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EFFECTS OF SELF-CONSTRUALS ON UNIVERSITY STUDENTS' CAUSAL ATTRIBUTIONS, SELF-EFFICACY BELIEFS, AND SELF-HANDICAPPING BEHAVIOR

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EFFECTS OF SELF-CONSTRUALS ON UNIVERSITY STUDENTS' CAUSAL ATTRIBUTIONS, SELF-EFFICACY BELIEFS, AND SELF-HANDICAPPING BEHAVIOR

A Dissertation APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

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ABSTRACT

Markus and Kitayama (1991) have presented a self-construal model and identified two types of self-images held by individuals in individualistic and collectivistic cultures. The model proposes that individualists tend to have self images that emphasize the uniqueness of the individual (independent self-construal), while collectivists tend to have self-images that emphasize connectedness with others (interdependent self-construal). Furthermore, the model illustrates how these two types of self-images differently reflect on cognition, emotion, and motivation. Arguing that the two types of self-images coexist within an individual, Singelis (1994) has extended the model to apply to interpret variations in psychological patterns demonstrated by individuals in the same type of cultures.

The primary purpose of the present study was to examine the applicability of the model and Singelis' argument by investigating individuals in the same cultural setting (United States). In particular, the present study explored the relationships between each self-construal and the following psychological constructs: causal attribution patterns, levels of self-efficacy and confidence, implicit theory of ability, and use of self-handicapping strategies. In addition, the present study was aimed at examining associations between level of self-efficacy and causal attributions, and confirming the predictive power of self-efficacy for academic achievement.

Participants were administered the Self-Construal Scale (Singelis, 1994), the Implicit Theory Measure (Dweck & Henderson, 1989), the Patterns of Adaptive Learning Survey (Midgley et al., 2000), the subject-specific self-efficacy scale used in Bong's (2000) research, the Revised Causal Dimension Scale (McAuley, Duncan, & Russell,

1992), and measures of perceived importance of pervasive causal factors and confidence developed by the research.

The results showed that individuals who scored higher on the independent self-construal measure demonstrated self-enhancement in some of the attribution patterns, while those who scored higher on the interdependent self-construal measure did not exhibit self-enhancement in regard to the corresponding attributions. Additionally, the latter exhibited lower self-efficacy compared to the former. These findings supported the model and Singelis' argument by demonstrating variations in causal attributions and self-efficacy as related to individual differences in the level of each self-construal. However, some findings were inconsistent with the self-construal theory, and thus indicate a need to re-examine the model.

CHAPTER ONE

Introduction

A number of studies have investigated the relationships among students' attribution patterns, self-efficacy, and academic performance (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Dweck, 1975; Kloosterman, 1988). These studies indicate that attributing success to high ability, effort, and use of effective study strategies, and having high self-efficacy beliefs, are associated with a higher academic achievement. Conversely, attributing failure to low or a lack of ability, and having low self- efficacy beliefs, are correlated with lower academic achievement. Thus, studies have highlighted the importance of an individual's attribution pattern and self-efficacy, since they may impact the learner's academic performance.

Several cross-cultural studies have found cultural variations in patterns of causal attribution. In particular, comparative studies on individuals in individualistic (e.g., Americans) and collectivistic cultures (e.g., East-Asians) have consistently evidenced the latter's stronger emphasis on effort relative to the former, and the former's inclination towards ability relative to the latter (Chen & Stevenson, 1995; Hess, Chih-Mei, & McDevitt, 1987; Holloway, Kashiwagi, Hess, & Azuma, 1986; Ryckman & Mizokawa, 1988; Tuss, Zimmer, & Ho, 1995). Based on previous research that has contrasted perceptions about self shared among individuals in individualistic and collectivistic cultures, Markus and Kitayama (1991) have illustrated processes in which culturally shaped construal of self impacts a person's cognition, emotion, and motivation. According to Markus and Kitayama's (1991) conceptualization, people in individualistic cultures tend to refer to their own internal attributes when construing selfness

(independent self-construals), while people in collectivistic cultures are more likely to refer to other's thoughts and feelings toward them (interdependent self-construals). In an attempt to explain associations between each type of self-construal and types of causal attributions, Markus and Kitayama (1991) have focused on variations in the perceived nature of ability. For individuals in individualistic cultures, ability is perceived to be relatively absolute and less variable across situations. On the other hand, individuals in collectivistic cultures tend to perceive ability as being changeable through time and specific to situations (Hamaguchi, 1985, cited in Markus & Kitayama, 1991). Markus and Kitayama (1991) have argued that this contrast may be a reflection of a difference in self-construal, which varies in accordance with the type of culture that the person is in (i.e., individualistic versus collectivistic).

Several cross-cultural studies on causal attributions have reported that individuals in non-western cultural settings may perceive the nature of causal factors somewhat differently thanwestern people, and thus supported Markus and Kit ayama's (1991) argument on cultural variations in perceived nature of causal factors including ability (e.g., Betancourt & Weiner, 1982; Chandler & Spies, 1991, 1993; Hau & Salili, 1991).

Singelis (1994) has extended Markus and Kitayama's (1991) conceptualization by introducing the concept of dual-self demonstrated in Cross and Markus' study (1991). That is, each person may posses both independent and interdependent self-construals to varying degrees despite the culture that he or she is in. The dual-self indicates that independent and interdependent self-construals can coexist to varying degrees within individuals in individualistic cultural settings as well as those in collectivistic cultural settings. A number of empirical studies have found evidence of the dual-self. Moreover,

findings of these empirical studies suggest that the two types of self-construals are orthogonal dimensions, each of which has unique associations with a number of psychological variables (e.g., Derlega, Cukur, Kuang, & Forsyth, 2002; Narasakkunkit & Kalik, 2002; Singelis & Sharkey, 1995).

The concept of self-construal discussed by Markus and Kitayama (1991) differs from that proposed by Singelis and other researchers in the assumption that the independent and interdependent self-construals are traits shared among people in individualistic and collectivistic cultures, respectively. Therefore, when illustrating the influence of the two types of self-construal on cognition, emotion, and motivation, Markus and Kitayama (1991) focused on differences between groups of individuals with the independent self-construal (i.e., people in individualistic cultures) and those with the interdependent self-construal (i.e., people in collectivistic cultures). However, if both independent and interdependent self-construals exist within each person, it is necessary to investigate the impact of each of the two self-construals on cognition, emotion, and motivation.

Attribution theory has identified the importance of capturing the nature of individuals' perceived reasons or causes of successful and unsuccessful outcomes, since these perceived causes impact attitudes toward learning. The theory has proposed three dimensions that characterize the nature of the perceived cause: locus of control, stability, and controllability. Furthermore, the theory lists four pervasive causal factors that people typically perceive as being responsible for their academic performance: ability, effort, task easiness or difficulty, and luck. Each factor has been characterized in terms of locus of control, stability, and controllability dimensions (Weiner, 1979, 1983, 1992, 1994).

Scales have been developed to assess the nature or characteristics of individuals' perceived causes of academic outcomes both indirectly and directly. The indirect method, which has been utilized in many studies, asks participants to choose the most important factor from among the four pervasive causes (ability, effort, task difficulty or easiness, and luck) or to rate importance of each cause. Instead of asking the participants to directly report on causal dimensions, researchers derive the dimensions from the participants' emphasis on a certain cause(s). For instance, emphasis on items that represent attribution of academic outcomes to ability or effort are considered to be internal, while emphasis on items that represent attribution to easy or difficult task or luck is determine to be external. However, it has been argued that the indirect method does not consider the fact that the classification of each causal factor in terms of the dimensions should not be conceived as fixed and universal, because the meaning of each causal factor could vary between individuals (Weiner, 1979). And, in fact, empirical studies have found evidence of individual variations in perceptions of the nature of causes (e.g., Betancourt & Weiner, 1982; Chandler & Spies, 1991, 1993). Therefore, the use of the direct method is necessary, which directly assesses participants' perceived nature of the cause in terms of the dimensions.

Furthermore, attribution theory has discussed that each dimension is uniquely associated with a number of motivation and emotionalvariables such as level of expectancy of future goal attainment, esteem-related affect (e.g., self-worth or confidence), and interpersonal judgments (e.g., beliefs about other's responsibility for success and failure) (Weiner, 1979). Concurrently, social cognitive theory conceptualized the possible impact of different patterns of causal attributions on self-

efficacy (e.g., Bandura, 1993; Schunk, 1989, 1991, 1994). Moreover, theories of self have illustrated associations between individual's self-construal, self-efficacy, and causal attributions (Dweck, 1999; Markus & Kitayama, 1991).

Social cognitive theory defines self-efficacy as "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1993, p. 118). Like other expectancy beliefs, self-efficacy refers to beliefs about one's perceived capability. However, self-efficacy beliefs differ from other expectancy beliefs that concern confidence in general (e.g., general confidence in succeeding in academic areas that were not bound to the specific subject) in the reference to a specific task or subject (Pajares, 1996). Furthermore, self-efficacy can be a strong predictor of related academic outcomes, however, for the sake of its predictive power, task- or subject-specificity and consistency with a criterial task are required (Pajares, 1995, 1996).

A number of empirical studies have investigated the generalizability of self-efficacy (e.g., Bong, 2000; Kim & Park, 2000). Although these studies have confirmed the subject-specific nature of self-efficacy, the findings indicated the generalizability of self-efficacy as well. That is, not only subject- or task-specific self-efficacy, but also that measured in the more generalized level can be a strong predictor of related academic performance (Kim & Park, 2000).

Empirical studies have consistently found a positive association between self-efficacy and related academic performance (Eaton & Dembo, 1997; Hackett, Betz, Casa, & Rocha-Singh, 1992; O'Brien, Kopala, & Pons, 1999; Pajares & Johnson, 1995). That is, individuals with higher self-efficacy beliefs relative to those with lower self-efficacy

beliefs are likely to show higher achievement on related tasks. Moreover, studies that contrasted individuals with higher interdependent self-construals with those with higher independent self-construals in their response to negative information about the self have reported a stronger self-enhancing bias among the latter and a distinctive self-effacement among the former (e.g., Heine et al., 2001; Hymes & Akiyama, 1991; Narasakkunkit & Kalick, 2002). The self-enhancing bias refers to a tendency to credit preferable feedback about selves and discount negative feedback in order to maintain confidence, while the self-effacement refers to an opposite tendency.

Finally, the present study also addresses the relationship between type of self-construal and the use of self-handicapping strategies. Self-handicapping is a strategy used by students to avoid damage to their self-worth by altering the meaning of failure, which is associated with an ego-goal orientation, self-deprecation, negative attitude toward education, and lower grades (Covington, 1992, Martin, Marsh, & Debus, 2001, Midgley, Arunkumar, & Urdan, 1996). Self-worth theory and a number of empirical studies have suggested that individuals' entity theory of intelligence (i.e., intelligence to be fixed) is an important predictor of the use of self-handicapping strategies.

Markus and Kitayama (1991) argue that the different self-construals reflect different views of ability (Markus & Kitayama, 1991). Those with an interdependent self-construal perceive ability as situation specific and relatively changeable over a long time through the effort, which is similar to the incremental theory of intelligence, while those with an independent self-construal perceive ability as more fixed and independent from situations, which is similar to the entity theory of intelligence. Considering the similarities between the concept of ability as a reflection of independent self-construal

and the entity theory of intelligence, it can be assumed that an emphasis on the independent self-construal can be an important predictor for the use of self-handicapping strategies.

Based on the theories and the findings in previous research, the present study investigates the influence of type of self-construal on university students' causal attributions, self-efficacy, and the use of self-handicapping strategies.

CHAPTER TWO

Literature Review

The literature review focuses on three main topics: (1) theories and research on causal attributions in general and from cross-cultural perspectives, (2) theories and research on the construal of self, (3) theories and research on self-efficacy and its relationship with causal attributions and construal of self, and (4)theories and research on the tendency to use self-handicapping strategies.

Attribution Theory

Attributions refer to "the search for understanding" (Weiner, 1979, p. 3), the reasons or causes of successful and unsuccessful outcomes. The often asked attributional question is "Why did I succeed or fail?" (Weiner, 1979, p. 3).

Attribution theory lists the following four pervasive causal factors that people typically perceive as being responsible for their academic performance: ability, effort, task easiness or difficulty, and luck (Weiner, 1979, 1983, 1992, 1994). Likewise, attribution theory characterizes an individual's causal perception in terms of three dimensions: locus of control, stability, and controllability. Locus of control refers to the location of a factor: internal or external to a person. Stability pertains to the temporal nature of a factor, in other words, it refers to whether a factor is perceived to be relatively enduring or changeable from situation to situation or moment to moment. Controllability concerns the degree of volitional influence that a person can exert over a factor (Weiner, 1979, 1983, 1992, 1994). For instance, attributions to ability or effort are considered to be internal, while attributions to contextual settings or luck are assumed to be external. For the dimension of controllability, attributions to ability, contextual settings, or luck are

considered to be less controllable than that to effort. Finally, for the dimension of stability, attributions to ability or contextual settings are considered to be more stable than that to effort or luck (Weiner et al., 1971, cited in Lefcourt, von Baeyer, Ware, & Cox, 1979).

Based on the assumptions that classify each pervasive causal factor in terms of the dimensions, scales have been developed to assess participants' perceived importance of the four dominant causal factors (i.e., ability, effort, contextual settings, and luck) for their successful and unsuccessful academic performance (e.g., good or poor grades or general performance at school). An example of these scales is the Multidimensional-Multiattributional Causality Scale (MMCS: Lefcourt et al., 1979). However, as cautioned by Weiner (1979), the classification of each causal factor in terms of the three dimensions should not be conceived as fixed and universal, because the conception of each factor could vary over time or between individuals. This caution is supported by the findings of a number of empirical studies (e.g., Betancourt & Weiner, 1982; Chandler & Spies, 1991, 1993). In order to capture an individual's attribution pattern more accurately, it is necessary to ask participants to directly rate the causal dimensions associated with their attributional factors. This is the approach taken in the present study.

Impact of attributional patterns on academic performance. Empirical research on children's motivation has contrasted children with learned-helplessness with mastery-oriented children and has identified differences between these two type of children in terms of causal attributions, achievement goals, behaviors in the face of obstacles, and expectancies for future outcomes (Diener & Dweck, 1978; Dweck, 1975; Dweck & Reppucci, 1973). For example, learned-helpless children relative to their mastery-

oriented counterparts are more likely to perceive the cause of an undesired outcome to be internal, stable, and less controllable. Moreover, learned-helpless children tend to perceive the cause of a successful outcome to be external, unstable, and less controllable. Furthermore, learned-helpless children are more likely to have performance goals, which may lead them to avoid engaging in challenging tasks and surrender to obstacles, while mastery-oriented children are more likely to hold learning goals, which encourage them to choose challenging tasks and to persevere in the face of difficulty. Thus, comparison between learned-helpless and mastery-oriented children indicates that the differences in perceived dimensions of causal attributions would impact the achievement goals that children hold, which would further influence their behavior.

A similar finding was shown in a study of college students, which revealed a significant correlation between final math grades in algebra classes and the causal dimensions of stability and locus of control (Pierce & Henry, 1993). In this study, students' attributional styles were measured with two types of scales:the Attributional Style Questionnaire (ASQ) (Peterson et al., 1985, cited in Pierce & Henry, 1993) and the End of Term Questionnaire (ETQ) developed by the researchers. The ASQprovided students with twelve hypothetical events (six with positive outcomes and six with negative outcomes) related to daily life events, and asked them to indicate a major cause for each event and then rate that cause along each of the dimensions: internality, stability, and globality. The ETQ was designed to learn about the specific attributions of the students for the college algebra class, which they were about to complete. The students were asked to indicate the strength of the explanation for their own performance in the algebra class for each of the four causes (ability, effort, task easiness or difficulty, and

luck). Then, the students were asked to rate a cause of their performance along the causal dimensions of locus, stability, and globality. The ASQ was administered during the first few days of the term, while the ETQ was administered two weeks before the end of the term. The students' performance was measured with their final grades for the algebra class.

A significant negative correlation was found between the composite negative (i.e., the sum of the responses to the negative events) on the ASQ and final grades. The finding indicated that students who had "optimistic" attributions (i.e., attributing negative outcomes to external, unstable, specific circumstances) relative to those with "pessimistic" attributions (i.e., attributing negative outcomes to internal, stable, and global circumstances) performed better in the algebra classes. However, no significant correlation was found between the composite positive score (i.e., the sum of the responses to the positive events) on the ASQ and final grades.

A step-wise regression regressing the final grade on the specific attributions to ability, effort, task difficulty, and luck measured with the ETQ revealed that attribution to ability was the strongest predictor of the final grade, followed by attributions to task difficulty and effort. Moreover, a step-wise regression regressing the final grade on the dimensions of causal attributions revealed that stability would be a reliable predictor of final grade, which indicated that "students [who] believed that their performance would be similar in other math courses" were more likely to obtain higher grades than those believed their performance would be different in other math courses (Pierce & Henry, 1993, p. 8).

Empirical research indicates that the perceived characteristics of the causal factors may be associated with the type of achievement goal that an individual holds. Achievement goals refer to those that students hold in achievement situations, and are classified to be two types: learning goal and performance goal. The learning goal is about increasing learners' competence and reflects "a desire to learn new skills, master new skills, or understand new things – a desire to get smarter" (Dweck, 1999, p. 15). In contrast, the performance goal is about winning positive judgment of the learner's competence and avoiding negative ones (Dweck, 1999).

Hayamizu and Weiner (1991) examined relationships among university students' achievement goals, perceptions of ability, and perceived characteristics of causes. As conceptualized in Dweck's model (Dweck, 1986, cited in Hayamizu & Weiner, 1991), a negative correlation was found between the strength of the learning goal and perceived stability of low ability. In addition, a negative correlation was found between the learning goal and perceived stability of a lack of effort. Thus, Hayamizu and Weiner's (1991) findings confirmed Dweck's model by showing that university students who perceived low ability as more unstable, as well as those who viewed a lack of effort as more unstable, were more likely to have learning goals. To the contrary, no positive relationship was found between the performance goal and the perceived stability of low ability, which was assumed in Dweck's model. Hayamizu and Weiner (1991) suggested that the inconsistency with Dweck's model might be to a large extent due to a difference in concepts of the performance goal. That is, not like Dweck's (1986) conceptualization of the performance goal, Hayamizu and Weiner assumed that avoiding negative judgments of competence did not necessarily imply avoiding challenges. In addition,

Hayamizu and Weiner (1991) indicated a difference in the subject population that was used in their study (i.e., university students) and those on which the Dweck's (1986) model was based (i.e., younger children).

Cultural variations in attribution style. Cross-national studies have found that people in non-western cultures are likely to make causal attributions somewhat differently from people in western cultural settings. For example, studies that have contrasted White Americans with Asian Americans and with East Asian students in their attribution patterns and academic achievement on mathematics have consistently found Asians' stronger emphasis on effort as an important factor for their achievement outcomes relative to White Americans (e.g., Chen & Stevenson, 1995; Hess et al., 1987; Holloway et al., 1986; Ryckman & Mizokawa, 1988; Tuss et al., 1995). These studies indicate that Asians' and Asian Americans' effort-oriented attributions may be a reflection of their cultural background, namely, the Confucian doctrine, which believes in human malleability, and thus emphasizes critical roles of effort for self-improvement (Lin & Fu, 1990). These studies have consistently reported a positive association between effort-orientation and academic achievement among Asians. That is, Asian students relative to their Caucasian counterparts were likely to obtain higher grades in academic settings (e.g., Chen & Stevenson, 1995, Chen, Lee, & Stevenson, 1996; Eaton & Dembo, 1997; Leung, Maeher, & Harnisch, 1993; Tuss et al., 1995) and to attribute their academic outcomes more strongly to effort (e.g., Chen & Stevenson, 1995; Hess et al., 1987; Holloway et al., 1986; Leung, et al., 1993; Ryckman & Mizokawa, 1988; Tuss et al., 1995). Furthermore, findings have suggested that the effects of the Confucian doctrine might diminish due to acculturation to American norms. That is, Asian

Americans appeared to take an intermediate position between East Asians and White Americans in mathematics achievement and a degree of effort-orientation (e.g., Chen & Stevenson, 1995; Hess et al., 1987).

Construals of Self

The concept of self has been studied both from cultural and individual perspectives (Singelis, 2000). From a cultural perspective, Markus and Kitayama (1991) contrasted the prototypical view of self in individualistic cultures with that in collectivistic cultures, and named each type of self as the independent and interdependent self-construal, respectively. They further argued that each type of self is shaped by the cultural context, and to a large extent influences the individual's cognition, emotion, and motivation. Singelis and other researchers have extended the concept by re-conceptualizing it from the individual perspective. They discussed that these two types of views of self can coexist in an individual to a varying degree (e.g. Singelis, 1994). The present study utilizes Singelis' concept of self-construal as "a constellation of thoughts, feelings, and actions concerning one's relationship to others, and the self as distinct from others" (Singelis, 1994, p. 581). Since the view of self from an individual's perspective has been developed based on the view of the cultural perspective, the current study reviewstheories and empirical studies both from cultural and individual perspectives.

The construal of self as a cultural prototype. The view of self was developed based on studies that targeted individuals in western cultures. Markus and Kitayama (1991) expanded the view of self by introducing the East Asian view of self (Singelis, 2000). They further contrasted between western and eastern views in terms of construal

of self, others, and the interdependence of the two, and characterized western and eastern views of selves as independent and interdependent, respectively (Markus & Kitayama, 1991). A person with an independent type of view tends to construe him or herself as "an individual whose behavior is organized and made meaningful primarily by reference to one's own internal repertoire of thoughts, feelings, and action, rather than byreference to the thoughts, feelings, and actions of others" (Markus & Kitayama, 1991, p. 226). On the other hand, a person with an interdependent type ofview is more likely to see him or herself as "part of an encompassing social relationship and recognizing that one's behavior is determined, contingent on, and, to a large extent organized by what the actor perceives to be the thoughts, feelings, and actions of others in the relationship" (Markus & Kitayama, 1991, p. 221).

The independent and interdependent views differ in two ways. First, they differ in the significance of others in defining the self. For the interdependent view, others play a critical role in the definition of self. For instance, an individual is motivated to find a way to fit in with others, to fulfill and create obligation, and to become part of various interpersonal relationships (Markus & Kitayama, 1991). Thus, individuals with an interdependent self-construal formulate a sense of self through interpersonal relationships with relevant others. Although others are important for individuals with an independent self-construal as well, the role of others remains mostly as a reference for social comparison and self-validation. In other words, others are important primarily as "standards of reflected appraisal, or as sources that can verify and affirm the inner core of the self" (Markus & Kitayama, 1991, p. 226).

Second, the two self-construals differ from each other in terms of perceived core attributes. For individuals with an independent view, core attributes refer to one's absolute characteristics, which are invariant across situations and independent from interpersonal relationships. In other words, when construing self, those individuals are less likely to refer to specific situations (e.g., schools, work places, or home) or relationships with critical others (e.g., teachers, peers, coworkers, or family members). In contrast, individuals with interdependent view of self tend to perceive their core attributes as situation specific, and thus are often elusive and unreliable (Markus & Kitayama, 1991). This contrast is further associated with a difference in the cultural ideal of becoming mature. Autonomy has a primary significance in an independent type of culture, while autonomy has a lower significance in an interdependent type of culture (Markus & Kitayama, 1991). In other words, the formulation of an invariant core self as well as the ability to express one's unique attributes is perceived to be the cultural ideal of becoming mature in an independent type of society. On the other hand, the ability to adapt flexibly into a variety of contexts is recognized and valued as a reflection of maturity in an interdependent type of society (Markus & Kitayama, 1991).

Independent and interdependent self-construals as dimensions of the self. Singelis (1994) extended the concept of self-construal proposed by Markus and Kitayama (1991) by making clear distinctions between self-construals as dimensions of an individual's view of self (i.e., independent and interdependent self-construals) and those as cultural prototypes (i.e., individualistic and collectivistic view of self). Both views of self are concerned of relationships between self and others. However, the view of self-construals as cultural prototypes differs from the other type of self view in its

conceptualization that independent and interdependent self-construals exemplify individualistic and collectivistic cultures, respectively. For instance, the view explains that individuals in most northern and western regions of Europe, North America, and Australia, which may belong to individualistic cultures, are likely to possess the independent self-construal, while individuals in Asia, Africa, South America, and the Pacific islands region, which can be classified as collectivistic cultures, are likely to show characteristics of the interdependent self-construal.

Based on Markus and Kitayama's (1991) definitions, Singelis re-conceptualized self-construal as "a constellation of thought, feelings, and actions concerning one's relationship to others, and the self as distant from others" (Singelis, 1994, p. 581). Unlike Markus and Kitayama (1991), who emphasized that the two types of self were prototypes of collectivistic and individualistic cultures, Singelis (1994) proposed that individuals in any cultures had both independent and interdependent self-construals, however, to a varying degree. Singelis (1994) argued that the types of self-construals are orthogonal dimensions rather than bipolar opposites that classify individuals into either type.

To clarify that self-construals are two dimensions, Singelis (1994) introduced the conception of the dual self. The conception of the dual self is rooted in Triandis' (1989, cited in Singelis, 1994) argument that each individual's self has three aspects: "the private self – cognitions that involve traits, states, or behaviors of the person"; "the public self – cognitions concerning the generalized other's view of the self"; and "the collective self – cognitions concerning a view of the self that is found in a collective". An individual draws (or samples) a particular aspect of self when confronted with social situations. An individual with a strong independent view may primarily sample the

private self, while an individual with a strong interdependent view may primarily sample the collective and public elements. In addition, these aspects of self are developed differently, and the relative development of these aspects is affected by cultures. This conceptualization has been evidenced by Cross and Markus' (1991, cited in Singelis, 1994) study on American and East-Asian exchange students. They found that each student had both interdependent and independent elements in their self-construal. Moreover, the East Asian students had better developed interdependent self-construals than did their American counterparts, however, no differences were found in the development of the independent self-construals. Interestingly, some East Asian students who scored higher on independent self and lower on interdependent self could cope with the individualist situations of an American university better than did other East Asian students (Cross & Markus, 1991, cited in Singelis, 1994).

Based on the assumptions that independent and interdependent self-construals are dimensions that each individual possess to a varying degree, and the degree is measurable, Singelis (1994) developed a 24-item Self-Construal Scale (SCS). In order to validate the scale, Singelis (1994) utilized it to assess the strength of each self-construal of Asian American and Caucasian American college students. As predicted, Asian Americans showed stronger interdependent self-construal relative to their Caucasian American counterparts, while Caucasian Americans reported higher degree of independent self-construal relative to their Asian American counterparts. In addition, students who reported higher interdependent self-construals were more likely to make attributions to situational or contextual influences than did those who were high in independent self-construals. Based on these findings, Singelis (1994) reported that the

construct and predictive validity for the SCS were supported.

A number of empirical studies have demonstrated distinctions between self-construals and cultural indices (i.e., individualism and collectivism). For instance, Oetzel (1998) demonstrated differential effects of cultural individualism-collectivism (I-C) and individuals' self-construals on their decision-making behavior in homogeneous and heterogeneous groups. Findings indicated that I-C, independent self-construal, and interdependent self-construal can be used as predictors of different types of decision-making behavior in both homogeneous and heterogeneous groups. In addition, the assumption that I-C may have a direct and an indirect effect, mediated by self-construal, was supported. That is, I-C had direct and indirect effects on turn-taking and conflict tactics. Moreover, I-C had a direct effect on initiating conflicts (Oetzel, 1998).

Another instance of studies that demonstrated distinctions between cultural indices (i.e., individualism and collectivism) and self- construals is Abe-Kim, Okazaki, and Goto's (2001) research on Asian American university students. Instead of assigning participants into either individualistic or collectivistic group depending on their ethnic identifications, Abe-Kim et al. (2001) assessed their cultural indices with the Individualism-Collectivism Scale (Hui & Villareal, 1989, cited in Abe-Kim et al., 2001), which evaluated the following three factors: self-reliance versus interdependence, competition, and sociability with neighbors. Collectivistic individuals are assumed to score lower on self-reliance, lower on competition, and higher on sociability with neighbors, while individualistic individuals are expected to score in the opposite direction on each factor.

Abe-Kim et al. (2001) evaluated relationships among the following variables: generational differences (i.e., foreign born or U.S.-born), cultural indices (I-C), level of acculturation to North American culture measured with the Suinn-Lew Asian Self-Identify Acculturation Scale (SL-ASIA) (Suinn, Rikard-Figueroa, Lew, & Vigil, 1987, cited in Abe-Kim et al., 2001), and self-construals. They found that both I-C and the level of acculturation were sensitive to generational factors, while self-construal was immune. That is, the U.S.-born relative to foreign-born Asian Americans unexpectedly showed lower self-reliance and higher sociability with neighbors on the I-C scale, which was the characteristic of collectivistic individuals. In contrast, the U.S.-born Asian Americans had higher total scores on the SL-ASIA relative to their foreign-born counterpart, which indicated that they were more westernized relative to the foreign born Asian Americans. However, no correlations were found between SL-ASIA and either independent or interdependent self-construals.

In summary, Markus and Kitayama (1991) proposed two types of self-construal (i.e., independent and interdependent self-construals) as cultural prototypes (i.e., reflections from individualistic and collectivistic cultures). They contrasted the way in which individuals in collectivist cultures formulate the view of self with those in individualist cultures, and categorized each as interdependent or independent self-construal. However, Singelis (1994) argued that independent-interdependent self-construals should be considered to be two dimensions that each individual possess regardless of regional differences. He further developed a scale that was aimed at assessing individuals' strength of independent and interdependent self-construals. A number of empirical studies have supported Singelis' argument by showing differential

influences of self-construals and cultural indices on a number of variables (e.g., Abe-Kim et al., 2001; Oetzel, 1998).

Influence of self-construals on cognition and emotion. Markus and Kitayama (1991) hypothetically contrasted the influence of the two types of self-construal on cognition and emotion. First, for the independent view, the representation of self is more elaborated and distinctive in memory than representations of other persons, while the interdependent view makes greater elaboration of others than the self. In addition, when asked to describe the self, individuals with the interdependent self-construal tend to characterize themselves with certain behaviors taken in a specific social context. On the other hand, individuals with the independent self-construal are more likely to describe themselves and others in terms of "self in general" or "other in general" rather than in a context-specific way (Markus & Kitayama, 1991).

Second, Markus and Kitayama (1991) argue that the independent self-construal is associated with ego-focused emotions (e.g., anger, frustration, and pride), while the interdependent self-construal is related to other focused emotions (e.g., sympathy, feelings of interpersonal communion, and a shame). Associations between self-construal and emotional variables have been shown bya number of empirical studies both in academic and non-academic settings. For example, Singelis and Sharkey's (1995) study reported correlations between embarrassability (i.e., an anxiety or fear that is due to negative sanctioning or lower evaluation from others) and both independent and interdependent self-construal. The negative correlation between independent self-construal and embarrassability is interpreted as a reflection of the tendency of the independent view, which focuses more on the inner attributes of a self rather than others'

evaluations, to be concerned with the image of self, while a positive correlation between the interdependent self-construals and embbarrassability is due to the interdependent view's tendency to be concerned more of others' evaluations.

Another example of studies that have found associations between self-construal and emotional variables is Derlega et al.'s (2002) study. This study found a positive association between the interdependent self-construal and the discontinuity effect, which refers to a tendency to respond more competitively in the intergroup condition (e.g., playing as a group member against another group) than in the interpersonal condition (e.g., playing individually against other individuals). Based on the finding that individuals with higher interdependent self-construals showed intense discontinuity effect relative to those with lower interdependent self-construals, Derlega et al. (2002) indicated that the interdependent self-construal concerns how much one thinks about oneself as interconnected with an in-group. A higher inclination towards the interdependent self-construal leads individuals to perceive themselves as connected to and belonging to a particular in-group, which may make them expect friendly relations with in-group members but not with out-group members.

Studies have also shown associations between the interdependent self-construal and attitudinal variables in school settings. For instance, Cross and Vick (2001) investigated associations of interdependent self-construal with patterns of students' self-esteem and persistence during the first two years of an undergraduate program in engineering. They found differences in patterns of perseverance between students with higher and lower interdependent self-construal. For students with higher interdependent self-construal, their perception that they had relationships affirmed thattheir competence

was critical for them to stay in the engineering program after two years. On the other hand, for students with lower interdependent self-construal, that perception had no impact on their willingness to persevere in staying with the program. These findings suggest that development and maintenance of close relationships may be the foundation of self-esteem for individuals with higher interdependent self-construal (Cross & Vick, 2001).

Yeh and Arora (2003) explored relationships between school counselors' interdependent and independent self-construals, previous multicultural training, and universal-diverse orientation (i.e., "being aware and accepting of both the similarities and the differences among people" (Yeh & Arora, 2003, p. 79)). They found that interdependent self-construal and previous participation in multicultural workshops were important predictors of school counselors' universal-diversity orientation. They discussed that the higher interdependent self-construal an individual has, the more likely that he or she becomes aware of other people's needs, desires, and goals, which associates with a stronger universal-diverse orientation (Yeh & Arora, 2003).

Influence of self-construal on motivation. Markus and Kitayama (1991) contrasted the influence of the two types of self-construal on achievement and self-related motives. Achievement motives refer to "the desire to overcome obstacles, exert power, to do something as well as possible, or to master, manipulate, or organize physical objects, human beings, or ideas" (Markus & Kitayama, 1991, p. 241). Although the achievement motive is a fundamental and universally possessed human characteristic, the drive or motive for achievement for the interdependent view differs from the independent view (Markus & Kitayama, 1991). For the independent view, achievement involves pushing oneself ahead of others and exerting control over the environment. On the other

hand, the interdependent view may have a different desire for achievement, that is, a desire to accommodate themselves into a group and to meet the expectations of the group. For instance, the group can be a child's family. The child's mission is to enhance social standing of the family by gaining admission to one of the top universities (Markus & Kitayama, 1991). In another case, a student studies hard to meet the expectations of their teachers. Thus, individuals with an interdependent view often work hard to achieve goals that also affect others such as family and teachers (Markus & Kitayama, 1991).

Furthermore, Markus and Kitayama (1991) introduced two types of achievement motivation proposed by Yang (Yang, 1982; Yang & Liang, 1973, cited in Markus & Kitayama, 1991): individually oriented and socially oriented achievement motivation. Individually oriented achievement motivation refers to an autonomous desire to achieve an internalized standard of excellence, whereas socially oriented motivation refers to the desire to meet the expectations of significant others. Markus and Kitayama (1991) discussed that individually oriented motivation is associated with theindependent view, while socially oriented motivation is related to the interdependent view.

The second type of motive, self-related motive, refers to the desire to maintain a positive view of the self. Similar to the achievement motive, the self-related motive is fundamental and universal. However, self-related motives vary between the independent and interdependent views of self in terms of what constitutes a positive view. For the independent view, positive feelings about self require "fulfilling the tasks associated with being an independent self; that is, being unique, expressing one's inner attributes, and asserting oneself" (Markus & Kitayama, 1991, p. 242). This type of desire often results in a self-serving bias, which leads people to "take credit for their successes, explain away

their failures, and in various ways try to aggrandize themselves" (Markus & Kitayama, 1991, p. 242). In contrast, for the interdependent view, positive feelings about self are derived from "fulfilling the tasks associated with being interdependent with relevant others" (Markus & Kitayama, 1991, p. 242). Therefore, for the interdependent view, self-esteem may be associated with the capacity to control their own desires and the ability to flexibly adjust themselves to social contingencies. For the interdependent view, self-enhancement is perceived negatively. This type of self-related motives often leads to self-effacing bias (Markus & Kitayama, 1991).

Extending the argument of self-enhancing and self-effacing biases as reflections of independent and interdependent self-construal, Markus and Kitayama (1991) discussed variations in causal attributions between Americans and Japanese in relation to type of self-construal. First, they pointed out that the self-enhancing bias is demonstrated in American's causal attributions, while the self-effacing bias is revealed in Japanese causal attributions. For example, Americans showed a tendency to believe that their internal attributes such as ability and competence were important for explaining their performance, and this was particularly the case when they succeeded (Shikanai, 1978, cited in Markus & Kitayama, 1991). On the other hand, Japanese tended to attribute failure to a large extent to a lack of effort, while attributing success primarily to the ease of the task (Shikanai, 1978, cited in Markus & Kitayama, 1991). Markus and Kitayama (1991) indicated that for Japanese, ability is perceived to be more important after a failure than after a success, while task difficulty or ease is regarded to be more important after a success than after a failure, which is characterized as the self-effacing pattern.

More importantly, Markus and Kitayama (1991) pointed out differences in conceptions of ability between independent and interdependent views of self. For the interdependent view, ability is perceived to be situation specific and relatively changeable over a long span of time through the effort the person expends, while the independent view may perceive ability to be rather abstract and independent from situations. The situation-specific and changeable perception of the interdependent view of self can be related to the concept of self associated with it. Unlike the independent self, the interdependent self cannot be properly characterized as a bounded whole, since not the inner self, but the relationships of the person to others are focal and objectified in an interdependent self. Therefore, an interdependent self changes structures with the nature of the particular social context where the person has developed a unique relationship with another individual. (Hamaguchi, 1985, cited in Markus & Kitayama, 1991).

However, little research has investigated the applicability of Markus and Kitayama's (1991) hypotheses regarding the process through which independent and interdependent self-constructs are reflected in an individual's attribution patterns. Although Asian's tendency to view ability as incremental and dependent on their effort has been supported by a number of comparative studies that contrasted Asians and White Americans (e.g., Heine et al., 2001), it has not been determined whether this beliefs arise from cultural differences in self construal. Therefore, it is necessary to examine the relationships between self-construal and causal attributions. In particular, future study is needed, which investigates whether individuals with higher independent self-construals view ability as fixed and show the self-enhancing attribution pattern, while individuals with higher interdependent self-construals view ability as flexible and show self-effacing

attribution patterns.

Self-Efficacy

Self-efficacy is defined as "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1993, p. 118). Efficacy beliefs affect an individual's feelings, thoughts, motivation, and behaviors through the cognitive, motivational, affective, and selection processes (Bandura, 1993). Self-efficacy can be a strong predictor of related academic outcomes. In addition, self-efficacy mediates the influence of other determinants (e.g., ability, aptitude, ethnicity, gender, and socioeconomic status) of academic performance (Pajares, 1995, 1996).

Generalizability of self-efficacy. Based on Bandura's (1986, cited in Pajares, 1995, 1996) guidelines, Pajares (1995, 1996) distinguished self-efficacy from other expectancy beliefs as follows: "self-efficacy and other expectancy beliefs have in common that they are beliefs about one's perceived capability; they differ in that self-efficacy is defined in terms of individuals' perceived capabilities to attain designated types of performances and achieve specific result" (Pajares, 1996, p. 546). In particular, self-efficacy beliefs differ from other expectancy beliefs in that "self-efficacy judgments are both more task- and situation-specific and in that individuals make use of these judgments in reference to some type of goal" (Pajares, 1996, p. 546). Based on this conceptualization, Pajares (1996) identified two problems that are involved in many previous studies on self-efficacy. First, these studies assessed people's self-efficacy by asking their general confidence of succeeding in academic areas that are not bound to the specific subject, which results in weakening the predictive power of the self-efficacy.

Second, studies that assess participants' subject specific self-efficacy beliefs can be problematic, if they aimed at predicting the role of self-efficacy beliefs for task free outcomes (e.g., semester grades or generalized achievement test scores). He suggests that the subject or task-specificity in the measurement of self-efficacy and consistency with a criterial task are necessary for the sake of a predictive power of self-efficacy (Pajares, 1995, 1996).

Bong (2000) has supported Pajare's argument by demonstrating the subject-specific nature of self- efficacy with Korean middle and high school students. The students' self-efficacy beliefs related to four subject areas (i.e., Korean, English, Mathematics, and Science) were measured with subject-level academic self-efficacy items adapted from the Patterns of Adaptive Learning Survey (PALS: Middleton & Midgely, 1997; Roeser, Midgley, & Urdan, 1996, cited in Bong, 2000). First, she examined a basic first-order factor model where each indicator loaded on a single factor and where all factors were presumed to be correlated, and confirmed that there is acceptable fit for both middle and high school students. Thus, the finding supported subject-specificity in self-efficacy. Furthermore, she investigated higher-order correlation models and obtained different results from high school and middle school groups. For middle school students, a model that specified a general factor underlying all four subject-specific factors represented the best fit, while for high school students, a model that specified verbal (i.e., Korean and English) and quantitative (i.e., math and science) second-order factors showed the best fit. In other words, high school students' self-efficacy beliefs were somewhat distinctive between verbal and quantitative subjects, whereas middle school students' self-efficacy beliefs were more similar across different

subject areas. In either case, the emergence of the first-order subject-specific factors indicates support for the subject specificity of self-efficacy.

Furthermore, Kim and Park (2000) have demonstrated the hierarchical structure of self-efficacy with regard to generality levels (subject-specific, context-specific, and domain-specific) and its relationship with academic achievement among Korean high school students. That is, the context-specific self-efficacy beliefs predicted the domain-specific self-efficacy beliefs, and the domain-specific self-efficacy beliefs predicted students' achievement scores in verbal and quantitative domains. Furthermore, both subject-specific and context-specific beliefs were strong predictors for corresponding achievement scores. However, the context-specific beliefs were found to be stronger predictors than the subject-specific beliefs. This finding was inconsistent with the theory and other research findings that indicate subject-specific self-efficacy is a stronger predictor of related academic performance than self-efficacy measured through a broader omnibus scales.

Kim and Park's (2000) study has provided empirical evidence that not only subject- or task-specific self-efficacy, but also self-efficacy measured in the more generalized level, can be a strong predictor of related academic performance. However, there may be limitation in generalizability of their findings, since "there may be important differences in motivational patterns between Korean or Asian students in general and Western students" (Bong, 2000, p. 13). Further study that examines the generalizability of self-efficacy across a variety of cultural contexts is necessary. Since the generalizability of self‡ efficacy has not been confirmed, this study will follow Bandura's guidelines and focus on the task specific self-efficacy beliefs (i.e., students'

beliefs about their capabilities to achieve satisfactory level in the first exam in a specific math course), and will investigate the self-efficacy beliefs' predictive power for the related task (i.e., outcome of the first exam in the course).

An association between selfe fficacy beliefs and school performance. Research has demonstrated thatthe level of students' self-efficacy beliefs can be a strong predictor of their academic performance in the related tasks. For instance, Hackett et al. (1992) investigated the predictive power of different self-efficacy beliefs (i.e., self-efficacy for occupational and academic abilities, adapted from Lent, Brown, and Larkin, 1986, cited in Hackett et al., 1992) for a variety of outcomes in university students majoring in Engineering consisting of White Americans, Hispanics, African Americans, and Asian Americans. The purpose of the study was to examine which type of self-efficacy would be a better predictor of the students' high school GPA and SAT scores (past performance), their cumulative college GPA, and their spring quarter college GPA. The correlation coefficients revealed that both occupational and academic self-efficacy beliefs were significantly correlated with the college GPAs (both the cumulative and spring quarter). Overall, the forward-selection stepwise multiple regression analysis revealed that self-efficacy for academic achievement was a stronger predictor of students' college GPA than occupational self-efficacy.

Pajares and Johnson (1995) investigated the relationship between writing self-efficacy beliefs and writing skills among ninth graders in public high school. They operationalized writing self-efficacy as "students' judgments of their competence in writing, specifically their judgments that they possess various composition, grammar, usage, and mechanical skills" (Pajares & Johnson, 1995, p. 10). Students' writing

performance was assessed with a 30-minute essay writing task, while their self-efficacy beliefs were assessed on a questionnaire developed by the researchers. Taking into consideration theoretical guidelines that indicate that self-efficacy beliefs are sensitive to a context and thus need to specifically correspondence with the assessed performance, identical criteria (i.e., students' demonstration of grammar, usage, composition, and mechanical skills) were used for scoring the students' essays and for creating self-efficacy items, so that they were corresponded each other.

The path analysis revealed both direct and mediating effects of self-efficacy for predicting writing performance, which was consistent with the theory. Among self-efficacy, apprehension, and aptitude, which showed significant direct effects on performance, self-efficacy and writing aptitude appeared to have stronger effects. In addition, findings indicated that writing aptitude impacted writing performance through its effect on students' writing self-efficacy beliefs. Based on the findings, Pajares and Johnson (1995) emphasized the important role of self-efficacy beliefs for the related performance and suggested that teachers should make an effort to prevent students from developing negative perceptions and to raise their level of confidence.

Relationship between causal attributions and self-efficacy. Attribution theory explains that each of the three causal dimensions (i.e., locus, stability, and controllability) is uniquely associated with a number of psychological consequences (Weiner, 1979, 1983, 1992, 1994). The locus of control dimension affects self-esteem. For example, attributing success to an internal cause promotes an individual's pride or self-esteem (Eccles & Wigfield, 2002). The stability dimension is related to changes in expectancy of success and failure, and it also influences affective reactions (e.g., feelings of

hopelessness). The controllability dimension is associated with sentiments and evaluations of others (Weiner, 1983). Weiner (1983) describes the impact of the controllability dimension as follows:

> If another person fails or is in need of aid because of a controllable cause, such as lack of effort, then that person often elicits anger and is negatively evaluated. On the other hand, if failure or need is due to an uncontrollable cause such as a physical handicap, then that person elicits sympathy and is positively evaluated. (p. 531)

Likewise, the self-efficacy model in social cognitive theory illustrates the impact of attributions on self-efficacy. For example, attribution of success to one's ability would be likely to raise self-efficacy; however, attribution of success to effort, if it is perceived to be compensating for lack of ability, would not raise self-efficacy. Likewise, attribution of success to the context such as other's help would not raise self-efficacy (Bandura, 1993; Schunk, 1989, 1991, 1994).

Social cognitive theory explains that self-efficacy beliefs influence causal attributions for academic success and failure, and these attributions further impact academic achievement both directly and through the mediated effects of other factors such as persistence and perseverance (Bandura et al., 1996; Pajares, 1995). Moreover, Silver, Mitchell, and Gist (1995) illustrated an impact of self-efficacy on causal attributions and academic achievement as follows: "self-beliefs of efficacy should influence causal attributions for performance, and these attributions should, in turn, affect subsequent self-efficacy appraisal. Self-efficacy will then be related to future motivation, performance, and causal attributions, creating tendencies to persist or give up" (p. 286).

The first study examined whether differences in self-efficacy are related to the causal attributions thatstudents make for successful and unsuccessful performance . First, Silver et al. (1995) asked their participants to fill out a self-efficacy measure thatcorresponded with a task (i.e., a data sufficiency test taken from the Graduate Management Admissions Test), and then asked them to complete the task. After the test, the participants received feedback consisting of answers and explanations for each problem, and then reported their causal attributions of their success and failure for each problem by dividing 100 points among ability, effort, good or bad luck, and task ease or difficulty attributions. From the points assigned to each causal factor, the researchers calculated causal dimension scores (i.e., locus of causality and stability dimensions). The finding that self-efficacy was positively correlated with subsequent performance was consistent with theory and findings from the previous research. Regarding successful performance, a positive relationship was found between self-efficacy and internal and stable attributions, while no relationship was found between self-efficacy and the locus of causality dimension. For unsuccessful performance, both internal and stable attributions were found to be negatively correlated with self-efficacy. Thus, Silver et al.'s (1995) study indicates thatassociations between self -efficacy and causal attributions differ for successful and unsuccessful performance.

In orderto examine whether past performance and causal attributions can be determinants of subsequent self-efficacy, Silver et al. (1995) conducted a second study. In this study, participants were asked to take two tests. After the first test, the participants obtained feedback, and were asked to estimate their efficacy for a subsequent problem set. At the same time, the participants were asked to make attributions for their

performance on the first test. Their attributions were assessed by two types of methods: a direct method that used the Causal Dimension Scale (CDS) developed by Russell, McAuley, and Tarico (1987, cited in Silver et al., 1995), and an indirect (derived dimensions) method. The direct method asked the participants to choose the most important cause of their successful and unsuccessful performance from among the four causal attributions (i.e., ability, effort, good or bad luck, and test ease or test difficulty) and then to evaluate on each of the locus of causality and stability dimensions. On the other hand, the indirect method asked the participants to indicate the degree of importance of ability, effort, good or bad luck, and test ease or difficulty in contributing to their successful or unsuccessful performance. Then, scores on locus of causality and stability dimensions were calculated in accordance with the degrees of emphasis on these causal factors. A Pearson product-moment correlation between the first test performance and subsequent self-efficacy showed a positive correlation between them.

To examine the relationship between causal attributions and subsequent self-efficacy, Silver et al. (1995) split the participants into successful and unsuccessful groups based on their test score. For the successful group, a positive correlation was found between the locus of controllability dimension and their subsequent self-efficacy, while a negative correlation was found between the locus of causality dimension and subsequent self-efficacy for the unsuccessful group. In addition, a positive correlation was found between subsequent self-efficacy and the importance of ability and good luck as causes of successful performance, while a negative correlation was found between subsequent self-efficacy and the importance of lack of ability and the difficulty of the task as causes of unsuccessful performance. Furthermore, hierarchical multiple regression analyses

were performed separately for successful and unsuccessful group in order to determine the proportion of variance in subsequent self-efficacy accounted for by past performance and attributions. The results indicated thatnot only level of past performance, but also the participants' causal attributions regarding their previous performance accounted for subsequent self-efficacy. In particular, the locus of causality dimension accounted for unique variance in self-efficacy.

In sum, Silver et al.'s (1995) research suggested that initial self-efficacy was related to future performance, and the previous performance was related to the subsequent self-efficacy. In addition, the research indicated that the level of initial self-efficacy resulted in different attributions for performance, and these attributions were related to subsequent self-efficacy level. Thus, the research findings have supported theories by demonstrating that performance, self-efficacy, and causal attributions are all interrelated (Silver et al., 1995).

Further study is necessary to extend Silver et al.'s (1995) studies. First, in addition to locus of causality and stability dimensions, a controllability dimension needs to be included in the investigation, which was not addressed in Silver's (1995) study. Second, participants' perceived outcomes (successful or unsuccessful) in addition to their actual performance indicated by their test scores need to be included to explore whether there are any variations in the relationships among self-efficacy, attributions patterns, and outcomes, when compared between actual and perceived outcomes. Therefore, the current study will investigate the relationships among self-efficacy, attribution patterns in terms of three dimensions, and outcomes, both based on reported perceived outcomes and actual performance (i.e., obtained test scores).

Influence of type of self-construal on self-efficacy. As reviewed, the different achievement motivation for the independent versus the interdependent self-construal leads to varying types of positive views about selves and thus often results in a certain type of causal attributions and self-efficacy beliefs: self-enhancing and self-effacing biases, respectively. A number of cross-national studies have compared individuals in cultures where independent self-construals are dominant (e.g., individualistic culture such as the United States or Canada) with individuals in cultures where interdependent self-construals are dominant (e.g., collectivistic culture such as Japan). These studies supported this argument by finding that self-enhancing causal attribution patterns (e.g., attributing successful performance to external and unstable factors, while attributing unsuccessful performance to internal and stable factors) are more frequently observed among individuals in the former type of culture, while self-effacing patterns (e.g., attributing successful performance to external and unstable factors, while attributing unsuccessful performance to internal and stable factors) are more obvious among those in the latter type of culture (e.g., Heine et al., 2001; Hymes & Akiyama, 1991).

Reviewing a number of comparative studies between Japanese and American college students, Markus and Kitayama (1991) contrasted self-enhancing biases that are distinctive among Americans with self-effacing biases that are common among Japanese, and discussed differential influences of these biases on students' attitudes and self-evaluation as reflections of the negative information about their competencies. First, Americans believed that only a small portion of people would have higher intellectual abilities than themselves, while Japanese estimated that about half of people would have more of a given trait or ability (Markus & Kitayama, 1991a, cited in Markus & Kitayama,

1991). Second, Japanese students reported greater confidence in their self-evaluation of their ability to complete a task and were less interested in seeking further information when they had unfavorable feedback than when they had favorable feedback (Wada, 1988; Takata, 1987, cited in Markus & Kitayama, 1991). On the other hand, American students showed little confidence in their self-estimate of their ability and sought further information when they discovered that they performed poorly relative to another person (Schwartz & Smith, 1976, cited in Markus & Kitayama, 1991). Markus and Kitayama (1991) discussed that these tendencies demonstrated by Americans and Japanese were characterized as self-enhancing and self-effacing biases, which result from the type of self-construal that they have. A number of comparative studies have confirmed Japanese lower exhibition of self-enhancement relative to their American counterparts (e.g., Heine et al., 2001; Hymes & Akiyama, 1991). Moreover, Heine et al.'s (2001) study found that Japanese university students showed evidence of self-criticism (i.e., demonstrating higher sensitivity to information indicating their weakness rather than strengths), which may aid them in spotlighting the areas in which they need to make efforts to correct deficits.

Several studies have investigated the relationship between type of self-construal and self-enhancement. These studies have found that the impact of self-construal on self-enhancement is mediated by behavioral traits that are valued differently by those holding independent and interdependent self-construals. For instance, Sedikides, Gaertner, and Toguchi (2003) demonstrated that American students self-enhanced on individualistic behaviors, but self-effaced on collectivistic behaviors, while Japanese students self-enhanced on collectivistic behaviors, but neither self-enhanced nor self-effaced on individualistic behaviors. No difference in the magnitude of self-enhancement was found

between these two cultural groups. Furthermore, among Japanese students, those who scored higher on the independent self-construal items self-enhanced on individualist behaviors and self-effaced on collectivistic behaviors, while those who scored higher on the interdependent self-construal items self-enhanced on collectivistic behaviors and self-effaced on individualistic behaviors. Again, there was no difference in the magnitude of self-enhancement between the two groups. Based on these findings, Sedikides et al. (2003) indicated the followings: (1) self-enhancement is a universal motive, (2) both independent and interdependent groups self-enhance, but on different dimensions, and (3) that difference in dimensions may have resulted from the fact that personally important dimensions differ between independent and interdependent groups.

Narasakkunkit and Kalick (2002) conducted a similar study, but found a different pattern in the relationship between the self-construals and self-enhancement. They asked participants to estimate the percentage of people of the same age and sex that are better than themselves on ten traits, containing five valued by the independent construal of self (i.e., attractive, interesting, independent, confident, and intelligent) and five valued by the interdependent construal of self (i.e., cooperative, loyal, considerate, hard-working, and dependable). Unlike Sedikides et al.'s (2003) study that demonstrated equal magnitude of self-enhancement between Americans and Japanese, and between Japanese with higher independent and interdependent self-construals, Narasakkunkit and Kalick's (2002) study showed that White-Americans relative to Asians showed more self-enhancement. Moreover, a positive correlation was found between self-enhancement and the independent self-construal, while no correlation was found between self-enhancement and the interdependent self-construal. Their findings indicate that the only independent

self-construal is associated with a tendency to self-enhance, even though items that are favorable for both types of self-construals are included. Further research is necessary to confirm that not the interdependent but the independent self-construal is associated with self-enhancement patterns. Moreover, few studies have investigated the relationship between independent and interdependent self-construals and self-enhancement or self-effacement as reflected in self-efficacy in academic settings. Therefore, the present study will examine whether individuals with higher independent self-construals relative to individuals with higher interdependent self-construals are more likely to estimate higher self-efficacy regardless of the perceived and actual performance on a math test.

Self-Handicapping Strategies

In summary, three major characteristics that distinguish between those with independent and interdependent self-construals can be identified. First, these construals differ in terms of the role or importance of others to the self. For the interdependent self-construal, the sense of self is formulated through interpersonal relationships with relevant others, while interrelationships with others merely plays as a reference for social comparison and self-validation for independent self-construal (Markus & Kitayama, 1991). Empirical studies have shown evidence that interpersonal relationships are more critical for individuals with a higher interdependent self-construal than those with a higher independent self-construal (e.g., Cross & Vick, 2001; Yeh & Arora, 2003). Second, these two construals differ in terms of perceived core attributes. The independent self-construal's core attributes are invariant and independent either across situations or interpersonal relationships, while the interdependent self-construal's core attributes are variable depending on situations or interpersonal relationships with relevant

others (Markus & Kitayama, 1991). Third, these different types of core attributes are associated with variations in views of ability (i.e., fixed or malleable) and patterns in causal attributions and a level of self-efficacy (i.e., self-enhancing or self-effacing).

Views of ability as influencing the use of self-handicapping strategies. In her essays on self-theory, Dweck (1999) contrasts two types of perceptions about the nature of intelligence called "theories" of intelligence (Dweck, 1999, p. 20): a fixed, entity, theory and a malleable, incremental, theory. The entity theory conceives intelligence as fixed, while the incremental theory describes intelligence as more dynamic, a quality that can be increased. Intelligence theories have a direct effect on students' goal choices (i.e., mastery or performance goals). Empirical studies have found relationships between the theories of intelligence and goal choices: the more students hold an entity theory of intelligence, the more likely they are to choose a performance goal, while the more they hold an incremental theory, the more likely they are to choose the learning goal (Bandura & Dweck, 1985; Leggett, 1985; Dweck & Leggett, 1988, cited in Dweck, 1999). Furthermore, Mueller and Dweck's (1997, cited in Dweck, 1999) experimental study found that given an entity passage, students were more likely than others to select a performance goal task, and those who were given an incremental passage were more likely than others to choose a learning goal task (Mueller & Dweck, 1997, cited in Dweck, 1999).

Explaining how the theories of intelligence affect students' choice of goals, Dweck (1999) contrasts the meaning or implications of failure to individuals with the entity and incremental theories. For individuals with entity-theory, a failure means low intelligence, and thus is to be avoided, whereas for incremental theorists, it means that

their present strategy or skills are inadequate, and thus works as a cue to try something new. Even though entity theorists may believe that learning for the sake of learning is desirable, they would "rather validate their intelligence than risk invalidating it by trying to learn something difficult" (Dweck, 1999, p. 27). Furthermore, effort has different meanings to entity and incremental theorists. For entity theorists, effort is called to compensate for low intelligence, while for incremental theorists effort can be used to improve their intelligence.

Self-worth theory (Covington, 1992) illustrates the meaning of failure to students who confuse ability to achieve competitively with self-worth, which is often the case in schools. Self-worth refers to the search for self-acceptance, which is assumed to be the highest human priority (Covington, 1992). In schools, a sense of worth is often related to students' ability to achieve competitively. Success may indicate high ability, while failure can imply low ability and thus risk students' sense of worth. However, that assumption is not always true depending on attributions that students make to explain the success or failure (Covington, 1992). For example, success as a result of much effort may limit its role as an indicator of high ability, while success without much effort can imply high ability. Likewise, attributions influence the meaning of failure in relation to self-worth. Failure after working hard may indicate low ability and thus risk one's self-worth, on the other hand, failure due to external and uncontrollable factors or little effort do not necessary imply low ability, therefore, does not harm the students' sense of self-worth.

Self-handicapping is a strategy used by students to avoid damage to their self-worth by altering the meaning of failure (Covington, 1992; Martin et al., 2001). Self-

handicappers introduce impediments or obstacles to their performance so that they are able to show that the cause of potential failure isthose impediments rather than low ability. Self-handicapping includes procrastination (i.e., "postponing until tomorrow what one might do today" (Covington, 1992, p. 85), having unattainable goals (i.e., holding exceedingly challenging goals that most individual could fail), underachieving (i.e., avoiding "any test to their ability by refusing to work" (Covington, 2001, p. 87), and using the academic wooden leg (a minor personal weakness or handicap) as an excuse of failure. Those excuses not only protect students' self-worth in the face of failure (self-protective self-handicapping), but also add more credit to their perceived level of ability when they succeed (self-enhancing self-handicapping). Although the use of this strategy temporarily relieves the pain of academic failure, it is positively associated with an ego - goal orientation, self-deprecation, negative attitude toward education, and lower grades (Martin et al., 2001; Midgley et al., 1996). Moreover, self-handicappers are more concerned with other's view of themselves and outperforming other students, while those who are less likely to adapt self-handicapping strategy are more intrinsically oriented and enjoy the experience of mastery and challenge tasks (Martin, Marsh, Williamson, & Debus, 2003).

Martin et al.'s (2001) study of Australian university students revealed relationships between self-handicapping and other motivational constructs, including goal orientation (i.e., task and performance orientation), attributional orientation, and students' theories about intelligence. Analysis with first- and higher order confirmatory factor analysis (CFA) and structural equation modeling (SEM) revealed that task-orientation, external attributional orientation, and performance orientation were important predictors

of the use of self-handicapping strategies. Among them, task-orientation was the strongest negative predictor, external attributional orientation was a key factor, and performance orientation was a weaker predictor of the use of self-handicapping strategies. A positive association of the entity view of intelligence with the use of self-handicapping strategies was assumed, since theoretically, entity theorists saw their intelligence as more fixed and were more concerned with protecting or augmenting their self-worth than with mastery learning. On the other hand, because incremental theorists saw their intelligence as something that could be changed or improved, and interpreted failure as a indicator of an opportunity for improvement rather than low intelligence, a negative association of the incremental view of intelligence with the use of self-handicapping strategies was expected. However, inconsistent with the hypotheses, neither the entity nor incremental view of intelligence appeared to predict the use of self-handicapping strategies. Martin et al. (2001) proposed two possible reasons for the finding that was inconsistent with the conceptualization. First, it has been conceptualized that the effects of entity and incremental theory of intelligence may be mediated by students' motivational orientation (Dweck, 1991, cited in Martin et al., 2001). Thus, students' motivation orientations (ego and task orientations) might explain variance in the use of self-handicapping that theory of intelligence otherwise would. Second, the survey items related to theory of intelligence reflected beliefs about other students in general rather than about the respondent himself or herself. Martin et al. (2001) suggested that beliefs about other students were neither salient nor relevant, therefore, items should have been worded to reflect self-related beliefs.

Turner, Meyer, Midgley, and Patrick (2003) examined the relationship between the nature of teacher discourse patterns and sixth-grade students' reports of achievement-related affect and approach and avoidance behavior including self-handicapping. Their study consisted of observations in two classes that were perceived by students as emphasizing both mastery and performance goals. Then the teachers' discourse patterns as well as students' survey responses were contrasted.

Although the two classes were similar in terms of students' perceptions of goal orientation (both were high on mastery and performance goal orientations), students in one class reported higher negative affect after failure and avoidance behaviors than did those in other class. Contrasts between teachers' discourse patterns revealed differences in the amount and quality of explicit encouragement, positive feedback, and negative affective discourse. Turner et al. (2003) characterized the latter teacher's type of discourse as "consistent, credible, and contingent support" (p. 375) and summarized it as follows: "her motivational discourse coupled with support for student autonomy appeared to sustain both mastery goals and, in a complementary fashion, the ability of students to strive for competence without putting their self-worth on the line" (p. 376). In contrast, Turner et al. (2003) characterized the former teacher's type of discourse as "mixed motivation, mixed messages, and mixed results" (p. 376), and identified elements in the discourse, which could result in the students' negative affect after failure and avoidance behaviors. First, the teacher frequently used nonsupportive motivational discourse, especially during lessons in which students struggled. Second, the teacher missed opportunities for students to demonstrate their learning. Finally, the teacher was more likely to note students' shortcomings than their successes, and to blame students for not

trying. Based on those findings, Turner et al. (2003) implicated the importance of supportive teacher discourse for students outcomes in classrooms, which provided "an environment in which all students can take risks, make mistakes, try out ideas, and maintain self-worth" (p. 377).

As reviewed, the use of self-handicapping strategies is associated with individuals' perceived meaning of failure (i.e., failure as an indication of lack of ability), which is further related to an entity theory of intelligence (i.e., intelligence as fixed). Although self-construals are broader and cannot be equated with theories of intelligence, these concepts are related, since the self-construals reflect different views of ability (Markus & Kitayama, 1991). Interdependent self-construals perceive ability as situation specific and relatively changeable over a long time through the effort, which is similar to the incremental theory of intelligence, while independent self-construals perceive ability as more fixed and independent from situations, which is similar to the entity theory of intelligence. If these assumptions regarding the characteristics of ability perceived by different types of self-construal (i.e., ability with an incremental nature for the interdependent self-construals and ability with an entity nature for the independent self-construals) are valid, further relationships can be proposed as well: individuals with higher independent self-construals are more likely than those with higher interdependent self-construals to engage in self-handicapping strategies, when they are not certain about their capability of performing successfully. However, few studies have investigated this assumption. Therefore, the current study will examine the relationships of each type of self-construal with a tendency to use self-handicapping strategies. In addition, the present study will investigate to find an answer to a question: is it the type of self-

construal (independent or interdependent self-construal) or cultural factors (individualistic or collectivistic) that are related to the use of self-handicapping strategies and self-enhancing or self-effacing attributions?

The Present Study

The primary purpose of the present study was to collect empirical evidence for the hypothesized impact of self-construal (i.e., independent and interdependent self-construals) on causal attributions and self-efficacy beliefs. In particular, the present study investigated whether individuals' inclination to either type of self-construal was associated with self-enhancement or self-effacement as reflected in causal attributions and self-efficacy beliefs, and use of self-handicapping strategies.

In spite of the evidence that indicates individual differences in the perceived nature of causal factors, many attribution studies categorized causes (e.g., ability as internal, stable, and uncontrollable; effort as internal, unstable, and controllable; task ease or difficulty as external, unstable, and uncontrollable, and luck as external, unstable, and uncontrollable) without considering the situation as perceived by the individual (Silver et al., 1995; Weiner, 1983). In order to take these individual differences into consideration, the present study assessed causal dimensions by the direct method, which was similar to Silver et al.'s (1995) study. Thus, the present study first asked participants to indicate the most important cause of their successful or unsuccessful performance on the first test that they had taken in general education mathematics courses, and then asked them to evaluate that cause in regard to the locus, stability, and controllability dimensions. However, unlike Silver et al.'s (1995) study, which asked participants to choose the most important cause from among four pervasive causal factors (i.e., ability, effort, good or

bad luck, and test ease or difficulty), the present study asked participants to report the cause in an open-ended format, so that the participants were able to indicate their perceptions more precisely. In addition, the present study included the controllability dimension in the assessment, which had been missing in Silver et al.'s (1995) study.

By following Pajares' suggestions (1995, 1996) that highlight the importance of task specificity in the self- efficacy assessment and consistency with a criterial task for the sake of a predictive power of self-efficacy, the present study assessed participants' self-efficacy for a subsequent test in their general education mathematics courses, which was characterized as a parallel version of the test that they had taken, and explored the relationship between their self-efficacy and their perceived and the actual performance in the previous test.

Since Markus and Kitayama (1991) conceptualized the influences of the different types of self-construal on cognition, emotion, and motivation, a number of empirical studies have been conducted to find evidence that supports Markus and Kitayama's (1991) argument. Those studies have consistently found self-enhancing patterns in emotional and motivational variables that are associated with the independent self-construal among people in individualistic cultures, and self-effacing patterns that are related to the interdependent self-construal among people in collectivistic cultures. However, few studies have investigated the self-enhancing and self-effacing patterns as a reflection of self-construal using Singelis' (1994) re-conceptualization (i.e., self-construal as orthogonal dimensions rather than bipolar opposites). Furthermore, few researchers have studied the influence of self-construal on motivation, in particular, causal attributions and self-efficacy beliefs. Therefore, the present study evaluated whether

individuals with higher independent self-construal differed from those with higher interdependent self-construal in inclination to either self-enhancement or self-effacement as reflected in causal attributions and self-efficacy beliefs.

In addition, it is necessary to examine theoretically identified differences in concepts of ability between independent and interdependent views (by Markus & Kitayama, 1991) and their impact on motivation. Self-worth theory (Covington, 1992) and theories of intelligence (Dweck, 1999) have conceptually explained that individuals' theory of intelligence can be a predictor of the use of self-handicapping strategies, and empirical studies have supported this in general (Martin et al., 2001). Therefore, the present study evaluated whether individuals with higher independent self- construal would perceive ability differently than individuals with higher interdependent self-construal. If so, would these differences in concepts of ability further impact the likelihood of using self-handicapping strategies.

Finally, attribution theory and social cognitive theory have conceptualized the relationship between causal attributions and self-efficacy in relation to academic achievement. Social cognitive theory assumes that an individual's self-efficacy directly and indirectly impacts performance on related content through the mediating effect on other constructs, including the person's causal attributions. Concurrently, attribution theory argues that each causal dimension has a unique relationship with other psychological constructs, including a person's confidence-related variables. However, few empirical studies have been conducted to examine these theoretical conceptualizations. Moreover, few studies have investigated self-efficacy and causal attributions, both of which are assessed with task-specificity. Therefore, the present

study explored relationships between causal attributions for performance on the first test in a math course and self-efficacy for the subsequent test described as a parallel version of the first test in relation to both perceived (reported by the participants as either successful or unsuccessful) and actual performance (test scores) in the first test.

Hypotheses

Drawing on theories of self-construal, attribution theory, social cognitive theory, self-worth theory, and on previous findings, the current study tested the following hypotheses:

Hypothesis 1: Comparing individuals with higher independent and lower interdependent self-construal scores (the ID group) with those with higher interdependent and lower independent self-construal scores (the IT group), the ID group will show self-enhancement in their causal attributions, self-efficacy, and confidence, while the IT group will show self-effacement in their causal attributions, self-efficacy, and confidence:

a. the IT group will assign more importance to ability as an explanation of perceived failure relative to the ID group (self-effacement).

b. the IT group will assign more importance to exam ease as an explanation of perceived success relative to the ID group (self-effacement).

c. comparing those who felt successful with those who felt unsuccessful within the ID and IT groups, the ID group will show the self-enhancing patterns (i.e., perceiving a cause of failure to be more external than that of success, and attributing success to ability to a greater extent than attributing failure to a lack of ability), while the IT group will show the self-effacing patterns (i.e., perceiving a cause of failure to be more internal than that of success, and assigning importance of effort equally for successful and

unsuccessful outcomes).

d. the ID group will have higher self-efficacy beliefs and confidence than will the IT group (self-enhancement).

e. the IT group will be more likely to hold an incremental theory of ability than would the ID group, while the ID group will be more likely to hold an entity theory of ability than would the IT group.

f. the ID group will be more likely to use self-handicapping strategies than will the IT group.

g. for the ID group relative to the IT group, self-efficacy will be associated more strongly with actual performance measured with the first test scores in the math class.

Hypothesis 2: Comparing individuals with higher self- efficacy to individuals with lower self-efficacy,

a. The former will be more likely than the latter to perceive the primary cause of their success to be internal, controllable, and stable.

b. The former will be more likely than the latter to perceive the primary cause of their failure to be external, controllable, and unstable.

Hypothesis 3: For all groups, among variables of self-efficacy, attribution patterns (locus, stability, and controllability dimensions), independent and interdependent self-construals, and beliefs in incremental theory of abilities, self-efficacy will be the primary predictor of actual performance measured as the first test score in a math class.

Hypotheses 1-a through d were formulated based on Markus and Kitayama's (1991) conceptualization regarding attribution patterns for independent and interdependent construal of self. Hypothesis 1-e. was formulated based on Markus and

Kitayama's (1991) argument that for independent self-construals, core attributes are invariant and independent either across situations or interpersonal relationships, while for interdependent self-construals, core attributes are variable depending on situations or interpersonal relationships with relevant others. Hypothesis 1-f. was rooted in the theoretical argument that explains entity theorists see their intelligence as more fixed, and are more concerned with outperforming others, and thus more likely to use self-handicapping strategies. Hypothesis 1-g. was drawn from Markus and Kitayama's (1991) conceptualization that contrasted independent and interdependent views. According to their conceptualization, the independent view has a stronger need to maintain confidence in their capability in regard to task or achievement. On the other hand, the interdependent view attends more on information that identifies their weakness, believing that their ability can be enhanced through efforts to work on their weakness. If a strong need to maintain self-efficacy beliefs in regard to a related achievement context that is associated with the independent view, while the need may be less prominent for an interdependent view, individuals who score high on independent self-construal will show higher self-efficacy than will those score high on interdependent self-construal.

Hypotheses 2 and 3 were rooted in the self-efficacy model in social cognitive theory and previous research that has supported the model (e.g., Bandura et al., 1996; Eaton & Dembo, 1997; Pajares & Johnson, 1995). In particular, the present study included variables related to self-construal in the analysis, which were out of focus in these previous studies, to confirm direct and superior importance of self-efficacy beliefs for the related performance.

CHAPTER THREE

Method

Participants

A total of 329 questionnaires were collected from participants enrolled in general education mathematics courses at the University of Oklahoma (n = 209), the University of Central Oklahoma (n = 52), and Rose State College (n = 68) during the Fall 2004. Four questionnaires were excluded from the analysis because the participants were younger than 18 years old. One questionnaire was excluded from the analysis because it was returned without completing major questionnaire subscales.

A total of 324 participants (60% female) were included in the analyses as follows: 12 Asian Americans (4%), 20 African Americans (6%), 247 Caucasians (76%), 10 Hispanics (3%), 21 Native Americans (7%), and 10 who were of other statuses (3%) (e.g., identified with more than one ethnic group). In addition, no international students but one Indonesian participated. Two immigrants (from India and Pakistan) participated, both who had been in the U.S. for more than 9 years. Ages of the participants ranged from 18 to 47 years, with a mean of 20.31 years. The majority of participants (62%) were 1st-year students, 11% were 2nd-year students, 23% were 3rd-year students, 3% were 4th-year students, and 1% were of unclassified. Across three schools, the gender distribution, mean age, and the percentages of Caucasians were approximately equal.

Instruments

Demographic information. Demographic information including age, sex, ethnicity (i.e., White Americans, African Americans, Asian Americans, Latinos, Native Americans, and others), program (i.e., freshmen, junior, senior, sophomore, and others),

and major was collected. For international students, their nationalities and years of studying in the United States were collected in addition to the above demographic information.

Causal attributions in regard to dimensions. Participants' causal attributions were measured with the Revised Causal Dimension Scale (CDSII) developed by McAuley, Duncan, and Russell (1992). The CDSII is the revised version of the original Causal Dimension Scale (CDS) developed by Russell (1982). The original CDS asks participants to: (a) indicate their perceived performance (how well or poorly they have done); (b) note the factor responsible for their perceived performance; and (c) characterize the factor in regard to the causal dimensions of locus, stability, and controllability.

The problem of the original CDS was low internal consistency with the dimension of controllability (coefficient alpha was below .50, reported by Vallerand & Richer, 1988, cited in McAuley et al., 1992). McAuley and his colleagues (1992) assumed that the low internal consistency might be due to a lack of homogeneity among items of controllability, and pointed out a need to differentiate controllability by the agent and others (McAuley et al., 1992). Thus, the revised CDSII includes two types of controllability items (i.e., personal and external) in addition to locus and stability items that are the same as in the original CDS. Coefficient alpha for the revised CDSII's locus, stability, personal control, and external control items were .67, .67, .79, and .82, respectively. Furthermore, evaluation of the goodness-of-fit index (GFI) indicated that the hypothesized four-factor model provided an excellent fit to the data (χ^2 (48, N = 380) = 96.85, $p < .001$, GFI = .958). All loadings of the individual items on the

corresponding factors were highly significant, and the factors explained from 31% to 67% of the variation in responses to the individual items (McAuley et al., 1992).

Perceived importance of pervasive causes. In order to assess to what extent participants perceive an importance of each of the four pervasive causes (i.e., ability, effort, task difficulty or easiness, and luck) in regard to successful and unsuccessful academic outcomes, the present study asked participants to indicatea contribution of each cause to the test outcome with a percentage so that the total equals 100%.

Subject-specific self efficacy scale. The present study utilized the same subject-level academic self-efficacy items that were used in Bong's (2000) study. Bong (2000) adapted the five self-efficacy items from the Patterns of Adaptive Learning Survey (PALS) (Middleton & Midgley, 1997; Roeser et al., 1996, cited in Bong, 2000) and the self-efficacy subscale of the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & De Groot, 1990, cited in Bong, 2000). Bong (2000) reported that all scales demonstrated acceptable reliability with standardized coefficient alphas ranging above .70. These five self-efficacy items are: "I can master even the hardest material in this course if I try," "I can do almost all the work in this course if I don't give up," "I'm certain that I can do an excellent job on the problems and tasks assigned for this course," "I know that I will be able to learn the material for this course," and "I'm confident that I will receive a good grade in this course." In addition to these five items, two items were included that asked participants to indicate a degree of confidence in doing well on the next test in the course and a parallel version of the current exam given next week.

Self-construal. Participants' emphasis on independent and interdependent self-construal were measured with the Self-Construal Scale (SCS). The SCS was developed

by Singelis (1994), designed to measure the "constellation of thoughts, feelings, and actions that comprise independent and interdependent self-construals as separate dimensions" (Singelis & Sharkey, 1995). The SCS consists of 24 items, with two 12-item subscales assessing independent and interdependent self-construals. Participants were asked to indicate their agreement with each item on a 7-point Likert scale (1 = strongly disagree and 7 = strongly agree). Cronbach alpha reliabilities for the two subscales were .70 for the independent items and .74 for the interdependent items (Singelis, 1994). Construct validity was confirmed by finding differences in self-construals between Asian Americans (combined Japanese, Chinese, Korean, and Filipino ethnic groups) and Caucasian Americans, which was consistent with Markus and Kitayama's (1991) characterizations of Asians as interdependent and North Americans as independent (Singelis, 1994). A finding that participants with higher interdependent scores were more likely to make attributions to situational or contextual influences than did those with lower interdependent scores was consistent with the characteristics of interdependent self-construals, and indicated predictive validity (Markus & Kitayama, 1991; Singelis, 1994).

The Implicit Theory Measure (ITM). To assess the participants' beliefs in the incremental nature of intelligence, the presentstudy used the ITM. The ITM is a 3-item scale that is designed to assess participants' implicit theories regarding the fixed nature of intelligence (Dweck & Henderson, 1989). These items are: "You have a certain amount of intelligence and you really can't do much to change it," "Your intelligence is something about you that you can't change very much," and "You can learn new things, but you can't really change your basic intelligence." Participants were asked to indicate

their agreement with each item on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). The higher the participants' scores, the more they believe in the fixed nature of personality. Many studies have supported the validity of this method of assessing incremental theories (e.g., Dweck, Chiu, & Hong, 1995; Levy & Dweck, 1999, Levy, Stroessner, & Dweck, 1998; cited in Dweck, 1999).

The self-handicapping measure. The current study included the self-handicapping strategies subscale from the Patterns of Adaptive Learning Survey (PALS) (Midgley et al., 2000, cited in Turner et al., 2003). The subscale consists of six items all of which measures self-handicapping strategies. Turner et al. (2003) reported Cronbach alpha reliabilities for the subscales to be .82.

Procedure

Participants were recruited from undergraduate general education mathematics courses at the University of Oklahoma, University of Central Oklahoma, and Rose State College during fall semester in 2004. Prior to the recruitment, the researcher contacted the instructors to obtain permission for the recruitment and arrange times and days. For the recruitment at the University of Oklahoma, the researcher visited classes to recruit volunteers and handed out the questionnaires with permission from the instructors. For the recruitment at other the two institutions, the instructors distributed the questionnaires to their students. The recruitment was held after the administration of the first test in the course. Questionnaires were filled out outside the classes and handed to the researcher when she visited the instructors in the following weeks.

The order of the measures were the demographic scale, the Self-Construal Scale (SCS), Implicit Theory Measure (ITM), the Self-handicapping measure, and Questions

about General Education Mathematics (including the Revised Causal Dimension Scale (CDSII), perceived importance of pervasive causes items, and subject-specific self-efficacy scales). The entire set of questionnaires typically took about 20 to 30 minutes to complete.

CHAPTER FOUR

Results

The primary purpose of this study was to explore whether individuals' inclination into either independent or interdependent self-construals would be related to causal attributions and self-efficacy beliefs. In particular, the present study was aimed at finding empirical evidence of the theoretically explained relationships between the independent self-construal and self-enhancement, and the interdependent self-construal and self-effacement. In addition, the present study investigated whether theoretically discussed views of ability held by independent and interdependent self-construals share characteristics with theories of intelligence, which may lead to more or less use of self-handicapping strategies.

Combining Samples

In order to examine whether it would be appropriate to combine participants from the three universities, a series of ANOVAs was conducted on the following variables of interest with school as the independent variables: two dimensions of self-construal, theory of intelligence, use of self-handicapping strategies, subject-specific self-efficacy beliefs, percentage grade on the exam, causal attributions for successful and unsuccessful performance, perceived importance of ability, effort, task difficulty or ease, and luck in regard to the successful and unsuccessful test outcome, and the confidence in being successful on a subsequent test (parallel version of the previously taken exam and the next exam). None of the ANOVAs revealed significant differences among the three schools. Therefore, the participants from the three schools were combined for the further analyses.

Cronbach Alpha Reliability for Each Scale

The initial Cronbach's alphas for the interdependent and independent subscales on SCS were .66 and .65, respectively. Two items that lowered the reliability of the scale were detected: "If my brother or sister fails, I feel responsible" in the interdependent subscale, and "I feel comfortable using someone's first name soon after I meet them, even when they are much older than I am" in the independent subscale. After excluding these items, the Cronbach's alphas were .66 for the interdependent (11 items) and .66 for independent subscales (11 items).

Cronbach's alphas for the Implicit Theory Measure (ITM: three items), the self-handicapping measure (six items), the subject specific self-efficacy scale (five items), and confidence in being successful on a subsequent test for successful and unsuccessful outcomes (two items for each outcome) were .91, .82, .91, .69, and .71, respectively. No items that lowered the reliability were detected.

Cronbach's alphas for the locus of causality subscale on the Revised Causal Dimension Scale (CDSII) were .79 for successful and .69 for unsuccessful outcomes. For successful outcome, an item that asked participants to indicate whether the cause of their performance reflected an aspect of themselves or the situation appeared to lower the reliability and thus was excluded. After the exclusion, Cronbach's alpha for the locus of causality subscale (successful) was .80. No items that lowered the alpha were detected for unsuccessful outcome.

Cronbach's alphas for the stability subscale on the Revised Causal Dimension Scale (CDSII) were .65 for successful and .64 for unsuccessful outcome. For successful outcome, an item that asked participants to indicate whether the cause of their

performance is unchangeable or changeable was found to lower the reliability, and thus was excluded. Likewise, for unsuccessful outcome, an item that asked participants to indicate whether the cause of their performance is stable or variable over time appeared to lower the alpha. After the exclusion, Cronbach's alpha for the stability subscales for successful and unsuccessful outcomes were .74 and .79, respectively.

For the external controllability subscale, an item that asked whether the participants perceived the cause of their performance as controllable by themselves or others was found to lower the Cronbach's alpha scores for both successful and unsuccessful outcomes and thus was excluded. As a result, alpha improved from .68 to .73 for successful, and .82 to .85 for unsuccessful outcomes. On the other hand, the same item that lowered the alpha of the external controllability subscale appeared to improve the alpha of the personal controllability. As a result of the inclusion of the item, alphas of the personal controllability subscale improved from .84 to .86 for successful, and from .84 to .89 for unsuccessful outcomes. The final Cronbach's alphas for the personal (four items) and external controllability (two items) subscales were .82 and .73 for successful, and .89 and .85 for unsuccessful outcomes, respectively.

Prior to the analyses, scores of internal locus of causality, personal and external controllability, and stability for success and failure were re-corded, so that higher scores reflected stronger endorsement of these causal dimensions. The further analyses utilized the participant's mean score of items within each subscale.

Alpha Adjustment

An alpha level of .01 was set as the level of significance for all analyses due to the following reasons. First, since the present study included a large number of comparisons,

a more conservative level than that of .05 was set in order to reduce chances of committing type I errors. Second, the relatively low reliabilities of the self-construal scale indicated a certain degree of error associated with those scores. If an extremely conservative alpha level was set, chances of committing type II errors would increase. Thus, in order to avoid type I and II error, an intermediate level of alpha (.01) was set.

Intercorrelations Among Scales

Although intercorrelations except for between self-efficacy and grade were not associated with the hypotheses, a series of Pearson correlations was calculated between variables of interest and each self-construal score to present descriptive information. Table 1 presents intercorrelations among the self-construals, theory of ability, use of self-handicapping strategies, self-efficacy, grade, and confidence for the whole sample, and Table 2 shows correlations between the above variables and causal attributions separately for students who judged their performance to be successful and unsuccessful.

Although the two self-construals were uncorrelated theoretically and empirically (Singelis, 1994), a significant correlation (r = .29, p = .000) was detected between the subscales in the present study. Moreover, positive correlations were found between the interdependent self-construal and two causal dimensions: internal locus of causality (r = .23, p = .006) and personal controllability (r = .31, p = .000) for unsuccessful performance. These findings indicate that individuals with higher interdependent self-construal were more likely to: (a) have higher independent self-construal scores, and (b) take more responsibility for failure and perceive the cause of failure to be something that was manageable by them.

Second, compared to the interdependent self-construal, the independent self-construal appeared to have a positive and stronger correlation with self-efficacy (r = .27, p = .000). Furthermore, the independent self-construal had important correlations with other variables: confidence when being successful (r = .34, p = .000) and unsuccessful (r = .25, p = .002), personal controllability for successful outcome (r = .26, p = .000), stability for successful outcome (r = .27, p = .000), and implicit theory of ability (r = -.15, p = .007). These findings indicate that individuals with the higher independent self-construal were more likely than those who have the lower independent self-construal to: (a) have higher self-efficacy, (b) be more confident in being successful on a subsequent test regardless of perceived outcomes of the exam that they have taken, (c) show an optimistic view when being successful on the exam by perceiving a cause of success to be more stable and controllable by them, and (d) give weaker endorsement to an entity theory of ability.

In summary, distinct patterns for independent and interdependent self-construal scores were: (1) interdependent self-construal score was associated with internal locus and personal controllability dimensions indicating that individuals with higher interdependent self-construal scores were more likely to perceive a cause of failure to be more internal and manageable by them, and (2) independent self-construal score was associated with external controllability indicating that individuals with higher independent self-construal were more likely to perceive the cause of failure to be more controllable by others.

Comparisons of Interdependent and Independent Self-Construal Scores

A dependent t-test contrasted mean scores on the independent and interdependent self-

construal subscales. The present sample scored marginally higher on the independent (M = 4.31, SD = .63) than interdependent self-construal subscale (M = 4.22, SD = .62), t(323) = -2.33, p = .020). Moreover, a series of one sample t-tests revealed that the mean scores for both interdependent and independent self-construals of the present sample were significantly lower than either those of Singelis' (1994) Caucasian samples (interdependent: M = 4.37 for sample 1, and M = 4.47 for sample 2; independent: M = 5.14 for sample 1, and M = 5.06 for sample 2), (interdependent: t(323) = -4.47, p = .000 for sample 1, and t(323) = -7.38, p = .000 for sample 2; independent: t(323) = -23.80, p = .000 for sample 1, and t(323) = -21.50, p = .000 for sample 2) or those of Grace and Cramer's (2003) Canadian sample (interdependent: M = 4.53, SD = .78; independent: M = 4.82, SD = .83), t(323) = -9.13, p = .000 for interdependent, and t(323) =- 14.68, p = .000 for independent self-construals.

Hypotheses 1-a and b: Comparisons between the ID and IT Groups on the Importance of a Lack of Ability for Failure and Exam Ease for Success

First, each participant's mean scores on interdependent and independent self-construal subscales were ranked as either "high" or "low" based on a median split. Then, the participant was assigned to one of the following four groups in accordance of the ranking: ID (high on independent and low on interdependent), IT (high on interdependent and low on independent items), LTD (low on both self-construals), and HTD (high on both self-consturals). Frequencies and percentages of the ID, IT, LTD, and HTD groups were: 72 (22%), 59 (18%), 100 (31%), and 93 (29%), respectively. Note that only the ID and IT groups were targeted in the hypotheses. Table 3 shows mean scores of the two self-construals for each group. Table 4 through Table 8 present means, standard

deviations, and mean comparisons of each group on variables of interest.

To test Hypothesis 1 (a: The IT group would assign more importance to ability as an explanation of perceived failure relative to the ID group, and b: the IT group would assign more importance to exam ease as an explanation of perceived success relative to the ID group), two independent t-tests were performed comparing the ID and IT groups on the importance of ability for unsuccessful outcome and that of exam ease for successful outcome.

Contrary to the hypothesis, the ID and IT group did not differ from each other for the importance of ability as an explanation of failure, $t(55) = .64$, p = n.s., or of exam ease as an explanation of success, $t(70) = -.55$, p = n.s. Therefore, Hypotheses 1-a and b were not supported. In addition, a series of independent t-tests was performed comparing the ID and IT groups on importance of the other factors (ability for success, exam difficulty for failure, effort for success and failure, and good and bad luck for success and failure). These two groups did not differ from each other on any factor. Moreover, two Hotelling's t-tests were performed comparing the ID and IT groupson the causal dimensions (i.e., dimensions of internal locus of causality, personal and external controllability, and stability) and confidence levels for successful and unsuccessful outcomes. No significant multivariate group difference was found for successful outcome. A significant multivariate group difference was found for unsuccessful outcome ($F(57) = 3.35$, $p = .01$); however, univariate follow-up tests showed no group difference for the causal dimensions and self-confidence level. In summary, the two groups did not show any significant differences in attributions with regard to causal dimensions and attributions to pervasive factors.

Table 1

Intercorrelations Among Variables

	1	2	3	4	5	6	7	8
1. Int SCS	–							
2. Ind SCS	.29***	–						
3. ITM	-.025	-.15**	–					
4. S-H	.01	-.14*	.18**	–				
5. Efficacy	.13*	.27***	-.16**	-.24***	–			
6. Grade	.13*	.06	-.11	-.15**	.40***	–		
7. Conf (success)	.17*	.34***	-.05	-.12	.45***	-.08	–	
8. Conf (failure)	.05	.25**	-.09	-.15	.53***	.06	–	–

Note. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Int SCS = interdependent self-construal; Ind SCS = independent self-construal; ITM = implicit theory measure; S-H = self-handicapping strategy measure; Conf = confidence in being successful on a subsequent test.

Table 2

Correlations Between Causal Attribution Variables and Others

				(Successful)				
Variables	Internal Locus	P-ctrl	E-ctrl	Stability	Ability	Exam	Effort	Luck
Int SCS	.08	.04	.02	.11	-.02	.09	.05	-.13
Ind SCS	.13	.26***	-.14	.27***	.02	-.04	.07	-.11
ITM	-.04	-.12	.11	-.09	-.06	.24**	-.12	.03
S-H	-.03	-.17*	.11	-.27***	-.02	.00	-.05	.09
Efficacy	.20**	.23**	-.11	.38***	.32***	-.15	-.16*	-.11
Grade	.08	.03	-.13	.01	.22**	.08	-.27***	-.04
Conf.	.32***	.27***	-.09	.32***	.20**	-.11	-.05	-.12
				(Unsuccessful)				
	Internal Locus	P-ctrl	E-ctrl	Stability	Ability	Exam	Effort	Luck
Int SCS	.23**	.31***	-.12	-.14	.00	-.09	.08	-.04
Ind SCS	.10	.19*	-.26**	-.03	-.09	-.21*	.08	.17*
ITM	-.10	-.28**	.19*	.12	.13	.00	-.02	-.11
S-H	-.04	-.08	.10	.08	.06	-.06	.09	-.13
Efficacy	-.03	.23**	-.06	-.22**	-.42***	.04	.24**	.05
Grade	.02	.02	.06	-.02	-.13	.06	-.01	.09
Conf	.03	.19*	-.17*	-.27**	-.31***	.02	.08	.18*

Table 2 (*continued*). *Correlations Between Causal Attribution Variables and Others*

Note. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Int SCS = interdependent self-construal; Ind SCS = independent self-construal; ITM = implicit theory measure; S-H = self-handicapping strategy measure; Conf = confidence in being successful on a subsequent test.

Hypothesis 1-c: Comparisons between ID and IT Groups on Differences in Causal Attributions by Outcome

To examine Hypothesis 1-c (comparing those who felt successful with those who felt unsuccessful within the ID and IT groups, the ID group would show the self-enhancing patterns (i.e., perceiving a cause of failure to be more external than that of success, and attributing success to ability to a greater extent than attributing failure to a lack of ability), while the IT group would show the self-effacing patterns (i.e., perceiving a cause of failure to be more internal than that of success, and assigning importance of effort equally for successful and unsuccessful outcomes), a series of independent t-tests was performed separately for each group, contrasting each dimension of causality and the importance of ability and effort for successful and unsuccessful outcomes. Table 5 through Table 8 show means and standard deviations. Table 9 presents mean difference between successful and unsuccessful outcomes and a t-value for each group.

As hypothesized, the ID group showed a stronger external attribution when being unsuccessful than being successful (successful: M = 5.07, SD = .99; unsuccessful: M = 3.82, SD = 1.28), $t(69) = 4.64$, p = .000. On the other hand, the IT group did not show any difference on external attribution when being successful (M = 4.75, SD = 1.54) and being unsuccessful (M = 4.39, SD = 1.21), $t(57) = .94$, p = n.s. However, unlike the prediction, the IT group did not show the self-effacing attribution by perceiving a cause of failure to be more internal than that of success. Therefore, the hypothesis regarding the self-effacing attribution for the IT group was not supported.

Second, as hypothesized, the ID group showed a significant self-enhancing pattern by emphasizing an importance of ability when being successful (M = 38.80, SD =

Table 3

Means and Standard Deviations on Self-Construal Scores

	All (N = 324)	ID (N = 72)	IT (N = 59)	*t* values
Int SCS	4.22	3.89_a	4.69_b	-12.65
	(.62)	(.41)	(.28)	*p*=.000
Ind SCS	4.31	4.79_b	3.90_a	15.55
	(.63)	(.31)	(.34)	*p*=.000

Note. Means in the same row that do not share subscripts differ significantly at $p < .01$ in the *t*-test comparison.

Int SCS = interdependent self-construal; Ind SCS = independent self-construal.

Table 4

Means and Standard Deviations on Implicit Theory of Ability, Use of Self Handicapping Strategies, Self-Efficacy, and Percentage Grade

	All (N = 324)	ID (N = 72)	IT (N = 59)	*F* values
ITM	2.54	2.56	3.10	4.63
	(1.33)	(1.57)	(1.29)	n.s.
S-H	2.42	2.24	2.51	2.21
	(1.04)	(.92)	(1.13)	n.s.
Self-efficacy	4.46	4.66	4.51	.52
	(1.17)	(1.22)	(1.09)	n.s.
% grade	79.86	79.56	83.23	1.58
	(17.18)	(17.18)	(15.36)	n.s.

Note. ITM = implicit theory measure; S-H = self-handicapping strategy measure.

Table 5

Means and Standard Deviations on Causal Attribution and Confidence Variables Related to General Education Mathematics When Students Felt Successful

Successful	all (N = 175)	ID (N = 37)	IT (N = 36)	*F* values
Internal locus	4.83	5.07	4.75	1.10
	(1.27)	(.99)	(1.54)	n.s.
Personal	5.06	5.32	4.81	4.81
Controllability	(1.06)	(.84)	(1.16)	n.s.
External	2.67	2.45	2.69	.57
Controllability	(1.46)	(1.23)	(1.57)	n.s.
Stability	4.19	4.32	3.97	1.38
	(1.27)	(1.23)	(1.33)	n.s.
Confidence	4.64	4.69	4.47	1.12
	(.92)	(.82)	(.93)	n.s.

Table 6

Means and Standard Deviations on Causal Attribution to Pervasive Factors Related to General Education Mathematics When Students Felt Successful

Successful	all (N = 175)	ID (N = 37)	IT (N = 36)	*t* values
Ability (%)	40.08	38.80	43.34	-.92
	(20.50)	(20.75)	(21.36)	n.s.
Exam (%)	15.87	14.95	16.94	-.55
	(14.68)	(14.75)	(15.95)	n.s.
Effort (%)	36.54	36.94	35.14	.35
	(20.18)	(21.39)	(22.32)	n.s.
Luck (%)	6.86	8.08	4.57	1.10
	(12.74)	(16.96)	(8.67)	n.s.

Table 7

Means and Standard Deviations on Causal Attribution and Confidence Variables Related to General Education Mathematics When Students Felt Unsuccessful

Unsuccessful	all (N = 149)	ID (N = 35)	IT (N = 23)	*F* values
Internal locus	4.11	3.82	4.39	2.89
	(1.28)	(1.28)	(1.21)	n.s.
Personal	4.69	4.51	5.11	2.49
Controllability	(1.36)	(1.62)	(1.04)	n.s.
External	2.55	2.51	2.89	.79
Controllability	(1.45)	(1.58)	(1.58)	n.s.
Stability	2.55	2.41	1.78	3.11
	(1.28)	(1.59)	(.78)	n.s.
Confidence	5.01	5.27	5.02	1.18
	(.89)	(.89)	(.79)	n.s.

Table 8

Means and Standard Deviations on Causal Attribution to Pervasive Factors Related to General Education Mathematics When Students Felt Unsuccessful

Unsuccessful	all (N = 149)	ID (N = 35)	IT (N = 23)	*t* values
Ability (%)	20.79	15.53	18.48	-.47
	(22.74)	(25.95)	(17.99)	n.s.
Exam (%)	20.97	15.47	20.43	-1.01
	(19.83)	(19.12)	(16.98)	n.s.
Effort (%)	43.91	49.00	53.26	-.51
	(31.73)	(36.41)	(26.27)	n.s.
Luck (%)	14.46	20.00	7.83	2.00
	(23.32)	(31.87)	(12.95)	n.s.

20.50) more than when being unsuccessful (M = 20.79, SD = 22.74), $t(68) = 4.42$, p = .000. However, the finding that the IT group showed the same pattern by perceiving the importance of ability when being successful (M = 43.34, SD = 21.36) more than when being unsuccessful (M = 18.48, SD = 17.99), $t(56) = 4.61$, p = .000, shows that this self-enhancing pattern was not unique for the ID group.

Finally, contrary to the hypothesis, the IT group did not perceive the importance of effort equally when being successful and unsuccessful. Instead, students who were unsuccessful (M = 53.26, SD = 26.27) placed more emphasis on the importance of effort than did those who were successful (M = 35.14, SD = 22.32), $t(56) = -2.82$, p = .007. On the other hand, the ID group perceived the importance of effort nearly equally for successful (M = 36.94, SD = 21.39) and unsuccessful (M = 49.00, SD = 36.41) outcomes, $t(52) = -1.57$, p = n.s.

Although it was not hypothesized, additional independent t-tests were performed to examine whether the ID and IT groups would show different attribution patterns in personal and external controllability and stability dimensions, and the importance of other factors (i.e., exam ease and difficulty and good and bad luck) when compared for being successful and unsuccessful. First, the ID group was more likely to perceive that the cause of performance was something that they could manage when being successful (M = 5.32, SD = .84) than being unsuccessful (M = 4.51, SD = 1.62), $t(69) = 2.79$, p = .007. On the other hand, the IT group showed no differences in regard to personal controllability when being successful (M = 4.81, SD = 1.16) and being unsuccessful (M = 5.11, SD = 1.04), $t(57) = -1.02$, p = n.s. However, for external controllability that concerned whether an individual perceived a cause to be controllable by other people or

not, neither the ID nor IT group showed any differences when being successful and unsuccessful.

Second, for the stability dimension, both groups were more likely to perceive that a cause of their performance on the exam was more stable and lesslikely to change over time when being successful (ID: M = 2.41, SD = 1.59; IT: M = 3.97, SD = 1.33) than being successful (ID: M = 2.41, SD = 1.59; IT: M = 1.78, SD = .78), (ID: $t(69) = 5.71$, p = .000; ID: $t(57) = 7.16$, p = .000).

Third, both groups perceived the importance of exam ease or difficulty equally when being successful and unsuccessful.

Finally, within the IT group, students who were successful and unsuccessful perceived the importance of luck nearly equally. On the other hand, within the ID group, students who were unsuccessful assigned marginally more importance to a luck (M = 20.00, SD = 31.86) than did those who were successful (M = 5.53, SD = 6.92), $t(36) = -2.59$, p = .014.

In summary, as hypothesized, the ID group showed self-enhancing attributions in regard to dimension of internal locus of causality by perceiving a cause of failure to be more external than that of success**.** Likewise, as hypothesized, the ID group attributed success to ability to a greater extent than attributed failure to a lack of ability. However, this self-enhancing pattern was shared by the IT group as well.

Contrary to the hypotheses, the IT group did not show any evidence of self-effacing patterns. Although not showing the self-enhancing pattern in terms of the internal locus of causality for successful and unsuccessful outcomes, the IT group did not perceive a cause of unsuccessful outcome to be more internal than that of successful

Table 9

Mean Differences (Success-Failure) on Causal Attribution Variables

	Mean difference	*t* value	std. error	*sig*
Internal locus				
ID	1.26	4.64	.27	$p = .000$
IT	.36	.94	.38	n.s.
Personal controllability				
ID	.85	2.79	.31	$p = .007$
IT	-.30	-1.02	.30	n.s.
External controllability				
ID	0	-.29	.34	n.s.
IT	-.20	-.47	.42	n.s.
Stability				
ID	1.93	5.71	.34	$p = .000$
IT	2.19	7.16	.31	$p = .000$

Table 9 (*continued). Mean Differences (Success-Failure) on Causal Attribution Variables*

	Mean difference	*t* value	std. error	*sig*
Ability (%)				
ID	24.35	4.42	5.52	$p = .000$
IT	24.86	4.61	5.40	$p = .000$
Exam (%)				
ID	-.11	-.03	4.07	n.s.
IT	-3.49	-.80	4.39	n.s.
Effort (%)				
ID	-11.04	-1.55	7.14	n.s.
IT	-18.12	-2.82	6.43	$p = .007$
Luck (%)				
ID	-14.47	-2.59	5.59	$p = .014$
IT	-3.25	-1.15	2.83	n.s.

outcome. In addition, when asked to indicate how much importance they would place on an effort, students who were unsuccessful assigned more than did those who were successful.

Hypotheses 1-d, e, and f: Comparisons between the ID and IT Groups on Self-Efficacy and Confidence Level, Incremental or Entity Nature of Ability, and Use of Self-Handicapping Strategies

In order to examine Hypotheses 1-d. (the ID group would have higher self-efficacy beliefs and confidence than would the IT group), 1-e. (the IT group would be more likely to hold an incremental theory of ability than would the ID group, while the ID group would be more likely to hold an entity theory of ability than would the IT group), and 1-f. (the ID group would be more likely to use self-handicapping strategies than would the IT group), a Hotelling's t-test contrasted the ID and IT groups on their mean scores of self-efficacy and scores of the Implicit Theory Measure (ITM) and the self-handicapping measure. For the confidence level for successful and unsuccessful outcomes, the results of Hotelling's t-tests that were used to examine group differences in causal dimensions for successful and unsuccessful outcomes were utilized.

For self-efficacy, the ITM scores, and use of self-handicapping strategies, the two groups did not significantly differ from each other ($F(1, 127) = 2.38$, p = n.s.). For the confidence levels for successful and unsuccessful outcomes, as already reported, a significant group difference was detected only for unsuccessful outcome, however, univariate follow-up tests showed that the two groups did not differ for self-confidence level. Therefore, the hypotheses with regard to the group differences in self-efficacy, confidence level, ITM scores, and use of self-handicapping strategies were not supported.

Hypothesis 1-g: Importance of Self-Efficacy for Performance

In order to examine Hypothesis 1-g (for the ID group relative to the IT group, self-efficacy would be associated more strongly with actual performance measured with the first test scores in the math class), a Pearson correlation was calculated between self-efficacy and percentage grade for each group. For both groups, self-efficacy and percentage grade were significantly correlated. Although it was hypothesized that the correlation would be stronger for the ID group, the IT group (r = .53, p = .000) yielded the slightly stronger correlation than did the ID group (r = .31, p = .008).

Hypotheses 2-a and b: Self-Efficacy Beliefs and Causal Attributions

In order to examine Hypothesis 2-a (individuals with higher self-efficacy would be more likely than those with lower self-efficacy to perceive the primary cause of their success to be internal, controllable, and stable) and Hypothesis 2-b (individuals with higher self-efficacy would be more likely than those with lower self-efficacy to perceive the primary cause of their failure to be external, controllable, and unstable), each participant's mean score of self-efficacy items was ranked as either "high" or "low" based on a median split. Then, the participant was assigned either to high- or low-efficacy group in accordance with the ranking. T-tests were performed separately for students who felt successful and unsuccessful, contrasting high- and low-efficacy groups on measures of internal locus of causality, personal and external controllability, and stability dimensions.

First, among students who felt successful, those who were in the high- and low-efficacy groups showed differences in the attributions. The low-efficacy group perceived a cause to be less personally controllable (M = 4.82, SD = 1.13) relative the high-efficacy

group (M = 5.23, SD = .97), $t(174) = -2.60$, $p = .010$. Furthermore, the low-efficacy group perceived the cause of their performance to be less stable (M = 3.80, SD = 1.24) relative to the high-efficacy group (M = 4.46, SD = 1.23), $t(174) = -3.50$, $p = .001$. These findings indicated that participants with lower self-efficacy were more likely to perceive the cause of their successful performance to be less controllable and stable than did those with higher self-efficacy. Although it was hypothesized that the low-efficacy group would show more external attributions than would the high -efficacy group, the difference was not significant. Therefore, Hypothesis 2-a was supported only for the personal controllability and stability dimensions.

On the other hand, no group differences were shown on the attribution measures for those who felt unsuccessful. Thus, Hypothesis 2-b was not supported.

Hypothesis 3: Predictive Power of Self-Efficacy for Performance

To examine Hypothesis 3 (among the variables of self-efficacy, attribution patterns (locus, stability, and controllability), independent and interdependent self-construals, and beliefs in incremental theory of abilities, self-efficacy would be the primary predictor of actual performance measured as the first test score in a math class), two regression analyses were performed separately for those who felt successful and unsuccessful with the percentage grade scores as the dependent variable and self-efficacy, ITM scores, internal locus of causality, personal and external controllability, stability, and interdependent and independent self-construal scores as predictors.

Consistent with the hypothesis, self-efficacy was the only significant predictor of the grade for both successful and unsuccessful students (successful: B = 3.67, β = .39, p = .000; unsuccessful: B = 4.93, β = .36, p = .000). Moreover, for successful students, the

independent self-construal appeared to be a predictor that negatively associated with the grade scores (B = -3.21, β = -.18, p = .028), however, this appeared to be due to a suppressor effect, as there was no correlation between the independent self-construal and the grade for the successful students (r = -.05, p = n.s.).

Ancillary Analyses

The use of median splits on independent and interdependent self-construals to create self-construal types yields four possible categories, although only two (independent and interdependent) have been the focus of analyses. The unexpectedly high number of people falling into the HTD (high on both self-construals) and LTD (low on both self-construals) groups begged the question of whether these self-construal types differed from ID and IT, and if so, how.

Groups differences in causal dimensions and attributions to the pervasive factors. In order to examine whether the four groups would differ in causal dimensions (i.e., internal locus of causality, personal and external controllability, and stability), two MANOVAs were performed comparing the four groups on the causal dimensions and confidence levels for successful and unsuccessful outcomes. No significant multivariate group difference was found for successful outcome. On the other hand, a significant multivariate group difference was found for unsuccessful outcome (F(3, 87) = 2.44, p = .002, η^2 = .08). Univariate follow-up tests showed a significant group difference for personal controllability (F(3, 87) = 4.97, p = .003, η^2 = .09). Moreover, Post-hoc Turkey tests revealed that the LTD group (M = 4.23, SD = 1.48) perceived a cause of unsuccessful outcome to be significantly less controllable than did the IT (M = 5.11, SD = 1.04) and HTD (M = 5.16, SD = .86) groups.

Furthermore, a series of ANOVAs was performed on the causal factors: importance of ability, exam ease or difficulty, effort, and luck for successful and unsuccessful outcomes. The findings showed no group differences in any of the factors.

Group Differences in attributions for successful and unsuccessful outcomes. In order to examine whether the four groups would show different patterns in attributions when comparing those who felt successful with those who felt unsuccessful, a series of independent t-tests was performed separately for each of the four groups, contrasting the internal locus of controllability dimensions and the importance of ability, exam ease or difficulty, effort, and luck for successful and unsuccessful outcomes. Table 10 through Table 15 show means and standard deviations. Table 16 presents mean difference between successful and unsuccessful outcomes and a t-value for each group.

First, similar to the ID group, the LTD group showed a stronger external attribution when being unsuccessful (M = 3.13, SD = 1.41) than being successful (M = 2.38, SD = 1.21), $t(97) = -2.82$, $p = .005$. On the other hand, similar to the IT group, the HTD group did not show difference in internal locus of causality when being successful (M = 4.93, SD =1.09) and being unsuccessful (M = 4.47, SD = 1.09), $t(90) = 2.10$, p = n.s.

In addition, similar to the IT group, both LTD and HTD perceived the personal controllability of the cause of their performance nearly equally when being successful (LTD: M = 4.88, SD =1.13; HTD: M = 5.25, SD =1.00) and unsuccessful (LTD: M = 4.23, SD = 1.48; HTD: M = 5.16, SD = .86). Furthermore, like the ID and IT groups, the LTD and HTD groups showed no differences when being successful (LTD: M = 2.92, SD =1.39; HTD: M = 2.56, SD =1.59) and unsuccessful (LTD: M = 2.81, SD =1.55; HTD: M = 2.08, SD =1.00) in terms of external controllability. For the stability dimension, like

the ID and IT groups, both HTD and LTD groups were more likely to perceive that a cause of their performance on the exam was more stable and less likely to change over time when being successful(LTD: *M* = 3.94, *SD* =1.34; HTD: *M* = 4.49, *SD* =1.13) than being unsuccessful (LTD: *M* = 2.23, *SD* =1.20; HTD: *M* = 1.98, *SD* =1.27).

Second, like the ID and IT groups, the HTD and LTD groups showed a significant self-enhancing pattern by emphasizing an importance of ability when being successful more than being unsuccessful. Furthermore, like the ID and IT groups, HTD group perceived the importance of exam ease or difficulty equally when being successful and unsuccessful. On the other hand, the LTD group emphasized the impact of exam difficulty on their performance significantly more when being unsuccessful (M = 27.60, SD = 21.61) than when being successful (M = 15.20, SD = 13.46), t(72) = -3.33, p = .001.

Finally, like the IT group, students of the LTD group who were successful and unsuccessful perceived the importance of luck nearly equally. On the other hand, like the ID group, students of the HTD group who were unsuccessful assigned marginally more importance to a luck (M = 15.83, SD = 24.85) than did those who were successful (M = 5.78, SD = 10.74), t(52) = -2.41, p = .019.

In summary, four groups showed the same patterns in terms of external controllability (i.e., showing no differences regardless of outcomes), stability (i.e., perceiving less stability of the cause of unsuccessful than of successful outcome), and the importance of ability (emphasizing more importance of ability when being successful than being unsuccessful). Similar to the ID group, the LTD group showed self-enhancing attributions in regard to dimensions of internal locus of causality and importance of

ability. Moreover, the LTD group was unique in assigning more importance to exam difficulty than to exam ease, while other groups did not differentiate.

Similar to the IT group, the HTD group perceived a cause of successful and unsuccessful outcomes to be nearly equal in regard to internal locus of causality and personal and external controllability dimensions. Like the ID and IT groups, the HTD group did not differentiate importance of exam ease from that of difficulty. Furthermore, like the ID and LTD groups, the HTD group perceived the importance of effort equally when being successful and unsuccessful as well. For the importance of luck, similar to the ID group, the HTD group marginally emphasized a deficit of bad luck more than a credit of good luck.

Comparisons among four self-construal groups on self -efficacy, confidence level, incremental or entity nature of ability, and use of self-handicapping strategies. First, a MANOVA was performed to compare the four groups on their mean scores of self-efficacy and scores of the Implicit Theory Measure (ITM) and the self-handicapping measure. A significant multivariate group difference was detected, $F(3, 314) = .3.25$, $p = .000$, $\eta^2 = .04$). Furthermore, univariate follow-up tests revealed significant group differences for the ITM scores ($F(3,314) = 6.20$, $p = .000$, $\eta^2 = .056$) and self-efficacy ($F(3,314) = 4.80$, $p = .003$, $\eta^2 = .044$). Furthermore, as shown in Table 3, overall mean ITM score was relatively low ($M = 2.54$, $SD = 1.33$), which indicated that the majority of the participants gave weaker endorsement to an entity theory of ability. However, Post hoc Tukey tests revealed that the IT group ($M = 3.10$, $SD = 1.29$) supported the entity theory of ability significantly more than did the HTD group ($M = 2.17$, $SD = 1.19$, $p = .000$).

Moreover, Post hoc Tukey tests showed that the LTD group (M = 4.11, SD = 1.11) had the significantly lower self-efficacy scores than the HTD (M = 4.66, SD = 1.16), p = .008, and ID groups (M = 4.66, SD = 1.22), p = .008.

For the confidence level for successful and unsuccessful outcomes, the results of MANOVAs that were performed to examine group differences in causal dimensions for successful and unsuccessful outcomes were utilized. As already reported, a significant multivariate group difference was found for unsuccessful outcome (F(3, 87) = 2.33, p = .004, η^2 = .12), however, univariate follow-up tests showed no group differences. Therefore, the four groups did not differ one another in regard to the confidence level.

Correlation between self-efficacy and performance. A Pearson correlation was calculated between self-efficacy and percentage grade for each of the four groups. The correlation was positive and significant for each group. Moreover, like the IT group (r = .53, p = .000), the LTD (r = .45, p = .000) showed a stronger correlation relative to the ID (r = .31, p = .008) and HTD (r = .35, p = .001) groups.

Table 10

Means and Standard Deviations on Self-Construal Scores (Four Groups)

	All (N = 324)	ID (N = 72)	IT (N = 59)	LTD (N = 99)	HTD (N = 93)	*F* values
Int SCS	4.22	3.89_{b}	4.69_{c}	3.68_{a}	4.74_{c}	167.00
	(.62)	(.41)	(.28)	(.50)	(.26)	*p*=.000
Ind SCS	4.31	4.79_{b}	3.90_{a}	3.75_{a}	4.82_{b}	193.51
	(.63)	(.31)	(.34)	(.43)	(.37)	*p*=.000

Note. Means in the same row that do not share subscripts differ significantly at $p < .01$ in the Post hoc Tukey comparison.

Int SCS = interdependent self-construal; Ind SCS = independent self-construal.

Table 11

Means and Standard Deviations on Implicit Theory of Ability, Use of Self- Handicapping Strategies, Self-Efficacy, and Percentage Grade (Four Groups)

	All (N = 324)	ID (N = 72)	IT (N = 59)	LTD (N = 99)	HTD (N = 93)	*F* values
ITM	2.54	2.56_{ab}	3.10_{b}	2.53_{a}	2.17_{a}	6.20
	(1.33)	(1.57)	(1.29)	(1.19)	(1.19)	*p*=.000
S-H	2.42	2.24	2.51	2.50	2.41	1.04
	(1.04)	(.92)	(1.13)	(.97)	(1.13)	n.s.
Self-efficacy	4.46	4.66_{b}	4.51_{ab}	4.11_{a}	4.66_{b}	4.80
	(1.17)	(1.22)	(1.09)	(1.11)	(1.16)	*p*= .003
% grade	79.86	79.56	83.23	77.96	79.74	1.13
	(17.18)	(17.18)	(15.36)	(19.04)	(16.12)	n.s.

Note. Means in the same row that do not share subscripts differ significantly at $p < .01$ in the Post hoc Tukey comparison.

ITM = implicit theory measure; S-H = self- handicapping strategy measure.

Table 12

Means and Standard Deviations on Causal Attribution and Confidence Variables Related to General Education Mathematics When Students Felt Successful (Four Groups)

Successful	all (N = 175)	ID (N = 37)	IT (N = 36)	LTD (N = 52)	HTD (N = 51)	*F* values
Internal locus	4.83	5.07	4.75	4.62	4.93	1.12
	(1.27)	(.99)	(1.54)	(1.21)	(1.31)	n.s.
Personal	5.06	5.32	4.81	4.88	5.25	2.55
Controllability	(1.06)	(.84)	(1.16)	(1.13)	(1.00)	n.s.
External	2.67	2.45	2.69	2.92	2.56	.73
Controllability	(1.46)	(1.23)	(1.57)	(1.39)	(1.59)	n.s.
Stability	4.19	4.32	3.97	3.94	4.49	2.35
	(1.27)	(1.23)	(1.33)	(1.34)	(1.13)	n.s.
Confidence	4.64	4.69	4.47	4.30	5.06	6.82
	(.92)	(.82)	(.93)	(1.02)	(.73)	*p*=.000

Table 13

Means and Standard Deviations on Causal Attribution to Pervasive Factors Related to General Education Mathematics When Students Felt Successful (Four Groups)

Successful	all (N = 175)	ID (N = 37)	IT (N = 36)	LTD (N = 52)	HTD (N = 51)	*F* values
Ability (%)	40.08	38.80	43.34	39.39	39.05	.40
	(20.50)	(20.75)	(21.36)	(23.07)	(17.08)	n.s.
Exam (%)	15.87	14.95	16.94	15.20	16.60	.19
	(14.68)	(14.75)	(15.95)	(13.46)	(15.38)	n.s.
Effort (%)	36.54	36.94	35.14	35.61	38.29	.22
	(20.18)	(21.39)	(22.32)	(21.14)	(17.20)	n.s.
Luck (%)	6.86	8.08	4.57	8.43	5.96	.83
	(12.74)	(16.96)	(8.67)	(13.42)	(10.71)	n.s.

Table 14

Means and Standard Deviations on Causal Attribution and Confidence Variables Related to General Education Mathematics When Students Felt Unsuccessful (Four Groups)

Unsuccessful	all (N = 149)	ID (N = 35)	IT (N = 23)	LTD (N = 49)	HTD (N = 42)	*F* values
Internal locus	4.11	3.82	4.39	3.86	4.47	2.75
	(1.28)	(1.28)	(1.21)	(1.09)	(1.09)	n.s.
Personal	4.69	4.51_{ab}	5.11_{b}	4.23_{a}	5.16_{b}	4.92
Controllability	(1.36)	(1.62)	(1.04)	(1.48)	(.86)	p=.003
External	2.55	2.51	2.89	2.81	2.08	2.55
Controllability	(1.45)	(1.58)	(1.58)	(1.55)	(1.00)	n.s.
Stability	2.55	2.41	1.78	2.23	1.98	1.45
	(1.28)	(1.59)	(.78)	(1.20)	(1.27)	n.s.
Confidence	5.01	5.27	5.02	4.83	5.01	1.73
	(.89)	(.89)	(.79)	(1.00)	(.76)	n.s.

Note. Means in the same row that do not share subscripts differ significantly at $p < .01$ in the Post hoc Tukey comparison.

Table 15

Means and Standard Deviations on Causal Attribution to Pervasive Factors Related to General Education Mathematics When Students Felt Unsuccessful (Four Groups)

Unsuccessful	all (N = 149)	ID (N = 35)	IT (N = 23)	LTD (N = 49)	HTD (N = 42)	*F* values
Ability (%)	20.79	15.53	18.48	23.64	23.24	1.09
	(22.74)	(25.95)	(17.99)	(20.57)	(24.45)	n.s.
Exam (%)	20.97	15.47_{a}	20.43_{ab}	27.44_{b}	18.59_{ab}	2.81
	(19.83)	(19.12)	(16.98)	(21.40)	(18.71)	p=.042
Effort (%)	43.91	49.00	53.26	36.45	42.80	1.86
	(31.73)	(36.41)	(26.27)	(28.45)	(32.84)	n.s.
Luck (%)	14.46	20.00	7.83	12.47	15.83	1.43
	(23.32)	(31.87)	(12.95)	(17.34)	(24.85)	n.s.

Note. Means in the same row that do not share subscripts differ significantly at $p < .01$ in the Post hoc Tukey comparison.

Table 16

Mean Differences (Success-Failure) on Causal Attribution Variables (Four Groups)

	Mean difference	*t* value	std. error	*sig*
Internal locus				
ID	1.26	4.64	.27	$p = .000$
IT	.36	.94	.38	n.s.
LTD	.75	2.85	.26	$p = .005$
HTD	.52	2.10	.25	$p = .038$
Personal controllability				
ID	.85	2.79	.31	$p = .007$
IT	-.30	-1.02	.30	n.s.
LTD	.61	2.26	.27	$p = .027$
HTD	.10	.53	.20	n.s.
External controllability				
ID	0	-.29	.34	n.s.
IT	-.20	-.47	.42	n.s.
LTD	0	.28	.30	n.s.
HTD	.44	1.61	.27	n.s.
Stability				
ID	1.93	5.71	.34	$p = .000$
IT	2.19	7.16	.31	$p = .000$
LTD	1.73	6.70	.26	$p = .000$
HTD	2.58	10.48	.25	$p = .000$

Table 16 (*continued). Mean Differences (Success-Failure) on Causal Attribution Variables (Four Groups)*

	Mean difference	*t* value	std. error	*sig*
Ability (%)				
ID	24.35	4.42	5.52	$p = .000$
IT	24.86	4.61	5.40	$p = .000$
LTD	15.67	3.48	4.51	$p = .001$
HTD	15.99	3.65	4.38	$p = .000$
Exam (%)				
ID	-.11	-.03	4.07	n.s.
IT	-3.49	-.80	4.39	n.s.
LTD	-12.41	-3.33	3.73	$p = .001$
HTD	-2.05	-.57	3.59	n.s.
Effort (%)				
ID	-11.04	-1.55	7.14	n.s.
IT	-18.12	-2.82	6.43	$p = .007$
LTD	-.54	-.10	5.20	n.s.
HTD	-4.45	-.78	5.69	n.s.

Table 16 (*continued). Mean Differences (Success-Failure) on Causal Attribution Variables (Four Groups)*

	Mean difference	*t* value	std. error	*sig*
Luck (%)				
ID	-14.47	-2.59	5.59	$p = .014$
IT	-3.25	-1.15	2.83	n.s.
LTD	-4.10	-1.29	3.17	n.s.
HTD	-10.05	-2.41	4.17	$p = .019$

CHAPTER FIVE

Discussion

Self-Construal

Contrasting the ID and IT groups, the hypotheses predicted that the former would show self-enhancing patterns, while the latter would demonstrate self-effacing patterns with regard to attributions, implicit theory of ability, self-efficacy, and use of self-handicapping strategies. However, the two groups appeared to show similar patterns except for some outcome biases in attributions. The major findings and their indications are listed below.

First, it was hypothesized that the two groups would differ in degrees of emphasis of the importance of a lack of ability when being unsuccessful and exam ease when being successful, however, the results showed no group differences. Moreover, the two groups showed no differences in rated importance of the other factors (ability, effort, and good luck for successful outcome, and exam difficulty, insufficient effort, and bad luck for unsuccessful outcome). In addition, the two groups perceived the dimensions of the cause (i.e., internal locus of causality, personal and external controllability, and stability) of their performance in the same way. These findings indicated that individuals with high independent and low interdependent self-construals would make attributions in the same way as would those with high interdependent and low independent self-construals.

Second, as hypothesized, the ID group demonstrated an outcome bias by perceiving a cause of an unsuccessful outcome to be more external than that of a successful outcome. On the other hand, the IT group perceived the cause to be equally internal regardless of the outcomes. These findings imply that, unlike individuals with

high interdependent and low independent self-construals, those with the opposite pattern of self-construals would be likely to show outcome bias with regard to internal locus of causality. Moreover, the finding that both groups emphasized the importance of ability when they felt successful more than when they felt unsuccessful indicated that individuals would demonstrate outcome bias regardless of self-construal pattern by crediting the role of ability when successful, while discounting the role of one's lack of lack of ability when unsuccessful.

The finding that the two groups differed in showing outcome biases with regard to the perceived importance of effort and luck indicated that these groups might have viewed effort and luck somewhat differently each other. The IT group emphasized the importance of effort more when being successful than when being unsuccessful, while the ID group did not differentiate the importance of effort. In addition, the ID group assigned more importance to luck when being unsuccessful than being successful, while the IT group did not show the outcome bias in terms of luck.

Third, contrary to the hypotheses that predicted that the ID group would: (a) endorse an entity theory of ability to a greater extent, (b) have higher self-efficacy and confidence levels, and (c) be more likely to use self-handicapping strategies, while the IT group would: (a) support the incremental theory of ability to a greater extent, (b) have lower self-efficacy and confidence levels, and (c) be less likely to use self-handicapping strategies, no group differences were yielded. In particular, the relatively low mean score on the implicit theory of ability scale indicated that overall participants gave weaker endorsement to an entitytheory of ability .

Finally, although it was hypothesized that a stronger correlation between self-efficacy and percentage grade would be detected for the ID than for the IT group, the result appeared to be opposite. Both groups showed positive and significant correlations, however, the correlation was slightly stronger for IT.

Since previous research has focused on individuals with high scores on only one of the self-construal scales, little is known about those who are high or low on both self-construals. However, due to the finding that a larger number of participants appeared to be high or low on both self-construals, and that more differences in self-enhancing patterns were observed by adding these two groups into the comparisons, the following discussion addresses the findings in regard to comparisons of the four groups.

The self-enhancing pattern. The finding that the ID group showed more pronounced outcome bias (i.e., perceiving a cause of failure to be more external than that of success) than the IT or LTD groups suggests that the stronger degree of independent self-construal may be related to a tendency to show the outcome bias, which is consistent with the self-construal theory. On the other hand, a positive correlation between interdependent self-construal and internal attributions for an unsuccessful outcome, and the finding that the IT group did not show the outcome bias indicate that a stronger degree of interdependent self-construal may be related to a reduction of the tendency to show the outcome bias. Moreover, the finding that the HTD group showed no outcome bias indicates that there may be a conflict of the two self-construals for individuals who are high on both self-construals. The HTD group's high interdependent self-construal may have offset self-enhancement, which may otherwise lead to an equal or stronger self-enhancement relative to the ID group.

However, except for the outcome bias reported above, the ID and IT groups yielded little differences in attribution patterns, self-efficacy and confidence levels, an endorsement to an entity theory of ability, and use of self-handicapping strategies. The lack of support of the hypotheses that predicted group differences indicates that these differences may be cultural, rather than due to self-construal.

Self-effacing pattern. The following aspects of the self-effacing pattern were observed: citing the importance of effort equally for successful and unsuccessful performance, and giving weaker endorsement to an entity theory of ability. However, these patterns were demonstrated by groups other than the IT group, which was inconsistent with self-construal theory. The findings also indicate that some of the proposed characteristic of individuals with high interdependent self-construal may be of people in collectivistic cultures, and thus, may not be applicable for people in individualistic cultures regardless of their higher scores on interdependent self-construal. As the lack of variation in self-enhancing patterns implies, the lack of self-effacement, which was expected for individuals with high interdependent self-construal, suggest that it is cultural factors, not self-construal, that are related to self-effacement. For instance, the finding thatthe IT group supported an entity theory of ability to a greaterextent than did the other groups, and the significant positive correlation between the independent self-construal and an inclination toward an incremental theory of ability, indicate that not the interdependent but the independent self-construal may be related to a stronger support of an incremental theory of ability. Moreover, it is important to note that the attribution pattern demonstrated by the IT group (i.e., citing the importance of effort more for unsuccessful than for successful performance) was often demonstrated among people

who have an entity theory of ability, that is, to alter the meaning of failure by deflecting its cause away from their ability and onto a lack of effort (Martin et al., 2001).

Markus and Kitayama (1991) proposed thatthose with independent and interdependent self-construals differ in views in regard to core attributes that characterize the self. For the independent self, core attributes areproposed to be invariant across situations, while the interdependent self considers its core attributes as variable depending on situations or interpersonal relationships. They proposed that the difference in core attributes influence views of achievement and stated that people with interdependent selves are more likely to "view intellectual achievement not as a fixed attribute that one has a certain amount of, but instead as a product that can be produced by individual effort in a given social context" (Markus & Kitayama, 1991, p. 244). Moreover, previous studies (e.g., Heine et al., 2001; Stevenson, Lee, Chen, Kato, & Londo, 1994; Stevenson & Nerison-Low, 2002) support the argument with the findings that collectivistic people (e.g., Japanese, Taiwanese, and P.R. Chinese) were more likely to support the incremental theory of ability relative to individualistic people (e.g., Americans). However, the lack of self-effacement by the IT group in the present findings implies that the demonstrations of self-effacing patterns may be related to collectivistic cultures rather than to the high interdependent self-construal. Therefore, further study is necessary that separates influence of cultures (i.e., collectivistic) on self-effacement from that of the interdependent self-construal.

Another explanation is proposed in regard to the lack of self-effacement by the IT group. The mean scores for independent and interdependent self-construal of the present participants were significantly lower than those of individualistic participants in the

previous studies (Caucasians (interdependent: *M* = 4.37, independent:*M* = 5.06) in Singelis' (1994); and Westerns (interdependent: *M* = 4.54, independent: *M* = 4.94) in Yamada & Singelis' (1999) studies). Although the HTD (*M* = 4.74) and IT (*M* = 4.69) groups were higher on the interdependent self-construal subscale relative to the ID (*M* = 3.89) and LTD (*M* = 3.68) groups, their mean scores for the interdependent self-construal items were significantly lower than those for the previous groups that were more interdependent than their counterparts (e.g., Asian Americans (sample 1: *M* = 4.91, sample 2: *M* = 4.94) in Singelis' (1994); and Traditional group (*M* = 5.00) in Yamada and Singelis' (1999) study). The lack of self-effacement that was expected for participants in the IT group may be due to the level of their interdependent self-construal, which was not high enough to induce self-effacement.

Characteristics of each self-construal group. Based on Berry and Kim's (1988, cited in Singelis, 1994) model, Singelis (1994) listed the following four types of self-construals observed among people who have immigrated to the United States from collectivistic cultures: Western, Traditional, Culturally-alienated, and Bicultural. These types were characterized in accordance with a degree of an individual's willingness and ability to adjust self in the culture that he or she belongs to. An example of the Western type of individual are those who are from a collectivist culture and replace their interdependent self-image with the type that is most common in the Western culture: independent self-construal. On the other hand, self-construals of individuals who retain the traditional interdependent self, while living in the Western culture are classified as Traditional. The self-construals of individuals who have developed an independent self during acculturation, while retaining their interdependent self-construal are classified as

Bicultural. Finally, self-construals of individuals who degrade their interdependent self-construal without replacing it with independent self-construal are classified as Culturally-alienated.

Extending the notion of the four types to characterize non-immigrants as well, Yamada and Singelis (1999) conducted a study that was aimed at examining applicability of the classification. Based on the categorizations, Yamada and Singelis (1999) selectively recruited participants who would fit into one of the groups. The Western group consisted of European Americans who had no experience of living outside the U.S. The Traditional group consisted of individuals of Asian ethnic groups who were older than 50 years of age and held traditional beliefs that were associated with their ethnic group. The Culturally-Alienated group consisted of high school students who were having adjustment problems in school and thus identified as not fitting in with the school culture. Finally, the Bicultural group consisted of individuals who were residing in a different type of culture from thatth ey were born (either individualistic or collectivistic), able to speak more than one language, and demonstrating an active interest in other cultures.

After assigning the participants into the groups, Yamada and Singelis (1999) measured their endorsement of the independent and interdependent self-construals. As hypothesized, the Bicultural and Traditional groups were equivalent and significantly higher on the interdependent self-construal than the Western and Culturally-Alienated groups, while the Bicultural and Western groups were equivalent and significantly higher on the independent self-construal than the Traditional and Culturally-Alienated groups. Based on the findings, Yamada and Singelis (1999) concluded that having a well-

developed self-construal that is dominant in a culture helps an individual understand culturally shared assumptions that guide behavior and apply them to appropriately function in the culture. In particular, the availability of both types of self should facilitate adjustment to various cultures. Moreover, Yamada and Singelis (1999) proposed deficits of having a poorly developing self-construal, especially, if the self-construal is prototypical in a culture. For instance, a poorly developed prototypical self-construal may be related to segregation or a lack of cultural integration. Furthermore, poor development of both types of self may be problematic as can be seen among alienated individuals who have little concern for the consequences of their actions and are unable to regulate their behavior in accordance with social roles and norms.

While these groups defined by Yamada and Singelis (1999) seem similar to the four self-construal groups in the present study, it should be noted that overall mean scores of independent and interdependent self-construal scales of the present participants were relatively low. The median-split divided the participants who were relatively high and relatively low on the self-construal scale, however, it is questionable that the high group was actually high on the self-construal, because of the low overall mean. Therefore, it is not appropriate to simply consider that the participants in the ID, ITD, LTD, and HTD groups in the present study are equivalent with respect to cultural integrations with those who were classified to be Western, Traditional, Culturally-Alienated, and Bicultural in Yamada and Singelis' (1999) study, respectively.

In addition, a possible validity problem with the Self-Construal Scale should be considered. It is possible that individual items on the scale could be interpreted differently by participants who construe self in more independent way and those whose

self is more interdependent. For instance, a higher rating on an item "I should take into consideration my parents' advice when making education/career plans" is considered to be higher endorsement to interdependent self-construal, based on the theory that argues that individuals with high interdependent self-construal are more likely to value other important people's decision over their own. However, even those whose self is more independent would rate a higher score on the item, if they acknowledge that their parents' advice is indeed helpful. Thus, it is possible that both independent and interdependent individuals endorse the statement, but for different reasons, which calls the validity of the scale into question.

Self-Handicapping Strategies, View of Ability, Self-Efficacy, and Self-Construals

The significant correlation between entity theory of ability and the use of self-handicapping strategies provided support to the self-worth theory. In addition, as was consistent with the theory (Covington, 1992) and the previous studies (e.g., Martin et al., 2001; Midgley et al., 1996), participants who were more likely to use handicapping strategies tended to have a lower percentage grade. In addition, the lower grade was associated with the lower self-efficacy. Furthermore, use of self handicapping strategies appeared to be negatively correlated with self-efficacy. These findings indicate that individuals who had a lower level of self-efficacy(the LTD group) and/or who supported an entity theory of ability to a greater extent (the IT group) may be more likely to self-handicap, which may result in poor performance. Therefore, the IT and LTD groups may be potentially at risk, though no group differences were detected in the use of self-handicapping strategies or in grades in the present study.

Limitations

There are some limitations to consider when interpreting the present results. First, all constructs in the present study were measured with self-report questionnaires. It is recommended to use a multi-method approach in studying self-concept, including both quantitative and qualitative approach, since the approach both with open ended and fixed response measures enables researchers to study self-concept with a richer scope (Grace & Cramer, 2003; Martin et al., 2001; Okazaki, 1994).

A second concern is in relatively low internal consistency of the Self-Construal Scale (.66 for both interdependent and independent subscales). Although the scale has been validated and widely used, it is important to consider what makes internal consistency of the scale consistently low (satisfactory but less than ideal) (Grace & Cramer, 2003; Singelis, 1994). Some researchers suggest using a three factor model (e.g., Grace & Cramer, 2003) that include a factor that is concerned *power distance* (Hofstede, 1994, cited in Grace & Cramer, 2003), *hierarchy versus egalitarian commitment* (Schwartz, 1994, cited in Grace & Cramer, 2003), or *authority ranking* (Fiske, 1991, 1992, cited in Grace & Cramer, 2003). Further study is necessary to examine the model.

Finally, as has been already discussed, there are potential validity problems with the Self-Construal Scale, due to the possibility that the participants might have interpreted the items differently and responded in such a way that did not reflect their view of self.

In addition, it is important to note that the use of median-split for classifying the participants as high and low on each self-construal may not be appropriate in this study,

whose participants yielded low mean scores on both self-construal scales.

Conclusions

Based on the findings, the author proposes that the higher scores on the independent self-construal may be related to a magnification of the outcome bias that perceives a cause of failure to be more external than that of success. On the other hand, it is suggested that the higher scores on the interdependent self-construal may be related to a reduction of that outcome bias.

The hypotheses formulated for the present study were based on the argument that the two self-construals co-exist within individual to a varying degree, and the variations in degree may be related to the individuals' motivation (Markus & Kitayama, 1991; Singelis, 1994). However, many hypotheses related to self-construal were not supported. In particular, the findings that yielded a lack of variation between the ID and IT groups with regard to self-enhancement and self-effacement were inconsistent with the self-construal theory and previous findings in cross-cultural settings. The inconsistent results suggest that those self-enhancing and self-effacing patterns may be due to culture (individualistic and collectivistic) rather than self-construal. Thus, apparently, it is culture, not self-construal, that impacts individuals' beliefs, attitudes, and behaviors. Therefore, it is necessary to make clear distinctions between factors that are related to self-construal pattern and those are rooted in cultures (individualistic and collectivistic).

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APPENDIX

Appendix A. Sample Questionnaires

Demographic Questions

1. Age ____
2. Gender a. ___ Male b. ___ Female
3. American students only
    a. ___ Asian American
    b. ___ African American
    c. ___ Caucasian
    d. ___ Hispanic
    e. ___ Native American
    f. ___ Other, please indicate _____
4. International students only
    a. Nationality _____
    b. How long have you been in the U.S.? ____ years ____ months
5. Student classification
    a. ___ freshman
    b. ___ junior
    c. ___ sophomore
    d. ___ senior
    e. ___ masters student
    f. ___ doctoral student
    g. ___ unclassified
6. Major (if you have more than one, list all of them)

    _____

    _____

Self-Construal Scale

After reading each statement, please choose the number that tells how true that statement is for you. There are no right or wrong answers because everyone is different.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

_____ 1. I would offer my seat on a bus to my professor.

_____ 2. I feel comfortable using someone's first name soon after I meet them, even when they are much older than I am.

_____ 3. Speaking up during a class is not a problem for me.

_____ 4. I respect people who are modest about themselves.

_____ 5. I should take into consideration my parents' advice when making education/career plans.

_____ 6. I am the same person at home that I am at school.

_____ 7. If my brother or sister fails, I feel responsible.

_____ 8. I'd rather say "No" directly, than risk being misunderstood.

_____ 9. I have respect for the authority figures with whom I interact.

_____ 10. I prefer to be direct and forthright when dealing with people I've just met.

_____ 11. I often have the feeling that my relationships with others are more important than my own accomplishments.

_____ 12. Having a lively imagination is important to me.

_____ 13. It is important for me to maintain harmony within my group.

_____ 14. I enjoy being unique and different from others in many respects.

_____ 15. My happiness depends on the happiness of those around me.

_____ 16. I value being in good health above everything.

_____ 17. It is important to me to respect decisions made by the group.

_____ 18. I act the same way no matter who I am with.

_____ 19. I will stay in a group if they need me, even when I am not happy with the group.

_____ 20. I am comfortable with being singled out for praise or rewards.

_____ 21. I will sacrifice my self-interest for the benefit of the group I am in.

_____ 22. Being able to take care of myself is a primary concern for me.

_____ 23. Even when I strongly disagree with group members, I avoid an argument.

_____ 24. My personal identity, independent of others, is very important to me.

Implicit Theory Measure

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements by writing the number that corresponds to your opinion in the space next to each statement.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

_____1, You have a certain amount of intelligence and you really can't do much to change it.

_____2. Your intelligence is something about you that you can't change very much.

_____3. You can learn new things, but you can't really change your basic intelligence.

The Patterns of Adaptive Learning Scale

Please indicate how true each of the statements listed below is to you by writing the number that corresponds to the strength of your agreement or disagreement.

1	2	3	4	5	6
Not at all true					Very true

_____1. Some students put off doing their math work until the last minute. Then if they don't do well, they can say that is the reason. How true is this of you?

_____2. Some students purposely don't try hard in math. They if they don't do well, they can say it's because they didn't try. How true is this of you?

_____3. Some students fool around the night before a math test. Then if they don't do well, they can say that is the reason. How true is this of you?

_____4. Some students purposely get involved in lots of activities. Then if they don't do well in math, they can say it is because they were involved with other things. How true is this of you?

_____5. Some students let their friends keep them from paying attention during math or from doing their math homework. Then if they don't do well, they can say their friends kept them from working. How true is this of you?

_____6. Some students look for reasons to keep them from studying math (not feeling well, having to help their parents, taking care of a brother or sister, etc.). Then if they don't do well on their math work, they can say this is the reason. How true is this of you?

Questions about General Education Mathematics

Following are questions about your experiences in the general education math course that you were recruited from. Please indicate how true each of the statements listed below is to you by writing the number that corresponds to the strength of your agreement or disagreement.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

_____1. I can master even the hardest material in this math course.

_____2. I can do almost all the work in this math course if I don't give up.

_____3. I'm certain that I can do an excellent job on the problems and tasks assigned for this math course.

_____4. I know that I will be able to learn the material for this math course.

_____5. I'm confident that I will receive a good grade in this math course.

Think about the exam that you have recently taken in this course.

6. What was your percentage grade on the exam? _____%

7. Do you think you were successful or unsuccessful on the exam?
   a. ___ Successful. **Complete items 8 – 23 below**
   b. ___ Unsuccessful. **Complete items 24 – 39, beginning on p. 4**

8. If you think you were <u>successful</u> on the previous exam, indicate the cause or factor you perceive to be most responsible for your successful performance on the previous exam.

   My success was mostly due to: _____

Think about the cause or factor that your have written above. The items below concern your impressions or opinions about the cause of successful performance on the exam. Circle one number for each of the following questions.

The cause or factor identified above …

9.	reflects an aspect of yourself.	1	2	3	4	5	6	reflects an aspect of the situation
10.	is manageable by you	1	2	3	4	5	6	is not manageable by you
11.	is permanent	1	2	3	4	5	6	is temporary
12.	is something you can regulate	1	2	3	4	5	6	is something you cannot regulate
13.	is something over which others have control	1	2	3	4	5	6	is something over which others have no control
14.	is inside of you	1	2	3	4	5	6	is outside of you
15.	is stable over time	1	2	3	4	5	6	is variable over time
16.	is under the power of other people	1	2	3	4	5	6	is not under the power of other people
17.	is something about you	1	2	3	4	5	6	is not something about you
18.	is something over which you have power	1	2	3	4	5	6	is something over which you have no power
19.	is unchangeable	1	2	3	4	5	6	is changeable
20.	is controllable by you	1	2	3	4	5	6	is controllable by others

21. To what degree do the following factors explain that success? Please use percentages to indicate how important each of the following factors was to your success. Percentages must total to 100%.

Ability	____	%
Easy exam	____	%
Effort	____	%
Good luck	____	%
TOTAL	100	%

Please indicate the degree of your confidence in being successful on a subsequent test by writing the number that corresponds to your opinion in the space next to each statement.

1	2	3	4	5	6
Much less successful					Much more successful

_____22. If I were to take a parallel version of the exam next week, I'm confident that I will be…

_____23. I'm confident that I will be … on the next exam in this course.

This is the end of the questions. Thank you very much for your participation.

24. If you think you were <u>unsuccessful</u> on the previous exam, indicate the cause or factor you perceive to be most responsible for your unsuccessful performance on the previous exam.

    My unsuccessful performance was mostly due to: _____

Think about the cause or factor that your have written above. The items below concern your impressions or opinions about the cause of successful performance on the exam. Circle one number for each of the following questions.

The cause or factor identified above …

25.	reflects an aspect of yourself.	1	2	3	4	5	6	reflects an aspect of the situation
26.	is manageable by you	1	2	3	4	5	6	is not manageable by you
27.	is permanent	1	2	3	4	5	6	is temporary
28.	is something you can regulate	1	2	3	4	5	6	is something you cannot regulate
29.	is something over which others have control	1	2	3	4	5	6	is something over which others have no control
30.	is inside of you	1	2	3	4	5	6	is outside of you
31.	is stable over time	1	2	3	4	5	6	is variable over time
32.	is under the power of other people	1	2	3	4	5	6	is not under the power of other people
33.	is something about you	1	2	3	4	5	6	is not something about you
34.	is something over which you have power	1	2	3	4	5	6	is something over which you have no power
35.	is unchangeable	1	2	3	4	5	6	is changeable
36.	is controllable by you	1	2	3	4	5	6	is controllable by others

37. To what degree do the following factors explain that unsuccessful performance? Please use percentages to indicate how important each of the following factors was to your unsuccessful performance. Percentages must total to 100%.

Lack of ability	____	%
Difficult exam	____	%
Lack of effort	____	%
Bad luck	____	%
TOTAL	100	%

Please indicate the degree of your confidence in being successful on a subsequent test by writing the number that corresponds to your opinion in the space next to each statement.

1	2	3	4	5	6
Much less successful					Much more successful

_____38. If I were to take a parallel version of the exam next week, I'm confident that I will be…

_____39. I'm confident that I will be … on the next exam in this course.

This is the end of the questions. Thank you very much for your participation.