characterizes themselves, and each social role contains not only specialized knowledge, skills, abilities, and other characteristics (KSAOs) but also expectations, goals and values, and self-regulatory systems (Lord & Hall, 2005). In addition, the degree of overlap among self-aspects may help to reflect an individual's cognitive ability to abstract relevant mental frameworks in each self-aspect to meet situational demands. As such, I aim to extend Linville's (1985, 1987) social-cognitive model of self-complexity to examine its association with cognitive flexibility in the current research.

Cognitive flexibility theory was first proposed by Spiro and his colleagues (Spiro, Coulson, Feltovich, & Anderson, 1988; Spiro & Jehng, 1990; Spiro, Vispoel, Schmitz, Samarapungavan, & Boerger, 1987) and was defined as "*the ability of individuals to restructure knowledge in multiple different way depending on changing situational demands*" (Gino & Ariely, 2012, p.446).

Creativity and strategic management researchers have identified two cognitive processes that are critical for complex and ill-structured problem-solving: Cognitive flexibility (Spiro & Jehng, 1990) and divergent thinking (Guilford, 1968, 1982). Cognitive flexibility describes the ability of an individual to assemble disparate knowledge from precedent cases and various concepts to adaptively fit the situation at hand (Spiro, 1980; Spiro et al., 1987). By contrast, divergent thinking refers to the ability of an individual to think "*outside the box*" or "*without boundaries*" to develop original ideas and envision multiple solutions to a given problem (Thompson, 2008, p.226). When confronting novel, ill-defined, or even conflicting problems, it is impossible for leaders to have a prepackaged schema for everything. Therefore, cognitive

flexibility allows individuals to break old cognitive patterns and overcome functional fixedness to seek interconnections between their previous experiences and the current situation, whereas divergent thinking allows individuals to generate creative solutions by envisioning possible solutions beyond their cognitive boundaries to the given problem.

A large body of existing research has found that exposure to diverse experiences, which was defined as "*unusual events and situations that are actively experienced*" (Ritter et al., 2012), helps individuals to flexibly draw upon mental schemas and behavioral scripts from different perspectives and to be more creative in problem-solving (Carson, Peterson, & Higgins, 2005; Cheng, Leung, & Wu, 2011; Leung, Maddux, Galinsky, & Chiu, 2008; Maddux, Adam, & Galinsky, 2010; Maddux & Galinsky, 2009; Ritter et al., 2012). In a similar vein, research in strategic management also found that strategic decision-makers who are able to update their mental representations, adapt their cognitive processes, and engage in cognitive shifts are more able to cope with the uncertainty and changes in the external environments (Foldy, Goldman, & Ospina, 2008; Laureiro-Martinez & Brusoni, 2018; Louis & Sutton, 1991; Marcel, Barr, & Duhaime, 2011; Mom, Van Den Bosch, & Volberda, 2007).

While several studies have shown that cognitive flexibility can result in several positive outcomes, some studies have cast caution on the widespread approbation of cognitive flexibility and revealed the dark side may lurk within. For instance, Lu, Quoidback, Gino, Chakroff, Maddux, and Galinsky (2017) demonstrated that cognitively flexible individuals are more likely to relax their moral standards and engage in immoral behavior such as cheating. In addition, indirect support for this position was also reported by Gino and Ariely (2012), whose experimental studies showed that creative individuals are more likely to behave dishonestly due to their greater ability to justify their dishonest behavior. Specifically, Gino and Ariely (2012)

found that creative individuals are more likely to resolve the tension of ethical dilemmas through self-serving rationalizations, such that they behave dishonestly enough to profit from their unethical behavior but honestly enough to maintain a positive self-concept as honest human beings (Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009).

2.4 Abusive Supervision

Several researchers (e.g., Baumeister, 1997; Courtright, Gardner, Smith, McCormick, & Colbert, 2016; Gottfredsom & Hirschi 1990; Hagger, Wood, Stiff, & Chatzisarantis, 2010; Stucke & Baumeister, 2006) have drawn upon self-control theory (Baumeister, Heatherton & Tice, 1994) and resource drain theory (Edwards & Rothbard, 2000; Rothbard, 2001; Rothbard & Edwards, 2003) to suggest that the depletion of self-control resources is the most proximal cause of interpersonal aggression. In addition, from the cognitive perspective, the extent to which leaders are able to read the situation comprehensively and thoughtfully, judge the social situation accurately, and select responses appropriately may also help to predict their leadership behaviors. As such, I drew upon the self-control and cognitive perspectives to study abusive supervision as negative leadership behavior.

Abusive supervision is defined as "*subordinates' perceptions of the extent to which supervisors engage in the sustained display of hostile verbal and nonverbal behaviors, excluding physical contact*" (Tepper, 2000, p.178). Psychologists and behavioral ethics scholars have devoted a significant amount of effort to studying the negative outcomes of abusive supervision. From the organizational perspective, Tepper, Duffy, Henle, and Lambert (2006) reported that abusive supervision has caused organizations in the U.S. to lose approximately $23.8 billion annually. This estimated figure includes a wide range of costs, such as absenteeism, turnover,

workplace deviance, legal costs, and reduced productivity. Although the later study by Martinko, Harvey, Brees, and Mackey (2013) noted that this figure is simply a rough estimation of the true organizational cost of abusive supervision, it clearly highlighted the pervasiveness and urgency of this organizational issue.

From a subordinate's or follower's perspective, Schat, Frone, and Kelloway (2006) have indicated that approximately 14% of the employees in the U.S. are victims of abusive supervision. Several empirical studies have found that the perception of abusive supervision may lead followers to experience several negative consequences, such as low life and job satisfaction, negative psychological well-being, greater alcohol consumption, more work-to-family conflict, and negative physiological consequences (for reviews, see Aquino & Thau, 2009; Bowling & Beehr, 2006; Krasikova, Green, & LeBreton, 2013; Mackey, Frieder, Brees, & Martinko, 2017; Martinko et al., 2013; Schyns & Schilling, 2013). Clearly, the perception of abusive supervision is associated with a wide range of deleterious outcomes.

While much is known about the deleterious outcomes associated with abusive supervision, research attention on examining the antecedents of abusive supervision is relatively sparse. Moreover, this disproportionated research attention focusing on the outcomes of abusive supervision has caused several researchers to critique that the abusive supervision literature is "*more phenomenon driven than theory driven*" (Tepper, 2007, p.285). In response to the critique, several researchers have employed various theories to introduce those overlooked antecedents of abusive supervision. Generally speaking, empirical studies that examine the antecedent of abusive supervision can be divided into two research lines.

On the one hand, researchers have employed relevant theories such as resource drain theory (Edwards & Rothbard, 2000; Rothbard, 2001; Rothbard & Edwards, 2003), conservation

of resources theory (Hobfoll, 1989, 2001), and ego depletion theory (Baumeister, 1997) to argue that the perception of abusive supervision is the result of self-regulatory failure. To this perspective, researchers have argued that the most proximal cause of interpersonal aggression is the depletion of self-control resources that otherwise serves as an inner set of psychological restraints to help us to override aggression impulses, restrain aggression impulses from translating into actual aggression, and replace actual aggression with peaceful means of conflict resolutions (Courtright, Gardner, Smith, McCormick, & Colbert, 2016; Gottfredsom & Hirschi 1990; Hagger, Wood, Stiff, & Chatzisarantis, 2010; Stucke & Baumeister, 2006).

On the other hand, several researchers argued that acting abusively toward subordinates in the workplace involves a conscious process. To support their argument, researchers have employed several theories such as social learning (Liu, Liao, & Loi, 2012; Mawritz, Mayer, Hoobler, Wayne, & Marinova, 2012), moral licensing (Lin, Ma, & Johnson, 2016; Yu & Duffy, 2017), displaced aggression (Tepper, Duffy, Henle, & Lambert, 2006), and moral exclusion (Tepper, Moss, & Duffy, 2011) to argue that the perception of abusive supervision is the result of intentional or mimicked behavior.

Regarding the instrument in measuring abusive supervision, several review and meta-analysis studies have revealed that Tepper's (2000) 15-item abusive supervision scale is by far the most wildly employed instrument. Although some studies have attempted to adapt the number of items or modify the agreement scales or different frequency scale points to measure the perception of abusive supervision, the results in the meta-analysis showed little influence on the reported mean of the measure. Nonetheless, Tepper's (2000) abusive supervision scale may confront potential social desirability and cultural effects issues in measuring abusive supervision.

To overcome these issues, I also employed Hanges, Grand, Epistola, and Stark's (2021) 13-paired-item scale in the present research.

2.5 Servant Leadership

The empirical studies on servant leadership have largely focused on measurement development, how leaders influence follower outcomes, and the mechanisms in explaining these associations. Only 11 empirical studies, to date, were found studying the antecedents of servant leadership that was limited only to leaders' gender and characteristics (for reviews, see Eva et al., 2019; Van Dierendonck, 2011). To fulfill this research gap, I first draw upon the self-control perspective to discuss whether ego-depleted leaders will be less likely to display servant leadership behaviors due to the defensive posture to conserve their remaining resources. In the second mediation path, I draw upon the cognitive perspective to discuss whether cognitively flexible leaders are more likely to serve as a servant to their followers due to their superior cognitive ability to flexibly process and restructure knowledge in multiple ways contingent upon the changing situational demands. As such, I adopt self-control and cognitive perspectives to study servant leadership as positive leadership behavior.

The terminology of servant leadership was first proposed by Robert Greenleaf in his "*The Servant as Leader.*" In this work, he described servant leadership as:

> "*The Servant-Leader is servant first. . . . It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead. . . . The best test, and difficult to administer is this: Do those served grow as persons? Do they, while being served, become healthier, wiser, freer, more*

> *autonomous, and more likely themselves to become servants? And, what is the effect on the least privileged in society? Will they benefit, or at least not further be harmed?*" (1977: 7)

Since Greenleaf (1970) proposed his seminal work, leadership scholars (e.g., Spear, 1995; Laub, 1999; Russell & Stone, 2002; Patterson, 2003) have attempted to translate his ideas into their research models to characterize the servant-leader. Specifically, Spear (1995) distilled 10 characteristics of servant-leader, Laub (1990) developed 6 clusters of servant-leadership characteristics, Russell and Stone (2002) distinguished 9 functional characteristics and 11 additional characteristics of servant leadership, and Patterson (2003) identified 7 dimensions of servant leadership in her model. Although these models help to enrich our understanding of servant leadership, each model has its limitations and some of the characteristics are overlapped. For example, some models overlooked the leader perspective, some models failed to differentiate between the intrapersonal aspects, interpersonal aspects, and outcomes of servant leadership, and some models did not provide a theoretical reason why certain attributes were sorted into a particular category. To reconcile those different viewpoints, van Dierendonck (2011) reviewed the 44 characteristics of servant leadership in those research models and categorized them into six key characteristics, which are (1) empowering and developing people, (2) humility, (3) authenticity, (4) interpersonal acceptance, (5) providing direction, and (6) stewardship, to describe the servant-leader.

The first key characteristic of servant leadership is empowering and developing, which is a motivational concept that refers to the ability to enable people, realize a person's abilities, and recognize other learning opportunities (Conger, 2000; Greenleaf, 1998). In other words,

empowerment aims at fostering subordinates' self-worth, increasing their personal power, and encouraging their personal development. Consistent with this perspective, servant-leaders tend to display more empowering and developing behaviors, such as highlighting the significance of the employee's work, promoting self-direct decision-making, removing bureaucratic constraints, providing personal coaching, and fostering information sharing (Ahearne, Mathieu, & Rapp, 2005; Dansereau, et al. 1995; Wallis, Yammarino, & Feyerherm, 2011; Yammarino & Dansereau, 2002).

The second key characteristic of servant leadership is humility, which refers to the extent to which leaders are capable of putting their personal accomplishments and talents in a proper perspective (Patterson, 2003). Humility is closely related to modesty (Greenleaf, 1996); servant-leaders tend to put the interests of their followers at first place, seek the contribution to facilitate their followers, provide followers with essential resources, and, most importantly, retreat into the background when the task has been successfully accomplished.

The third key characteristic of servant leadership is authenticity, which refers to the extent to which the leaders' expressions are aligned with their inner thoughts, convictions, and feelings (Harter, 2002). In other words, servant leaders' authenticity is closely related to whether they genuinely reflect their private and public internal states, intentions, and commitments (Peterson & Seligman, 2004). As servant-leaders tend to be authentic and genuine in their interaction with others, they are more likely to accept vulnerability (Luthans & Avolio, 2003), be honest (Russell & Stone, 2002), and keep their promises.

The fourth key characteristic of servant leadership is interpersonal acceptance, which refers to the extent to which leaders are able to experience the feelings of others, understand the background, beliefs, and core values of others (George, 2000), and bear and forgive others'

mistakes (McCullough, Hoyt, & Rachal, 2000). In this sense, the characteristic of interpersonal acceptance is closely related to the element of empathy in perspective-taking. As servant leaders are able to cognitively adopt the psychological perspectives of others, they tend to create a team climate that has a high level of autonomy, trust, warmth, and tolerance toward arguments, offenses, and wrongdoings (Ferch, 2005).

The fifth key characteristic of servant leadership is providing direction. The extent to which leaders are able to provide clear direction, while at the same time ensuring that followers understand what is expected is critical for both employees and organizations (Laub, 1999). In this sense, providing direction includes behaviors such as assigning tasks based on followers' abilities, needs, and inputs; enacting the right degree of accountability; and creating novel approaches to solve issues.

The sixth key characteristic of servant leadership is stewardship, which is closely related to social responsibility, loyalty, and teamwork. Servant-leaders tend to act as role models for othersl thus, they are willing to sacrifice their self-interests and serve the interests of others, take greater responsibilities, and encourage team members to act in organizational citizenship behaviors and collaborative teamwork (Block, 1993; Spears, 1995).

As servant leadership is a people-centered leadership style, not surprisingly, there is solid empirical evidence suggesting that servant leaders will bring several positive consequences to their followers. Based on Greenleaf's quotation, the positive outcomes of servant leadership from the follower perspective can be differentiated into three categories: Self-actualization, positive job attitudes, and performance (van Dierendonck, 2011). First, for self-actualization, Neubert, Kacmar, Carlson, Chonko, and Roberts (2008) have found that servant leadership can increase followers' promotion focus, which includes behaviors such as seeking opportunities to achieve

continuous personal development, working with goals, and pursuing ideals. In a similar vein, Mayer, Bardes, and Piccolo (2008) have found the relevance of servant leadership to followers' psychological needs.

Second, regarding job attitudes, Hebert (2003), Earnhardt (2008), and Horsman (2001) have found that servant leadership is positively associated with job satisfaction and empowerment. Moreover, the positive association between servant leadership and organizational commitment has been found in different geographic areas such as U.S. (Jaramillo, Grisaffe, Chonko, & Roberts, 2009a), South Africa (Dannahauser & Boshoff, 2007), and Philippines (West & Bocarnea, 2008). Third, several studies have also found that servant leadership has a positive influence on performance, which was studied in team effectiveness and organizational citizenship behavior. Specifically, existing evidence has shown that servant leadership is positively associated with followers' self-reported performance (Jaramillo, Grisaffe, Chonko, & Roberts, 2009b), self-reported helping and creative behaviors (Neubert et al., 2008), organizational citizenship behaviors (Ehrhart, 2004), motivation to serve (Ng, Koh, & Goh, 2008), and perceived team effectiveness (Irving & Longbotham, 2007).

In contrast to the research attention that has been devoted to studying the outcomes of servant leadership, the research attention on studying the antecedents of servant leadership is meager. To date, only 11 empirical studies were found studying the antecedents of servant leadership that was limited only to leaders' gender and characteristics (Eva, Robin, Sendjaya, van Dierendonck, & Liden, 2019). From the gender perspective, existing research has found that female leaders are more expected to and are more likely to display servant leadership behaviors such as emotional healing, organizational stewardship, and altruistic calling than male leaders (Beck, 2014; de Rubio & Kiser, 2015; Hogue, 2016). From the personality perspective,

researchers (e.g., Flynn, Smither, & Walker, 2016; Hunter, Neubert, Perry, Witt, Penny, & Weinberger, 2013; Peterson, Galvin, & Lange, 2012) have shown that leaders who are more agreeable, less extraverted, stronger in core self-evaluation, and low in narcissistic personality will display higher levels of servant leadership behaviors.

In summary, from the self-control perspective, I will first discuss the associations between the components of self-complexity, the interaction effect of the number of self-aspects and the degree of overlap among self-aspects, and ego depletion, then employ the conservation of resources (COR) theory to discuss the associations between ego depletion and abusive supervision and servant leadership. From the cognitive perspective, I will first examine the associations between the components of self-complexity, the interaction effect of the number of self-aspects and the degree of overlap among self-aspects, and cognitive flexibility, then investigate the associations between cognitive flexibility and abusive supervision and servant leadership.

Chapter 3: Conceptual Framework and Hypotheses Development

3.1 Self-complexity and Ego Depletion

As presented in the previous chapter, several self-complexity models have been proposed. Among those various models of self-complexity, Linville's (1985, 1987) social-cognitive model of self-complexity has piqued the most attention from social and clinical psychologists and sociologists. Several researchers have employed Linville's initial descriptive works to address a wide range of psychological well-being outcomes such as self-esteem (Campbell, Chew, & Scratchley, 1991), depression (Brown & Rafaeli, 2007; Linville, 1987), coping in everyday life (Campbell, Chew, & Scratchley, 1991; Cohen, Pane, & Smith, 1997; Constantino, Wilson, & Horowitz, 2006; Miller, Omens, & Delvadia, 1991), coping with mood following trauma (Morgan & Janoff-Bulman, 1994), escape from self (Dixon & Baumeister, 1991), narcissistic personality (Rhodewalt & Morf, 1995), and response following domestic violence (Steinberg, Pineles, Gardner, & Mineka, 2013) (for reviews, see Campbell, Assanand, & Paula, 2003; Koch & Shepperd, 2004; Rafaeli & Hiller, 2010; Rafaeli & Steinberg, 2002). Consistent with this research interest regarding the SC-well-being association, I aim to extend Linville's (1985, 1987) social-cognitive model of self-complexity to examine its relationship with an important yet studied psychological well-being - ego depletion in the present research.

In her seminal work, Linville (1985, p.97) defined self-complexity as the "*function of two things: the number of aspects that one uses to cognitively organize knowledge about the self and the degree of relatedness of these aspects*." While high self-complexity individuals are featured to possess a greater number of self-aspects (i.e., a person's cognitive representation of the self) and maintain a greater distinction among those self-aspects, low self-complexity individuals are characterized to possess few self-aspects and share more attributes in common (Linville, 1985,

1987). Accordingly, differences in self-complexity are therefore based on both the number of self-aspects and the degree of redundancy among the traits in describing those self-aspects. Such self-aspects may include information about specific events and behaviors as well as generalizations that are developed from repeated observation, roles, physical features, category membership, behavior, abilities, preferences, goals, autobiographical recollections, and relations with others (Linville, 1985). Nevertheless, it is important to note that not all self-aspects are activated at any given time. Rather, only specific self-aspects are activated contingent on factors such as their context and associated thoughts, their relation to currently activated self-aspects, and their recency and frequency of activation (Linville, 1987).

The self-complexity literature provides two underlying processes that help to explain how one's complex cognitive representation of self can help to effectively cope with both positive and negative events: Spillover and buffering processes. Specifically, the spillover process depicts that high self-complexity individuals are more able to stem the flow of affective spillover because feedback about a particular self-aspect does not share common attributes with other self-aspects, and the self-aspect implicated by the feedback represents only a small proportion of their overall self-concept. Accordingly, several studies have found that high self-complex individuals fare better in maintaining a positive self-view and be less susceptible to extreme affective reactions following negative events (Dixon & Baumeister, 1991; Linville, 1985; Niedenthal, Setterlund, & Wherry, 1992; Renaud & McConnell, 2002).

On the other hand, the stress-buffering process suggests that when people engage in self-affirming, they preserve their global self-esteem following a threat to one self-relevant area by looking to positive qualities in other self-relevant areas. Accordingly, the stress-buffering process suggests that as high self-complexity individuals are more capable of confining negative

thoughts and feelings to spill over to other unrelated self-aspects, and they can employ the greater proportion of positive thoughts and feelings in their self-representation to buffer against those negative implications. As such, the stress-buffering process benefits self-complex individuals to experience less affective extremity in response to stress and both positive and negative feedback or events.

Ego depletion is defined as "*a state in which the self does not have all the resources it has normally*" (Baumeister & Vohs, 2007, p.116). Ego-depletion theory (Baumeister, Bratslavsky, Muraven, & Tice, 1998) suggests that people have a limited pool of regulatory resources to exert self-control, and one's ability to engage in self-control waxes and wanes across time and circumstances (Muraven & Baumeister, 2000). Several studies have demonstrated that engaging in effortful activities such as controlling or suppressing thoughts, concentrating, and decision-making may diminish an individual's self-regulatory resources and may lead one to experience mental fatigue and be less able to control his/her behavioral responses to stressful situations until the resources are recovered. For instance, ego-depleted individuals were found to be less persistent on discouraging, frustrating, or intellectual tasks (Baumeister et al., 1998; Schmeichel, Vohs, & Baumeister, 2003), more prone to consume excessive alcoholic beverages (Muraven, Collins, & Neinhaus, 2002), less able to cope with aversity thoughts (Gailliot, Schmeichel, & Baumeister, 2006), and more likely to break their diet (Vohs & Heatherton, 2001). In their meta-analytic study, Hagger, Wood, Stiff, and Chatzisarantis (2010) have also revealed that ego depletion will affect individuals' subsequent task effort, subjective fatigue, and blood glucose level.

One possible explanation so far can be that high self-complexity individuals are less likely to experience ego depletion than low self-complexity individuals because both spillover

and buffering processes can help them to be less susceptible to affective extremity. In addition, as high self-complexity individuals are less often need to engage in self-control to regulate their actions and emotions to align with social rules and norms; they can maintain more self-regulatory resources than low self-complexity individuals to avoid themselves from a state of mental fatigue and from being less able to control their behavioral responses to stressful situations.

From the developmental perspective, psychologists (e.g., Cramer, 1987; Evans, 1994) argued that if adolescents are unable to identify those self-aspects in their self-structure, they are expected to have greater psychological problems. Their argument is supported by several studies (e.g., Evans & Seaman, 2000; Harter, 1982; Marsh, 1989; Marsh, Barnes, Cairns, & Tidman, 1984; Marsh & Shavelson, 1985) that young children tend to have a simple, global, and undifferentiated positive self-concept. Their ability to recognize and distinguish domains of self-aspect begins around the age of 7-8 years old to help them to cope well with positive and negative self-relevant feedback during maturation. If adolescents did not develop the ability to identify self-aspects from a simple, global, and undifferentiated positive self-concept, they would exhibit more reactive and experience more anxiety in their daily life. From this perspective, a high number of self-aspects can be thought of as a successful psychological development that can help people to have better psychological well-being. In addition, based on the fact that the *H* statistic (Atteneave, 1959; Scott, 1969) is strongly, positively associated with the number of self-aspects (Rafaeli-Mor, Gotlib, & Revelle, 1999; Pilarska & Suchanska, 2015) and existing studies often employed this single composite measure to find positive associations between self-complexity and better psychological well-being, I propose that the number of self-aspects is negatively associated with ego depletion.

Hypothesis 1a: The number of self-aspects is negatively associated with ego depletion.

While there is a solid theoretical rationale for the contention that a greater number of self-aspects contributes to better psychological well-being, not all self-complexity researchers have reached a consensus on the second component of self-complexity – overlap. For instance, several existing studies (e.g., Emmos & King, 1989; Gara, Woolfolk, Cohen, & Goldston, 1993; Halberstadt, Niedenthal, & Setterlund, 1996; Hershberger, 1990; Jordan & Cole, 1996; Koenig 1989; Woolfolk, Novalany, Gara, Allen, & Polino, 1995, Study 1) have failed to find evidence to support the view that high self-complexity individuals fare better in psychological well-being, adjustment, or resilience. To reconcile these inconsistent findings, researchers (e.g., Constantino et al., 2006; Pilarska & Suchanska, 2015; Rafaeli-Mor, Gotlib, & Revelle, 1999; Rafaeli & Hiller, 2010; Rafaeli-Mor & Steinberg, 2002) have examined the measurement issue and found that the *H* statistics certainly tell us nothing about the second component of the self-complexity (i.e., overlap) or even contradict to Linville's (1985, 1987) conceptual proposition. Thus, they urged future studies to pay closer attention to each component and the interaction effect of those components to provide a more balanced view. In response to this urge, I will discuss the role of overlap plays in the SC-well-being association in more detail below.

While the number of self-aspects is an index that reflects the concept of differentiation, the degree of overlap among self-aspects is another index that relates to the concept of integration (or also refers to unity in some studies). Theories that draw on self-concept unity and suggest that the higher degree of integration (i.e., lower overlap) among one's self-aspects contributes to better psychological well-being or adjustment include self-concept integration (Block, 1961), self-concept clarity (Campbell, 1990), and self-concept differentiation (Donahue,

Robins, Roberts, & John, 1993). First, self-concept integration refers to the extent to which the self is clear and coherent. In his initial work, Block (1961) maintained that high self-concept integrated individuals tend to have more clear, coherent, and integrated selves than low self-concept integrated individuals. Moreover, Block (1961) also suggested that self-concept integration is related to one's psychological well-being because the highly integrated selves can provide continuity and self-integrity across changing circumstances and different social roles. In contrast, Block (1961, p. 392) described individuals who lack a coherent self as "*an interpersonal chameleon, with no inner core of identity, fitfully reacting in all ways to all people*," indicating that low levels of self-concept integration can be seen as an outcome of failure in psychological development.

Self-concept differentiation (Donahue, Robins, Roberts, & John, 1993; Roberts & Donahue, 1994) was defined as "*the degree to which an individual's self is variable or consistent across personally important roles*" (Donahue et al., 1993, p. 834). Accordingly, self-concept differentiation focuses on the flipside of self-concept integration and examines the degree of unshared variance across social roles. However, the terminology of self-concept differentiation, unfortunately, creates conceptual confusion for the readers when considering it an integration instead of a differentiation measure. To avoid such conceptual confusion, some researchers suggested that self-concept differentiation is better termed self-concept fragmentation (Campbell, Assanand, & Paula, 2003) or self-concept consistency (Constantino et al., 2006). Literature in self-concept differentiation generally suggests that high self-concept differentiation is indicative of an incoherent and fragmented self-concept (e.g., Campbell et al., 2003; Hay & Diehl, 2010; Diehl, Hastings, Stanton, 2001; Donahue et al., 1993; McReynolds, Altrocchi, & House, 2000; Pilarska & Suchanska, 2015; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997). Research on

examining the association between self-concept differentiation and well-being has constantly shown that self-concept differentiation is relates to high level of anxiety, more depression, and low self-esteem (Constantino et al., 2006; Donahue et al., 1993).

Self-concept clarity (Campbell, 1990) refers to the extent to which the self is clearly and confidently defined, internally consistent, and temporally stable. Campbell maintained that having a clear self-concept can help individuals to be less vulnerable to threats to the self and, thus, at a decreased risk for psychological maladjustment. The empirical studies conducted by Campbell and her colleagues have found that low self-concept clarity individuals are often related to low self-esteem (Campbell, 1990; Campbell et al., 1996) and less positive about and more reactive to daily life events (Campbell, Chew, & Scratchley, 1991). In the study that specifically assesses the association between the measures of self-concept unity and psychological adjustment, Campbell, Assanand, and Paula (2003) found that the measures of self-concept unity were moderately, positively related to self-esteem and negatively correlated with neuroticism. Based on all three lines of research posit that having a stable, coherent, and integrated self-concept will contribute to better psychological well-being, adjustment, or resilience, I propose an opposing hypothesis to Linville's (1985, 1987) self-complexity literature that the degree of overlap among self-aspects will be negatively associated with ego depletion.

Hypothesis 1b: The degree of overlap among self-aspects is negatively associated with ego depletion.

As discussed above, individuals who have successful psychological development tend to possess a greater number of self-aspects, which can further lead them to be less susceptible to affective extremity due to the spillover and buffering processes. Moreover, as the number of self-

aspects increases, individuals less often need to engage in self-control to regulate their actions and emotions to align with social rules and norms. Hence, they can maintain more self-regulatory resources than low self-complexity individuals to avoid the state of mental fatigue and being less able to control their behavioral responses to stressful situations. In addition, theories in self-concept unity such as self-concept integration (Block, 1961), self-concept clarity (Campbell, 1990), and self-concept differentiation (Donahue, Robins, Roberts, & John, 1993) generally suggest that people who have a more stable, coherent, and integrated self-concept tend to have better psychological well-being. Consistent with Linville's (1987) theory that the interplay between the number of self-aspects and the organization underlying them influences individuals' subjective impact of life events, I suggest that individuals whose self-construct comprised of a greater number of self-aspects that are highly related to each other are less likely to experience ego depletion. Accordingly, I posit the following:

Hypothesis 1c: The interaction effect of a high number of self-aspects and a high degree of overlap is negatively associated with ego depletion.

3.2 Ego Depletion and Leadership Behaviors

As the present research is specifically interested in examining the associations between self-complexity and leadership behaviors in organizational settings, I studied two often-seen leadership behaviors in the workplace. For the negative leadership behavior, I focused on abusive supervision, which is defined as "*subordinates' perceptions of the extent to which supervisors engage in the sustained display of hostile verbal and nonverbal behaviors, excluding physical contact*" (Tepper, 2000, p.178). Researchers (e.g., Baumeister, 1997; Courtright, Gardner, Smith, McCormick, & Colbert, 2016; Gottfredsom & Hirschi 1990; Hagger, Wood,

Stiff, & Chatzisarantis, 2010; Stucke & Baumeister, 2006) have drew upon self-control theory (Baumeister, Heatherton & Tice, 1994) and resource drain theory (Edwards & Rothbard, 2000; Rothbard, 2001; Rothbard & Edwards, 2003) to suggest that the depletion of self-control resources is the most proximal cause of interpersonal aggression that otherwise serves as an inner set of psychological restraints to help us to override aggression impulses.

For the positive leadership behavior, I focused on servant leadership, which refers to "*an (1) other-oriented approach to leadership (2) manifested through one-on-one prioritizing of follower individual needs and interests, (3) and outward reorienting of their concern for self towards concern for others within the organization and larger community*" (Eva, Robin, Sendjaya, Van Dierendonck, & Liden, 2019, p.114). Among those positive leadership behaviors such as transformational leadership (Bass, 1985; Burns, 1978), ethical leadership (Brown, Trevino, & Harrison, 2005), and authentic leadership (Avolio & Gardner, 2005), I focused on servant leadership because it better helps to reflect the opposite perspective of the abusive supervision. In addition, the current research also responds to Van Dierendonck's (2011) suggestion that the extent to which leaders are able to judge the social situation accurately may help to predict their servant behaviors, which will be discussed in the later section.

Psychologists and behavioral ethics scholars have devoted a significant amount of effort to studying the negative outcomes of abusive supervision. From the organizational perspective, Tepper, Duffy, Henle, and Lambert (2006) reported that abusive supervision has caused organizations in the U.S. to lose approximately $23.8 billion annually. Although in the later study conducted by Martinko, Harvey, Brees, and Mackey (2013) noted that this figure is simply a rough estimate of the true organizational cost of abusive supervision, it clearly highlighted the pervasiveness and urgency of this organizational issue. From a subordinate's or follower's

perspective, several empirical studies have found the perception of abusive supervision may lead followers to experience several negative consequences such as low life and job satisfaction, negative psychological well-being, greater alcohol consumption, and negative physiological consequences (for reviews, see Aquino & Thau, 2009; Bowling & Beehr, 2006; Krasikova, Greem, & LeBreton, 2013; Mackey, Frieder, Brees, & Martinko, 2017; Martinko et al., 2013; Schyns & Schilling, 2013).

In comparison, research attention on examining the antecedents of abusive supervision is relatively little. Generally speaking, theories in studying the antecedent of abusive supervision can be divided into two research lines. On the one hand, researchers have argued that the most proximal cause of interpersonal aggression is the depletion of self-control resources that otherwise serves as an inner set of psychological restraints to help us to override aggression impulses, restrain aggression impulses from translating into actual aggression, and replace actual aggression with peaceful means of conflict resolutions (Baumeister, 1997; Courtright, Gardner, Smith, McCormick, & Colbert, 2016; Gottfredsom & Hirschi 1990; Hagger, Wood, Stiff, & Chatzisarantis, 2010; Stucke & Baumeister, 2006). On the other hand, researchers have employed several theories such as social learning (Liu, Liao, & Loi, 2012; Mawritz, Mayer, Hoobler, Wayne, & Marinova, 2012), displaced aggression (Tepper, Duffy, Henle, & Lambert, 2006), and moral exclusion (Tepper, Moss, & Duffy, 2011) to argue that acting abusively toward subordinates in the workplace involves a conscious process. As the current sector is concerned with the unconscious linkages between ego depletion and leadership behaviors, I employ the conservation of resources (COR) theory to propose that managers who are ego-depleted are more likely to be perceived as abusive supervisors and less likely to be perceived as servant leaders in the workplace.

The COR theory suggests that "*individuals strive to retain, protect, and foster those things that they value*" (Hobfoll, 2001, p.341) and that people are highly sensitive to the loss of those valuable resources (Halbesleben, Neveu, Paustian-Underdahl, & Westman, 2014; Hobfoll, 1989). As studies such as Baumeister et al., (1998) and Muraven & Baumeister, (2000) suggested that self-regulatory resources are valuable in which people may experience ego depletion after engaging in effortful self-regulatory processes, the COR theory helps to depict two possible mechanisms in explaining how leaders manage their self-regulatory resources when they perceive that their remaining resources are depleted. The first plausible mechanism can be that because ego-depleted leaders are highly sensitive to the loss of valued resources, they may therefore be less motivated to invest the limited remaining resources to withstand and override their aggressive impulses (Stucke & Baumeister, 2006; Muraven & Baumeister, 2000; Marcus & Schuler, 2004; Thau & Mitchell, 2010). In addition, subordinates are considered particularly vulnerable than other targets (e.g., leaders' managers) within the organizational setting because they are less powerful and more dependent upon position, leading them to become relatively "*easy and safe targets*" regarding supervisory aggression (Hoobler & Brass, 2006). Not surprisingly that several studies (e.g., Courtright et al., 2016; Joosten, Van Dijke, Van Hiel, & De Cremer, 2013; Lam, Walter, & Huang, 2017; Wang & Chan, 2019; Wang, Sinclair, & Deese, 2010) have found that deficit in leaders' self-regulatory resources is a proximal cause of abusive supervision because the state of reduced resources following exertion of self-control leads them unable to effectively inhibit, override, or refrain themselves from acting upon behavioral impulses. Accordingly, I posit the first prediction on the association between ego depletion and leadership behaviors as follows:

Hypothesis 2: Ego depletion is positively associated with abusive supervision.

The empirical studies on servant leadership have largely focused on measurement development, how leaders influence follower outcomes and the mechanisms in explaining these associations. To date, only 11 empirical studies were found in studying the antecedents of servant leadership that are limited only to leaders' gender and characteristics (for reviews, see Eva et al., 2019; Van Dierendonck, 2011). Specifically, researchers (e.g., Beck, 2014; de Rubio & Kiser, 2015; Hogue, 2016) have found that female leaders are more expected to and are more likely to display servant leadership behaviors such as emotional healing, organizational stewardship, and altruistic calling than their male counterparts. From the personality perspective, existing studies (e.g., Flynn, Smither, & Walker, 2016; Hunter, Neubert, Perry, Witt, Penny, & Weinberger, 2013; Peterson, Galvin, & Lange, 2012) have shown that leaders who are more agreeable, less extraverted, stronger in core self-evaluation, and low in narcissistic personality displayed higher levels of servant leadership behaviors.

Nonetheless, the existing research in studying the antecedent of servant leadership seems to overlook the predictors from the self-control perspective. Specifically, COR theorists suggested that self-control exhausted individuals will take on a defensive posture to conserve their remaining resources and eschew further resource expenditure rather than to invest the remaining resources to undertake those effortful actions (Halbesleben & Bowler, 2007; Halbesleben, Neveu, Paustian-Underdahl, & Westman, 2014). Consistent with this perspective, the second possible mechanism can be that because leaders are highly sensitive to the loss of those valuable resources, they may be unwilling to expend their limited remaining resources on displaying those effortful servant leadership behaviors such as understanding each follower's assumption, background, beliefs, and core values, focusing on the growth and development of

their followers, and fostering positive or knowledge-sharing team environments. Accordingly, I posit the second prediction on the association between ego depletion and leadership behaviors as follows:

Hypothesis 3: Ego depletion is negatively associated with servant leadership.

Based on the discussion above suggested that when managers possess a high number of self-aspects, they are less susceptible to affective extremity and less often need to engage in self-control to regulate their actions and emotions to align with social rules and norms. Accordingly, based on the self-control theory, high number of self-aspects managers are better than low number of self-aspects managers in avoiding the state of mental fatigue and being less able to control their behavioral responses to stressful situations. Moreover, the COR theory provides two possible mechanisms; (1) because managers are highly sensitive to the loss of valued resources, they may therefore be less motivated to invest the limited remaining resources to withstand and override their aggressive impulses, and (2) because leaders are highly sensitive to the loss of those valuable resources, they may be unwilling to expend their limited remaining resources on displaying those effortful servant leadership behaviors. In this sense, ego depletion, therefore, would mediate the relationships between the number of self-aspects and leadership behaviors. Accordingly, I posit the following:

Hypothesis 4: Ego depletion mediates the relationship between the number of self-aspects and abusive supervision.

Hypothesis 5: Ego depletion mediates the relationship between the number of self-aspects and servant leadership.

Furthermore, the degree of overlap among self-aspects in Linville's social-cognitive model of self-complexity also plays a critical role in this indirect effect to predict leaders' behaviors in the workplace. Specifically, theories in self-concept unity (e.g., self-concept integration, self-concept differentiation, and self-concept clarity) generally suggested that having a higher degree of integration among one's self-aspects will lead individuals to have better psychological well-being. Consistent with this perspective, I first suggest that leaders who maintain a high degree of overlap among those meaningful self-aspects are less likely to experience the state of ego depletion. In addition, I then draw upon those two possible mechanisms derived from the COR theory to suggest that ego-depleted leaders are expected to be perceived as (1) more abusive supervision and (2) less servant leadership in the workplace. In this sense, ego depletion, therefore, would mediate the relationships between the degree of overlap among self-aspects and leadership behaviors. Accordingly, I posit the following:

Hypothesis 6: Ego depletion mediates the relationship between the degree of overlap among self-aspects and abusive supervision.

Hypothesis 7: Ego depletion mediates the relationship between the degree of overlap among self-aspects and servant leadership.

When considered as part of my integrated framework, this implies that, when leaders whose self-construct contains several meaningful self-aspects that are highly overlapped, they are less likely to experience ego depletion. Furthermore, as mentioned above that the COR theory helps to outline two possible mechanisms in explaining how the reduced cognitive capacity for self-regulation will affect managers' leadership behaviors in the workplace, I propose that ego depletion will mediate the relationships between the interaction of a high

number of self-aspects and a high degree of overlap among self-aspects and leadership behaviors. Accordingly, I posit the following:

Hypothesis 8: Ego depletion mediates the relationship between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and abusive supervision.

Hypothesis 9: Ego depletion mediates the relationship between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and servant leadership.

3.3 Self-complexity and Cognitive Flexibility

As modern organizations are confronted with several unpredictable changes, leaders are required to adapt and evolve at ever-accelerating rates to deal with those novel, ill-defined, or even conflicting problems. To cope effectively with such increasing changes and uncertain situations, leaders are expected to draw relevant information dynamically and flexibly upon their self-complexity to guide their information processing, regulate their personal goals and values, and enact appropriate behavioral responses to match the complexity of the environment. Given the capability of generating novel ideas and thinking creatively about problem-solving has long been regarded as an important skill for individuals as well as for organizations and societies (Flach, 1990; Mumford & Gustafson, 1988), I will specifically focus on the associations between self-complexity as well as its components and cognitive flexibility, which is defined as "*the ability of individuals to restructure knowledge in multiple different way depending on changing situational demands*" (Gino & Ariely, 2012, p.446) in this section.

Like other complexity theories, the self-complexity theory also contains two key elements – differentiation and integration. In the self-complexity literature, differentiation refers to the number of dimensions that a person uses to cognitively organize knowledge about the self, whereas integration refers to the degree of relatedness of those self-aspects (Linville, 1985, 1987). To this perspective, differences in self-complexity are based on the breadth of the number of self-aspects that individuals characterize themselves (e.g., leader, parent, and friend) and on the extent to which people are able to mentally distinguish the breadth of skills, traits, and attributes contained in self-aspects. Such self-aspects may include information about specific events and behaviors as well as generalizations that are developed from repeated observation, roles, physical features, category membership, behavior, abilities, preferences, goals, autobiographical recollections, and relations with others (Linville, 1985).

The self-complexity literature draws upon role theory in that the number of self-aspects reflects the richness of social roles (e.g., leader/manager, religion, and charity/community member) that individuals cognitively characterize themselves. In other words, the more an individual experiences various social roles, relationships, and situations, the greater number of self-aspects that they possess in his/her self-concept. Each social role contains not only specialized knowledge, skills, abilities, and other characteristics (KSAOs) but also expectations, goals and values, and self-regulatory systems (Lord & Hall, 2005). Through social learning (Bandura, 1977), task learning, and personal learning (Karaevli & Hall, 2006), high number of self-aspects individuals, who have been immersed in more social roles and have experienced more diversifying experiences, are thus expected to develop a broader knowledge pool, a more complex cognitive pattern, and a greater repertoire of information processing aids.

Psychologists have identified information processing aids such as heuristics and schemas to provide us insights into how individuals are able to categorize, store, retrieve, and make sense of those complex demands efficiently, effectively, and dynamically without creating cognitive load. Fischhoff, Slovic, and Lichtenstein's (1977) behavioral decision theory (BDT) noted that heuristics support the selection of what specific information to attend to in the decision-making. Specifically, the information is quickly assimilated when it is consistent with the understanding of a particular domain, whereas the inconsistent information is either ignored or captured more effort analysis when the information is evaluated as important enough to pay extra attention. Although researchers such as Funder (1987), Sulsky and Day (1992), and Tversky and Kahneman (1974) indicated that in some cases, for example, when inconsistent information is ignored or when those cognitive shortcuts are over-generalized will lead to systematic cognitive errors, heuristics is still considered generally effective for which allow efficient information processing.

In addition, Lord and Foti (1986) defined schemas as "*cognitive structures that represent organized knowledge about a given stimulus as well as rules that direct information processing*" (Lord & Foti, 1986, p.22) and identified four types of schemas – self, person, person-in-situation, and behavioral schemas. Day, Harrison, and Halpin (2009) suggest that the concept of the schema is analogous to the filter, which helps individuals to process information and assist in decision-making in a relatively effortless fashion. In more detail, the developmental mechanic regards to schemas is that the more an individual repeatedly exposed to similar events or experiences, the more abstract, complex, and organized schemas become over time. In addition, the activation of the schemas operates like a web - when one element is triggered, other associated elements, experiences, and memories will also be activated. For this reason, each a

leader will develop unique hierarchically arranged schemas for goals, tasks, roles, other persons, and various aspects of the work environments that help to free up cognitive capacity to devote to novel challenges (Rosch, 1978).

Accordingly, an increase in the number of self-aspects allows one to process self-relevant information more efficiently, discriminate the various demands of one's roles and situations more effectively, and respond to those situational demands more appropriately and quickly. Several existing studies (e.g., Cheng, Leung, Wu, 2011; Leung, Maddux, Galinsky, & Chiu, 2008; Maddux, Adam, & Galinsky, 2010; Maddux & Galinsky, 2009; Ritter et al., 2012) have generally agreed that exposure to and immersion in more diverse experience can help individuals to break their old cognitive patterns and overcome functional fixedness. On the contrary, those individuals who possess few self-aspects will develop a limited knowledge pool, more simplistic cognitive pattern, and smaller repertoire of information processing aids, leading them more likely to suffer difficulties in restructuring their knowledge into multiple different ways to link the situational demands with their experiences (Sato, 1999). Prior research such as Hannah et al., (2013) also agrees with this viewpoint. Specifically, Hannah and his colleagues (2013) employed a psychological approach and found that military leaders who score high in the leader self-complexity (LSC) are more adaptable across contexts and role demands. Accordingly, I posit the following:

Hypothesis 10a: The number of self-aspects is positively associated with cognitive flexibility.

On the other hand, the degree of overlap among self-aspects also plays an important role in one's information processing. Hooijberg, Hunt, and Dodge (1997) provided an especially

instructive description of the association between differentiation and integration. Specifically, they suggested that differentiation allows people "*to see colors, shapes, and shades of gray on the canvas of social context*," whereas integration allows people "*to focus on whole objects in order to form a coherent, meaningful picture from among the colors, shapes, and shades*" (Hooijberg, Hunt, & Dodge, 1997, p.385). Accordingly, greater segmentation among self-aspects may allow individuals to focus more exclusively on the salient role (Ashforth, Kreiner, & Fugate, 2000; Rothbard & Edwards, 2003; Rothbard, Philips, & Dumas, 2005). Whereas greater integration among self-aspects provides more flexibility for individuals to juxtapose different thinking strategies, integrate ideas, and abstract relevant mental frameworks in each self-aspect to meet situational demands (Hannah, Woolfolk, & Lord, 2009). In other words, higher degree of overlap among self-aspects may allow individuals to see more commonalities and interrelatedness among those self-aspects or categories and respond more comprehensively and thoughtfully toward the contextual issue. Accordingly, I posit the following:

> *Hypothesis 10b: The degree of overlap among self-aspects is positively associated with cognitive flexibility.*

As discussed above, the number of self-aspects helps to reflect the richness of social roles that individuals cognitively characterize themselves, and each social role contains not only specialized knowledge, skills, abilities, and other characteristics (KSAOs) but also expectations, goals and values, and self-regulatory systems (Lord & Hall, 2005). Through social learning (Bandura, 1977), task learning, and personal learning (Karaevli & Hall, 2006), high number of self-aspects individuals are expected to develop a broader knowledge pool, a more complex cognitive pattern, and a greater repertoire of information processing aids to process self-relevant

information more efficiently, discriminate the various demands of one's roles and situations more effectively, and response to those situational demands more appropriately and quickly. In addition, the greater integration among self-aspects provides more flexibility for individuals to juxtapose different thinking strategies, integrate ideas, and abstract relevant mental frameworks in each self-aspect to meet situational demands. Thus, a higher degree of overlap among self-aspects may allow individuals to see more commonalities and interrelatedness among those self-aspects or categories and respond more comprehensively and thoughtfully toward the contextual issue. Based on Linville's (1987) theory that the degree of overlap work in combination with the number of self-aspects, I suggest that individuals whose self-construct comprised of a greater number of self-aspects that are highly related to each other will have a stronger ability to break old cognitive patterns, overcome functional fixedness, and restructure knowledge in multiple different way to adaptively fit the situation at hand. Accordingly, I posit the following:

Hypothesis 10c: The interaction of a high number of self-aspects and a high degree of overlap is positively associated with cognitive flexibility.

3.4 Cognitive Flexibility and Leadership Behaviors

A large body of existing research has found that individuals who are able to flexibly draw upon mental schemas and behavioral scripts from different perspectives are more creative in problem-solving (Baghetto & Kaufman, 2007; Bass, De Dreu, & Nijstad, 2008; Carson, Peterson, & Higgins, 2005; Cheng, Leung, Wu, 2011; Leung, Maddux, Galinsky, & Chiu, 2008; Maddux, Adam, & Galinsky, 2010; Maddux & Galinsky, 2009; Ritter et al., 2012). In a similar vein, research in strategic management also found that strategic decision-makers who are able to update their mental representations, adapt their cognitive processes, and engage in cognitive

shifts are more able to cope with the uncertainty and changes in the external environments (Foldy, Goldman, & Ospina, 2008; Laureiro-Martinez & Brusoni, 2016; Louis & Sutton, 1991; Marcel, Barr, & Duhaime, 2011; Mom, Van Den Bosh, & Volberda, 2007). Nevertheless, this superior cognitive ability to flexibly process and restructure knowledge in multiple different way contingent upon the changing situational demands may also play a critical role in predicting managers' leadership behaviors.

In the review study regarding servant leadership, Van Dierendonck (2011) suggested that in addition to self-determination and moral cognitive development, general cognitive complexity, the extent to which leaders are able to judge the social situation accurately, may help to predict their servant behaviors. However, in the later review study conducted by Eva et al. (2018) noted that the existing empirical studies have mainly focused on leaders' personality or gender and neglected antecedents from the cognitive perspective. From this perspective, the present research may help to fulfill the research gap by examining cognitive flexibility as one of the antecedents in predicting servant leadership.

Specifically, cognitively flexible leaders are more able to interpret the current situation from multiple perspectives, see the leitmotiv behind the issue, and integrate their cognitive patterns with situational demands, which together allow them to identify issues in depth and then select the most appropriate responses to fit the situation at hand. In the instance of their followers confronting novel, ill-defined, or even conflicting problems, cognitively flexible leaders may therefore be more likely to respond to followers by displaying several key characteristics of servant leadership behaviors such as developing people, interpersonal acceptance, providing direction, and stewardship (Van Dierendonck, 2011). In addition, the superior cognitive ability to seek interconnections between one's previous experiences and the current situation may also be

an important factor in predicting his/her behavior at leading. For example, leaders' superior ability to recall their past experiences may help them to adopt the psychological perspectives of others, such as understanding the difficulties that their followers are facing, experiencing the feelings of followers, and bearing and forgiving followers' mistakes. In this sense, cognitively flexible leaders may serve to create a team climate that has a high level of autonomy, trust, warmth, and tolerance toward arguments, offenses, and wrongdoings rather than display behaviors that will be perceived as abusive supervision.

Cognitively rigid leaders, in contrast, have a more functional fixedness cognitive pattern that will limit their ability to read the situation comprehensively and thoughtfully. In other words, if leaders are not able to identify those underlying issues, it is unlikely that they will serve to provide individual coaching or foster the knowledge-sharing team climate to prevent similar instances from happening in the future. What is worse is that when similar mistakes happen repeatedly, leaders may place the responsibility on followers' internal factors and engage in some abusive supervision behaviors such as telling their followers that they are incompetent, reminding their past mistakes and failures, and ridiculing them. Existing studies (e.g., Krasikova, Green, & LeBreton, 2013; Lam, Walter, Huang, 2017; Tepper, Moss, & Duffy, 2011; Walter et al., 2015) have found evidence to support this viewpoint that followers' low performance is especially provocative and frustrated that will trigger leaders to lash out toward them. Based on the discussion above, cognitively flexible leaders are expected to be perceived as (1) less abusive supervision and (2) more servant leadership in the workplace. Accordingly, I posit the following:

Hypothesis 11: Cognitive flexibility will negatively associate with abusive supervision.

Hypothesis 12: Cognitive flexibility will positively associate with servant leadership.

Based on the discussion above suggested that the number of self-aspects reflects the richness of social roles that individuals cognitively characterize themselves. Lord & Hall (2005) suggested that each social role contains not only specialized knowledge, skills, abilities, and other characteristics (KSAOs) but also expectations, goals and values, and self-regulatory systems. Through social learning (Bandura, 1977), task learning, and personal learning (Karaevli & Hall, 2006), a high number of self-aspects leaders are expected to develop a broader knowledge pool, a more complex cognitive pattern, and a greater repertoire of information processing aids. Moreover, leaders' superior cognitive ability to restructure their knowledge in multiple different ways and link their experiences with the situational demands may help them to understand the difficulties that their followers are facing, experience the feelings of followers, and bear and forgive followers' wrongdoings. Therefore, cognitively flexible leaders are less likely to display behaviors that will be perceived as abusive supervisors and more likely to be perceived as servant leaders in the workplace. Accordingly, I posit the following:

Hypothesis 13: Cognitive flexibility mediates the relationship between number of self-aspects and abusive supervision.

Hypothesis 14: Cognitive flexibility mediates the relationship between number of self-aspects and servant leadership.

Furthermore, the degree of overlap among self-aspects also plays a critical role in this indirect effect to predict leaders' behaviors in the workplace. Hooijberg, Hunt, and Dodge (1997, p.385) noted that the integration in the complexity theory allows individuals "*to focus on whole objects in order to form a coherent, meaningful picture from among the colors, shapes, and shades.*" Consistent with this perspective, the higher degree of overlap among leaders' self-

aspects will theoretically allow them to juxtapose different thinking strategies, integrate ideas, and abstract relevant mental frameworks in each self-aspect to meet situational demands (Hannah, Woolfolk, & Lord, 2009). In addition, leaders who are able to read the situation comprehensively and thoughtfully will allow them to identify those underlying issues and select more appropriate responses such as providing individual coaching and fostering a knowledge-sharing team climate that can help to prevent similar instances from happening in the future. On the other hand, if the leaders are not able to adapt their cognitive processes, they are unlikely to identify those underlying issues and more likely to place the responsibility on followers' internal factors and engage in behaviors that will be perceived as abusive supervisors. Accordingly, I posit the following:

Hypothesis 15: Cognitive flexibility mediates the relationship between the degree of overlap among self-aspects and abusive supervision.

Hypothesis 16: Cognitive flexibility mediates the relationship between the degree of overlap among self-aspects and servant leadership.

When considered as part of my integrated framework, this implies that, when leaders whose self-construct possess several meaningful self-aspects that are highly overlapped, they are more likely to be cognitively flexible. In addition, as previously noted that the extent to which leaders are able to restructure knowledge in multiple different ways to meet situational demands is critical in predicting their leadership behaviors in the workplace; I propose that cognitive flexibility will mediate the relationship between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and leadership behaviors. Accordingly, I posit the following:

Hypothesis 17: Cognitive flexibility mediates the relationship between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects and abusive supervision.

Hypothesis 18: Cognitive flexibility mediates the relationship between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects and servant leadership.

3.5 The Moderating Role of Time and Centrality

Since Linville (1985, 1987) proposed the seminal work to discuss the social cognitive perspective of self-complexity, psychologists have strived to enrich our understanding of the structure of the multifaceted self. Nevertheless, studies that examined the psychological factor in each self-aspect were limited. One exception is the study conducted by McConnell et al. (2005), which has investigated the extent to which individuals perceived their control over those multiple selves. Specifically, McConnell and his associates found that those high self-complexity individuals would exhibit more negative psychological well-being such as greater depression and lower self-esteem when they perceived relatively little control over their self-aspects. To fulfill this research gap and discover more features of one's self-aspects, I draw upon literature in multiple identities (e.g., Brook, Garcia, & Fleming, 2008; Hall, Hall, Galinsky, & Phillips, 2019; Ramarajan, 2014; Reitzes & Murtran, 1994; Rothbard, 2001; Settles, 2003) and self-regulation (e.g., Shah, Friedman, & Kruglanski, 2002) to examine the differences of time and centrality (also known as identity importance in some studies) in each perceived meaningful self-aspect.

As Muraven and Baumeister (2000) suggested that the capacity for self-control operates in a similar way as muscular strength or energy resource that will be depleted after being used

and will be replenished after rest, I expect the interaction of total amount of time that people spend on each self and the structure of the self (i.e., self-complexity) will play an important role in predicting ego depletion. Specifically, when considering my integrated framework that both high number of self-aspects and high degree of overlap among each self-aspect were expected to lead people to experience less ego depletion, I suggest individuals who possess a greater number of self-aspects that are highly integrated, and they devote less time to each self, will experience the lowest level of ego depletion because they have more time to replenish the self-control resources. In the contrary, when individuals whose structure of self consists low number of self-aspects that are highly segmented and spend more time on each self are expected to suffer the most from ego depletion due to the lack of time to recover those self-control resources.

However, time may play a different role in the cognitive perspective. Lord and Hall (2005) have discussed those qualitative changes and differences in the content, access, and use of knowledge among leaders/managers at different levels. Specifically, Lord and Hall (2005) indicated that the evolution from novice to expert requires around 10,000 hours of deliberate practice and dedicated work. In other words, the amount of time and hard work will lead manager to have the qualitative shift of reading issues in nature from novice level's if-then rules to intermediate level's connectionist networks (Hanges, Lord, Godfrey, & Raver, 2002) then to the expert level's deeper interpretive understanding of performance (Ericsson & Charness, 1994). To assess the amount of time that participants devoted to each self-aspect, I asked participants to rate how many hours they spent on those self-aspects each week after the trait sorting task. In addition, to operationalize the total amount of time that participants spend on their self-complexity, I summed the amount of time that they devoted to each self-aspect. Accordingly, I suggest those people who possess a high number of self-aspects that are highly

overlapped and devote more time to each self will develop a stronger cognitive ability to restructure knowledge in multiple different ways. Based on the discussion above, I posit the followings:

Hypothesis 19: There is a three-way interactive relationship between number of self-aspects, degree of overlap among self-aspects, and time, such that the negative association between the high number of self-aspects and ego depletion is strongest when the degree of overlap among self-aspects is relatively high and time is relatively low.

Hypothesis 20: There is a three-way interactive relationship between number of self-aspects, degree of overlap among self-aspects, and time, such that the positive association between the high number of self-aspects and cognitive flexibility is strongest when both degree of overlap among self-aspects and time are relatively high.

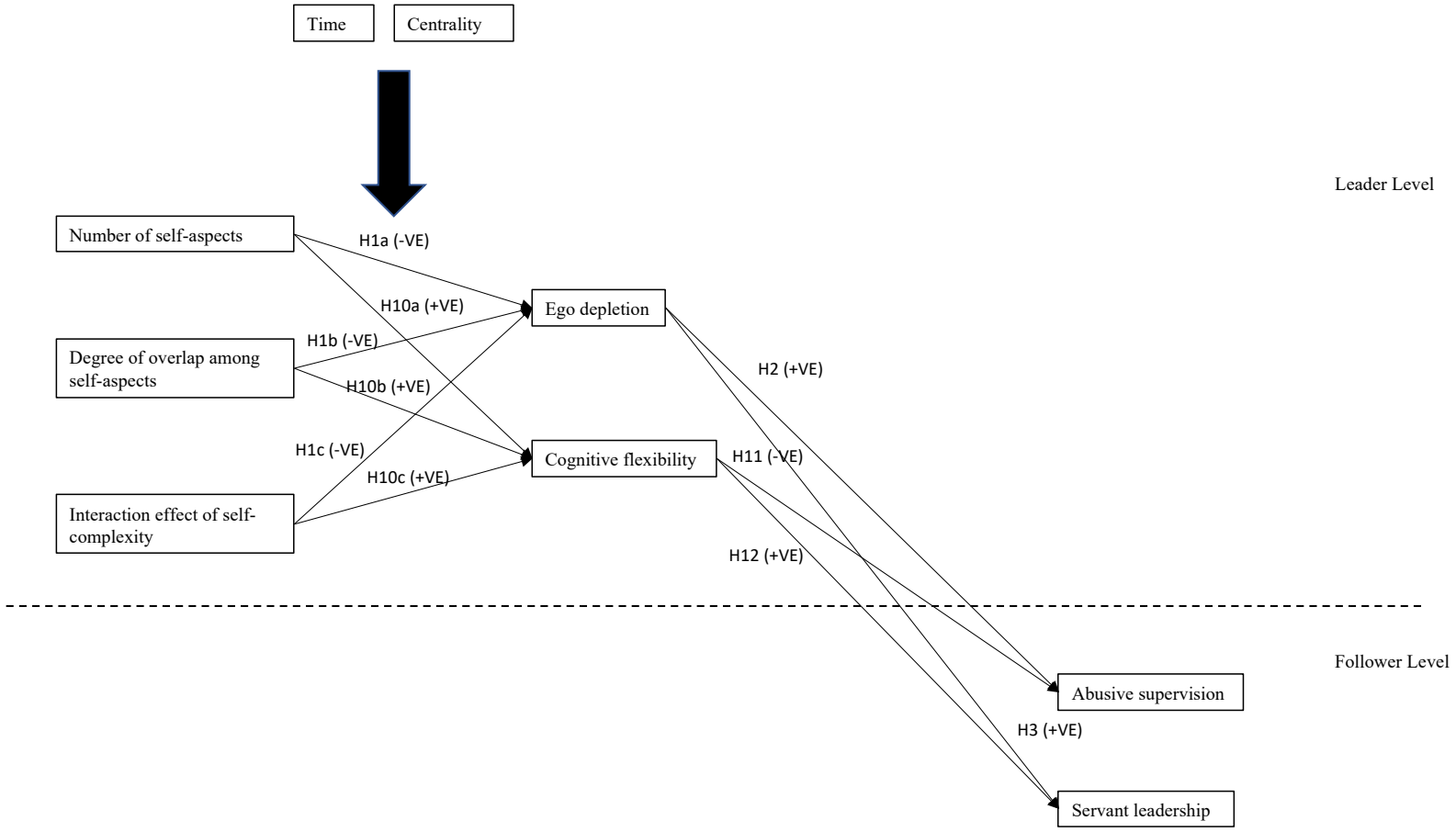
Furthermore, literature in multiple identities (e.g., Brook, Garcia, & Fleming, 2008; Reitzes & Murtran, 1994; Rothbard, 2001; Settles, 2004) and goal shielding theory (Shah, Friedman, & Kruglanski, 2002) have indicated the importance of centrality. Kierkegaard (1847) noted an often-seen challenge in our everyday life that people constantly struggle to coordinate their significant, and often conflicting, pursuits. For instance, how do we meet the deadline of our task from disrupting our focus on make time for our family? Namely, this often-seen challenge highlights the critical role of the extent to which we are committed to certain self-aspects. Specifically, when individuals perceive those self-aspects are highly important and fully invest their identity in those self-aspects to accomplish their current goal, they will regulate their focus on the self-aspects that are relevant to the current goal and inhibit the other self-aspects that are relevant to the alternative goals. On the contrary, when people have low commitment to

accomplish their current goal, they will have a weaker ability to inhibit self-aspects that are not relevant to the current goal. To assess the extent to which self-complexity is central to self-identity, I asked participants to evaluate the perceived importance of each self-aspect after they rated the amount of time that they spend on those self-aspects each week. Moreover, to operationalize the centrality, I summed the ratings in each self-aspect. Taking my integrated framework that both high number of self-aspects and high degree of overlap among each self-aspect were expected to lead people to experience less ego depletion, I suggest that the negative association between the interaction of high number of self-aspect and high degree of overlap among self-aspects and ego depletion will be weaker when the centrality is high rather than low. From the cognitive perspective, I suggest that the positive association between the interaction of high number of self-aspect and high degree of overlap among self-aspects and cognitive flexibility will be stronger when the centrality is high rather than low. Accordingly, I posit the following:

> *Hypothesis 21: There is a three-way interactive relationship between number of self-aspects, degree of overlap among self-aspects, and centrality, such that the negative association between the high number of self-aspects and ego depletion is strongest when both the degree of overlap among self-aspects and centrality are relatively high.*
>
> *Hypothesis 22: There is a three-way interactive relationship between number of self-aspects, degree of overlap among self-aspects, and time, such that the positive association between the number of self-aspects and cognitive flexibility is strongest when both degree of overlap among self-aspects and centrality are relatively high.*

FIGURE 1

Proposed Theoretical Model



CHAPTER 4: STUDY 1

METHOD

Procedure and Participants

In Study 1, I tested the hypotheses (except for those related to servant leadership) by recruiting participants (U.K. samples) from the online data collection platform (i.e., Prolific). Gosling, Vazire, Srivastava, and John (2004) have shown that such Internet recruitment allows researchers to employ samples from more diverse backgrounds than traditional recruitment methods are limited. To follow the Durham University's research ethical standard, I first stated in the information page that participants are required to be above the age of 18 and that all the responses are confidential and will only be used for the research purpose (for the approved ethics form, please see the Appendix A). After reading the participants' requirements (e.g., individuals who have managerial position experience), the purpose of this research, and the remuneration (£2.5), interested participants were directed to complete an online screening questionnaire. N = 200 individuals responded to my invitation, but only N = 179 participants were recruited due to 21 of them failed to meet the requirement for attention check in their responses. Participants (58.5% female) were employed in industries such as teaching, training, and education (14.5%), healthcare (12.3%), retail (11.7%), public service and administration (7.3%), accountancy, banking, and finance (6.7%), and information technology (6.1%). The remaining 41.4% of participants in the sample were in various industries, including social services, business consulting and management, law, and the arts. The participants' mean age was 36.16 years (s.d. = 11.07), mean organizational tenure was 13.65 years (s.d. = 7.34), mean managerial tenure was 8.24 years (s.d. = 6.09), and had an average team size of 8.1 subordinates (s.d. = 3.46).

Measures

The variables were measured using 7-point Likert scales unless otherwise indicated (1 = strongly disagree, 7 = strongly agree). For the questionnaires that have been employed in the present study, please see the Appendix B.

Self-complexity. As noted in the literature review that several studies (e.g., Pilarska & Suchanska, 2015; Rafaeli-Mor et al., 1999; Rafaeli-Mor & Steinberg, 2002) have found that the single composite measure of *H* statistic (Attneave, 1959; Scott, 1969) in measuring self-complexity is problematic; therefore I did not employ the *H* statistic to measure self-complexity. Rather, I first drew upon the literature on multiple-identity theory to develop an analogous measure to Linville's (1985) trait sorting task, but this newly introduced method specifically focuses on measuring the structure of the self at the role level and is compatible for participants to conduct it online. Regarding the traits that have been employed in the online trait sorting task, I adopted more balanced valence traits (23 positively to 21 negatively valenced traits) developed by Rafaeli-Mor, Gotlib, & Revelle (1999) and employed their pair-wise comparison approach to calculate the number of self-aspects and degree of overlap among those self-aspects separately.

Specifically, I first provided yes/no questions to ask whether those provided roles across different levels such as leadership related (e.g., leader/manager, and follower/subordinate), individual level (e.g., athlete and hobbyist), dyadic level (e.g., spouse/partner, son/daughter, parent, sibling, and friend), collective level (e.g., community/charity and religion member), and three optional self-aspects were meaningful to them. Once participants had selected "yes" on those meaningful roles to them, they were then instructed to choose the 44-item traits, which consisted of 23 positively valenced and 21 negatively valenced adjectives, to best help them to describe those selected meaningful social roles (Rafaeli-Mor, Gotlib, & Revelle, 1999). To

calculate the number of self-aspects and degree of overlap among self-aspects, I followed the pair-wise comparison formula introduced by Rafaeli-Mor, Gotlib, and Revelle (1999) and exported the data to the calculation program (i.e., Google Colab – Python) that my colleague and I developed and have been repeatedly tested to ensure the accuracy. In this approach, the number of self-aspects (NASPECTS) refers to the quantitative measure of how many meaningful roles that participants selected, and the overlap (OL) was calculated as:

$$OL = (\sum_i(\sum_j C_{ij})/T_i)/n*(n-1)$$

where C is the number of common features in 2 aspects, T is the total number of features in the referent aspect, n is the number of aspects in the person's sort, and i and j vary from 1 to n (i and j unequal).

Centrality. Participants were asked to evaluate the centrality of each self-aspect that they had selected immediately after the trait sorting task. Specifically, I modified Sellers, Rowley, Chavous, Shelton, and Smith's (1997) identity centrality scale into 3-item such as "*in general, being a leader is an important part of my self-image*" and "*overall, being a leader has very little to do with how I feel about myself* (reverse score)."

Time. Participants were then asked to rate how many hours do they devote to each role per week after the section of centrality, ranging from 1, "0 to 10 hours", to 5, "more than 40 hours."

Ego depletion. Although ego-depletion was originally measured as a temporary state in the laboratory, several studies have indicated that it also captures a relatively enduring state and has been examined with stable constructs such as abusive supervision (e.g., Lian et al., 2014; Thau & Mitchell, 2010). In the present research, I employed the five items scale that was chosen from

Twenge, Muraven, and Tice (2004) and later validated by Ciarocco, Twenge, Muraven, and Tice (2007). The sample items are "*I feel drained*," "*I feel worn out*," "*I would want to quit any difficult task I was given*," "*I feel lazy*," and "*I feel like my willpower is gone*" each item was given on a scale ranging from 1 = never to 7 = always. The Cronbach's alpha was .84 in the current study.

Cognitive flexibility. To measure participants' cognitive flexibility, I employed the 12-item Cognitive Flexibility Scale (CFS) developed by Martin and Rubin (1995). The sample items are "*I can communicate an idea in many different ways*," "*I have the self-confidence necessary to try different ways of behaving*," and "*I seldom have choices when deciding how to behave* (reverse score)." The Cronbach's alpha was .81 in the current study.

Abusive supervision. I assessed abusive supervision with Tepper's (2000) 15-item scale and with Hanges, Grand, Epistola, and Stark's (2021) 13-paired-item scale to overcome potential social desirability and cultural effects in measuring abusive supervision. In Tepper's (2000) scale, participants were instructed to indicate the frequency with which they as a supervisor performed behaviors such as "*I as a leader/manager put subordinates down in front of others*" on a scale ranging from 1, "*I can't remember I ever using this behavior with my subordinates*," to 5, "*I use this behavior very often with my subordinates*." In Hanges et al.'s (2021) civil-abusive supervision scale, participants were asked to select which of these two behaviors best characterize them as a leader such as "*occasionally speak poorly about subordinates to others in the workplace*" versus "*occasionally prevent subordinates from feeling worthless or stupid*." To calculate the level of abusive supervision in civil-abusive supervision scale, I followed the instructions provided by Hanges to first categorize the data to a specific format and then

uploaded to the website (https://hanges.drasgowassessments.com/) to receive the result. The Cronbach's alpha was .78 for Tepper's abusive supervision scale.

Control variables. I controlled for demographic factors such as age, gender, ethnic group, and education level in the analyses. In addition, I controlled for those leader-related factors such as their organizational tenure, managerial tenure, team size, weekly working hours, frequency of interaction with subordinates (weekly), Big Five personality traits (Soto & John, 2017). The Cronbach's alpha was .71 for extraversion, .75 for agreeableness, .73 for consciousness, .74 for openness to experience, and .86 for neuroticism.

RESULTS

Main Effects

Table 1 shows the means, standard deviation, alpha reliability coefficients, and correlations of the measured variables in Study 1. To test the main effects, I employed the Mplus 7.4 (Muthén & Muthén, 2015).

From the self-control perspective, Hypothesis 1a predicted that the number of self-aspects would be negatively associated with ego depletion. The result showed that the number of self-aspects was negatively associated with ego depletion (B = -.09, p < .01), supporting the Hypothesis 1a. Hypothesis 1b predicted that the degree of overlap among self-aspects would be negatively associated with ego depletion. The result showed that the degree of overlap among self-aspects was negatively associated with ego depletion (B = -.65, p < .05), supporting the Hypothesis 1b. Hypothesis 1c predicted that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects would be negatively associated with ego depletion. Nevertheless, the result showed that the interaction effect of high number of self-aspects and

high degree of overlap among self-aspects in predicting ego depletion was not statistically significant (B = -.00, *n.s.*), failing to support the Hypothesis 1c. Hypothesis 2 predicted that ego depletion would be positively associated with abusive supervision. The result showed that ego depletion was positively and significantly associated with abusive supervision (B = .05, p < .05) in Tepper's scale, but this association was not found to be statistically significant in Hanges et al's., (2021) scale (B = .00, *n.s.*), thus Hypothesis 2 was partially supported. As servant leadership was the additional variable that I proposed at the later stage in the research, therefore, Hypothesis 3 was not tested in Study 1.

From the cognitive perspective, Hypothesis 10a predicted that the number of self-aspects would be positively associated with cognitive flexibility. The result showed that the number of self-aspects was positively associated with cognitive flexibility (B = .07, p < .01), supporting Hypothesis 10a. Hypothesis 10b predicted that the degree of overlap among self-aspects would be positively associated with cognitive flexibility. The result showed that the degree of overlap among self-aspects was positively associated with cognitive flexibility (B = .98, p < .001), supporting Hypothesis 10b. Hypothesis 10c predicted that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects would be positively associated with cognitive flexibility. However, the result showed that this interaction of a high number of self-aspects and a high degree of overlap among self-aspects in predicting cognitive flexibility was not statistically significant (B = -.04, *n.s.*), failing to support Hypothesis 10c. Hypothesis 11 predicted that the cognitive flexibility would be negatively associated with abusive supervision. The result showed that cognitive flexibility was negatively and significantly associated with abusive supervision in both Tepper's (B = -.14, p < .01) and Hanges et al's., (2021) scale (B = -.26, p < .001), supporting Hypothesis 11. As servant leadership was the additional variable that I

proposed at the later stage in the research, therefore, Hypothesis 12 was not tested in the current study.

To test the robustness of the regression results, I have conducted the data analyses by using Mplus 7.4 (Muthén & Muthén, 2015), with all variables controlled. From the self-control perspective, Hypothesis 1a predicted that the number of self-aspects would be negatively associated with ego depletion. The result showed that the number of self-aspects was negatively associated with ego depletion (B = -.07, p < .01), supporting Hypothesis 1a. Hypothesis 1b predicted that the degree of overlap among self-aspects would be negatively associated with ego depletion. The result showed that the degree of overlap among self-aspects was negatively associated with ego depletion (B = -.18, *n.s.*), failing to support Hypothesis 1b. Hypothesis 2 predicted that ego depletion would be positively associated with abusive supervision. The result showed that ego depletion was positively and significantly associated with abusive supervision (B = .08, p < .05), supporting Hypothesis 2.

From the cognitive perspective, Hypothesis 10a predicted that the number of self-aspects would be positively associated with cognitive flexibility. The result showed that the number of self-aspects was positively associated with cognitive flexibility (B = .03, *n.s.*), failing to support Hypothesis 10a. Hypothesis 10b predicted that the degree of overlap among self-aspects would be positively associated with cognitive flexibility. The result showed that the degree of overlap among self-aspects was positively associated with cognitive flexibility (B = .44, p < .05), supporting Hypothesis 10b. Hypothesis 11 predicted that cognitive flexibility would be negatively associated with abusive supervision. The result showed that cognitive flexibility was negatively associated with abusive supervision (B = -.08, p < .05), supporting Hypothesis 11.

Comparing these results, we can see that Hypotheses 1a, 2, 10b, and 11 are consistent, whereas Hypotheses 1b and 10a are inconsistent in Study 1.

Mediation Tests

To test the indirect effects, I used Mplus 7.4 (Muthén & Muthén, 2015). From the self-control perspective, Hypothesis 4 predicted that ego depletion would mediate the relationship between the number of self-aspects and abusive supervision. The result showed that the indirect effect of the number of self-aspects on abusive supervision via ego depletion was -.005 and the 95% confidence interval contained zero (95% CI [-.013, .000]) when using Tepper's scale. Similarly, this indirect effect of number of self-aspects on abusive supervision via ego depletion was .000 and the 95% confidence interval also contained zero (95% CI [-.008, .007]) when using Hanges et al's., scale. Accordingly, the Hypothesis 4 was not supported. Hypothesis 6 predicted that ego depletion would mediate the relationship between the degree of overlap among self-aspects and abusive supervision. The result showed that the indirect effect of the degree of overlap among self-aspects on abusive supervision via ego depletion was -.035 and the 95% confidence interval contained zero (95% CI [-.124, .002]) when using Tepper's scale. Moreover, this indirect effect of the degree of overlap among self-aspects on abusive supervision via ego depletion was -.002 and 95% confidence interval also contained zero (95% CI [-.081, .062]) when using Hnages et al's., scale. As such, the Hypothesis 6 was not supported. Hypothesis 8 predicted that ego depletion would mediate the relationship between the interaction of high number of self-aspects and high degree of overlap among self-aspects and abusive supervision. The result showed that the indirect effect of the interaction of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision via ego depletion was .000 and

Table 1

Means, standard deviations, and correlations among variables in Study 1

Variable	M	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.Gender	1.61	0.49												
2.Age	36.16	11.07	.08											
3.Organizational tenure	13.65	7.34	-.11	.54***										
4.Managerial tenure	8.24	6.09	-.16*	.50***	.54***									
5.Team size	8.10	3.46	-.19*	.14	.27***	.43***								
6.Number of self-aspects	6.77	1.88	-.02	-.02	-.02	-.08	.01							
7.Degree of overlap	0.50	0.17	.04	.04	.06	-.03	.08	-.01						
8.Ego depletion	2.29	0.67	.19*	-.18*	-.12	-.21**	-.09	-.24***	-.17*					
9.Cognitive flexibility	3.99	0.47	-.04	.17*	.15*	.15*	.10	.17*	.28***	-.27***				
10.Abusive supervision (Tepper)	1.23	0.24	-.14	-.13	-.07	.00	.10	-.01	-.12	.22**	-.32***			
11.Abusive supervision (Hanges et al.,)	-1.36	0.04	-.19*	-.15*	.03	.11	.06	-.17*	-.21**	.09	-.31***	.34***		
12.Time	18.46	8.19	-.04	-.08	-.02	-.03	.17*	.50***	.27***	-.12	.10	.04	-.11	
13.Centrality	22.94	6.75	.08	.06	.01	.01	.04	.84***	-.20	.20**	.18*	.02	-.15	.47***

Note. *$p < .05$, **$p < .01$, ***$p < .001$

the 95% confidence interval contained zero (95% CI [-.004, .006]) when using Tepper's scale and was .000 and the 95% confidence interval also contained zero (95% CI [-.004, .004]) when using Hanges et al's., scale, failing to support Hypothesis 8.

From the cognitive perspective, Hypothesis 13 predicted that cognitive flexibility would mediate the relationship between the number of self-aspects and abusive supervision. The result showed that the indirect effect of the number of self-aspects on abusive supervision via cognitive flexibility was -.009 and the 95% confidence interval did not contain zero (95% CI [-.023, -.002]) when using Tepper's scale and was -.017 and the 95% confidence interval also did not contain zero (95% CI [-.039, -.003]) when using Hanges et al's., scale, supporting Hypothesis 13. Hypothesis 15 predicted that cognitive flexibility would mediate the relationship between the degree of overlap among self-aspects and abusive supervision. The result showed that the indirect effect of the degree of overlap among self-aspects and abusive supervision via cognitive flexibility was -.14 and the 95% confidence interval did not contain zero (95% CI [-.278, -.044]) when using Tepper's scale and was -.252 and the 95% confidence interval also did not contain zero (95% CI [-.475, -.080] when using Hanges et al's., scale, supporting Hypothesis 15. Hypothesis 17 predicted that the cognitive flexibility would mediate the relationship between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and abusive supervision. The result showed that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision via cognitive flexibility was .006 and the 95% confidence interval contained zero (95% CI [.000, .018]) when using Tepper's scale and was .011 and the 95% confidence interval also contained zero (95% CI [-.001, .030]) when using Hanges et al's., scale, failing to support Hypothesis 17.

Moderation Tests

To test the interaction effects, I employed the linear regression analysis in the SPSS. Hypothesis 19 predicted that time would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion and that Hypothesis 21 predicted that centrality would negatively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion. To test the three-way interaction, I first controlled demographic variables such as gender, age, education level, organizational tenure, managerial tenure, team size, weekly working hours, and weekly interaction with subordinates, and personality traits such as extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism in the step 1. I then put independent variables (i.e., number of self-aspects and degree of overlap among self-aspects) and moderators (i.e., time and centrality) in the step 2. In the step 3, I put the two-way interaction of each independent and moderation variable (i.e., NASPECTS x OL, NASPECTS x Time, NASPECTS x Centrality, OL x Time, and OL x Centrality), Finally, I put the three-way interaction (NASPECTS x OL x Time and NASPECTS x OL x Centrality) in the step 4. Table 2 showed that the three-way interaction in the linear regression found that the interaction of number of self-aspects x overlap x time was significant in predicting ego depletion ($B = .12$, $p < .05$), whereas the interaction of number of self-aspects x overlap x centrality was not significant in predicting ego depletion ($B = -.07$, *n.s.*) in the current study. The interaction, depicted in Figure 2, indicated that the relation between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion was weaker when time was short rather than high. Accordingly, the Hypothesis 19 was supported but the Hypothesis 21 was not supported.

Table 2

Centrality, Time, and Components of Self-complexity in Predicting Ego Depletion[a]

	Step			
Variables	1	2	3	4
Gender	.17(.10)	.16(.10)	.15(.10)	.14(.10)
Age	-.01(.01)	-.01(.01)	-.01(.01)	-.01(.01)
Education level	-.02(.06)	-.01(.06)	.00(.06)	.00(.06)
Organizational tenure	.06(.04)	.06(.04)	.07(.04)	.07(.04)
Managerial tenure	-.03(.04)	-.04(.04)	-.05(.04)	-.04(.04)
Team size	.04(.04)	.04(.04)	.04(.04)	.02(.04)
Working hours (weekly)	-.06(.06)	-.07(.06)	-.08(.06)	-.06(.06)
Interaction (weekly)	.02(.04)	.01(.04)	.01(.04)	.01(.04)
Extraversion	-.19(.07)*	-.19(.07)**	-.19(.07)**	-.19(.07)**
Agreeableness	-.16(.07)*	-.15(.07)*	-.15(.07)*	-.15(.07)*
Conscientiousness	-.23(.07)**	-.23(.07**)	-.22(.07**)	-.22(.07)**
Openness to experience	-.02(.06)	.00(.06)	.01(.06)	.03(.06)
Neuroticism	.17(.06)*	.15(.06)**	.16(.06)**	.17(.06)**
NASPECTS		-.18(.08)	-.14(.09)	-.19(.09)*
OL		-.04(.05)	-.04(.05)	-.05(.05)
Time		.07(.06)	.07(.06)	.09(.06)
Centrality		.06(.08)	.03(.09)	.03(.09)
NASPECTS x OL			-.07(.09)	-.07(.08)
NASPECTS x Time			.02(.06)	-.04(.06)
NASPECTS x Centrality			-.08(.05)	-.05(.05)
OL x Time			-.07(.06)	-.09(.06)
OL x Centrality			.10(.07)	.15(.08)
NASPECTS x OL x Time				.12(.05)*
NASPECTS x OL x Centrality				-.07(.04)
R^2	.36	.39	.42	.44

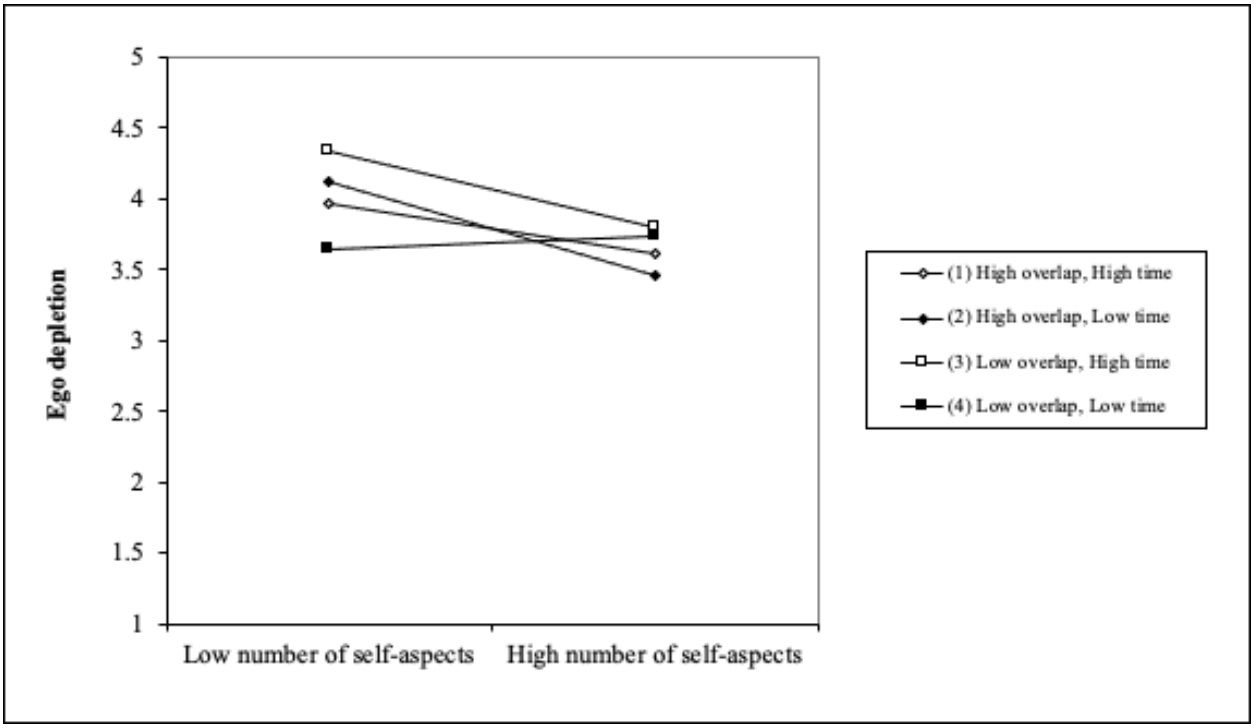
[a] N = 179. Values are unstandardized regression coefficients; standard error estimates are in parentheses; NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.

* p < .05

** p < .01

FIGURE 2

Three-way Interaction Predicting Ego Depletion



Hypothesis 20 predicted that time would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and cognitive flexibility and that Hypothesis 22 predicted that centrality would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap and cognitive flexibility. To test the three-wat interaction, I followed the exact procedures mentioned above. Table 3 showed that the three-wat interaction in the linear regression found that both the interaction of number of self-aspects x overlap x time (B = .01, *n.s.*) and the number of self-aspects x overlap x centrality (B = .02, *n.s.*) were not statistically significant in predicting cognitive flexibility. Accordingly, both the Hypothesis 20 and

Hypothesis 22 were not supported. So far, all the Hypotheses in Study 1 have been tested. For a clearer overview of all Hypotheses in the current study, please see Table 4 below.

Table 3
Centrality, Time, and Components of Self-complexity in Predicting Cognitive Flexibility[a]

	Step			
Variables	1	2	3	4
Gender	.04(.07)	.03(.07)	.00(.07)	.01(.07)
Age	.01(.00)	.01(.00)	.01(.00)	.00(.00)
Education level	.08(.04)*	.08(.04)*	.10(.04)*	.10(.04)*
Organizational tenure	.01(.03)	.00(.03)	.00(.03)	.00(.03)
Managerial tenure	-.01(.03)	.00(.03)	.00(.03)	.01(.03)
Team size	.02(.03)	.01(.03)	02(.03)	.02(.03)
Working hours (weekly)	-.08(.04)*	-.07(.04)	-.09(.04)*	-.09(.04)*
Interaction (weekly)	.03(.03)	.03(.03)	.04(.03)	.04(.03)
Extraversion	.15(.05)**	.14(.05)*	.12(.05)*	.12(.05)*
Agreeableness	.04(.05)	.02(.05)	.02(.05)	.02(.05)
Conscientiousness	.13(.05)*	.12(.05)*	.12(.05)*	.12(.05)*
Openness to experience	.13(.04)**	.12(.04)**	.13(.04)**	.12(.05)**
Neuroticism	-.10(.04)*	-.09(.04)	-.09(.04)*	-.09(.04)*
NASPECTS		.06(.06)	.06(.06)	.07(.07)
OL		.07(.04)*	.06(.03)	.03(.04)
Time		-.02(.04)	-.02(.04)	-.02(.04)
Centrality		-.02(.06)	.01(.06)	.00(.06)
NASPECTS x OL			-.02(.06)	-.01(.06)
NASPECTS x Time			.05(.04)	.04(.05)
NASPECTS x Centrality			-.06(.04)	-.06(.04)
OL x Time			-.07(.04)	-.06(.04)
OL x Centrality			-.02(.05)	-.03(.04)
NASPECTS x OL x Time				.01(.04)
NASPECTS x OL x Centrality				.02(.03)
R^2	0.32	0.34	0.39	0.40

[a] N = 179. Values are unstandardized regression coefficients; standard error estimates are in parentheses; NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.
* p < .05
** p < .01

Table 4

Summary of Hypotheses in Study 1

Main Effects:	
H1a: NASPECTS -> Ego depletion (-VE).	Supported
H1b: OL -> Ego depletion (-VE).	Supported
H1c: (High NASPECTS x High OL) -> Ego depletion (-VE).	Not supported
H2: Ego depletion -> Abusive supervision (+VE).	Partially supported
H3: Ego depletion -> Servant leadership (-VE).	N.A.
H10a: NASPECTS -> Cognitive flexibility (+VE).	Supported
H10b: OL -> Cognitive flexibility (+VE).	Supported
H10c: (High NASPECTS x High OL) -> Cognitive flexibility (+VE).	Not supported
H11: Cognitive flexibility -> Abusive supervision (-VE).	Supported
H12: Cognitive flexibility -> Servant leadership (+VE).	N.A.

Mediations:	
H4: NASPECTS -> Ego depletion -> Abusive supervision.	Not supported
H5: NASPECTS -> Ego depletion -> Servant leadership.	N.A.
H6: OL -> Ego depletion -> Abusive supervision.	Not supported
H7: OL -> Ego depletion -> Servant leadership.	N.A.
H8: (High NASPECTS x High OL) -> Ego depletion -> Abusive supervision.	Not supported
H9: (High NASPECTS x High OL) -> Ego depletion -> Servant leadership.	N.A.
H13: NASPECTS -> Cognitive flexibility -> Abusive supervision.	Supported
H14: NASPECTS -> Cognitive flexibility -> Servant leadership.	N.A.
H15: OL -> Cognitive flexibility -> Abusive supervision.	Supported
H16: OL -> Cognitive flexibility -> Servant leadership.	N.A.
H17: (High NASPECTS x High OL) -> Cognitive flexibility -> Abusive supervision.	Not supported
H18: (High NASPECTS x High OL) -> Cognitive flexibility -> Servant leadership.	N.A.

Moderations:	
H19: Time will positively moderate the negative association between the interaction of self-complexity and ego depletion.	Supported
H20: Time will positively moderate the positive association between the interaction of self-complexity and cognitive flexibility.	Not supported
H21: Centrality will negatively moderate the negative association between the interaction of self-complexity and ego depletion.	Not supported
H22: Centrality will positively moderate positive the association between the interaction of self-complexity and cognitive flexibility.	Not supported

Note. NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.

Supplementary Analyses

In addition to the hypotheses noted above, I also conducted some supplementary analyses such as examining whether the valence of one's self-construct will affect their ego depletion.

First, researchers such as Woolfolk and his colleagues have employed the HICLAS approach and found that positive self-complexity was not associated with depression or low self-esteem, but negative self-complexity was found to be positively associated with depression or low self-esteem, highlighting the positive and negative self-constructs may play important roles in predicting one's psychological well-being. Accordingly, I also examined whether similar results can also be found in my newly developed approach in measuring self-complexity. To partition the positive and negative self-complexity, I worked along with my colleague to develop another calculation program on the Google Colab – Python platform. In this program, I first followed the description in Rafaeli-Mor and his colleagues' (1999) work to set the parameters to distinguish those 44 traits into positively (23 in this case) or negatively (21 in this case) valenced. After setting the parameters, I then followed the equation mentioned above to calculate the components of the self-complexity.

For the positive self-complexity, the results showed that (1) the number of positive self-aspects was negatively associated with ego depletion (r = -.26, p < .01) and that (2) the degree of overlap among positive self-aspects was also negatively but statistically insignificant in associating with ego depletion (r = -.09, *n.s.*). On the other hand, for the negative self-complexity, the results showed that both the number of negative self-aspects and the degree of overlap among negative self-aspects were negatively associated with ego depletion in which the zero-order correlations were (r = .02, *n.s.*) and (r = .10, *n.s.*) respectively, but none of them were statistically significant. These results interestingly suggest that the components of positively

valenced self-complexity are powerful in assisting individuals to stay concentrate on the task at hand even if he/she did poorly on one self-aspect. In other words, the more people perceive themselves with multiple positive self-aspects and the more overlapped among those positive self-aspects, the better copping or psychological adjustment that they can exhibit to trauma. Whereas the components of negatively valenced self-complexity suggest that if he/she did poorly on one self-aspect, the spillover, buffering, and selective attention processes would not work that well to assist him/her to exert self-control in maintaining his/her attention. The similar findings were also found in Woolfolk et al., (1995) that the more people perceive themselves having several negative self-aspects, the greater their levels of depression, and the lower levels of self-esteem and adjustment to traumatic life events.

DISCUSSION

In Study 1, I have found that the number of self-aspects and the degree of overlap among self-aspects are (1) both negatively associated with ego depletion and are (2) both positively associated with cognitive flexibility. In the second stage of the mediation paths, the association between ego depletion and abusive supervision was successfully found to be positive in Tepper's abusive supervision scale but not to be the same case in Hanges et al's., civil-abusive supervision scale. Nevertheless, cognitive flexibility was found to be negatively associated with abusive supervision in both scales. Moreover, the three-way interaction of high number of self-aspects, high degree of overlap among self-aspects, and low level of time was found to predict the lowest degree of ego depletion.

CONCLUSION

In sum, Study 1 provided preliminary evidence that the components of self-complexity play important roles in predicting individuals' psychological well-being and cognitive ability to restructure knowledge in multiple different ways, which will further affect one's leadership behavior in the workplace. Nevertheless, as I planned to collect the time-lagged organizational data in Taiwan, I conducted another follow-up study by using the same procedure but employed leaders in Taiwan to examine whether similar findings would also be found in a different cultural context.

CHAPTER 5: STUDY 2

METHOD

To examine whether the findings can be replicated in a different geographic area, I followed the exact procedures mentioned in the previous chapter and tested the hypotheses by recruiting participants from Taiwan in Study 2. In total, N = 433 participants responded to the survey, but only N = 332 participants were retained due to the attention check. To follow the Durham University's research ethical standard, I first stated in the information page that participants were required to be above the age of 18 and that all the responses were confidential and would only be used for the research purpose (for the approved ethics form, please see the Appendix A).

Participants (59.9% female) were employed in industries such as manufacture (21.7%), information technology (19.6%), accountancy banking, and finance (10.5%), and retail (9.9%). The remaining 38.3% of participants in the sample were in various industries, including public service and administration, teaching, training, and education, and social services. The participants mean age was 38.21 years (s.d. = 7.90), mean organizational tenure was 15.53 years (s.d. = 17.07), mean managerial tenure was 13.38 years (s.d. = 10.15), and have an average team size of 9.12 subordinates (s.d. = 3.29).

Measures

The variables were measured using 7-point Likert scales unless otherwise indicated (1 = strongly disagree, 7 = strongly agree). For the questionnaires that have been employed in the present study, please see the Appendix B. As the measures were originally developed in English, I used the scales that have followed the translation-back-translation procedure suggested by

Brislin (1986) and have been widely used in several academic journals for all scales that have been utilized in Study 2. Although Hanges et al's., civil-abuse supervision scale has shown its superiority to overcome potential social desirability and cultural effects in measuring abusive supervision in Study 1, this scale has not yet been validated in Mandarin. Thus, it was excluded in the current study. To resolve the potential issues of social desirability and cultural effects, I added Reynolds' (1982) social desirability scale as another control variable.

Control variables. I first controlled for demographic factors such as age, gender, ethnic group, and education level in the analyses. In addition, I also controlled those leader-related factors such as their organizational tenure, managerial tenure, team size, weekly working hours, frequency of interaction with subordinates (weekly), Big Five personality traits (Soto & John, 2017), and social desirability (Reynold, 1982). The Cronbach's alpha was .74 for extraversion, .71 for agreeableness, and .80 for consciousness in the Big Five personality traits. In addition, the Cronbach's alpha was .75 for social desirability.

Self-complexity. To measure self-complexity with this newly introduced method, I first provided yes/no questions to ask whether those provided roles across different levels such as leadership related (e.g., leader/manager, follower/subordinate, colleague/co-worker), individual level (e.g., athlete, and hobbyist), dyadic level (e.g., spouse/partner, son/daughter, parent, sibling, and friend), collective level (e.g., community/charity and religion member), and three optional self-aspects that are meaningful to them. Once participants had selected "yes" on those meaningful roles to them, they were then instructed to choose the 44-item traits, which consisted of 23 positively valenced and 21 negatively valenced adjectives, to best help them to describe those selected meaningful social roles (Rafaeli-Mor, Gotlib, & Revelle, 1999). To calculate the

number of self-aspects and overlap, I followed the pair-wise comparison formula introduced by Rafaeli-Mor, Gotlib, and Revelle (1999) and exported the data to the calculation program (i.e., Google Colab – Python) that my colleague and I developed and have been repeatedly tested to ensure its accuracy.

Centrality. Participants were asked to evaluate the centrality of each self-aspect that they had selected immediately after the trait sorting task. Specifically, I modified Sellers, Rowley, Chavous, Shelton, and Smith's (1997) identity centrality scale into 3-item such as "*in general, being a leader is an important part of my self-image*" and "*overall, being a leader has very little to do with how I feel about myself* (reverse score)."

Time. Participants were then asked to rate how many hours do they devote to each role per week after the section of centrality, ranging from 1, "0 to 10 hours", to 5, "more than 40 hours."

Ego depletion. Although ego-depletion was originally measured as a temporary state in the laboratory, several studies have indicated that it also captures a relatively enduring state and has been examined with stable constructs such as abusive supervision (e.g., Lian et al., 2014; Thau & Mitchell, 2010). In the present research, I employed the five items scale that was chosen from Twenge, Muraven, and Tice (2004) and later validated by Ciarocco, Twenge, Muraven, and Tice (2007). The sample items are "*I feel drained*," "*I feel worn out*," "*I would want to quit any difficult task I was given*," "*I feel lazy*," and "*I feel like my willpower is gone*" each item was given on a scale ranging from 1 = never to 7 = always. The Cronbach's alpha was .91 in the current study.

Cognitive flexibility. To measure participants' cognitive flexibility, I employed the 12-item Cognitive Flexibility Scale (CFS) developed by Martin and Rubin (1995). The sample items are "*I can communicate an idea in many different ways*," "*I have the self-confidence necessary to try*

different ways of behaving," and "*I seldom have choices when deciding how to behave* (reverse score)." The Cronbach's alpha was .86 in the current study.

Abusive supervision. I assessed abusive supervision with Tepper's (2000) 15-item scale. In this scale, followers were instructed to indicate the frequency with which their supervisor performed behaviors such as "*My leader/manager put me down in front of others*," "*My leader/manager reminds me of my past mistakes and failures*," and "*My leader/manager makes negative comments about me to others*" on a scale ranging from 1, "I *can't remember I ever using this behavior with my subordinates*," to 5, "*I use this behavior very often with my subordinates*." The Cronbach's alpha was .95 in the current study.

RESULTS

Main Effects

Table 5 shows the means, standard deviation, alpha reliability coefficients, and correlations of the measured variables in the study 2. To test the main effects, I employed the Mplus 7.4 (Muthén & Muthén, 2015).

From the self-control perspective, Hypothesis 1a predicted that the number of self-aspects would be negatively associated with ego depletion. The result showed that the number of self-aspects was negatively but not statistically significant in associating with ego depletion (B = -.01, *n.s.*), failing to support the Hypothesis 1a. Hypothesis 1b predicted that the degree of overlap among self-aspects would be negatively associated with ego depletion. The result showed that the degree of overlap among self-aspects was negatively associated with ego depletion (B = -.80, $p < .05$), supporting the Hypothesis 1b. Hypothesis 1c predicted that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects would be negatively

associated with ego depletion. Nevertheless, as the result showed that the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects in predicting ego depletion was not statistically significant (B = -.04, *n.s.*), failing to support the Hypothesis 1c. Hypothesis 2 predicted that ego depletion would be positively associated with abusive supervision. The result showed that ego depletion was positively and statistically significant in associating with abusive supervision (B = .19, p < .001), supporting the Hypothesis 2. As servant leadership was the additional variable that I proposed at a later stage in the research, Hypothesis 3 was not tested in the current study.

From the cognitive perspective, Hypothesis 10a predicted that the number of self-aspects would be positively associated with cognitive flexibility. However, the result showed that the number of self-aspects was not statistically significant in associating with cognitive flexibility (B = -.00, *n.s.*), failing to support Hypothesis 10a. Hypothesis 10b predicted that the degree of overlap among self-aspects would be positively associated with cognitive flexibility. The result showed that the degree of overlap among self-aspects was positively associated with cognitive flexibility (B = .49, p < .01), supporting Hypothesis 10b. Hypothesis 10c predicted that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects would be positively associated with cognitive flexibility. However, the result showed that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects in predicting cognitive flexibility was not statistically significant (B = -.01, *n.s.*), failing to support Hypothesis 10c.

Hypothesis 11 predicted that the cognitive flexibility would be negatively associated with abusive supervision. The result showed that cognitive flexibility was negatively and

Table 5

Means, standard deviations, and correlations among variables in Study 2

Variable	M	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Gender	1.60	0.49											
2. Age	38.21	7.90	-.10										
3.Organizational tenure	15.53	17.07	.04	.50***									
4. Managerial tenure	13.38	10.15	-.11	.45***	.14*								
5. Team size	9.12	3.29	-.23***	.29***	.11*	.46***							
6. Number of self-aspects	7.68	2.16	.04	.08	-.02	.05	.10						
7. Degree of overlap	0.36	0.20	.13*	.01	.17**	.06	.04	-.01					
8. Ego depletion	2.84	0.90	.05	.01	-.02	-.05	-.06	-.06	-.22***				
9. Cognitive flexibility	3.58	0.41	-.03	-.03	-.03	.04	.08	-.05	.21***	-.36***			
10. Abusive supervision	1.64	0.64	-.19***	-.01	-.05	.00	.12*	-.00	-.21***	.34***	-.30***		
11. Time	16.79	13.55	.05	-.02	.-.08	.03	.12*	.29***	.05	.04	.09	.05	
12. Centrality	17.38	12.38	.06	-.05	-.11*	-.04	.06	.39***	.03	.04	.09	.03	.84***

Note. *p < .05, **p < .01, ***p < .001

statistically significant in associating with abusive supervision (B = -.31, p < .001), supporting Hypothesis 11. As servant leadership was the additional variable that I proposed at the later stage in the research, therefore, Hypothesis 12 was not tested in the current study.

To test the robustness of the regression results, I have conducted the data analyses by using Mplus 7.4 (Muthén & Muthén, 2015), with all variables controlled. From the self-control perspective, Hypothesis 1a predicted that the number of self-aspects would be negatively associated with ego depletion. The result showed that the number of self-aspects was negatively associated with ego depletion (B = -.01, *n.s.*), failing to support Hypothesis 1a. Hypothesis 1b predicted that the degree of overlap among self-aspects would be negatively associated with ego depletion. The result showed that the degree of overlap among self-aspects was negatively associated with ego depletion (B = -.71, p < .01), supporting Hypothesis 1b. Hypothesis 2 predicted that ego depletion would be positively associated with abusive supervision. The result showed that ego depletion was positively and significantly associated with abusive supervision (B = .13, p < .01), supporting Hypothesis 2.

From the cognitive perspective, Hypothesis 10a predicted that the number of self-aspects would be positively associated with cognitive flexibility. The result showed that the number of self-aspects was positively associated with cognitive flexibility (B = -.01, *n.s.*), failing to support Hypothesis 10a. Hypothesis 10b predicted that the degree of overlap among self-aspects would be positively associated with cognitive flexibility. The result showed that the degree of overlap among self-aspects was positively associated with cognitive flexibility (B = .30, p < .01), supporting Hypothesis 10b. Hypothesis 11 predicted that cognitive flexibility would be negatively associated with abusive supervision. The result showed that cognitive flexibility was

negatively associated with abusive supervision (B = -.20, p < .05), supporting Hypothesis 11. Comparing these results, we can see that all the results remain the same in Study 2.

Mediation Tests

To test the indirect effects, I used Mplus 7.4 (Muthén & Muthén, 2015). From the self-control perspective, Hypothesis 4 predicted that ego depletion would mediate the relationship between the number of self-aspects and abusive supervision. The result showed that the indirect effect of the number of self-aspects on abusive supervision via ego depletion was -.002 and the 95% confidence interval contained zero (95% CI [-.015, .011]), failing to support Hypothesis 4. Hypothesis 6 predicted that ego depletion would mediate the relationship between the degree of overlap among self-aspects and abusive supervision. The result showed that the indirect effect of the degree of overlap among self-aspects on abusive supervision via ego depletion was -.153 and the 95% confidence interval did not contain zero (95% CI [-.314, -.030]), supporting Hypothesis 6. Hypothesis 8 predicted that ego depletion would mediate the relationship between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision. The result showed that the indirect effect of the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision via ego depletion was -.008 and the 95% confidence interval contained zero (95% CI [-.029, .009]), failing to support Hypothesis 8.

From the cognitive perspective, Hypothesis 13 predicted that cognitive flexibility would mediate the relationship between the number of self-aspects and abusive supervision. The result showed that the indirect effect of the number of self-aspects on abusive supervision via cognitive flexibility was .001 and the 95% confidence interval contained zero (95% CI [-.007, .011]),

failing to support Hypothesis 13. Hypothesis 15 predicted that cognitive flexibility would mediate the relationship between the degree of overlap among self-aspects and abusive supervision. The result showed that the indirect effect of the degree of overlap among self-aspects and abusive supervision via cognitive flexibility was -.153 and the 95% confidence interval did not contain zero (95% CI [-.328, -.045]), supporting Hypothesis 15. Hypothesis 17 predicted that the cognitive flexibility would mediate the relationship between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision. The result showed that the indirect effect of the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision via cognitive flexibility was .004 and the 95% confidence interval contained zero (95% CI [-.009, .021]), failing to support Hypothesis 17.

Moderation Tests

To test the interaction effects, I employed the linear regression analysis in the SPSS. Hypothesis 19 predicted that time would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion and that Hypothesis 21 predicted that centrality would negatively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion. To test the three-way interaction, I first controlled demographic variables such as gender, age, education level, organizational tenure, managerial tenure, team size, weekly working hours, and weekly interaction with subordinates, and personality traits such as extraversion, agreeableness, and conscientiousness in the step 1. I then put independent variables (i.e., number of self-aspects and degree of overlap among self-aspects)

and moderators (i.e., time and centrality) in the step 2. In the step 3, I put the two-way interaction of each independent and moderation variable (i.e., NASPECTS x OL, NASPECTS x Time, NASPECTS x Centrality, OL x Time, and OL x Centrality), Finally, I put the three-way interaction (NASPECTS x OL x Time and NASPECTS x OL x Centrality) in the step 4. However, as Table 6 showed that that the three-way interaction in the linear regression found that both the interaction of number of self-aspects x overlap x time (*B* = -.07, *n.s*.) and the number of self-aspects x overlap x centrality (*B* = .04, *n.s.*) were not statistically significant in predicting ego depletion. Accordingly, both the Hypothesis 19 and Hypothesis 21 were not supported.

Table 6

Centrality, Time, and Components of Self-complexity in Predicting Ego Depletion[a]

	Step			
Variables	1	2	3	4
Gender	.11(.10)	.15(.10)	.13(.10)	.14(.10)
Age	.01(.01)	.01(.01)	.01(.01)	.01(.01)
Education level	.12(.08)	.11(.08)	.12(.08)	.12(.08)
Organizational tenure	.00(.00)	.00(.00)	.00(.00)	.00(.00)
Managerial tenure	.01(.05)	.01(.05)	.01(.05)	.00(.05)
Team size	-.01(.05)	.00(.05)	-.01(.05)	-.01(.05)
Working hours (weekly)	.01(.06)	.01(.06)	.01(.06)	.01(.06)
Interaction (weekly)	.01(.05)	.01(.05)	.01(.05)	.01(.05)
Extraversion	.00(.08)	-.01(.08)	-.01(.09_	-.01(.09)
Agreeableness	-.31(.13)*	-.24(.13)	-.26(.13)	-.27(.13)*
Conscientiousness	-.11(.10)	-.09(.10)	-.09(.10)	-.08(.10)
Social Desirability	1.44(.23)**	1.43(.23)**	1.40(.23)**	1.28(.24)**
NASPECTS		-.03(.05)	-.03(.05)	-.03(.05)
OL		-.14(.05)**	-.41(.05)**	-.14(.05)**
Time		.03(.05)	.02(.05)	.02(.05)
Centrality		-.04(.05)	-.03(.05)	-.03(.05)
NASPECTS x OL			.00(.06)	-.01(.06)
NASPECTS x Time			.10(.09)	.09(.09)

NASPECTS x Centrality			-.09(.08)	-.09(.08)
OL x Time			.03(.09)	.05(.10)
OL x Centrality			-.08(.09)	-.09(.11)
NASPECTS x OL x Time				-.07(.09)
NASPECTS x OL x Centrality				.04(.09)
R^2	0.22	0.24	0.25	0.26

[a] N = 332. Values are unstandardized regression coefficients; standard error estimates are in parentheses; NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.
* p < .05
** p < .01

Hypothesis 20 predicted that time would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and cognitive flexibility and that Hypothesis 22 predicted that centrality would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and cognitive flexibility. To test the three-way interaction, I followed the exact procedures mentioned above. However, as Table 7 showed that that the three-way interaction in the linear regression found that both the interaction of number of self-aspects x overlap x time (*B* = -.02, *n.s.*) and the number of self-aspects x overlap x centrality (*B* = .03, *n.s.*) were not statistically significant in predicting cognitive flexibility. Accordingly, both the Hypothesis 20 and Hypothesis 22 were not supported. So far, all the Hypotheses in Study 2 have been tested.

Table 7

Centrality, Time, and Components of Self-complexity in Predicting Cognitive Flexibility[a]

	Step			
Variables	1	2	3	4
Gender	-.05(.04)	-.07(.04)	-.07(.04)	-.07(.04)
Age	.00(.00)	.00(.00)	.00(.00)	.00(.00)
Education level	.08(.03)	.07(.03)*	.07(.03)*	.07(.03)*
Organizational tenure	.00(.00)	.00(.00)	.00(.00)	.00(.00)
Managerial tenure	-.02(.02)	-.02(.02)	-.01(.02)	-.01(.02)
Team size	.01(.02)	.01(.02)	.01(.02)	.01(.02)
Working hours (weekly)	-.01(.03)	-.02(.03)	-.02(.03)	-.02(.03)
Interaction (weekly)	.05(.02)*	.05(.02)*	.05(.02)*	.05(.02)*
Extraversion	.16(.04)**	.15(.04)**	.14(.04)**	.14(.04)**
Agreeableness	.32(.05)**	.27(.05)**	.29(.05)**	.29(.05)**
Conscientiousness	.08(.04)	.06(.04)	.06(.04)	.06(.04)
Social Desirability	.02(.10)	-.04(.10)	-.03(.10)	-.04(.10)
NASPECTS		-.02(.02)	-.03(.02)	-.03(.02)
OL		.05(.02)*	.04(.02)*	.03(.02)
Time		-.02(.02)	-.02(.02)	-.02(.02)
Centrality		.08(.02)**	.08(.02)**	.09(.02)**
NASPECTS x OL			-.01(.02)	.00(.02)
NASPECTS x Time			-.03(.04)	-.03(.04)
NASPECTS x Centrality			.01(.03)	.01(.03)
OL x Time			-.07(.04)	-.05(.04)
OL x Centrality			.05(.04)	.02(.05)
NASPECTS x OL x Time				-.02(.04)
NASPECTS x OL x Centrality				.03(.04)
R^2	0.32	0.35	0.35	0.36

[a] N = 332. Values are unstandardized regression coefficients; standard error estimates are in parentheses; NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.

* $p < .05$

** $p < .01$

DISCUSSION

As the results reported above show that some predictions have successfully been replicated, but some predictions were inconsistent with Study 1. As such, I will briefly summarize the findings in this section. For a clearer overview of all Hypotheses in both Studies 1 and 2, please see Table 8 below.

From the self-control perspective, both studies have found a negative association between the number of self-aspects and ego depletion (H1a), although this association was not statistically significant in Study 2. In addition, both studies have found solid evidence to support the prediction that the degree of overlap among self-aspects is negatively associated with ego depletion (H1b), indicating that the stable, coherent, and integrated self-concept will lead individuals to benefits from better psychological well-being. However, both studies failed to find the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects is negatively associated with ego depletion (H1c). Accordingly, the findings so far are consistent with suggestions from Constantino et al. (2006), Rafaeli & Hiller (2010), and Rafaeli-Mor & Steinberg (2002) that the components of self-complexity play critical roles in affecting people's psychological well-being. In the second stage of this mediation path, ego depletion was constantly found to be positively associated with abusive supervision in both studies, supporting the suggestion that the depletion of self-control resources is the most proximal cause of interpersonal aggression.

From the cognitive perspective, the prediction of the positive association between the number of self-aspects and cognitive flexibility in the H10a was inconsistent. Specifically, the result in Study 1 supported this prediction but was found negative though statistically insignificant in predicting one's ability to restructure knowledge in multiple different way.

Moreover, the degree of overlap among self-aspects was constantly found to be positively associated with cognitive flexibility (H10b), supporting Hooijberg, Hunt, and Dodge's (1997, p.385) description that integration allows people "*to focus on whole objects in order to form a coherent, meaningful picture from among the colors, shapes, and shades*." Although the components of self-complexity have shown their ability to predict cognitive flexibility in either or both studies, the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects was consistently found not to predict cognitive flexibility (H10c).

Accordingly, the main differences in the results in Studies 1 and 2 are the association between the number of self-aspects and ego depletion (H1a) and cognitive flexibility (H10a). One possible explanation for these differences might be cultural differences. Specifically, people from the individualistic culture such as the U.K. in Study 1 are thought to be relatively higher in independent self-construal, which includes defining oneself in terms of internal attributes, motives, or abilities that are perceived as stable across time and context (Markus & Kitayama, 1991). On the other hand, people from collectivistic cultures such as Taiwan in Study 2 are thought to be relatively higher in interdependent self-construal, which involves defining oneself in terms of attributes that occur in relation to other people and groups and that are experienced as unstable, flexible, and adjusted or tuned to the situation (Brewer & Gardner, 1996; Markus & Kitayama, 1991). As such, people in collectivistic culture may be expected to possess a greater number of self-aspects than people in individualistic culture because they tend to have more group-based bonds and obligations (Oyserman, Coon, & Kemmelmeier, 2002). Nevertheless, the higher level of group-based bonds and obligations may alternatively cause people in collectivistic culture to be more ego-depleted.

Table 8

Summary of Hypotheses in Study 1 and 2

Main Effects:	Study 1	Study 2
H1a: NASPECTS -> Ego depletion (-VE).	Supported	Not supported
H1b: OL -> Ego depletion (-VE).	Supported	Supported
H1c: (High NASPECTS x High OL) -> Ego depletion (-VE).	Not supported	Not supported
H2: Ego depletion -> Abusive supervision (+VE).	Partially supported	Supported
H3: Ego depletion -> Servant leadership (-VE).	N.A.	N.A.
H10a: NASPECTS -> Cognitive flexibility (+VE).	Supported	Not supported
H10b: OL -> Cognitive flexibility (+VE).	Supported	Supported
H10c: (High NASPECTS x High OL) -> Cognitive flexibility (+VE).	Not supported	Not supported
H11: Cognitive flexibility -> Abusive supervision (-VE).	Supported	Supported
H12: Cognitive flexibility -> Servant leadership (+VE).	N.A.	N.A.

Mediations:	Study 1	Study 2
H4: NASPECTS -> Ego depletion -> Abusive supervision.	Not supported	Not supported
H5: NASPECTS -> Ego depletion -> Servant leadership.	N.A.	N.A.
H6: OL -> Ego depletion -> Abusive supervision.	Not supported	Supported
H7: OL -> Ego depletion -> Servant leadership.	N.A.	N.A.
H8: (High NASPECTS x High OL) -> Ego depletion -> Abusive supervision.	Not supported	Not supported
H9: (High NASPECTS x High OL) -> Ego depletion -> Servant leadership.	N.A.	N.A.
H13: NASPECTS -> Cognitive flexibility -> Abusive supervision.	Supported	Not supported
H14: NASPECTS -> Cognitive flexibility -> Servant leadership.	N.A.	N.A.
H15: OL -> Cognitive flexibility -> Abusive supervision.	Supported	Supported
H16: OL -> Cognitive flexibility -> Servant leadership.	N.A.	N.A.
H17: (High NASPECTS x High OL) -> Cognitive flexibility -> Abusive supervision.	Not supported	Not supported
H18: (High NASPECTS x High OL) -> Cognitive flexibility -> Servant leadership.	N.A.	N.A.

Moderations:	Study 1	Study 2
H19: Time will positively moderate the negative association between the interaction of self-complexity and ego depletion.	Supported	Not supported
H20: Time will positively moderate the positive association between the interaction of self-complexity and cognitive flexibility.	Not supported	Not supported
H21: Centrality will negatively moderate the negative association between the interaction of self-complexity and ego depletion.	Not supported	Not supported
H22: Centrality will positively moderate positive the association between the interaction of self-complexity and cognitive flexibility.	Not supported	Not supported

Note. NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.

CONCLUSION

So far, I have employed my newly introduced method to examine the hypotheses in both U.K. and Taiwan samples. One unclear question can be whether this newly developed method has superior ability than the original free-format trait sorting task presented by Linville (1985) to predict other variables? To answer this question, I conducted another study to compare these two methods directly.

CHAPTER 6: STUDY 3

To examine whether my newly introduced method in measuring self-complexity has a stronger ability than Linville's (1985) free-response trait sorting task to predict those theoretically related variables, I recruited N = 130 participants in each method to test the current research model in Study 3. Following the Durham University's research ethical standard, I first stated in the information page that participants are required to be above the age of 18 and that all the responses are confidential and will only be used for the research purpose (for the approved ethics form, please see the Appendix A). To keep other conditions the same, I employed the same list of traits (N = 44) that has been employed in both Studies 1 and 2. With the assistance of administrators from the online survey platform, participants were only allowed to conduct one of the surveys in Study 3.

In Linville's free-response trait sorting task, there were 98 samples recruited because some of the participants misunderstood the description and sorted traits into groups to describe social roles (e.g., city mayor, lawyer, and doctor) that they perceived important to them. Nevertheless, as my newly introduced method first provided participants those often-seen social roles that were derived from the multiple identity theory and three optional self-aspects for them to add before they began the trait sorting task in those important self-aspects they selected, this issue did not happen, hence have more validated samples (N = 110).

METHOD

Measures

Self-complexity. In the free-response format trait sorting task, I consistent with Linville's (1985) work in guiding participants as follow:

"*You may sort the traits into groups on any meaningful basis, but remember to think about yourself while doing this. Each group of traits might represent a different aspect of yourself. Form as many or as few groups as you desire. Continue forming groups until you feel that you have formed the important ones. We realize that this task could be endless, but we want only what you feel is meaningful to you. When you feel that you are straining to form more groups, it is probably a good time to stop. Each group may contain as few or as many traits as you wish. You do not have to use every trait, only those that you feel are descriptive of you. Also, each trait may be used in more than one group; so you may keep reusing traits as many times as you like*."

Centrality. Participants were asked to evaluate the centrality of each self-aspect that they had selected immediately after the trait sorting task. Specifically, I modified Sellers, Rowley, Chavous, Shelton, and Smith's (1997) identity centrality scale into 3-item such as "*in general, being a leader is an important part of my self-image*" and "*overall, being a leader has very little to do with how I feel about myself* (reverse score)."

Time. Participants were then asked to rate how many hours do they devote to each role per week after the section of centrality, ranging from 1, "0 to 10 hours", to 5, "more than 40 hours."

Ego depletion. Although ego-depletion was originally measured as a temporary state in the laboratory, several studies have indicated that it also captures a relatively enduring state and has been examined with stable constructs such as abusive supervision (e.g., Lian et al., 2014; Thau & Mitchell, 2010). In the present research, I employed the five items scale that was chosen from

Twenge, Muraven, and Tice (2004) and later validated by Ciarocco, Twenge, Muraven, and Tice (2007). The sample items are "*I feel drained*," "*I feel worn out*," "*I would want to quit any difficult task I was given*," "*I feel lazy*," and "*I feel like my willpower is gone*" each item was given on a scale ranging from 1 = never to 7 = always. The Cronbach's alpha was .91 in the free-response format and was .92 in my newly introduced method.

Cognitive flexibility. To measure participants' cognitive flexibility, I employed the 12-item Cognitive Flexibility Scale (CFS) developed by Martin and Rubin (1995). The sample items are "*I can communicate an idea in many different ways*," "*I have the self-confidence necessary to try different ways of behaving*," and "*I seldom have choices when deciding how to behave* (reverse score)." The Cronbach's alpha was .70 in the free-response format and was .68 in my newly introduced method.

Abusive supervision. I assessed abusive supervision with Tepper's (2000) 15-item scale. In this scale, followers were instructed to indicate the frequency with which their supervisor performed behaviors such as "*My leader/manager put me down in front of others*," "*My leader/manager reminds me of my past mistakes and failures*," and "*My leader/manager makes negative comments about me to others*" on a scale ranging from 1, "*I can't remember I ever using this behavior with my subordinates*," to 5, "*I use this behavior very often with my subordinates*." The Cronbach's alpha was .90 in the free-response format and was .94 in my newly introduced method.

Servant leadership. I assessed servant leadership with Liden, Wayne, Meuser, Hu, Wu, and Liao's (2015) short form of the servant leadership measure (SL-7). The sample items are "*My leader can tell of something work-related is going wrong*," "*My leader gives me the freedom to handle difficult situations in the way that I feel is best*," and "*I would seek help from my leader if*

I had a personal problem." The Cronbach's alpha was .80 in the free-response format and was .83 in my newly introduced method.

RESULTS

Tables 9 and 10 show the means, standard deviation, and correlations of the measured variables in Linville's (1985) free-response format and the method that I developed in the trait sorting task respectively. As the main purposes of Study 3 were to (1) examine whether this newly introduced approach has a stronger ability in predicting theoretically related variables in the current research and to (2) test the additional leadership behavior (i.e., servant leadership) in the research model, I will specifically focus on the main effects in this sector. Moreover, the results of main effects were examined by using the Mplus 7.4 (Muthén & Muthén, 2015).

From the self-control perspective, Hypothesis 1a predicted that the number of self-aspects would be negatively associated with ego depletion. The result showed that the number of self-aspects was negatively but not statistically significant in associating with ego depletion (B = -.02, n.s.) in the free-response format. Nevertheless, this association was negatively and statistically significant (B = -.13, $p < .05$) in this newly introduced method, thus Hypothesis 1a is partially supported. Hypothesis 1b predicted that the degree of overlap among self-aspects would be negatively associated with ego depletion. The result showed that the degree of overlap among self-aspects was both negatively associated with ego depletion (B = -.25, $p < .05$) in the free-response format and in this newly introduced method (B = -2.44, $p < .001$), supporting Hypothesis 1b. Hypothesis 1c predicted that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects would be negatively associated with ego depletion. Nevertheless, the result showed that the interaction effect of a high number of self-aspects and a

high degree of overlap among self-aspects in predicting ego depletion was not statistically significant in both free-response format (B = -.09, n.s.) and this newly introduced method (B = -.14, n.s.), failing to support the Hypothesis 1c.

Hypothesis 2 predicted that ego depletion would be positively associated with abusive supervision. The result showed that ego depletion was positively and statistically significant in both surveys (B = .07, $p < .05$) and (B = .13, $p < .05$), supporting Hypothesis 2. Hypothesis 3 predicted that ego depletion would be negatively associated with servant leadership. However, the result showed that ego depletion was negatively associated with servant leadership but not statistically significant in both surveys (B = -.06, n.s.) and (B = -.02, n.s.), failing to support Hypothesis 3.

From the cognitive perspective, Hypothesis 10a predicted that the number of self-aspects would be positively associated with cognitive flexibility. The result showed that the number of self-aspects was positively but not statistically significant in associating with cognitive flexibility (B = .02, n.s.) in the free-response format. Nevertheless, this association was positively and statistically significant (B = .18, $p < .05$) in this newly introduced method, thus Hypothesis 10a is partially supported. Hypothesis 10b predicted that the degree of overlap among self-aspects would be positively associated with cognitive flexibility. The result showed that the degree of overlap among self-aspects was positively but not statistically significant in associating with cognitive flexibility (B = .06, n.s.) in the free-response format but this association was found to be positively and statistically significant in the newly introduced method (B = .52, $p < .01$), thus Hypothesis 10b is partially supported. Hypothesis 10c predicted that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects would be positively associated with cognitive flexibility. Nonetheless, the result showed that this interaction of a high

number of self-aspects and a high degree of overlap among self-aspects in predicting cognitive flexibility was not statistically significant (B = .06, n.s.) and (B = .01, n.s.) in both surveys, failing to support Hypothesis 10c.

Hypothesis 11 predicted that the cognitive flexibility would be negatively associated with abusive supervision. The result showed that cognitive flexibility was negatively and statistically significant in associating with abusive supervision (B = -.42, $p < .01$) and (B = -.55, $p < .01$) in both surveys, supporting Hypothesis 11. Hypothesis 12 predicted that the cognitive flexibility would be positively associated with servant leadership. The result showed that cognitive flexibility was positively and statistically significant in associating with servant leadership (B = .73, $p < .001$) and (B = .65, $p < .001$) in both surveys, supporting Hypothesis 12.

DISCUSSION

As the results in Study 3 showed, both methods have similar findings to studies 1 and 2. However, the newly introduced method that measures the structure of the self at the role level seems to be more statistically significant than Linville's free-response format in predicting ego depletion and cognitive flexibility. In addition, when conducting the content analysis in Linville's (1985) free-response format, I found that the current 11 self-aspects/social roles have covered most of the meaningful social roles that participants perceived in their self-construct. However, I discovered that several participants have stated that they perceived "*colleague/co-worker*" as an important social role in their self-construct. Accordingly, I included the role as colleague/co-worker as the 12th self-aspects in my next study by asking participants "*Does colleague/co-worker a meaningful self-aspect or social role to describe you?*" in the yes/no page.

CONCLUSION

So far, Studies 1 to 3 are cross-sectional in nature and leadership behaviors are measured by managers' self-rating, leading the current findings limited to capture the real nature of leadership. To have a more comprehensive understanding of the current findings, I conducted Study 4 to address some of these limitations. For a clearer overview of all Hypotheses in Studies 1 to 3, please see Table 11 below.

Table 9

Means, standard deviations, and correlations among variables in Study 3 (Linville's free-response format)

Variable	M	S.D.	1.	2.	3.	4.	5.
1. Number of self-aspects	6.13	1.47	-				
2. Degree of overlap	0.32	0.19	.05	-			
3. Ego depletion	3.09	0.83	-.06	-.15*	-		
4. Cognitive flexibility	3.52	0.33	.03	.08	-.22*	-	
5. Abusive supervision	1.61	0.47	-.07	.05	.19*	-.32***	-
6. Servant leadership	3.74	0.45	.06	.12	-.02	.51***	-.32**

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 10

Means, standard deviations, and correlations among variables in Study 3 (My newly introduced method)

Variable	M	S.D.	1.	2.	3.	4.	5.
1. Number of self-aspects	7.56	2.41	-				
2. Degree of overlap	0.34	0.20	-.03	-			
3. Ego depletion	2.96	0.98	-.17*	-.37***	-		
4. Cognitive flexibility	3.57	0.32	.19*	.36***	-.16	-	
5. Abusive supervision	1.68	0.64	.13	-.24*	.24*	-.31**	-
6. Servant leadership	3.78	0.53	.11	.10	-.02	.38***	-.13

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 11

Summary of Hypotheses in Studies 1 to 3

Main Effects:	Study 1	Study 2	Study 3
H1a: NASPECTS -> Ego depletion (-VE).	Supported	Not supported	Partially supported
H1b: OL -> Ego depletion (-VE).	Supported	Supported	Supported
H1c: (High NASPECTS x High OL) -> Ego depletion (-VE).	Not supported	Not supported	Not supported
H2: Ego depletion -> Abusive supervision (+VE).	Partially supported	Supported	Supported
H3: Ego depletion -> Servant leadership (-VE).	N.A.	N.A.	Not supported
H10a: NASPECTS -> Cognitive flexibility (+VE).	Supported	Not supported	Partially supported
H10b: OL -> Cognitive flexibility (+VE).	Supported	Supported	Partially supported
H10c: (High NASPECTS x High OL) -> Cognitive flexibility (+VE).	Not supported	Not supported	Not supported
H11: Cognitive flexibility -> Abusive supervision (-VE).	Supported	Supported	Supported
H12: Cognitive flexibility -> Servant leadership (+VE).	N.A.	N.A.	Supported

Note. NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.

CHAPTER 7: STUDY 4

METHOD

In Study 4, I collected the data from leaders and followers by using online survey questionnaires at three different time points within three organizations. The access to the organizations was achieved via family and personal connections. Of those three organizations, two are in the information technology industry, with the number of 324 and 381 employees respectively. The other organization is in the industry of manufacturing, with the number of 256 employees.

Following the Durham University's research ethical standard and to minimize potential self-selection biases, I first stated in the information page that participants are required to be above the age of 18 and that all the responses are confidential and will only be used for the research purpose (for the approved ethics form, please see the Appendix A). To minimize the potential self-selection biases, all the recruited participants were only provided with a generic description of my research aim.

At time 1, more than 566 research invitations were sent to leaders in the organizations, and N = 479 leaders responded to the online survey. They were instructed to respond to questions regarding their demographic information, control variables, and self-complexity. A week later, I sent the time 2 questionnaire link vis SMS to those leaders who have participated in the time 1 survey, and they were asked to rate their ego depletion and cognitive flexibility. For those N = 261 (respond rate = 55%) leaders who have successfully done both time 1 and 2 surveys, their corresponding subordinates N = 519 were then invited to participate the time 3 data collection. To ensure the accuracy and validity of the information, human resource

department in each company provided me its organization's hierarchical structure and the list of managers and corresponding subordinates in each department.

In addition to the human resource departments' assistance, I also asked leaders to provide their surname and mobile phone number at both Time 1 and 2 data collections, whereas subordinates were asked to provide (1) the surname of their supervisor, (2) last four digit of their supervisor's mobile phone number, (3) their surname, and (4) their mobile phone number. After the procedure of matching between leaders at two time spots and corresponding followers, there were N = 144 leaders and N = 450 followers data were recruited in the present research. There are 111 leaders with multiple followers (ranging from 3 to 42) and 33 leaders with one follower (i.e., dyads) in the current study. Participants (70.1% male) were employed in industries that mainly focused on information technology (63.9%) and manufacturing (17.4%). The remaining 18.7% participants in the sample were in various industries, including accountancy, banking, and finance, business consulting and management, and logistics. The participants' mean age was 42.58 years (s.d. = 8.45), organizational tenure was 10.83 years (s.d. = 8.97), managerial tenure was 7.88 years (s.d. = 9.44), and they have an average team size of 19.75 subordinates (s.d. = 11.42).

Measures

The variables were measured using 7-point Likert scales unless otherwise indicated (1 = strongly disagree, 7 = strongly agree). For the questionnaires that have been employed in the present study, please see the Appendix B.

Leader-Rated:

Self-complexity (Time 1). To measure self-complexity with this newly introduced method, I first provided yes/no questions to ask whether those provided roles across different levels such as leadership related (e.g., leader/manager, follower/subordinate, and colleague/co-worker), individual level (e.g., athlete, and hobbyist), dyadic level (e.g., spouse/partner, son/daughter, parent, sibling, and friend), collective level (e.g., community/charity and religion member), and three optional self-aspects that are meaningful to them. Once participants have selected "yes" on those meaningful roles to them, they were then instructed to choose the 44-item traits, which consisted of 23 positively valenced and 21 negatively valenced adjectives, to best help them to describe those selected meaningful social roles (Rafaeli-Mor, Gotlib, & Revelle, 1999). To calculate the number of self-aspects and overlap, I followed the pair-wise comparison formula introduced by Rafaeli-Mor, Gotlib, and Revelle (1999) and exported the data to the calculation program (i.e., Google Colab – Python) that my colleague and I developed and have been repeatedly tested to ensure its accuracy.

Centrality (Time 1). Participants were asked to evaluate the centrality of each self-aspect that they had selected immediately after the trait sorting task. Specifically, I modified Sellers, Rowley, Chavous, Shelton, and Smith's (1997) identity centrality scale into 3-item such as "*in general, being a leader is an important part of my self-image*" and "*overall, being a leader has very little to do with how I feel about myself* (reverse score)."

Time (Time 1). Participants were then asked to rate how many hours do they devote to each role per week after the section of centrality, ranging from 1, "0 to 10 hours", to 5, "more than 40 hours."

Ego depletion (Time 2). Although ego-depletion was originally measured as a temporary state in the laboratory, several studies have indicated that it also captures a relatively enduring state

and has been examined with stable constructs such as abusive supervision (e.g., Lian et al., 2014; Thau & Mitchell, 2010). In the present research, I employed the five items scale that was chosen from Twenge, Muraven, and Tice (2004) and later validated by Ciarocco, Twenge, Muraven, and Tice (2007). The sample items are "*I feel drained*," "*I feel worn out*," "*I would want to quit any difficult task I was given*," "*I feel lazy*," and "*I feel like my willpower is gone*" each item was given on a scale ranging from 1 = never to 7 = always. The Cronbach's alpha was .92 in the current study.

Cognitive flexibility (Time 2). To measure participants' cognitive flexibility, I employed the 12-item Cognitive Flexibility Scale (CFS) developed by Martin and Rubin (1995). The sample items are "*I can communicate an idea in many different ways*," "*I have the self-confidence necessary to try different ways of behaving*," and "*I seldom have choices when deciding how to behave* (reverse score)." The Cronbach's alpha was .92 in the current study.

Control variables (Time 1). I first controlled for demographic factors such as age, gender, ethnic group, and education level in the analyses. In addition, I also controlled those leader-related factors such as their organizational tenure, managerial tenure, team size, weekly working hours, frequency of interaction with subordinates (weekly), Big Five personality traits (Soto & John, 2017), and social desirability (Reynold, 1982). The Cronbach's alpha was .79 for extraversion, .74 for agreeableness, .82 for consciousness, .80 for neuroticism, and .76 for openness to experience in the Big Five personality traits. In addition, the Cronbach's alpha was .71 for social desirability.

Follower-Rated:

Abusive supervision (Time 3). I assessed abusive supervision with Tepper's (2000) 15-item scale. In this scale, followers were instructed to indicate the frequency with which their supervisor performed behaviors such as "*My leader/manager put me down in front of others*," "*My leader/manager reminds me of my past mistakes and failures*," and "*My leader/manager makes negative comments about me to others*" on a scale ranging from 1, "*I can't remember I ever using this behavior with my subordinates*," to 5, "*I use this behavior very often with my subordinates*." The intra-class correlation coefficient (ICC) was .95, and the Cronbach's alpha was .96 in the current study Although Hanges et al's., civil-abuse supervision scale has shown its superiority to overcome potential social desirability and cultural effects in measuring abusive supervision in Study 1, this scale has not yet been validated in Mandarin. Thus, it was excluded in studies that were collected in Taiwan (i.e., Studies 2 to 4). To resolve the potential issues of social desirability and cultural effects, I added Reynolds' (1982) social desirability scale as a control variable.

Servant Leadership (Time 3). I assessed followers' perception of servant leadership with Liden, Wayne, Meuser, Hu, Wu, and Liao's (2015) short form of the servant leadership measure (SL-7). The sample items are "*My leader can tell of something work-related is going wrong*," "*My leader gives me the freedom to handle difficult situations in the way that I feel is best*," and "*I would seek help from my leader if I had a personal problem*." The intra-class correlation coefficient (ICC) was .93, and the Cronbach's alpha was .94 in the current study.

RESULTS

Main Effects

Table 12 shows the means, standard deviation, and correlations of the measured variables in the Study 4. As the current study contains both leaders and their followers' ratings, I used Mplus 7.4 (Muthén & Muthén, 2015) to analyze the two-level model. To examine the nested data, I set the cluster as leader in the syntax to ensure that followers rated their corresponding leader.

From the self-control perspective, Hypothesis 1a predicted that the number of self-aspects would be negatively associated with ego depletion. The result showed that the number of self-aspects was negatively associated with ego depletion (B = -.21, p < .01), supporting Hypothesis 1a. Hypothesis 1b predicted that the degree of overlap among self-aspects would be negatively associated with ego depletion. The result showed that the degree of overlap among self-aspects was negatively associated with ego depletion (B = -1.56, p < .05), supporting Hypothesis 1b. Hypothesis 1c predicted that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects would be negatively associated with ego depletion. Nevertheless, the result showed that the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects in predicting ego depletion was not statistically significant (B = .10, *n.s.*), failing to support the Hypothesis 1c.

Hypothesis 2 predicted that ego depletion would be positively associated with abusive supervision. The result showed that ego depletion was positively associated with abusive supervision (B = .23, p < .001), supporting Hypothesis 2. Hypothesis 3 predicted that ego depletion would be negatively associated with servant leadership. However, the result showed

that ego depletion was negatively but not statistically significant in associated with servant leadership (B = -.07, *n.s.),* failing to support Hypothesis 3.

From the cognitive perspective, Hypothesis 10a predicted that the number of self-aspects would be positively associated with cognitive flexibility. The result showed that the number of self-aspects was positively associated with cognitive flexibility (B = .23, p < .001), supporting Hypothesis 10a. Hypothesis 10b predicted that the degree of overlap among self-aspects would be positively associated with cognitive flexibility. The result showed that the degree of overlap among self-aspects was positively associated with cognitive flexibility (B = 1.42, p < .05), supporting Hypothesis 10b. Hypothesis 10c predicted that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects would be positively associated with cognitive flexibility. However, the result showed that the interaction of a high number of self-aspects and a high degree of overlap among self-aspects in predicting cognitive flexibility was not statistically significant (B = -.12, *n.s*.), failing to support Hypothesis 10c.

Hypothesis 11 predicted that the cognitive flexibility would be negatively associated with abusive supervision. The result showed that cognitive flexibility was negatively and statistically significant in associating with abusive supervision (B = -.29, p < .001), supporting Hypothesis 11. Hypothesis 12 predicted that the cognitive flexibility would be positively associated with servant leadership. The result showed that cognitive flexibility was positively and statistically significant in associating with servant leadership (B = .21, p < .05), supporting Hypothesis 12.

To test the robustness of the regression results, I have conducted the data analyses by using Mplus 7.4 (Muthén & Muthén, 2015), with all variables controlled. From the self-control perspective, Hypothesis 1a predicted that the number of self-aspects would be negatively associated with ego depletion. The result showed that the number of self-aspects was negatively

associated with ego depletion (B = -.14, p < .01), supporting Hypothesis 1a. Hypothesis 1b predicted that the degree of overlap among self-aspects would be negatively associated with ego depletion. The result showed that the degree of overlap among self-aspects was negatively associated with ego depletion (B = -.56, *n.s.*), failing to support Hypothesis 1b. Hypothesis 2 predicted that ego depletion would be positively associated with abusive supervision. The result showed that ego depletion was positively and significantly associated with abusive supervision (B = .29, p < .001), supporting Hypothesis 2. Hypothesis 3 predicted that ego depletion would be negatively associated with servant leadership. However, the result showed that ego depletion was negatively but not statistically significantly associated with servant leadership (B = -.12, *n.s.),* failing to support Hypothesis 3.

From the cognitive perspective, Hypothesis 10a predicted that the number of self-aspects would be positively associated with cognitive flexibility. The result showed that the number of self-aspects was positively associated with cognitive flexibility (B = .17, p < .001), supporting Hypothesis 10a. Hypothesis 10b predicted that the degree of overlap among self-aspects would be positively associated with cognitive flexibility. The result showed that the degree of overlap among self-aspects was positively associated with cognitive flexibility (B = 1.05, p < .01), supporting Hypothesis 10b. Hypothesis 11 predicted that cognitive flexibility would be negatively associated with abusive supervision. The result showed that cognitive flexibility was negatively associated with abusive supervision (B = -.33, p < .001), supporting Hypothesis 11. Hypothesis 12 predicted that cognitive flexibility would be positively associated with servant leadership. The result showed that cognitive flexibility was positively and statistically significant in associating with servant leadership (B = .21, p < .05), supporting Hypothesis 12.

Comparing these results, we can see that besides Hypothesis 1b, the results of other Hypotheses remain the same in Study 4.

Mediation Tests

To test the indirect effects, I also used Mplus 7.4 (Muthén & Muthén, 2015) to analyze the two-level model. From the self-control perspective, Hypothesis 4 predicted that ego depletion would mediate the relationship between the number of self-aspects and abusive supervision. The result showed that the indirect effect of the number of self-aspects on abusive supervision via ego depletion was (B = -.049, p < .05), supporting the Hypothesis 4. Hypothesis 5 predicted that ego depletion would mediate the relationship between the number of self-aspects and servant leadership. The result showed that the indirect effect of the number of self-aspects on servant leadership via ego depletion was (B = .015, *n.s.*), failing to support Hypothesis 5.

Hypothesis 6 predicted that ego depletion would mediate the relationship between the degree of overlap among self-aspects and abusive supervision. The result showed that the indirect effect of the degree of overlap among self-aspects on abusive supervision via ego depletion was (B = -.0358, p < .05), supporting Hypothesis 6. Hypothesis 7 predicted that ego depletion would mediate the relationship between the degree of overlap among self-aspects and servant leadership. The result showed that the indirect effect of the degree of overlap among self-aspects on servant leadership via ego depletion was (B = .111, *n.s.*), failing to support Hypothesis 7. Hypothesis 8 predicted that ego depletion would mediate the relationship between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision. The result showed that the indirect effect of the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on abusive

supervision via ego depletion was (B = .022, *n.s.*), failing to support Hypothesis 8. Hypothesis 9 predicted that the ego depletion would mediate the relationship between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on servant leadership. The result showed that the indirect effect of the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on servant leadership via ego depletion was (B = -.007, *n.s.*), failing to support Hypothesis 9.

From the cognitive perspective, Hypothesis 13 predicted that cognitive flexibility would mediate the relationship between the number of self-aspects and abusive supervision. The result showed that the indirect effect of the number of self-aspects on abusive supervision via cognitive flexibility was (B = -.068, p < .01), supporting Hypothesis 13. Hypothesis 14 predicted that cognitive flexibility would mediate the relationship between the number of self-aspects and servant leadership. The result showed that the indirect effect of the number of self-aspects on servant leadership via cognitive flexibility was (B = .049, *n.s.*), failing to support the Hypothesis 14. Hypothesis 15 predicted that cognitive flexibility would mediate the relationship between the degree of overlap among self-aspects and abusive supervision. The result showed that the indirect effect of the degree of overlap among self-aspects and abusive supervision via cognitive flexibility was (B = -.417, p < .05.), supporting the Hypothesis 15. Hypothesis 16 predicted that cognitive flexibility would mediate the relationship between the degree of overlap among self-aspects and servant leadership. The result showed that the indirect effect of the degree of overlap among self-aspects on servant leadership via cognitive flexibility was (B = .300, *n.s.*), failing to support the Hypothesis 16.

Table 12

Means, standard deviations, and correlations among variables in Study 4

Variable	M	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Gender	1.30	0.46												
2. Age	42.58	8.45	-.16											
3. Organizationa tenure	10.83	8.97	-.09	.50***										
4. Managerial tenure	7.88	9.44	-.03	.41***	48***									
5. Team size	19.75	11.42	-.20*	.36***	.11	.29***								
6. Number of self-aspects	10.29	1.87	-.06	-.17*	-.13	-.08	.12							
7. Degree of overlap	0.56	0.22	-.14	.16	.21*	.07	.25**	.14						
8. Ego depletion	2.45	1.15	.02	.01	-.11	.02	-.24**	-.30***	-.26**	(.92)				
9. Cognitive flexibility	5.04	0.97	-.15	.09	.03	.12	.39***	.36***	.26**	-.26**	(.86)			
10. Abusive supervision	1.62	0.70	.16	-.17*	-.01	-.10	-.17*	-.06	-.09	.25**	-.25**	**(.95)**		
11. Servant leadership	5.48	0.86	-.21	.19*	-.04	.07	.17*	.02	.06	.03	.30***	-.39***	**(.93)**	
12. Time	25.69	11.65	-.12	-.06	.05	-.16	.10	.45***	.24**	-.10	.12	.06	-.06	
13. Centrality	53.82	14.83	-.14	-.08	-.15	-.14	.11	.74***	.19*	-.23**	.33***	-.12	.11	.46***

Note. *p < .05, **p < .01, ***p < .001

Hypothesis 17 predicted that the cognitive flexibility would mediate the relationship between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision. The result showed that the indirect effect of the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on abusive supervision via cognitive flexibility was (B = .034, *n.s.*), failing to support the Hypothesis 17. Hypothesis 18 predicted that the cognitive flexibility would mediate the relationship between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on servant leadership. The result showed that the indirect effect of the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects on servant leadership via cognitive flexibility was (B = -.025, *n.s.*), failing to support the Hypothesis 18.

Moderation Tests

To test the interaction effects, I employed the linear regression analysis in the SPSS. Hypothesis 19 predicted that time would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion and that Hypothesis 21 predicted that centrality would negatively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion. To test the three-way interaction, I first controlled demographic variables such as gender, age, education level, organizational tenure, managerial tenure, team size, weekly working hours, and weekly interaction with subordinates, and personality traits such as extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism in the step 1. I then put independent variables (i.e., number of self-aspects and degree of overlap among self-aspects) and moderators (i.e., time and centrality) in the step 2. In

the step 3, I put the two-way interaction of each independent and moderation variable (i.e., NASPECTS x OL, NASPECTS x Time, NASPECTS x Centrality, OL x Time, and OL x Centrality), Finally, I put the three-way interaction (NASPECTS x OL x Time and NASPECTS x OL x Centrality) in the step 4. However, as Table 13 showed that the three-way interaction in the linear regression found that both the interaction of number of self-aspects x overlap x time (*B* = -.01, *n.s.*) and the number of self-aspects x overlap x centrality (*B* = -.03, *n.s.*) were not statistically significant in predicting ego depletion. Accordingly, both the Hypothesis 19 and Hypothesis 21 were not supported.

Table 13

Centrality, Time, and Components of Self-complexity in Predicting Ego Depletion[a]

	Step			
Variables	1	2	3	4
Gender	-.13(.20)	-.20(.20)	-.28(.21)	-.29(.22)
Age	.02(.01)	.03(.01)	.03(.01)*	.03(.01)*
Education level	-.10(.11)	-.14(.11)	-.14(.11)	-.14(.11)
Managerial tenure	-.33(.19)	-.37(.20)	-.37(.20)	-.36(.22)
Organizational tenure	.14(.11)	.13(/11)	.09(.12)	.09(.12)
Team size	-.19(.06)**	-.19(.06)**	-.20(.07)**	-.20(.07)**
Interaction (weekly)	-.03(.07)	.01(.07)	.00(.08)	.00(.08)
Extraversion	.03(.13)	.03(.13)	.00(.13)	.00(.13)
Agreeableness	-.18(.16)	-.11(.16)	-.11(.17)	-.11(.17)
Conscientiousness	-.08(.16)	-.09(.16)	.00(.17)	.01(.17)
Neuroticism	.36(.13)**	.37(.13)**	.38(.14)**	.38(.14)**
Openness to Experience	.23(.15)	.33(.16)*	.29(.16)	.30(.16)
Social Desirability	.07(.51)	-.14(.54)	-.25(.54)	-.24(.55)
NASPECTS		.02(.14)	-.08(.18)	-.07(.19)
OL		-.10(.10)	-.10(.10)	-.08(.13)
Time		.08(.11)	.16(.12)	.16(.12)
Centrality		-.27(.15)	-.29(.15)	-.29(.16)
NASPECTS x OL			.02(.15)	-.01(.18)
NASPECTS x Time			-.22(.14)	-.21(.15)

NASPECTS x Centrality			.04(.13)	.05(.14)
OL x Time			-.08(.11)	-.07(.12)
OL x Centrality			.15(.14)	.14(.14)
NASPECTS x OL x Time				-.01(.16)
NASPECTS x OL x Centrality				-.03(.13)
R^2	0.24	0.28	0.31	0.31

[a] N = 144. Values are unstandardized regression coefficients; standard error estimates are in parentheses; NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.
* p < .05
** p < .01

Hypothesis 20 predicted that time would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and cognitive flexibility and that Hypothesis 22 predicted that centrality would positively moderate the association between the interaction of a high number of self-aspects and a high degree of overlap among self-aspects and cognitive flexibility. To test the three-way interaction, I followed the exact procedures mentioned above. Nevertheless, as Table 14 showed that the three-way interaction in the linear regression found that both the interaction of number of self-aspects x overlap x time (*B* = -.06, *n.s.*) and the number of self-aspects x overlap x centrality (*B* = .07, *n.s.*) were not statistically significant in predicting cognitive flexibility. Accordingly, both the Hypothesis 20 and Hypothesis 22 were not supported. So far, all the Hypotheses in Study 4 have been tested.

Table 14

Centrality, Time, and Components of Self-complexity in Predicting Cognitive Flexibility[a]

	Step			
Variables	1	2	3	4
Gender	-.04(.12)	01(.12)	.00(.13)	.00(.13)
Age	.00(.01)	-.01(.01)	-.01(.01)	-.01(.01)
Education level	.04(.07)	.06(.07)	.06(.07)	.06(.07)
Managerial tenure	-.08(.12)	-.07(.12)	-.07(.12)	-.11(.13)
Organizational tenure	.06(.07)	.08(.07)	.06(.07)	.07(.07)
Team size	.13(.04)	.13(.04)**	.13(.04)**	.13(.04)**
Interaction (weekly)	.03(.04)	.00(.04)	-.01(.05)	-.01(.05)
Extraversion	-.01(.08)	.01(.08)	.02(.08)	.03(.08)
Agreeableness	.00(.10)	-.05(.10)	-.05(.10)	-.05(.10)
Conscientiousness	.12(.10)	.12(.10)	.12(10)	.12(.10)
Neuroticism	-.19(.08)*	-.19(.08)*	-.20(.08)*	-.20(.08)*
Openness to Experience	.13(.09)	.05(.09)	.03(.10)	.04(10)
Social Desirability	-.03(.31)	.02(.32)	.00(.33)	.01(.33)
NASPECTS		-.17(.08)	-.18(.11)	-.19(.11)
OL		.05(.06)	.06(.06)	.04(.08)
Time		-.01(.06)	-.02(.07)	-.02(.07)
Centrality		.27(.09)**	.29(.09)**	.28(.09)**
NASPECTS x OL			.08(.09)	.11(.11)
NASPECTS x Time			-.01(.09)	-.01(.09)
NASPECTS x Centrality			-.01(.08)	-.03(.08)
OL x Time			-.01(.07)	.00(.07)
OL x Centrality			.01(.08)	.01(.08)
NASPECTS x OL x Time				-.06(.10)
NASPECTS x OL x Centrality				.07(.08)
R^2	0.33	0.39	0.4	0.40

[a] N = 144. Values are unstandardized regression coefficients; standard error estimates are in parentheses; NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.

* $p < .05$

** $p < .01$

DISCUSSION

As the results reported above show, some predictions have successfully been replicated, but some predictions were inconsistent across the four studies. As such, I will briefly summarize the findings in this section. For a clearer overview of all Hypotheses in Studies 1 to 4, please see Table 15 below.

From the self-control perspective, the negative association between the number of self-aspects and ego depletion (H1a) has constantly been found across four studies, although this association was not statistically significant in Study 2 and in Study 3 (Linville's free-response format). The negative association between the degree of overlap among self-aspects and ego depletion (H1b) has consistently been found across four studies. However, the negative association between the interaction effect of a high number of self-aspects and a high degree of overlap among self-aspects and ego depletion (H1c) was not statistically significant across all the studies. At the second stage of the mediation path in the self-control aspect, the positive association between ego depletion and abusive supervision (H2) has consistently been found across Studies 1 to 3. Moreover, the negative association between ego depletion and servant leadership (H3) has been found in both Studies 3 and 4, but neither of the results were statistically significant.

From the cognitive perspective, the positive association between the number of self-aspects and cognitive flexibility (H10a) has been found in Studies 1, 3, and 4. The positive association between the degree of overlap among self-aspects and cognitive flexibility (H10b) has successfully been found across all the studies, though this association was not statistically significant in Sudy 3 (Linville's free-response format). However, the positive association between the interaction effect of a high number of self-aspects and a high degree of overlap

among self-aspects and ego depletion (H10c) was not statistically significant across all the studies. At the second stage of the mediation path in the cognitive aspect, there was solid evidence to support the prediction that cognitive flexibility is negatively associated with abusive supervision (H11) across all the studies. Similarly, there was also solid evidence to support the prediction that cognitive flexibility is positively associated with servant leadership (H12) across Studies 3 to 4.

Table 15

Summary of Hypotheses in Studies 1 to 4

Main Effects:	Study 1	Study 2	Study 3	Study 4
H1a: NASPECTS -> Ego depletion (-VE).	Supported	Not supported	Partially supported	Supported
H1b: OL -> Ego depletion (-VE).	Supported	Supported	Supported	Supported
H1c: (High NASPECTS x High OL) -> Ego depletion (-VE).	Not supported	Not supported	Not supported	Not supported
H2: Ego depletion -> Abusive supervision (+VE).	Partially supported	Supported	Supported	Supported
H3: Ego depletion -> Servant leadership (-VE).	N.A.	N.A.	Not supported	Not supported
H10a: NASPECTS -> Cognitive flexibility (+VE).	Supported	Not supported	Partially supported	Supported
H10b: OL -> Cognitive flexibility (+VE).	Supported	Supported	Partially supported	Supported
H10c: (High NASPECTS x High OL) -> Cognitive flexibility (+VE).	Not supported	Not supported	Not supported	Not supported
H11: Cognitive flexibility -> Abusive supervision (-VE).	Supported	Supported	Supported	Supported
H12: Cognitive flexibility -> Servant leadership (+VE).	N.A.	N.A.	Supported	Supported

Mediations:	Study 1	Study 2	Study 3	Study 4
H4: NASPECTS -> Ego depletion -> Abusive supervision.	Not supported	Not supported	N.A.	Supported
H5: NASPECTS -> Ego depletion -> Servant leadership.	N.A.	N.A.	N.A.	Not supported
H6: OL -> Ego depletion -> Abusive supervision.	Not supported	Supported	N.A.	Supported
H7: OL -> Ego depletion -> Servant leadership.	N.A.	N.A.	N.A.	Not supported
H8: (High NASPECTS x High OL) -> Ego depletion -> Abusive supervision.	Not supported	Not supported	N.A.	Not supported
H9: (High NASPECTS x High OL) -> Ego depletion -> Servant leadership.	N.A.	N.A.	N.A.	Not supported

H13: NASPECTS -> Cognitive flexibility -> Abusive supervision.	Supported	Not supported	N.A.	Supported
H14: NASPECTS -> Cognitive flexibility -> Servant leadership.	N.A.	N.A.	N.A.	Not Supported
H15: OL -> Cognitive flexibility -> Abusive supervision.	Supported	Supported	N.A.	Supported
H16: OL -> Cognitive flexibility -> Servant leadership.	N.A.	N.A.	N.A.	Not Supported
H17: (High NASPECTS x High OL) -> Cognitive flexibility -> Abusive supervision.	Not supported	Not supported	N.A.	Not supported
H18: (High NASPECTS x High OL) -> Cognitive flexibility -> Servant leadership.	N.A.	N.A.	N.A.	Not supported

Moderations:	Study 1	Study 2	Study 3	Study 4
H19: Time will positively moderate the negative association between the interaction of self-complexity and ego depletion.	Supported	Not supported	N.A.	Not supported
H20: Time will positively moderate the positive association between the interaction of self-complexity and cognitive flexibility.	Not supported	Not supported	N.A.	Not supported
H21: Centrality will negatively moderate the negative association between the interaction of self-complexity and ego depletion.	Not supported	Not supported	N.A.	Not supported
H22: Centrality will positively moderate positive the association between the interaction of self-complexity and cognitive flexibility.	Not supported	Not supported	N.A.	Not supported

Note. NASPECTS = number of self-aspects; OL = degree of overlap among self-aspects.

CHAPTER 8: GENERAL DISCUSSION

Over the past few decades, psychologists have shifted their research attention on the self as a unitary construct to treating it as a multifaceted and context-dependent construct. To study the representation and the implication of the multifaceted self, researchers have focused on examining self-complexity. Among those various models of self-complexity, Linville's (1985, 1987) social-cognitive model of self-complexity has caught the most attention from researchers in several research areas. Several leadership scholars (e.g., Hannah, Eggers, & Jennings, 2008; Hannah, Woolfolk, & Lord, 2009; Lord & Hall, 2005; Lord, Hannah, & Jennings, 2011) have also drawn upon the self-complexity theory to propose several conceptual works in discussing how one's self-structure is related to leadership. However, empirical study that directly examines this association is limited. The present research may help to fulfill this research gap by employing theories in self-control and cognitive perspectives to propose two mediation paths to investigate the association between self-complexity and leadership behaviors.

Across four studies, I found that the components of individuals' self-construct play a significant role in predicting individuals' ego depletion and cognitive flexibility, which will further affect their leadership behaviors in the workplace. Study 1 found that people who possess a greater number of self-aspects in their self-construct are less likely to experience the state of ego depletion and are more cognitively flexible. In addition, individuals whose self-aspects are highly overlapped can avoid the reduced cognitive capacity for self-regulation and to be more able to restructure knowledge in multiple different ways. Nevertheless, the interaction of high number of self-aspects and high degree of overlap among self-aspects was not found statistically significant to lead one to experience less ego depletion nor lead one to be more cognitively flexible. The result of the three-way interaction of high number of self-aspects and high degree

of overlap among self-aspects and high amount of time spent on self-aspects showed that the negative association between the interaction effect of high number of self-aspects and high degree of overlap among self-aspects and ego depletion would be stronger when people spend more time on their self-aspects. Lastly, Study 1 also showed that cognitively flexible managers are less likely to behave abusively toward their followers.

Study 2 followed the exact procedures in Study 1 but employed the samples in Taiwan. Study 2 supported the findings in Study 1 in that for those people whose self-aspects are highly overlapped will experience less ego depletion and will be more cognitively flexible. In addition, Study 2 also found that ego-depleted managers are more likely to behave abusively toward their followers, whereas cognitively flexible managers are less likely to do so than their counterparts. Although some predictions have been repeatedly found in both studies, Studies 1 and 2 are limited in telling us whether this newly developed method of measuring self-complexity has a stronger predicting ability than the original method adopted in Linville's (1985, 1987) studies.

Study 3 showed that this newly developed approach has superior predictive ability than Linville's free response format in measuring self-complexity. In the free-response format, only the negative association between the degree of overlap among self-aspects and ego depletion was successfully found. In contrast, in my approach, both the number of self-aspects and the degree of overlap among self-aspects were found to be negatively associated with ego depletion. In addition, from the cognitive perspective, both the number of self-aspects and the degree of overlap among self-aspects were found to be positively associated with cognitive flexibility. Moreover, Study 3 included positive leadership behavior (i.e., servant leadership) and found that cognitively flexible managers are more likely to display servant leadership behaviors in the

workplace. However, ego-depleted managers were not found to display less servant leadership behaviors.

Study 4 revealed that individuals who possess a greater number of self-aspects in their self-construct are less likely to experience the state of ego depletion and are more cognitively flexible. In addition, individuals whose self-aspects are highly overlapped can help them to experience less ego depletion and to be more cognitively flexible. Study 4 also found that cognitively flexible managers are more likely to be perceived as servant leaders and less likely to be perceived as abusive leaders by their subordinates.

According to the results of the four studies, there is strong empirical evidence supporting the finding that the components of the self-complexity (i.e., the number of self-aspects and the degree of overlap among self-aspects) play significant roles in predicting ego depletion and cognitive flexibility, which further relates to followers' perceptions of their managers' leadership behaviors in the workplace.

Theoretical Implications

First, the present research is among the first studies that empirically examine the association between self-complexity and leadership. Previous research on self-complexity (e.g., Hannah et al., 2013) has employed psychological and neurological approaches and found that military leaders who score high in leader self-complexity (LSC) are more adaptable across contexts and role demands. In the present research, I employed two different theories and revealed that the components of self-complexity play critical roles in predicting individuals' psychological well-being and cognitive flexibility, which broadens the research on the underlying processes of the effect of self-complexity. The results in the present research agreed

with the existing studies that the greater number of self-aspects contributes to better psychological well-being and a stronger ability to restructure knowledge in multiple different ways. However, the results in the present research challenged the self-complexity literature and offered novel insights into that the higher degree of overlap among self-aspects is more beneficial to one's psychological well-being and cognitive flexibility. In addition, the present research includes two often-seen leadership behaviors in the workplace – one positive and one negative - to offer new insights into the association between self-complexity and leadership.

Second, the current research also contributes to the self-complexity literature by introducing a new approach that specifically focuses on measuring the role level of self-complexity and employing a more appropriate measurement to provide a more comprehensive view of the components of self-complexity. Although the issues of *H* statistic (Attneave, 1959; Scott, 1969) have been noted in several studies (e.g., Pilarska & Suchanska, 2015; Rafaeli-Mor, Gotlib, & Revelle, 1999; Rafaeli-Mor & Steinberg, 2002), most researchers to date are still consistent with Linville (1985, 1987) to employ this single composite measure of self-complexity in their studies. To avoid the issues of sensitivity to the valence of the traits, counter theoretical definition, and misunderstanding the concept, I employed a more balanced trait list and adopted a more systematic pairwise comparison method developed by Rafaeli-Mor, Gotlib, and Revelle (1999) to offer new insights to the self-complexity literature. As the present research focuses on the role level of self-complexity, I developed an analogous approach that focuses on measuring the structure of the self at the role level and is compatible for participants to conduct it online. More importantly, this newly introduced approach has been tested and found to have a stronger predictive ability than the original free response format introduced in Linville's studies.

Third, the current research serves as one of the limited studies that examine the psychological factor in self-complexity literature. Prior study (e.g., McConnell et al., 2005) had examined the psychological factor of perceived control over those multiple selves and found that those high self-complexity individuals would exhibit more negative psychological well-being such as greater depression and lower self-esteem when they perceived relatively little control over their self-aspects. In the present research, I drew upon the multiple identity theory to examine two psychological factors (i.e., time and centrality) in self-complexity and found that the negative association between the interaction effect of self-complexity and ego depletion will be stronger when people spend more time on their self-aspects (Study 1). The current findings may offer new insights to research focusing on the SC-well-being association.

Fourth, the current research contributes to the literature on abusive supervision and servant leadership by studying their antecedents from two theoretical perspectives. Existing research on abusive supervision and servant leadership has predominantly focused on studying the outcomes of those leadership behaviors. In contrast, the research on examining the antecedents of those leadership behaviors is relatively little. In the current research, I responded to Van Dierendonck's (2011) suggestion and found that cognitively flexible leaders are more likely to be perceived as servant leaders and less likely to be perceived as abusive superivisors in the workplace.

Practical Implications

Findings in the present research also have important practical implications. First, organizations should encourage managers to have a healthy work/life balance. The results in the present research showed that leaders who have a greater number of social roles (e.g., parent,

hobbyist, and athlete) and have a more clear, coherent, and integrated selves will have better psychological well-being and be more cognitively flexible. Therefore, organizations can foster a healthy work/life balance climate, such as encouraging managers to explore other meaningful social roles and allowing managers to blur role boundaries and accommodate multiple identities and constituencies in the workplace.

Second, organizations should be vigilant in evaluating managers' psychological well-being. It is clear that considerable stressors and demands are embedded in the supervisory positions; thus, a certain degree of exhaustion may be considered inevitable at times. As the result in study 1 showed that the relationship between the interaction of high number of self-aspects and high degree of overlap among self-aspects and ego depletion will be weaker when the time is low rather than high, organizations can help managers to replenish their self-regulatory resources by providing them sufficient "off hours" after work or annual leave (Barnes, Lucianetti, Bhave, & Christian, 2015).

Third, given the pervasive and deleterious consequences of abusive supervision, organizations are well advised to prevent instances of exhaustion in supervisors' self-regulatory resources. Existing studies have shown that excessive job demands and unfair working conditions are likely to cause managers to experience exhaustion (Cole, Bernerth, Walter, & Holt, 2010; Halbesleben & Buckley, 2004; Lee & Ashforth, 1996). Therefore, organizations should carefully manage their job characteristics and working environments and allow their managers enough autonomy to schedule their tasks. Additionally, existing research (e.g., Awa, Plaumann, & Walter, 2010) also found that intervention programs designed to reduce one's mental fatigue can also be effective in assisting managers in avoiding the state of exhaustion.

Fourth, organizations can provide training and development programs to strengthen leaders' cognitive flexibility. Studies 3 and 4 showed that cognitively flexible leaders are more likely to be perceived as servant leaders and less likely to be perceived as abusive supervisors in the workplace. Therefore, organizations can provide or encourage their managers to participate in training and developmental programs that may help managers to interpret the issue from multiple perspectives, see more commonalities and interrelatedness in their previous experiences, and integrate their cognitive patterns with situational demands.

Limitations and Future Directions

Despite the theoretical and practical implications of the present research, several limitations remain to be addressed in future research. First, Studies 1 to 3 are cross-sectional and leadership behaviors are leaders self-rated, which may cause the issue of common method bias and limit our ability to interpret the associations appropriately. Moreover, although Study 4 has resolved this issue by collecting data at different time points, participants in Study 4 are predominantly working in the industries of information technology and manufacturing, which could limit the generalization of current findings in other industries. As such, future research can further examine the effectiveness of the number of self-aspects and the degree of overlap among self-aspects by considering this contingency factor. For example, the number of self-aspects and the degree of overlap among self-aspects may be more effective in R&D intense industries that require managers to concentrate on the projects and draw upon their previous experience to be cognitively flexible. In contrast, the number of self-aspects and the degree of overlap among self-aspects may not be that effective for managers in highly automated industries with relatively highly structured work processes.

Second, future research can consider other mediators or moderators to enrich our understanding of self-complexity theory. The current research only contained ego depletion and cognitive flexibility as mediators. According to the self-complexity literature, it is possible that individuals' diverse experience in different social roles (i.e., number of self-aspects) may affect their moral standard. For instance, Lu, Quoidbach, Gino, Chakroff, Maddux, and Galinsky (2017) have found that the breadth of foreign experiences can foster one's cognitive flexibility and moral relativism. In addition, Rai and Holyoak (2013) found that individuals who read a relativist definition of morality were more likely to cheat in the subsequent task than individuals who read an absolutist definition of morality in their experiment. As such, future studies can draw upon the findings in the current research to examine whether high self-complexity managers may be more perceived as abusive supervisors by their subordinates through the mediators of cognitive flexibility and moral relativism. As for the moderators, although the current research contained two psychological factors in self-complexity, future research can take cultural differences into consideration and conduct cross-cultural research. For example, Gelfand et al. (2011) have studied the differences between cultures that are tight (i.e., have several strong norms and a low tolerance of deviant behavior) versus loose (i.e., have weak social norms and a high tolerance of deviant behavior) across 33 nations and developed a scale to measure these cultural differences. It is possible that the negative associations between the components of self-complexity and ego depletion will be weaker when individuals perceive a tight rather than loose culture in their society.

Last, future research can develop some domain-specific self-complexity measurements. For example, Hannah and his colleagues (2013) have developed the military leader-specific self-complexity measure, whereas the present research has developed a general version of the self-

complexity measure. The future study can first employ Linville's (1985, 1987) free-response format to ask participants the meaningful sub-roles and traits that best help describe sub-roles in the specific domain, then adopt a similar format as the present research to develop the domain-specific self-complexity measure. In addition, future studies can also develop a scale to assess one's self-construct. As complexity theories are known for being difficult to measure, if researchers can introduce a scale to capture those components in self-complexity theory will make a significant contribution to this research area.

CONCLUSION

The present research revealed that the number of self-aspects and the degree of overlap among self-aspects are beneficial for individuals' psychological well-being and cognitive flexibility. In addition, ego-depleted leaders are more likely to be perceived as abusive supervision by their followers, whereas cognitively flexible leaders are more likely to be perceived as servant leaders and less likely to be perceived as abusive supervision by their followers.

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APPENDIX A

Ethical Assessment Form

The purpose of ethical review is to ensure that any ethical risks are managed appropriately, and to protect those involved. It is not intended to prevent work, but to ensure that risks havebeen suitably identified and addressed in the design of the project. This form is intended to assist review in line with the University's ethics policy, to identify possible risks and to gather further information where needed. The form will automatically direct you to the most appropriate review panel (if required).

In the first section you will provide the key project information, and you will then be asked to confirm whether your project involves any considerations which the University has identifiedas areas of potential ethical risk. If you select any of these areas you will be directed to somefurther screening questions to identify whether your project involves any significant risk areas. If your project does not involve any significant risk areas your project will not require any further review: you will be directed to the declaration and the process will be complete.

If your project does involve a significant risk area, you will be asked to complete some further questions relevant to the risks you have selected. Once you submit the form, it will be directedto the relevant review process. This process will vary according to the type of risk, and you canfind further information at https://www.dur.ac.uk/research.innovation/governance/ethics/process/.

All fields are required, unless indicated as 'Optional'.

Overview

This section is designed to collect the key project information.

Applicant	HU, ALEX H.
Preferred Name	Alex This will be used in emails sent to you by the system.
Applicant Email	han-lin.hu@durham.ac.uk
Department/School to which this application relates.	Business School
Status	Postgraduate Research
Student ID (Optional)	000851654
Supervisor or module leader	EPITROPAKI, OLGA

Students on the Durham and EBS Executive MBA Programme ONLY:If your supervisor is from EBS, please select the Durham programme director as your supervisor above, and enter the name of your EBS supervisor below.

Title of Project	The Relationship Between Self-Complexity and Abusive Supervision: A DualMediation Model
Type of Project	Research / Scholarship
Expected Start Date	25/02/2021
Expected End Date	22/09/2021

Does the project involve external funding? ○Yes ◉No

Ethical Considerations

The purpose of this section is to highlight whether your project involves any of the potential risk areas identified by the University. If you're not sure then select the area(s) that you thinkmay apply and review the further screening questions.

Does the project involve any of the following? (please tick all that apply):

☑ a) Living human participants/subjects, data about living individuals[1], or human tissue from living or deceased subjects.

[1]This includes both primary data (i.e. data you intend to collect directly) and secondary data (i.e. data already collected by others).

b) NHS or Social Care, including staff, patients, data or facilities.

c) A 'protected animal' as defined by the Animals (Scientific Procedures) Act[2] [2]The Act defines protected animals as: 'all living vertebrates, other than man, and any living cephalopod. Fish and amphibia are protected once they can feed independently and cephalopods at the point when they hatch. Embryonic and foetal forms of mammals, birds and reptiles are protected during the last third of their gestation or incubation period.'

d) Study of an organisation categorised as terrorist or violent extremist, or viewing or usage of materials that are subject to statute (e.g. Official Secrets Act / Counter- Terrorism and Security Act) or otherwise illegal.

e) Environmental implications, including any significant potential risk to a physical environment or material culture (including artefacts).

☐ f) International partners or work undertaken outside of the European Economic Area(EEA).

☐ g) Outputs which may be subject to export controls and which could: breach the UK's international commitments; present a risk to security; raise other significant ethical concerns, e.g. abuse of human rights, terrorism, contribution to conflict; or hamper sustainable development.

☐ h) Source of funding / resource (e.g. materials) or collaborator which raises ethical concerns. This includes (but is not limited to) organisations engaged with or closely connected to any of the following: arms manufacture, fossil fuel extraction, tobacco, alcohol, gambling or pornography.

☐ i) Any actual, potential or perceived conflict of interest.

☐ j) Other (please give details in the relevant section of the form)

☐ k) None of the above

Do any of the following apply to this project? (You should take into account your own activity for the project, and that of any other Durham University staff or students involved)

Yes - one more applies

No - none of these apply

- ☐ A member of staff or postgraduate research student will travel outside the UK for the purposes of this project.
- ☐ An undergraduate or taught postgraduate student will travel more than 60 miles from Durham for the purposes of this project (or more than 60 miles from their home, if based at home while undertaking research).
- ☐ An undergraduate or taught postgraduate student will undertake offsite work for the purposes of this project involving an overnight stay (other than in their own home).

Purpose of application

Please select the option which best applies:

- ◉ New project
- ○ Amendment to a project which has received ethical approval
- ○ Full application following provisional ethical approval / pre-funding application
- ○ Continuation of a project which has received ethical approval (request for renewal)
- ○ Other (please specify)

Project Summary

Please provide a summary of the project, including its purpose, rationale, design and methods, making clear any expected benefits (this should be written in a way that would be intelligible to non-specialists).

The current research outlines two mediation paths to enrich our understanding of the relationship between self-complexity and abusive supervision. In study 1, we first draw upon spill-over and buffering effects to examine the relationship between self-complexity and ego depletion, we then draw upon the conservation of resource (COR) theory to examine the relationship between one's cognitive capacity for self-regulation and abusive supervision. In study 2, we aim to employ the X-system (i.e., a reflexive pattern matching system) and the C-system (i.e., a higher order conscious reasoning system) in the neurocognitive model of the ethical decision-making process to examine how one's construction of the self (i.e., self-complexity) will affect his/her perception toward social and organizational norms (i.e., moral relativism) and perceived abusive behavior in the workplace.

In the present research, we aim to fulfill the research gap by (1) proposing new proximal (i.e., moral relativism) and distal (i.e., self-complexity) antecedents in predicting abusive supervision, (2) arguing that high self-complexity may have some hidden costs that prior research did not aware, and (3) investigating how individual differences in terms of personality traits as moderators interact with self-complexity will affect people's self- regulatory resource.

Where applicable, please upload relevant supporting documentation, e.g. a copy of theproject proposal detailing methods and reporting strategies.

Paragraphs for ethical form and funding applcation .docx

Existing or external ethical approval

Do any of the following apply to your project?

Yes
No

The project requires ethical approval from an external body

The project has already received ethical approval from an external body

The project is part of a larger project or activity which has already received ethical approval from the University

Screening Questions

The purpose of this section is to identify whether your project involves any of the higher risk factors relating to the areas you have selected. If you are unsure whether any of the factors apply, then seek further advice from your departmental ethics convenor, or from Research andInnovation Services (research.policy@durham.ac.uk)

HUMAN PARTICIPANTS / DATA / TISSUES

Please indicate which of the following are involved in your project (tick all that apply):

☑ a. Human participants / subjects. This includes primary data collection e.g. throughinteraction, observation or provision of data by individuals.

b. Secondary data that includes data relating to living individuals

c. Physical samples from humans / Human tissue

Does the project involve any of the following risk factors?

a) The intentional recruitment of participants in any of the following categories / raising the following issues:

Yes
No

☐ Children or Minors

☐ participants aged 15 years or under;participants aged 16-18 years;

Vulnerable adults*;

People in custody or on parole;

Welfare recipients;
People engaged in illegal activity (e.g. drug taking);
Communication issues may arise due to the language in which thestudy is conducted;
Small sample sizes where anonymisation is impractical.

* Vulnerable adults are defined as those who are relatively or absolutely incapable of protecting their own interests, or those in unequal relationships; e.g. people with learning or communication disabilities; people with dementia; participants who are subordinate to the researcher(s) in a context outside the research.

b) The project requires the co-operation of a 'gatekeeper' for initial accessto the groups or individuals to be recruited (e.g. students at school, members of a self-help group, residents of a nursing home). Yes No

c) Participants will take part in the study without full knowledge and consent at the time. (Please note that this includes observation of public behaviour, whether covert or overt, in any space other than those where people would expect to be observed by strangers. It also includes collectionof data without consent from interactive online spaces such as chat rooms and forums.) Yes No

d) Deliberately misleading participants. Yes No

e) A potentially sensitive topic, including e.g. collection or analysis of data relating to racial/ethnic origin, politics, religious beliefs, Trade Union membership, physical or mental health, sexual activity or orientation, illegal activities.

f) Risk to participants of physical or psychological harm, discomfort, stress, anxiety or any other negative consequence, beyond the risks encounteredin their normal life.

g) Participants will receive financial or other inducement (other thanreasonable expenses and compensation for time) to participate.

h) The project involves a physical intervention or use of physical humansamples or genetic/biometric data (including DNA).
This could include (but is not limited to):
Drugs, placebos or other substances (e.g. food, vitamins) administered to participants;
Invasive, intrusive or potentially harmful procedures of any kind;Prolonged or repetitive testing;
Blood or tissue samples (including saliva or waste products)obtained from participants;
Other human tissue in scope of the HTA and not covered by an existing HTB approval*

Collection or analysis of genetic data (including DNA);
Collection or analysis of biometric data.

* Refer to Human Tissue Authority guidance on relevant material	Yes No
	Yes No
	Yes No
	Yes No
i) Collecting / processing special category data without explicit consent	Yes No
j) Transferring or transporting special category data outside the European	Yes

Economic Area (EEA) (either travelling with data, or sending data to a thirdparty outside the EEA)	○ No
k) Members of the public who are acting as researchers or as co-producersin the design or delivery of the research (e.g. participatory research, citizen science).	○ Yes ○ No

Project Funding

Please add any further information regarding project funding. If the project is not in receipt of external funding, please indicate how any costs will be met. (Optional)

In the pilot study, we first put all relevant control variables and key measurements into the Qualtrics, the system shows that the estimated response time is around 20 minutes. In addition, we aim to employthe sample size of N = 500 managers whose first language is English to make sure that they can fully understand the scales through the online survey distribution platform – Prolific to examine the validity of our model. After putting all the above-mentioned criteria into the Prolific system and consent that weagree to pay £2.5 (£7.5/hour) to the participants, the total amount will be participant payment 500 x £2.5 + £416.67 (33 % service fee) + £83.34 (VAT is 20% of service fee) = £1750.01.

Regarding the funding, I will apply for the "research allowance" through the department.

Project

Where will the work be undertaken? (please tick all that apply)

- ☐ On University premises
- ☑ Outside the University, within the UK
- ☐ Outside the UK

Please specify the location(s) outside the University where the work will be taking place

Prolific - online data collection platform.

Please list other members of the project team at Durham.
If you have more than one supervisor, please include your additional supervisor(s) below.

Name	Department	Project Role
EPITROPAKI, OLGA	19	Supervisor
GUAN, YANJUN	19	Supervisor

Does your project involve external collaborators?

○ Yes
○ No

o

What are the intended methods for dissemination of project findings, e.g. Dissertation,Academic Journal, Conference?

Dissertation

Project Involving Human Participants / Data /

NB If your project involves secondary data, or tissue samples obtained via a third party, please

consider the data subjects or donors as 'participants'

Who are the participants?

Managers who are registered with the Prolific.

How many participants are involved? 500

Please describe how potential participants will be
a) identified, including how you will select them (your sampling strategy) and any criteria forselection e.g. inclusion / exclusion criteria;
b) recruited, including who will contact them and method of contact.

We will employ participants via the Prolific - online data collection platform, thus, participants in this study will only be the registered members who are willing to participate in this study. In addition, as all questionnaires in this study are in English and the outcome variable is leadership specific, we select the criteria that require participants in this study are (1) fluent English speakers and (2) managers in the workplace.

Please describe what the participants will be required to do. Please include:
- what is the activity (e.g interviews, questionnaires, other activity);
- where this will take place;
- how long are the sessions (for multiple sessions: how many sessions and total duration of participation in the study);
- any reward or remuneration for participants.
If the activity involves a sensitive topic or any risk to participants, please make clear what this is and how any risks will be mitigated.

There will be three sections in this study. The first section includes some demographic factors and personality traits. In the second sector, we are interested in the meaningful aspects of them or their lifeand the traits that can help describe those aspects. In the third sector, we are interested in (1) their perception toward social and organizational norms, (2) their beliefs and feelings about their behavior, and (3) their behavior in the workplace.

To complete this study, participants can answer the questionnaires either on their PC/laptop or on theirmobile phones. On average, this survey will take participants around 18 to 23 minutes to complete, with £2.5 (£7.5/hour) of reward.

Please upload copies of any data collection tools to be used (e.g. questionnaire, survey,example interview questions).

What types of data will be collected/analysed? (select relevant types below)

Written questionnaires

INFORMATION AND CONSENT

In this section you should ensure that you provide a full justification of any non-standard consent arrangements. If your project will involve covert observation or deception, please provide detail on the reasons for this and how it will be managed. If your project involves long term contact with participants, please indicate how continued informed consent will be ensured.

	Yes	No	Not Applicable
a. Will you give participants a written summary of your project, including how you will store and use any information given to you? (This is normally provided in an information sheet)	◉	○	
b. Will you give participants an oral verbal summary of your project, including how you will store and use any information given to you?	○	○	◉
c. Will you obtain written, informed consent from participants for participation and for all intended uses of the data arising from the project?	◉	○	
d. Will you tell participants that their involvement is voluntary and that they may withdraw from the research at any time (without their having to give any reason and without any repercussions)?	◉	○	
e. Will any monitoring or recording devices be used openly and only with the permission of participants?	○	○	◉
f. With questionnaires or interviews, will you remind participants of their option of omitting questions they do not want to answer?	◉	○	○
g. Will you automatically anonymise information in your work, or will you explicitly give all participants the right to remain anonymous?	◉	○	
h. Will you offer to provide participants with a lay summary of the research findings?	○	○	◉

Please provide any further relevant information regarding the information to be provided toparticipants, the arrangements for obtaining consent, and the basis for processing personal data.

In this research, we are interested in how individuals' self-view will affect their thinking and leadership style in the workplace. Thus, there are no right or wrong answers, please select the answers that truly reflect you.

There will be three sections in this survey. The first section includes some demographic factors and your personality traits. In the second sector, we are interested in the meaningful aspects of you or your life and the traits that can help describe those aspects. In the third sector, we are interested in (1) your perception toward social and organizational norms, (2) your beliefs and feelings about your behavior, and (3) your behavior in the workplace.

Please note that all the responses in this research are confidential and are following theguidance of the Durham University ethical team for the research purpose only.

If you have any concern, please email the researcher han-lin.hu@durham.ac.uk

Do you agree to participate in this research?

Please indicate what documents will be provided for participants, and upload copies of allrelevant documents, including your consent form, privacy notice, information sheet and debriefing sheet (where applicable).

☑ Information Sheet

☑ Front page for the pilot study.docx

Separate Privacy Notice

☑ privacy notice.docx

Consent Form

☑ consent form.docx

Debriefing Sheet

☐ debriefing sheet.docx

Other documentation for participants

Please indicate how you will ensure confidentiality and security of personal data, including atwhat stage your participants' data will be anonymised. NB. If non anonymised personal data will be released e.g. attributed verbatim quotes, then the circumstances and methods for obtaining consent must be highlighted.

In this study, we did not ask participants to reveal any of their personal information such as name, date of birth, or ID number in their organization. In addition, all the data in this study will be anonymized since they agree to participate in this research and will only be used for the research purpose.

What will happen in the event that a participant withdraws their consent (and what will happen to the data for that participant)?

If the participants do not agree to participate in this study, the system will automatically direct them to the page that says, "We thank you for your time spent taking this survey," and because they do not agreeto participate in this study, no data will be collected in this case.

Conflicts of Interest

A conflict of interest is defined as a relationship or interest that could lead to bias or perceivedbias in the design or delivery of the work.

Please provide details regarding any conflict of interest involved in the project: (Optional)

Conflict of Interest

Management Strategy

If the management strategy has been approved, please provide details (i.e. approved by,date of approval)

Please upload any relevant documentation

Other Issues

Please provide any relevant information not addressed elsewhere in this form. If your project raises any ethical issues not covered above, please provide a full description of theissues and how you intend to deal with them. This should include any issues relating to source of funding / resource or collaborator (where applicable). (Optional)

Governance

PROJECT RISK ASSESSMENT AND INSURANCE

Some departments require evidence of a project risk assessment and confirmation of insurance cover as part of the ethical review process. Please check your departmentalguidance before completing this section.

Will you provide the following as part of this application?

	No: Not I will required or not provide further documentation below	**Yes:** I will upload relevant applicable details	**Yes:**
a) Risk assessment regarding risk to participants and/or the project team	◉	○	○
b) Indication of insurance cover This is required for activities not covered by standard University insurance. If in doubt consultthe guidance on insurance and / or contact University insurance staff (please upload a copy of their response).	◉	○	○

DATA MANAGEMENT PLAN

Have you completed a data management plan for this project?

○ Yes
◉ No

If yes, please upload a copy of your data management plan.

Please describe the arrangements for managing data during and after the project, including who will have access to the data, the arrangements for storing / archiving data, and how longdata will be kept.

After participants have done the survey, I will download the data and employ the SPSS

to do further dataanalysis for the research purpose. There will not be others to have the access to download the data.

OTHER PERMISSIONS AND LICENCES

Please provide details of any other permissions or licences required for the project (e.g. DBScheck, SSI licence, permission from colleges for involvement of their students etc)?

Permission needed	Granting body	Status	Date of approval
		Select...	

Please upload any relevant documentation e.g. evidence of permission.

Supporting Documentation

Before submitting this form, please ensure that you have included all relevant supportingdocumentation

Currently attached documents:

Information Sheet	Front page for the pilot study.docx
Project proposal applcation .docx	Paragraphs for ethical form and funding
Privacy Notice	privacy notice.docx
Debriefing Sheet	debriefing sheet.docx
Consent Form	consent form.docx

Please tick to confirm:

☑ I have uploaded all relevant documentation

Declaration

Thank you for completing the University's Ethical Review Form. Please be aware that if you make any significant changes to your project you should complete this form again as furtherreview may be required. Please complete the declaration to submit your application.

I confirm that:

- ☑ I acknowledge my obligation to (and rights of) any participants, and my responsibility to be up to date and comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- ☑ The information contained within this application is accurate and complete.
- ☑ Any risks that may arise in conducting this project have been identified to the best of my ability.
- ☑ I undertake to abide by the University's ethical guidelines and the ethical principles underlying good practice provided in the guidelines appropriate to my field.
- ☑ The project will be undertaken in line with all applicable University, funder, legislativeand local standards and regulations.
- ☑ If the project is approved, I undertake to adhere to the study protocol, the terms of this application and any conditions set out by the ethics committee.
- ☑ No work will begin until all appropriate permissions are in place.

To be completed by the supervisor:

I have checked and approve the content of this form. ◉ Yes ○ No

Your department (or a programme within your department) has established parameters within which supervisors may give final approval to student projects. Please check the documentation available to determine whether this project is in scope of these parameters, and then select therelevant option below. If in doubt, please contact the relevant ethics co-ordinator in your department for advice.

☑ I confirm that this project is within the scope of the authorisation given for supervisor approval, and that I am willing to approve it on this basis. I am content that all relevantethical considerations have been identified and adequately addressed, and that the project does not require further ethical review.

☐ This project is outside the scope of the authorisation given for supervisor approval, or contains elements which I believe need further ethical review. Please provide your comments on the application in the box below, highlighting any particular issues whichrequire further scrutiny.

Please add any comments below.

Form Administration

Form version 5	
Application Reference	DUBS-2021-02-11T00_16_09-vtzj85
Form url	https://durhamuniversity.sharepoint.com/teams/researchoffice/ethics/For mRedirect.html?qdd=%2fteams%2fresearchoffice%2fethics%2fDUBS%20Forms%2fDUBS-2021-02-11T00_16_09-vtzj85.xml

APPENDIX B

Big Five Personality – Soto & John (2017)

Extraversion:

1. Tends to be quiet. (R)
2. Is dominant, acts as a leader.
3. Is full of energy.
4. Is outgoing, sociable.
5. Prefers to have others take charge. (R)
6. Is less active than other people. (R)

Agreeableness:

1. Is compassionate, has a soft heart.
2. Is sometimes rude to others. (R)
3. Assumes the best about people.
4. Can be cold and uncaring. (R)
5. Is respectful, treats others with respect.
6. Tends to find fault with others. (R)

Conscientiousness:

1. Tends to be disorganized. (R)
2. Has difficulty getting started on tasks. (R)
3. Is reliable, can always be counted on.
4. Keeps things neat and tidy.
5. Is persistent, works until the task is finished.
6. Can be somewhat careless. (R)

Open-mindedness:

1. Is fascinated by art, music, or literature.
2. Has little interest in abstract ideas. (R)
3. Is original, comes up with new ideas.
4. Has few artistic interests. (R)
5. Is complex, a deep thinker.
6. Has little creativity. (R)

Negative Emotionality (Neuroticism):

1. Worries a lot.
2. Tends to feel depressed, blue.
3. Is emotionally stable, not easily upset. (R)
4. Is relaxed, handles stress well. (R)
5. Feels secure, comfortable with self. (R)
6. Is temperamental, gets emotional easily.

Ego Depletion - Twenge, Muraven, & Tice (2004)

1. I feel drained.
2. I feel worn out.
3. I would want to quit any difficult task I was given.
4. I feel lazy.
5. I feel like my willpower is gone.

Abusive Supervision – Tepper (2000)

The items were prefaced with the statement, “My boss…” Respondents used a five-point response scale where 1 was “I cannot remember him/her ever using this behavior with me,” 2 was “He/she very seldom uses this behavior with me.” 3 was “He/she occasionally uses this behavior with me,” 4 was “He/she uses this behavior moderately often with me,” and 5 was “He/she uses this behavior very often with me.” The items were:

1. Ridicules me.
2. Tell me my thoughts or feelings are stupid.
3. Gives me the silent treatment.
4. Puts me down in front of others.
5. Invades my privacy.
6. Reminds me my past mistakes and failures.
7. Does not give me credit for jobs requiring a lot of effort.
8. Blames me to save my embarrassment.
9. Breaks promises that he/she makes.
10. Expresses anger at me when he/she is mad for another reason.
11. Makes negative comments about me to others.
12. Is rude to me.
13. Does not allow me to interact with my coworkers.
14. Tells me that I am incompetent.
15. Lies to me.

Civil-Abusive Leadership Dimension – Hanges, Grand, Epistola, & Stark (2021)

Which of these two behaviors best characterize you as a leader?

1. a. Frequently publicly belittle subordinates

b. Rarely avoid gossiping about employee's work and personal life to others.

2. a. Frequently ridicules subordinates.

b. Rarely encourage subordinates to have a healthy work/life balance.

3. a. Occasionally ridicules subordinates.

b. Occasionally avoid gossiping about employee's work and personal life to others.

4. a. Occasionally speak poorly about subordinates to others in the workplace.

b. Occasionally prevent subordinates from feeling worthless or stupid.

5. a. Rarely prevent subordinates from feeling worthless or stupid.

b. Occasionally encourage subordinates to have a healthy work/life balance.

6. a. Rarely is inconsiderate about subordinates' commitments outside of work.

b. Frequently encourage subordinates to have a healthy work/life balance.

7. a. Occasionally stop co-workers from belittling and insulting other employees.

b. Occasionally remind subordinates of their past mistakes and failures.

8. a. Rarely speak poorly about subordinates to others in the workplace.

b. Rarely encourage subordinates to have a healthy work/life balance.

9. a. Frequently stop co-workers from belittling and insulting other employees.

b. Rarely avoid gossiping about employee's work and personal life to others.

10. a. Frequently treat employees with respect and dignity.

b. Occasionally use employees past mistakes and failures as positive teaching opportunities.

11. a. Frequently publicly belittle subordinates.

b. Frequently remind subordinates of their past mistakes and failures.

12. a. Frequently tell subordinates that they are incompetent.

b. Rarely stop co-workers from belittling and insulting other employees.

13. a. Frequently speak poorly about subordinates to others in the workplace.

b. Occasionally remind subordinates of their past mistakes and failures.

Cognitive Flexibility – Martin & Rubin (1995)

The following statements deal with your beliefs and feelings about your own behavior. Please read each statement and respond by circling the number that best represents your agreement with each statement.

1. I can communicate an idea in many different ways.

2. I avoid new and unusual situations. (R)
3. I feel like I never get to make decisions. (R)
4. I can find workable solutions to seemingly unsolvable problems.
5. I seldom have choices when deciding how to behave. (R)
6. I am willing to work at creative solutions to problems.
7. In any given situation, I am able to act appropriately.
8. My behavior is a result of conscious decisions that I make.
9. I have many possible ways of behaving in any given situations.
10. I have difficulty using my knowledge on a given topic in real life situations. (R)
11. I am willing to listen and consider alternatives for handling a problem.
12. I have the self-confidence necessary to try different ways of behaving.

Servant Leadership - Liden, Wayne, Meuser, Hu, Wu, & Liao (2015)

1. My leader can tell if something work-related is going wrong.
2. My leader makes my career development a priority.
3. I would seek help from my leader if I had a personal problem.
4. My leader emphasizes the importance of giving back to the community.
5. My leader puts my best interests ahead of his/her own.
6. My leader gives me the freedom to handle difficult situations in the way that I feel is best.
7. My leader would NOT compromise ethical principles in order to achieve success.

APPENDIX C

Trait list - Rafaeli-Mor, Gotlib, & Revelle (1999)

1boring	2focused
4dishonest	3optimistic
5dependent	6honest
8nervous	7agreeable
11unmotivated	9happy
14sad	10loyal
16confused	12content
18lazy	13intelligent
20insecure	15relaxed
21lonely	17calm
23unfriendly	19ambitious
25mean	22independent
26uncaring	24active
27selfish	28considerate
30irresponsible	29secure
32immature	31interesting
33avoidant	34mature
35stressed	36trustworthy
38discontent	37helpful
41unintelligent	39creative
42pessimistic	40confident
	43conscientious
	44friendly