Diatheses to Depression: The Interactions of Schema Propositions,

Schema Structure, and Negative Life Events

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(ABSTRACT)

Drawing from the meta-construct model of cognition (Ingram, 1984; Ingram & Kendall, 1986), the goal of the present study was to examine whether the structural (i.e., self-complexity; SC, Linville, 1985) and propositional components of schemas (dysfunctional attitudes; DAS, Weissman & Beck, 1978), independently and in interaction with each other and stressors, lead to changes in depressive symptoms. The prediction was that if negative self-attributes across different self-aspects in a specific domain, interpersonal or achievement, are highly distinct (i.e., high negative SC) or if positive self-attributes across different aspects of self are redundant (i.e., low positive SC), then the DAS would be more likely to lead to higher levels of depression when domain-congruent stressors occur. To test the main effect, two-way interaction, and three-way interaction hypotheses, the present study used a two month longitudinal design involving three assessment periods, separated by one month. At the baseline, a total of 189 students participated in the study. Of these students, 163 and 121 students participated in the first and second follow-ups, respectively. Multiple hierarchical regression analyses were used to examine two-way and three-way interactions. Results showed strong support for the predictive power of negative SC with respect to depressive symptomatology. The DAS, on the contrary, was a concurrent factor related to depressive symptoms. Further, the present study did not provide supportive evidence for the diathesis-stress model of depression. Although contradicting expectations, the pattern of relationships between interpersonal negative SC, DAS, distal stressors suggested promising venues for future research.

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Dedication

To my parents for their unconditional support and love, and to my beloved aunt,

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Introduction

Multiple vulnerability factors have been proposed in the literature (e.g., Gotlib & Hammen, 2002) to predict the occurrence and recurrence of depression. Cognitive factors, particularly cognitive schemas as proposed by Beck (1976) are one of the most widely- studied vulnerability factors in depression. By definition, schemas are cognitive structures that compose a highly- organized network of stored personal information based on early life experiences (Beck; Segal, 1988; Segal & Ingram, 1994).

In Beck's cognitive theory of depression (1976), depressogenic schemas in interaction with stressors generate negative automatic thoughts that lead to negative interpretations about self, other, and the world (i.e., cognitive triad). Elevations in the cognitive triad in turn lead to depression. As such, depressogenic schemas are the proposed diathesis to depression in Beck's theory and are the treatment focus for relapse prevention in cognitive- behavioral therapy of depression (Beck, Rush, Shaw, & Emery, 1979; Beck, 1983; Young, Beck, & Weinberger, 1993; Young, Weishaar, & Klosko, 2003).

There are certain assumptions about schemas that have important implications for the understanding of the role of schemas in depression. One assumption is that schemas are not readily available to conscious reflection, i.e., are latent. Thus, activating schemas via mood priming or studying schemas when activated by stressors have been suggested as ways to increase the likelihood of valid assessment (Beck, 1976; Teasdale, 1988). This approach is represented by the mood-state hypothesis (Miranda & Persons, 1988) and diathesis-stress model of depression. According to the mood-state hypothesis, schemas are more likely to be accessible to conscious reflection when activated by

congruent mood states. According to the diathesis- stress model, schemas lead to depression only if stressors occur that activate them.

Empirical support for the role of schemas as a diathesis in depression has been limited by research deficiencies in both non-clinical populations (e.g., Brosse, Craighead, & Craighead , 1999; Rude, Covich, Jarrold, Hedlund, & Zentner, 2001) and clinical populations (e.g., Dozois, 2001; Jacobson et al., 1996; Wilkinson & Blackburn, 1981). These deficiencies include: 1) defining schemas as latent constructs, but measuring them as if they were readily accessible to conscious reflection; 2) failure to take into account Beck's proposed link between schemas and their activation by congruent stressors; and 3) inadequacy of study designs. For example, studies that used self-report measures of schema content have failed to use longitudinal designs to test diathesis-stress interactions or to include priming procedures that prompt recall of the latent schemas. Likewise, a majority of treatment outcome studies (e.g., Jacobson et al.) have not adhered to the methodological implications of the diathesis-stress model for studying the course of depression post-treatment.

In addition to limitations in study design, most studies of the role of schemas in depression have focused exclusively on schema propositions/statements, in spite of Beck's discussion of schemas in terms of both *cognitive structure* and *propositions* (Segal, 1988; Segal & Ingram, 1994). A more detailed description of structural and propositional properties of schemas was explicated in the *meta-construct model* of cognition (Ingram, 1984; Ingram & Kendall, 1986).

According to the meta-construct model, four elements of cognition are related to depression: structure, propositions, processes, and products (Ingram, Miranda, & Segal, 1998). In this taxonomic system, these four elements compose an interrelated and

dynamic system and are not mutually exclusive. *Structure* is defined by the elements of internal organization, representations, and storage of information in memory. *Propositions* are defined by the content of the information stored in memory as represented by self-statements, and are measured by such instruments as the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978) and Young's Schema Questionnaire (YSQ; Young, 1994). Schemas in turn affect cognitive *processes* such as attention, encoding, and retrieval. *Products* reflect cognitions that result from the interrelationships among the other three cognitive elements. Compared to schemas, which are considered distal diatheses, products (e.g., negative automatic thoughts; Beck, 1976) occur more proximately to or concurrent with depression.

The present study focuses on the two of elements of cognition –propositions and structure – that have been proposed as components of schemas. Accordingly, schemas are not only propositions or structure, but both. However, the relationship of these two properties of schemas in the prediction of depression is largely unknown and has not yet been examined. Below, literature on the propositional and structural components of schemas as they separately relate to depression will be examined first. Then, a relationship between these two components will be proposed.

Schema Propositions: Dysfunctional Attitudes

The most widely- used measure of schema propositions is the DAS (Weissman & Beck, 1978). The statements on the DAS reflect dysfunctional attitudes or beliefs about self. These beliefs are mainly related to deprecating self-views, such as belief in deficiency, unworthiness, and defectiveness. These depressogenic beliefs have been found to be related to depression in longitudinal studies in which schemas were examined in interaction with stressors (Abela & D'Alessandro, 2002; Barnett & Gotlib, 1988;

Barnett & Gotlib, 1990; Brown, Hammen, Craske, & Wickens, 1995; Dykman & Johll, 1998; Joiner, Metalsky, Lew, & Klocek, 1999; Klocek, Oliver, & Ross, 1997). Some of these studies examined stressors as measured by self-report (e.g., Barnett & Gotlib; Dykman & Johll; Klocek et al., 1997), while others studied objective stressors such as failure on midterm examinations (Brown et al., 1995; Joiner et al., 1999) or college admission (Abela & D'Allessandro).

While the majority of research has supported the interaction between cognitive schemas as operationally defined by propositions in the DAS, and stressors in predicting depression, schema theory postulates that congruent stressors are more likely to activate latent schemas than are non-congruent stressors. Research has focused on two major areas of congruence: interpersonal and achievement. Beck (1987) defined two dimensions for cognitive schema propositions congruent with these areas: respectively, the need for approval and excessive concern over performance evaluation. Beck further described two related personality types that are sociotropic (i.e., excessive worry about interpersonal relationships) and autonomous (i.e., excessive worry about achievement.) Interaction between autonomy schemas and achievement stressors (Brown et al., 1995) has been less consistently linked to depression than interaction between sociotropy schemas and interpersonal stressors (e.g., Clark, Beck, & Brown, 1992; Robins, Hayes, Block, Kramer, & Villena, 1995; Zuroff & Mongrain, 1987).

The mood-state hypothesis with regard to the dormancy of schemas has not been examined in longitudinal diathesis-stress studies. This hypothesis has been mostly examined in cross-sectional studies of schema- propositions as measured by the DAS using mood priming procedures (Blackburn & Symth, 1985; Brosse, Craighead, &

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Craighead, 1999; Dykman, 1997; Miranda, Gross, Persons, & Hahn, 1998). In these studies, never-depressed individuals were compared to previously-depressed individuals, with the expectation that priming would activate latent schema propositions in the latter, but not the former groups. However, results were inconsistent in terms of support for the expected difference between these two groups.

Two plausible explanations for the lack of supportive findings for the mood-state hypothesis with respect to schema propositions can be proposed. One is simply that cross-sectional designs provide an inadequate test of the vulnerability hypothesis (e.g., Just, Abramson, & Alloy, 2001). It may be, for example, that symptoms in previously depressed individuals are unrelated to cognitive vulnerability, but are related to other forms of vulnerability (e.g., Gotlib & Hammen, 2002; Ingram & Price, 2001; Just et al., 2001). Longitudinal designs eliminate this deficiency by identifying individuals who possess the cognitive schema diathesis and examining their vulnerability to depression. Second, mood priming techniques have been proposed to vary in their ability to evoke schema- content. The most widely- used mood priming techniques are the Velten procedure (Velten, 1967), which requires participants to read depressing words, and the presentation of depressing film clips (Gross & Levenson, 1995). Bower (1987) has suggested that these mood- induction procedures are not meaningful for particants, and can be improved by procedures designed to evoke idiosyncratic depressive memories (i.e., the autobiographical recollections method; Goodwin & Williams, 1982; self-generated imagery; Salovey, 1992).

Cognitive Structure: Self- Complexity

The most elaborate conceptualization of the role of *cognitive structure* in depression has been provided by the self-complexity model (SC, Linville, 1985; 1987).

The construct of SC is based on the perspective that the self is composed of multiple self-aspects that can have distinct meanings and implications for an individual's different life domains (e.g., interpersonal, academic, financial). According to the SC model, these self-aspects can be organized at various levels of self-perception, including roles (e.g., teacher, student) and attributes (e.g., hardworking, beautiful, worthless). Each aspect of self has a cognitive representation that can be activated by internal as well as situational factors. According to this model, SC is defined by the number of different ways people describe themselves (i.e., self-aspects) and how these descriptions relate to each other. When individuals have multiple self-aspects that are relatively independent in terms of their descriptions (i.e., high SC), individuals are better protected from events that threaten any one of their self-aspects.

One reason for the buffering effect of SC has been explained by the associative network model (Gluck & Bower, 1988; Hinton & Anderson, 1981). According to this model, activation of a self-aspect spreads to related self-aspects. When an individual's self-aspects are sufficiently differentiated, activation of a negative self-aspect is restricted to the specific domain activated by the stressor and does not easily generalize to other aspects of self. Thus, individuals with more complex self-structures would be relatively protected from the spreading activation of self-deprecating beliefs and therefore protected from depression.

In a meta-analysis of the literature on the relationship between SC and depression, Rafaeli-Mor and Steinberg (2002) concluded that SC was negatively and weakly related to psychological adjustment, a finding that was explained in terms of the heterogeneity of findings and how SC was operationally defined in different studies. For instance, in line with Linville's SC model, in several cross-sectional studies, individuals with high SC

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were less likely to get depressed than were individuals with low SC (Kalthoff &

Neimeyer, 1993; Linville, 1987).   However, the opposite conclusion was reached in

several other studies (Hershberger, 1990; Study 2 and 3, Kalthoff & Neimeyer).

Further studies on *overall SC* conceptualization brought attention to the

importance of valence of SC (i.e., negative and positive). A negative/positive SC refers

to how distinctly varied negative/positive self-descriptions are identified by individuals

across different aspects of self. Studies that examined both negative and positive SC

consistently showed evidence contradicting the predictions based on Linville's

hypothesis, finding instead that higher negative SC leads to higher depression. In a 9-

month longitudinal study (Woolfolk et al., 1999), high negative SC predicted poor

recovery for individuals suffering from major depressive episodes. In a cross-sectional

study (Gara et al., 1993), high negative SC and low positive SC were characteristics of

clinically depressed individuals. In another cross-sectional study, Woolfolk, Novalany,

Gara, Allen, and Polino (1995) found negative SC, but not positive SC, was positively

and uniquely related to depression levels in college students.

For *overall SC,* evidence for the stress-buffer hypothesis has been supportive

(Dixon & Baumeister, 1991; Linville, 1985; Niedenthal, Setterlund, & Wherry, 1992).

These studies have evaluated such stressful events as feedback on a bogus test. However,

further research (Solomon & Haaga, 2003; Showers, Abramson, & Hogan, 1998) has

shown that there is a buffer effect, but the relationships between SC and stressors were

not as was predicted by Linville's SC model. For instance, in a longitudinal study of

depression with college students with and without cognitive vulnerability (i.e., high and

low on the DAS and negative cognitive style), Showers et al. (1989) found that low

overall SC moderated the effects of high levels of self-rated life events/stressors on

depression only when the negative content of the SC was low. Based on these findings,

Showers et al. (1989) suggested that individuals with high negative content across their

self-aspects may feel "the best" during highly stressful times only if their SC is low.

When valence of SC was considered, findings for the stress-buffer effect were

inconsistent. Woolfolk and colleagues (1995), in a cross-sectional study, failed to find

the buffering effect of either positive or negative SC on the relationship between stress

and depression. Morgan and Janoff-Bulman (1994) reported that only positive SC

buffered the effects of traumatic events on psychological adjustment.

Compared to the above studies that used *general* stressors, studies that examined

SC using domain- specific stressors and congruent SC measures have found support for

the stress-buffering effect of SC. These studies operationally defined stressful events as

feedback on a bogus interpersonal lab task (Cohen, Pane, & Smith, 1997) and self-rated

life events (Cohen et al., 1997; Smith & Cohen, 1993). These studies emphasized SC

with respect to interpersonal life (i.e., distinctiveness of various attributes that refer to

interpersonal life). Smith and Cohen found that college students responded to the

breakup of a relationship with higher feelings of upset if their aspect impact quotient was

high (i.e., low SC in a specific domain of self). Overall SC was not related to reactions to

the break-up. Again with college students, using a longitudinal study, Cohen et al. found

support for the buffering effect of the aspect impact quotient related to interpersonal self-

aspects on experienced negative interpersonal life events. There was no buffer-effect for

overall SC. Cohen and colleagues explained the supportive findings for the buffering

effect of *overall* SC in other studies (Dixon & Baumeister, 1991; Linville, 1985;

Niedenthal et al., 1992) by pointing out the overlap between the characteristics of the

college population of these studies at Yale, Johns Hopkins and Case Western Reserve,

and the achievement focus of the tasks. In neither of these studies, with general stressors or domain-congruent stressors and SC, valence of SC was considered.

Framework and Goal of the Present Study

As reviewed, both schema propositions and schema structure have been related to current and future depression. Further, in studies that used elaborative analysis of content and valence, stressors interacted with these two schema properties in predicting depression. However, little research (Dozois, 2001; Hedlund & Rude, 1995; Rude, Covich, Jarrold, Hedlund, & Zentner, 2001) has attempted to understand how these properties of schemas relate to each other and stressors in predicting depression. Only one study tested the relative importance of SC and schema content at the level of propositions in a regression analysis (Woolfolk et al., 1999). In this study, SC predicted the persistence of depression after accounting for the effects of initial depression levels and schema content as measured by the DAS. The DAS was not a significant predictor when self-complexity was considered. However, Woolfolk et al. (1999) did not evaluate the possible interaction between SC and the DAS in predicting depression. Future research is thus warranted to test the relationship of these two components of schemas, both separately and in interaction with stress and with each other, with respect to depression.

The present study examined whether negative SC interacts with schema propositions (i.e., DAS) and congruent stressors to predict depression. The prediction is that, if negative self-attributes across different self-aspects in a specific domain, interpersonal or achievement, are highly distinct (i.e., high negative SC), then depressogenic beliefs measured by the DAS would be more likely to lead to higher levels of depression when a domain-congruent stressor occurs. If negative attributes are not

distinct and/or numerous (i.e., low negative SC), then the strength of depressogenic

beliefs would be less likely to augment the effects of negative stressors on the mood of

the individual. Based on the stronger evidence for the predictive value of negative SC,

positive SC will only be examined with respect to depression when individuals are under

high stress and have high levels of depressogenic beliefs.

The mechanism behind these hypothesized relationships is based on findings on the

relationship between depression, constructive thinking, and negative/positive SC (Gara et

al., 1993; Woolfolk et al., 1995). Based on supportive findings for the role of negative

SC in depression (Gara et al.; Woolfolk et al.), it has been speculated that numerous and

distinct negative self-descriptions across different aspects of self (i.e., high negative SC)

in depressed individuals may be a result of self-focus and rumination about negative

information. Further, the elaborative nature of self- related negative information may

cause individuals with high SC difficulties in challenging negative beliefs about self and

appreciating positive self- referent information (Woolfolk et al., 1995). This explanation

was supported by the findings on the relationship between constructive thinking and

negative SC (Morgan & Janoff-Bulman, 1994). Among people who had a traumatic

experience, a higher negative SC was related to less constructive thinking, while a higher

positive SC was related to more constructive thinking. Such a relationship between

coping and complexity was not found for overall SC (Morgan & Janoff-Bulman). These

findings may be explained by that individuals with highly positive SC have a broad

knowledge base or descriptions about positive aspects of self that would counteract the

effects of negative beliefs evoked by negative events (Koch & Shepperd, 2004). On the

other hand, for individuals who have higher negative SC and stronger negative beliefs

about self, the occurrence of stressors sufficient to evoke negative beliefs would have a

broader meaning for the individual due to the broader knowledge base for negative aspects of self. Thus, these individuals would have a more difficult time constructively dealing with their beliefs and evoking stressors.

Several design features were introduced in this study to offer the best test of Beck's (1976) schema theory of depression. To test the hypothesized relationships, the present study used a longitudinal design, controlling for initial levels of depression, as such a design offers the best test of the diathesis-stress interaction. Also, a priming procedure was used to increase negative mood at the baseline phase, prior to assessing schema propositions, to increase accessibility to latent schemas.

Hypotheses of the Study

The following hypotheses were tested separately for both the interpersonal and achievement domains.

1. Hypothesis 1a: Negative SC at Time 1 is positively related to depressive symptoms at T2 and T3, controlling for depressive symptoms at T1.

2. Hypothesis 1b: Negative DAS at T1 is positively related to depressive symptoms at T2 and T3, controlling for depressive symptoms at T1.

3. Hypothesis 1c: Stressors experienced in the month prior to each follow-up is positively related to depressive symptoms at T2 and T3, controlling for depressive symptoms at T1.

4. Hypothesis 2a: Negative SC at T1 interacts with DAS at T1 to predict depressive symptoms at T2 and T3, controlling for depressive symptoms at T1.

5. Hypothesis 2b: Negative SC at T1 interacts with congruent stressors in the month prior to each follow-up to predict depressive symptoms at T2 and T3, controlling for depressive symptoms at T1.

6. Hypothesis 2c: Negative DAS at T1 interacts with congruent stressors in the month prior to each follow-up to predict depressive symptoms at T2 and T3, controlling for depressive symptoms at T1.

7. Hypothesis 3: Negative SC at T1 interacts with DAS at T1 and congruent stressors in the month prior to each follow-up period to predict depressive symptoms at T2 and T3, controlling for depressive symptoms at T1.

8. Hypothesis 4: Positive SC at T1 interacts with DAS at T1 and congruent stressors in the month prior to each follow-up period to predict depressive symptoms at T2 and T3, controlling for depressive symptoms at T1.

Method

Participants

During the baseline assessment, a total of 189 students, participated in the study. Of these students, 86% (N = 163) and 64% (N = 121) participated in the first and second follow-ups, respectively. Two extra credit points were given for their participation in each of the three assessment periods. The demographic characteristics for the samples at baseline (T1), one month follow-up (T2), and two month (T3) follow-up assessments are presented in Table 1.

Procedures

The present study is longitudinal, involving three assessment periods, separated by one month. At the baseline (T1), participants were group-administered the measures of schema variables, stressors, and depressive symptoms. The groups ranged between 2 and 20 participants at a time. At each assessment period, participants read the consent form and voluntarily agreed to participate in the present study.

Before the administration of the DAS at the baseline assessment session, participants went through the mood induction procedure adapted from Ingram and Ritter (2000) and Gilboa and Gotlib (1997). This mood induction procedure was composed of both the autobiographical recollections method (ARM; Goodwin & Williams, 1982; Salovey, 1992) and music induction. The evidence showed that this type of mood induction affects participants' mood as measured by a visual analogue scale (Gilboa & Gotlib) and the depression scale of the Multiple Affect Adjective Checklist (MAACL; Zuckerman & Lubin, 1965).

The mood induction procedure was as follows: Participants were asked to sit relaxed, make themselves comfortable, and focus their attention on the instructions. Participants were then asked to think about the saddest event in their lives while sad music was played for 5 minutes (i.e., Prokofiev's "Russia Under the Mongolian Yoke"). Participants were further instructed to imagine the event using Salovey's "relive" instructions (1992):

"I would like you to begin imagining the situation that made you feel sad. Imagine the situation as vividly as you can. Picture the events happening to you. See all the details of the situation. Picture in your "mind's eye" the surroundings as clearly as possible. See the people or objects; hear the sounds; experience the event happening to you. Think the thoughts you would actually think in the situation. Feel the same sad feelings you would feel. Let yourself react as if you were actually there."

After 5- minutes, while the music plays, participants were asked to write about the event. Right after, participants again took the 2nd mood measure and the DAS. Administration of the SC measure followed the DAS. At the end of the assessment, to

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remedy the effects of the mood manipulation, participants went through a neutralizing procedure. Participants were asked to relive and write about a neutral experience that they recently experienced. While thinking of this neutral experience, an excerpt from Vivaldi's "Spring" violin concerto op. 12 was played. Participants were then debriefed about the study.

At one month (T2) and two month (T3) follow-ups, participants filled out the stressor and depressive symptom measures online. Schema variables were measured only at T1. The T1 administration of questionnaires and mood manipulation lasted about 2 hours. The T2 and T3 measurements lasted about an hour.

Measures of Cognitive Schema Indices

Cognitive structure measure: Self-Complexity (SC). The Card- Sorting Task (CST) (Linville, 1985; 1987) has been used as a measure of SC, using both positive and negative self-descriptive adjectives. In the present study, the procedures of the Card-Sorting Task were adjusted to make the administration of the SC task to a large group of participants feasible. The procedures from the paper-pencil version of the CST used by (Cohen et al., 1997; Morgan & Janoff- Bulman, 1994) were converted into a computerized version of the task.   In this task, the list of adjectives was composed of 20 positive and 20 negative adjectives, a list developed by Showers (1992).

There were two parts of the task, for the interpersonal and achievement domains, respectively. Both parts have the same instructions. Participants were instructed to think of different aspects of themselves and their life that involve both interpersonal relationships (Part 1) and personal achievement (Part 2). Interpersonal aspects were described as roles or traits related to relationships with family, friends, intimates, co-workers, strangers, and the world. Achievement aspects were described as roles or traits

associated with their roles as student, artist, athlete and employee. Then, for each domain, multiple lists of adjectives with a blank line on top were presented on the computer page. Each list was composed of the same adjectives. Participants were asked to write an aspect of themselves for the domain in question on each blank line and subsequently check the adjectives that describe these aspects. Participants had 25 minutes to complete this task.

The SC measure is a measure of dimensionality and the *H* statistic is used to define the number of dimensions (Scott, Osgood, & Peterson, 1979). *H* represents the number of distinct self-descriptive attributes implicit in each individual's self aspects for each domain. The formula is as follows:

$$H = log_2\, n - (\textstyle\sum n_i\, log_2\, n_i)/n,$$

where n is the total number of trait adjectives (40) and n_i is the number of trait adjectives that appear in a given combination of groups of adjectives (i.e., the number of adjectives that belong to only one sub-self, and those that belong to two or more sub-selves). The more self-aspects created and the less redundant the trait adjectives describing each self-aspect, the higher is the *H* or SC score. With 40 adjectives, the possible range of H is limited by the number of adjectives in the lists of each self-aspect (n =40); max(H) = log_2 (40) = 5.32.

The degree of complexity for negative components of self (i.e., negative SC) and the degree of complexity for positive components of self SC (i.e., positive SC) was computed for both the interpersonal and achievement domains. The negative and positive SC was calculated by considering only the negative adjectives and positive adjectives within a sub-self, respectively. Overall, there were four parameters of

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cognitive structure: 1) interpersonal negative SC, 2) interpersonal positive SC, 3) achievement negative SC, and 4) achievement positive SC.

Schema propositional- content measure: Dysfunctional Attitudes Scale (DAS)-A. The DAS (Weissman, 1980) is a measure of negative beliefs about oneself. The DAS is composed of two sets of items that reflect negative statements about the self in the interpersonal (10 items) and achievement (15 items) domains (Cane, Olinger, Gotlib, & Kuiper, 1986). Statements in the interpersonal domain indicate "need for approval" and statements about "performance evaluation" reflect concerns related to achievement. Participants are required to rate each statement on a scale from 1 to 7, with 1 = totally agree and 7 = totally disagree. The total score ranges from 40 to 280. A higher score on the DAS reflects a higher level of endorsement of negative statements about self. Test-retest reliabilities for college population vary between .79 and .93 (Dobson & Brietier, 1983; Kuiper, Olinger, MacDonald, & Shaw, 1985; Olinger, Kuiper, & Shaw, 1987; Weissman & Beck, 1978). Internal consistency of the DAS varies between .84 and .92 (Cane & Gotlib, 1987). In the present study, internal consistencies were good for the interpersonal (α = .85) and achievement domains (α = .90).

Measure of Life Events

College Student Life Events Schedule (CSLES). The CSLES (Sandler & Lakey, 1982) was devised to assess life events that are likely to be experienced by college students. There are 111- items composed of different categories of life events, rated on a 7- point scale (1 = extremely negative, 4 = no impact, 7 = extremely positive). In the present study, participants completed the CSLES to reflect events experienced in the past month at T1, and to reflect the month prior at T2 and T3. Cohen and colleagues (1997) categorized the items in terms of five dimensions: 1) academic events (18 items; e.g.,

increased demands from academic course work), 2) interpersonal/friend events (6 items;

e.g., separation from close friend due to moving), 3) family-related events (15 items; e.g.,

parents separated or divorced), 4) romantic relationship events (16 items; e.g., decreased

sexual activity), and 5) other events (i.e., victim of crime). In the present study, events

were identified as being in the interpersonal (approval) and achievement (performance

evaluation) domains based on agreement in blind ratings between the author and the

author's major professor. The average negativity ratings were computed for experiences

in interpersonal and achievement domains. Internal consistencies were good for these

domains at the baseline and the two follow-ups; ranging between .81 and .85 for the

interpersonal domain and .80 and .90 for the achievement domain.

Measure of Depressive Symptoms

   The Center for Epidemiologic Studies Depression Scale (CES-D). The CES-D

(Radloff, 1977) is a 20-item, self-report measure of depressive symptoms that mainly

measures depressive affect. In the present study, the measure was adjusted to measure

depressive symptoms during the past two weeks rather than the past week. The items are

rated using a four-point Likert scale that range from 0 (rarely or none of the time) to 3

(most or all of the time). Previous research has shown support for the psychometric

properties of the measure in non-clinical populations (e.g., Cohen et al., 1997; Radloff).

Internal consistencies of the scale were good at the baseline and both follow-ups, ranging

between .88 and .90.

Mood State Measure

   The Brief Mood Introspection Measure was devised by Mayer and Gaschke

(1988). This measure was used to measure the mood state of the participants before and

after the mood manipulation. The measure is composed of 16 items (e.g., lively, happy,

sad, tired, caring, content, nervous, calm, jittery), rated on a 4- point scale ranging from 0 (definitely do not feel) to 5 (definitely feel). In addition to the 16 items, participants rate their overall mood on a scale ranging from -10 (very unpleasant) to +10 (very pleasant). Participants were instructed to rate each item according to their present mood. This measure was shown to have high reliability estimates in previous research (Hall & Baum, 1995; Mayer, Allen, & Beauregard, 1995). In the present study, internal consistency of the negative and positive items of the measure was good, .69 and .70, respectively.

Measure of Verbal Fluency

Verbal Fluency Test. The Controlled Oral Word Association Test (COWAT; Benton & Hamsher, 1976) measures the oral or written production of words beginning with a designated letter. The task involves three trials. In these trials, participants are required to write as many words as possible in one minute beginning with a specific letter (i.e., F, A, S). Proper names, numbers, and the same word with different suffixes are not allowed. "F", "A", and "S" are the most frequently used letters and these will be utilized in the present experiment.

<div align="center">Results</div>

Descriptive Statistics

The independent t-test analyses were conducted to examine whether differences existed between the samples participating at each of the three time periods on any demographic, predictor, or criteria variables. The only significant difference was on ratings of interpersonal stressors experienced within the last month prior to the baseline assessment ($M = 10.48$, $SD = 5.97$) and the second month follow-up ($M = 7.95$, $SD = 4.39$), $t(145) = -2.04$, $p < .05$.

Descriptive statistics and correlations between predictor and criteria variables at

<div align="center">18</div>

the baseline and the two follow-up periods are shown in Tables 2, 3 and 4, respectively.

T-tests examining the mean differences in stressors, schema variables, and depression levels showed significant differences (for means, see Tables 3 and 4). For the first follow-up data, the level of T1 achievement stressor was significantly lower than T1 interpersonal stressors, $t(162)= -5.54$, $p < .001$. Achievement stressors at T2 and interpersonal stressors at T2 were not significantly different. The results were the same for the second follow-up data. The level of T1 achievement stressor was significantly lower than T1 interpersonal stressors at the second month follow-up, $t(120) = -4.786$, $p < .001$. The difference between the T2 achievement and interpersonal stressors were not significant. These results showed that the highest stressors in the present sample happened at T1 in the interpersonal domain. The interpersonal stressors showed a significant decrease over time, and was not, anymore, significantly larger than achievement stressors at T2 and T3 periods.

In terms of the cognitive variables, in the sample at the first follow-up, the achievement DAS was higher than interpersonal DAS, $t(120) = -4.76$, $p < .001$. For this sample, the SC in the interpersonal domain was higher than the achievement domain, $t(120) = -7.82$, $p < .001$. For the second follow-up sample, the interpersonal DAS was higher than the achievement DAS, $t(162)= -4.30$, $p < .001$. Likewise, the interpersonal SC was higher than the achievement SC, $t(162) = -6.58$, $p < .001$. The means and SDs of these variables are shown in Tables 3 and 4.

Correlations between interpersonal/achievement positive SC and depression were non-significant at any time period, while correlations between negative SC and depressive symptoms were consistently significant (see Tables 2, 3, and 4). Correlations between both interpersonal and achievement DAS and depressive symptoms at T1and T2

were significant (see Table 2 and 3). Achievement DAS, but not interpersonal DAS, was significantly correlated with depressive symptoms at T3 (see Table 4).

Correlations between achievement and interpersonal negative SC and DAS levels of the participants at the baseline, the first follow-up, and the second follow-up were low to moderate at the three time points (see Tables 2, 3, and 4).

Correlations between the stressors were examined across time periods. Results related to stressors indicated a consistent, moderate to high level, significant relationship between achievement stressors at T1 and T2 at the first follow-up (see Table 3), and T1 and T3 at the second follow-up (see Table 4). However, correlations cross time between the interpersonal stressors were not significant.

Manipulation Check

T-tests were performed to test whether the mood of the participants before the mood manipulation, as measured by the Brief Mood Introspection Scale, was different from the mood after the manipulation. As shown in Table 5, a significant difference was found between the positive, negative, and overall mood ratings before and after the mood manipulation in the expected direction. After the mood manipulation, participants exhibited a significant decrease in positive mood and overall pleasant mood ratings, and a significant increase in negative mood ratings.

Control Variables

Prior to testing the hypotheses, the effects of control variables (i.e., current status of psycho-medical interventions, level of verbal fluency, gender) on the DAS, negative SC, stressors, and depressive symptoms were examined. No significant relationships were found at any time period.

Testing Hypotheses 1, 2, and 3: DAS-Negative SC-Stressors Link to Depressive

Symptoms

Hypotheses 1a-1c (main effects) were tested using partial correlations.

Hypotheses 2a-2c (two-way interactions), and 3 (three-way interactions) were tested

using hierarchical regression analysis. The predictor variables were baseline measures of

negative SC and DAS, and stressors at T2 and T3, with depressive symptoms at T2 and

T3, respectively, as the criteria variables.

Each regression analysis was done using domain-congruent predictor variables.

First, the control variable - depressive symptoms at T1 - was entered into the regression

equation in Step 1. In Step 2, predictor variables (DAS, SC, and stressors) were entered.

In Step 3, the two-way interactions between DAS and SC, DAS and stressors, and SC and

stressors were added to the equation. The three-way interaction of DAS, SC and stressors

was entered into the equation in Step 4. To reduce the effect of collinearity in the

regression analyses, the predictor variables were centered by subtracting the mean from

raw values before calculating the interaction terms (Aiken & West, 1991). The results for

the one month and two month follow-ups are presented below.

One month follow-up. Hypotheses 1a-1c, regarding the main effects of predictors

on depressive symptoms at T2, were tested using partial correlations, controlling for

depression at T1. The main effects of negative interpersonal (*partial r* = .20, *p* = .01) and

achievement (*partial r* = 18, *p* < .05) SC on depression at T2 were significant, supporting

hypothesis 1a. The main effect of DAS on depression at T2 was not significant in either

domain of the DAS. Hence, hypothesis 1b was not supported. The relationships between

the stressors at T2 and depression at T2 were significant for both interpersonal (*partial r*

= .17, $p < .05$) and achievement (*partial r* = .16, $p < .05$) stressors, supporting hypothesis 1c.

Hypotheses 2a-2c predicted a two-way interaction between the domain-congruent DAS, negative SC, and stressors at T2 in their effect on depressive symptoms at T2. Results of multiple hierarchical regressions did not provide supportive evidence for the two-way interactions – hence hypotheses 2a-2c were rejected.

Hypothesis 3 predicted a three-way interaction between the DAS, negative SC, and stressors at T2 to predict depressive symptoms at T2. Neither the three-way interaction in the interpersonal domain ($B = .01$, t = .51, *Adjusted R^2=.31, $\Delta R^2 < .001$, p = .61*) nor the three-way interaction in the achievement domain ($B < -.001$, $t = -.80$, *Adjusted R^2=.31, $\Delta R^2 < .001$, p = .43*) were significant, failing to support Hypothesis 3.

Overall, there was support for the relationship between negative SC, T2 stressors, and depressive symptoms at T2. DAS was not found to be related to T2 depressive symptoms. Further, neither two-way nor three-way interactions had a significant contribution to the prediction of T2 depressive symptoms.

Two month follow-up. The same analyses as the ones used to test the hypotheses at one month follow-up were applied to the two month follow-up data. All hypotheses were re-tested; this time using the stressors at T3 (stressors that occurred within one month prior to the second follow-up measure) as the stressor variable, and depressive symptoms at T3 as the dependent variable.

First, the main effects of predictor variables (Hypotheses 1a-1c) were tested using partial correlation analyses, controlling for depressive symptoms at T1. These results were the same as those for the one month follow-up data. Results supported the main effects of negative SC (*partial $r_{interpersonal}$* = .32, $p < .01$; *partial $r_{achievement}$* = .32, $p < .01$)

and stressors (*partial r$_{interpersonal}$* = .38, *p* < .001; *partial r$_{achievement}$* = .37, *p* < .001) on depressive symptoms at T3. Hence, hypotheses 1a and 1c were supported. Neither the interpersonal (*partial r* = .10, *p* = .27) nor the achievement (*partial r* = .07, *p* = .47) DAS was significantly related to the depressive symptoms measured at T3, rejecting hypothesis 1b.

The three two-way interactions among the stressor and schema variables were again analyzed to test hypotheses 2a-2c. As shown in Table 6, the interaction between the achievement DAS and negative SC was significant (ΔR^2 = .03, *p* = .02). This two-way interaction was not found for the DAS and SC in the achievement domain. Thus, the support for hypothesis 2a is only partial. Using the median split approach, the relationship between achievement DAS and depressive symptoms at T3 was examined for different levels of negative SC (see Figure 1). As shown in Figure 1, the direction of the relationship was as expected – higher levels of dysfunctional attitudes and negative SC predicted higher levels of depressive symptoms at T3.

As were the results for the one month follow-up, the two-way interactions between the DAS and T3 stressors (hypothesis 2b) and negative SC and T3 stressors (hypothesis 2c) were not supported.

The three-way interaction between the domain-congruent DAS, SC, and stressors at T3 (Hypothesis 3) did not make a significant contribution to the prediction of depressive symptoms at T3. Compared to the three-way interaction of the variables in the achievement domain (*B* = -.01, *t* = - .70, ΔR^2 < .01, *p* = .49), the three-way interaction in the interpersonal domain (*B* = -.02, *t* = - 1.87, ΔR^2 = .02, *p* = .07) showed a trend toward significance (see Table 7).

Testing Hypothesis 4: DAS-Positive SC-Stressors Link to Depressive Symptoms

The same sequence of regression analyses as with the first three hypotheses was conducted to test the relationship between the DAS, positive SC, and stressors with respect to predicting depression. The results did not support the main effect, two-way interactions, or the three-way interaction between positive SC and other predictor variables in predicting depressive symptoms at T2 and T3.

Exploratory Analyses 1: Independent Effect Analyses of Predictor Variables

In order to examine the independent effects of stressors and the schema variables on depressive symptoms, partial correlations were used in prior analysis. As an exploratory analysis, a hierarchical regression was carried out to examine the main effect of the predictor variables when they were considered simultaneously. Baseline level of depressive symptoms was again controlled for the analyses of the first and second follow-up data.

At baseline, except for the negative SC in the achievement domain, the independent effect of all predictor variables were significant with respect to depressive symptoms at T1. More specifically, stressors ($B_{interpersonal} = .12$, $t_{interpersonal} = 1.92$, $p = .05$; $B_{achievement} = .15$, $t_{achievement} = 2.50$, $p = .01$) and DAS ($B_{interpersonal} = .10$, $t_{interpersonal} = 2.57$, $p = .01$; $B_{achievement} = .13$, $t_{achievement} = 4.58$, $p < .01$) were independently related to concurrent depressive symptoms. Negative SC in the interpersonal domain ($B = 1.67$, $t = 4.17$, $p < .01$) was significantly related to concurrent depressive symptoms, while negative SC in the achievement domain ($B = .77$, $t = 1.65$, $p = .10$) was not.

At the first follow-up, only the main effect of interpersonal ($B = 1.70$, $t = 2.26$, $p < .05$) and achievement ($B = 1.64$, $t = 1.93$, $p < .15$) negative SC was significant. The DAS and stressors did not add significantly to the prediction of depressive symptoms at T2.

At the second follow-up, negative SC ($B_{interpersonal} = 2.13$, $t_{interpersonal} = 2.86$, p

$< .01$; $B_{achievement} = 2.33$, $t_{achievement} = 2.76$, $p < .01$) and stressors at T3 ($B_{interpersonal} = .44$,

$t_{interpersonal} = 3.80$, $p < .001$; $B_{achievement} = .38$, $t_{achievement} = 3.61$, $p < .001$) had a significant

main effect on the prediction of depressive symptoms at T3. The main effect of the DAS

was not significant.

Overall, these findings indicate the consistent main effect of negative SC in

predicting *future* depressive symptoms. On the other hand, the main effect of the DAS

was not significant in predicting *future* depressive symptoms, while the main effect of the

DAS was significant in predicting *concurrent* depressive symptoms. The results for the

main effects of stressors varied.

Exploratory Analyses 2: Testing Hypotheses 1, 2, and 3 Using the Retrospective Measure

of Stressors at T1

Preliminary note. In the exploratory analyses that follow, the hypotheses of the

study were examined using the retrospective stressor ratings at T1 and schema variables

to predict concurrent depressive symptoms (concurrent analyses) and depressive

symptoms at T2 and T3 (predictive analyses). In these analyses, stressor ratings at T1

referred to the retrospective measures of the intensity of stress experienced within the

month prior to the baseline assessment, measured concurrently with the DAS and SC. In

previous analyses of the hypotheses, the stressors proximate to the measurement of

depressive symptoms, T2 and T3 stressors for the prediction of T2 and T3 depressive

symptoms, respectively, were used instead of the stressors distal to the measure of

depressive symptoms. A problem with the concurrent measurement of the stressors and

cognitive variables is the potential confounding effect of either variable on the other.

However, as shown in Tables 2, 3 and 4, the correlations between the stressors at T1 and

schema variables were non-significant for the interpersonal domain and low for the achievement domain.

Concurrent analyses using stressors at T1. As an exploratory analysis, the three hypotheses of the current study were tested using the data collected during the baseline assessment. In these analyses, the predictor variables were the DAS, SC, and stressors at T1, with depression at T1 as the criterion variable.

As shown in Table 2, the bivariate analysis of the relationships between the DAS, negative SC, stressors, and depression at T1 yielded correlations ranging from $r = .19$, $p < .01$ to $r = .38$, $p < .01$, supporting the relationship between these variables and T1 depressive symptoms. While the main effects were significant, neither two-way nor three-way interactions between the DAS, SC, and T1 stressors significantly added to the prediction of depressive symptoms at T1.

Predictive analyses using T1 stressors. The main hypotheses of the study were next tested examining the distal or T1 stressors in interaction with SC and DAS with respect to predicting depressive symptoms at T2 and T3.

For depressive symptoms at T2, the two-way and three-way interactions betwen the DAS, SC, and T1 stressors were rejected. As was the case with the analyses of the relationships between the DAS, SC and proximate stressors, the two-way and three-way interactions between the DAS, SC, and distal stressors did not add a significant variance to the prediction of depressive symptoms at T2, above and beyond the main effects and depressive symptoms at T1.

For depressive symptoms at T3, no supportive evidence was found for the two-way interactions between the DAS, SC, and distal stressors, as was the case for the two-way interaction between the schema variables and proximate stressors. Different from

the previous analyses using proximate stressors, the three-way interaction (DAS*SC*T1 Stressors) in the interpersonal domain made a significant contribution to the prediction of depressive symptoms at T3 (see Table 8).

The three-way interaction of interpersonal DAS, SC, and stress at T1 is depicted in Figure 2, following the guidelines for post-hoc analysis by Aiken and West (1991) and Holmbeck (2002). DAS was selected as the primary independent variable (X), with SC (W) and stressors (Z) as the moderator variables. New conditional moderators involving W and Z were then created. There are four conditional moderators in a three-way interaction post-hoc analysis. In this study, these were: high SC and high stress, high SC and low stress, low SC high stress, low SC and low stress. The formulae for high and low values of the moderator variables, for instance Z, are as follows:

Z ABOVE $= Z - (SD_Z)$, for the regression of Y on X at centered value of

Z $(CV_Z) = (+SD_Z)$, one standard deviation above the mean of Z,

Z BELOW $= Z + (SD_Z)$, for the regression of Y on X at centered value of

Z $(CV_Z) = (- SD_Z)$, one standard deviation below the mean of Z.

Then, for each conditional moderator, a separate simultaneous regression was run, with an output of four regression equations. To this end, the three-way interaction of the conditional moderators and DAS (e.g., hi SC*lo Stress*DAS) was entered into a simultaneous regression equation containing the main effects (e.g., hi SC, lo Stress, DAS), the two-way interactions (e.g., hi SC*lo Stress, hi SC*DAS, lo Stress*DAS), and the three-way interaction (e.g., hi SC*lo Stress*DAS).

In these regression equations, the standard beta coefficient of the DAS (*X*) is the slope of the regression line and the constant the intercept. The four regression equations and statistics related to the regression lines depicted in Figure 2 are shown in Table 9.

The significance test of differences between pairs of slopes was conducted following the rules outlined by Dawson and Richter (2004). According to the t-test analyses, the differences between (hi Z/SC and hi W/stress) and (hi Z/SC and lo W/stress), t (113) = -2, $p < .05$; the difference between (lo Z/SC, hi W/stress) and (lo Z/SC, lo W/stress), t (113) = -2, $p < .05$; and the difference between (hi Z/SC, lo W/stress) and (lo Z/SC, hi W/stress), t *(113) = 7.69*, $p < .01$, were significant.

Exploratory Analysis 3: Testing Hypothesis 2 and 3 without Controlling for Baseline Depressive Symptoms

Except for the two-way interaction between the achievement DAS and negative SC ($B = - .16$, $t = 2.66$, $p = .01$) with respect to depressive symptoms at T3, two-way interactions were not significant for the one-month and two-month follow-ups. These results are in line with the results of the analyses in which T1 depressive symptoms were controlled.

The three-way interaction between the DAS, negative SC, and stressors at T2 did not significantly add to the prediction of depressive symptoms at T2, again the same result as when the baseline depressive symptoms were controlled. At two month follow-up, the three-way interaction between the DAS, negative SC, and T3 stressors in the interpersonal domain was significant (see Table 10). This result was different from the previous results. When baseline levels of depressive symptoms were controlled, this three-way interaction showed only a trend toward significance. The three-way interaction is depicted in Figure 3.

The four regression equations and statistics related to the regression lines depicted in Figure 3 are shown in Table 11. The differences between pairs of slopes were tested following the rules outlined by Dawson and Richter (2004). According to the t-test

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analyses, the difference between (hi Z/SC and lo W/stress) and (lo Z/SC and lo W/stress), $t(113) = 7.77, p < .01$ was significant.

Discussion

The purpose of the present study was to advance the line of research evaluating the schema construct in relation to predicting depressive symptoms. This was done by drawing from the SC (Linville, 1985, 1987), dysfunctional attitudes/schema propositions (Beck, 1976), and depression literatures. Following the meta-construct model of cognition, it was proposed that these two elements of schemas – schema structure as measured by SC and schema propositions as measured by the DAS - relate to each other to predict depressive symptoms. The relationship of both negative SC and the DAS to depressive symptoms were explained via the diathesis-stress model that proposed the interactive effect of the schema constructs and stressors. Thus, in the present study, negative SC and the DAS were expected to contribute independently and in interaction with each other and congruent stressors to predict depressive symptoms. Discussion of the results is organized according to the sequence of the hypotheses.

Main Effects

First, the main effects of negative SC, DAS, and stressors on depressive symptoms were examined to see whether previous findings on the relationships between these constructs would be replicated. Consistent with previous research (Gara et al. 1993; Woolfolk et al., 1995; Woolfolk, Novalany, et al., 1999), present findings showed that individuals with multiple and distinct interpersonal and achievement roles (high negative SC) experience more severe depressive symptoms concurrently and at one- month and two-month follow-ups. Further, individuals' level of negative SC continued to predict depressive symptoms at follow-up, even when scores on DAS, negative life events, and

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prior depressive symptoms were accounted for, supporting a previous finding by Woolfolk, Novalany, et al. (1999).

Findings about the DAS-depression link were different than those about the SC-depression link. Overall, results showed that higher scores on the DAS were related to concurrent, but not future, levels of depressive symptoms.

These findings on the DAS-depression link support conclusions from several past literature reviews (e.g., Coyne & Gotlib, 1983; Segal & Shaw, 1986) and textbooks (e.g., Zuckerman, 2000) that the DAS is a concomitant factor, rather than a diathesis, with regard to depression. However, it needs to be kept in mind that Beck (1976) in his diathesis-stress model of depression, proposed that schemas/dysfunctional attitudes do not act as diatheses to depression in the absence of negative stressors. Supporting this assumption, of six studies that did not measure stressors or use mood manipulation, four failed to support the main effect of the DAS in predicting depressive symptoms in follow-ups from a month to a year (Hamilton & Abramson, 1983; Lewinsohn, Steinmetz, Larson, & Franklin, 1981; O'Hara, Rehm, and Campbell, 1982; Power, 1988). Those studies that used a longitudinal design and tested the diathesis-stress model did support the role of the DAS in predicting depressive symptoms in college samples, but only when examined in interaction with stressors (Abela & D'Alessandro, 2002; Brown, Hammen, Craske, & Wickens, 1995; Joiner, Metalsky, Lew, & Klocek, 1999). Thus, based on Beck's theoretical assumption and previous research, the DAS may not be a stand-alone diathesis for future depressive symptoms in sub-clinical samples.

In the present study, negative SC and schema propositions as measured by the DAS were proposed to be separate components of schemas that act alike with respect to predicting depression; higher levels of either were expected to relate to higher levels of

depressive symptoms. However, unlike negative SC, the DAS did not significantly

predict depressive symptoms. An explanation for the difference in predictive validity of

these two schema constructs may relate to how they are measured.

The DAS assesses negative beliefs about the self by instructing individuals to

evaluate themselves with respect to negative statements that are easily identified as

depressive. This feature of the DAS may have been experienced by the participants in

the present study as a challenge or a threat to self or as a chance to express oneself.

Either way, the measure carries with it the problem of response bias. Also, some

participants may have felt pressured by the mood induction manipulation to alter their

self-report and produce a more pessimistic picture of their attitudes toward self. In

contrast, the SC measure assesses schema structure indirectly, making the goal of the

instrument more obscure and rendering it less prone to response bias. Moreover, the

balance between negative and positive adjectives in the SC measure may be perceived as

less threatening to participants and allow them to express themselves more openly. To

the extent that response bias accounts for scores on the DAS, its validity as a schema

measure is reduced, a factor unlikely to be operating with the measure of negative SC

used in the present study.

Overall, these results suggest that the structural component of schemas as

measured by the SC is a construct separate from the propositional component of schemas

measured by the DAS. Further, it seems that negative SC is a better stand-alone predictor

of depressive symptoms, than is the DAS.

Two-Way Interactions

The second goal of the study was to examine whether participants with higher

negative SC or higher scores on the DAS would experience more depressive symptoms

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after experiencing a domain-congruent stressor. It was also of interest to examine whether participants who have a higher level of endorsement of depressogenic beliefs about self would show increases in their depressive symptoms if they also have a higher negative SC supporting those beliefs. Only the interaction between the DAS and negative SC in the achievement domain was significant.

Interaction between the DAS and stressors. The lack of a significant interaction between the DAS and stressors was unexpected. In this study, the DAS was primed and the diathesis-stress interactions were examined for congruent content areas, two refinements that were predicted to enhance the likelihood of finding interactions between stressors and the DAS. Mitigating against such findings was the duration of the follow-up and the decision to control for initial levels of depression. To address the latter concern, moderator analyses were redone without controlling for depressive symptoms at T1. Again, no support was found for any of the diathesis-stress interactions.

If the diathesis-stress theory (Beck, 1976) is accurate and the measure of the DAS is a reliable and valid measure of schema propositions, several explanations exist for not finding support for the two-way interaction hypotheses: measurement and characteristics of the DAS, measurement of stress, and the level of depressive symptoms in sub-clinical samples.

First, the failure to find significant DAS-stress interactions may be a result of an inherent response bias in the DAS due to its straightforward questioning format. Using this argument, negative SC was expected to be a better measure of schemas and thus show a positive interaction with stressors in predicting depressive symptoms. However, this was not the case in the present study.

A second possibility is that the mood manipulation and stressors of the present study were not strong enough to activate latent schemas as measured by the DAS. In previous cross-sectional studies, mood manipulation did not consistently lead to differences in the DAS levels of previously depressed and never-depressed individuals (Blackburn & Symth, 1985; Brosse, Craighead, & Craighead, 1999; Dykman, 1997; Miranda, Gross, Persons, & Hahn, 1998). Thus, although the present study used a more effective mood induction (the autobiographical recollections method; Goodwin & Williams, 1982; self-generated imagery; Salovey, 1992), the sad mood induced by the manipulation may not have been sufficiently intense to activate the schema propositions measured by the DAS.

Another potential explanation for the lack of a two-way interaction between the DAS and stressors is that, in a sub-clinical sample like the college sample of the present study, the DAS-stressor interaction may be more difficult to detect due to low variability in depressive symptoms and low levels of enduring reactivity to acute stressors (Abela & D'Alessandro, 2002). Almost all longitudinal research on the DAS diathesis-stress hypothesis was done using college samples that mainly reflect sub-clinical levels of depressive symptoms (e.g., Brown, Hammen, Craske, & Wickens, 1995; Joiner, Metalsky, Lew, & Klocek, 1999). These studies invariably found support for the interactive hypothesis, leading to the expectation in the present study to find two-way interactions between the DAS and stressors in predicting depressive symptoms.

An analysis of the designs of these longitudinal studies (e.g., Brown, Hammen, Craske, & Wickens, 1995; Joiner, Metalsky, Lew, & Klocek, 1999) reveals some intriguing possibilities for how and when to measure stressors in relation to depressive symptoms and schema variables. These studies provide consistent support for the

interaction between *congruent* DAS and stressors when the stressors were the same for all participants (e.g., performance discrepancy on midterm examinations) and mood reactions were measured shortly after the occurrence of the stressor and the measurement of schemas (2 days to 2 weeks). Studies using self-report measures of stressors, which are less specific in terms of what/when stressors occurred and which are longer in terms of follow-up duration (6 weeks to 3 months), also supported the diathesis-stress model. But in these studies, findings in terms of congruency of the diathesis-stress interaction were inconsistent (Barnett & Gotlib, 1990; Segal, Shaw, Vella, and Katz, 1992; Robins, Hayes, Block, Kramer, & Villena, 1995). The differences in these findings seem to imply that congruent diathesis-stress interactions in a sub-clinical sample may be most apparent when the same specific stressor is evaluated for each individual and when responses to these acute stressors are measured within a brief period of time of the measurement of depressive symptoms and schemas.

In the present study, the duration between the retrospective measures of stressors, schema variables, and depressive symptoms range between a month and 2 months. This duration between assessments is longer than what was suggested in the studies on the diathesis-stress model of depression in a college sample. However, it is still unclear whether the time lag is important or the diathesis-stress interaction is not as powerful as was proposed in Beck's theory of depression (Beck, 1976) in predicting sub-clinical levels of depression. Future research is warranted to evaluate the effect of proximity to the stressor on the diathesis-stress interaction and the appearance of depressive symptoms in clinical and sub-clinical samples. The time lag between the measurement of stressors, cognitive measures, and depression may not be as important in clinical samples and with chronic stressors as in sub-clinical samples and with acute stressors.

Interactions between negative SC and stressors. For the interaction between negative SC and stressors, the expectation was that individuals with higher levels of stress would have a difficult time dealing with their level of stress, thus experience higher levels of depressive symptoms, if they have negatively structured highly distinct descriptions across different roles in domains congruent with stressors. However, present findings suggested that negative SC does not act as a catalyst in the relationship between stressors and depression.

Previous research showed equivocal support for the interaction between negative SC and stressors with respect to predicting depressive symptoms (Morgan & Janoff-Bulman, 1994; Woolfolk et al., 1995). On the basis of an analysis of this research, improvements were made in the present study, primarily aimed at specifying the content of the stressors and negative SC to ensure congruence across domains. Nonetheless, support for the hypotheses was not found. This result suggests that negative SC as a structural component of schemas does not require stressors to activate it. One possibility is that individuals who are highly negatively complex in their self-descriptions may produce their own chronic stressors rather than be influenced by acute stressors, thus increasing their vulnerability to depression. This hypothesis is to be examined in future studies.

Interactions between the DAS and negative SC. The expectation in this study was that individuals experience more depressive symptoms if they have highly distinct elaborative negative self-descriptions (negative SC) combined with higher levels of dysfunctional attitudes. Accordingly, individuals who have negative beliefs about self in the achievement-related area of life experienced higher levels of depressive symptoms, if they have highly distinct and developed negative descriptions of self across different

roles in their achievement lives. The complexity of their negative self-descriptions in achievement augments the effect of their beliefs on their level of depression.

It is intriguing why this interaction between the DAS and negative SC only occurred in the achievement domain and with respect to depressive symptoms measured at 2 months follow-up. A potential explanation for the domain-specificity of this interaction may lie in the differences between the nature of achievement and interpersonal domains of life. It may be that in a college sample, achievement is considered to be more in one's control and predictable compared to one's interpersonal life. Thus, there may be a two-way interaction between the cognitive structure and content in the achievement domain irrespective of other external or third factor, whereas a two-way interaction in the interpersonal domain may not be found due to the factors that are affecting this relationship but were not included in a two-way interaction. Overall, schema constructs related to interpersonal life may be a separate construct from those related to the achievement life.

Three-Way Interactions

A final goal of the present study was to examine how the two components of schemas relate to stressors to lead to higher levels of depressive symptoms. It was hypothesized that individuals who endorse higher agreement with depressogenic beliefs about self in interpersonal and/or achievement domains of life, and who experience higher levels of stressors in respective domains, would experience more depressive symptoms, if they also have a higher level of negative SC in the congruent domain.

The three-way interaction hypotheses were best tested using the measures of stressors that occur after the measurement of schema variables, thus most proximate to the measurement of depression. These tests of the three-way interaction provided no

support for the expected relationships between the DAS, SC, and proximate stressors to depressive symptoms at T2 and T3. However, there was a trend toward significance for the relationship between the interpersonal schema variables and stressors at T3 with respect to predicting changes in depressive symptoms at T3. This trend became significant when predicting the level of depressive symptoms at T3 without controlling for depressive symptoms at T1.

The three-way interaction hypothesis was again examined using a less ideal way of testing the cognitive diathesis-stress hypothesis; that is using T1 stressors (stressors distal to the depression measurement) that were measured concurrently with the schema variables. This analysis yielded a significant interaction between the interpersonal stressors at T1, the DAS, and negative SC with respect to predicting changes in depressive symptoms at T3, but not depressive symptoms at T2.

In both of the significant three-way interactions, the interpersonal domain, rather than the achievement domain, was implicated. This is consistent with the interpersonal theory of depression (Joiner & Coyne, 1999) and with a literature review by Hammen (1999), who concluded that stressors and cognitions in the interpersonal domain are more consistently related to depression than those in the achievement domain.

The post-hoc analysis of the three-way interaction for the interpersonal domain of the DAS, negative SC, and stressors at T1, showed an unexpected pattern of relationships with depressive symptoms. Contradicting expectations, higher levels of depressive symptoms did not occur for individuals with high negative SC, high DAS, and high stressors.

When the post-hoc results for the three-way interaction between the DAS, negative SC, and stressors at T1 were examined (Figure 2), the directions of relationships

were exact opposites for high and low SC groups. In these relationships, what seems to lead to higher levels of depression for both high and low negative SC groups, is the discrepancy or the non-congruency between the levels of negative SC and the DAS, that is triggered by high stressors. Individuals who had high negative SC and low DAS experienced the highest level of depressive symptoms when they experienced *high* negative stress that triggered or augmented this discrepancy (i.e., *high* negative SC, *low* DAS, and *high* stress). On the other hand, for those individuals with *high* negative SC and *low* DAS, *low* stressors led to a lower level of depressive symptoms. It seems that in the low stress condition compared to the high stress condition, individuals felt less threatened in terms of their incongruent self-representations, and thus experienced less depressive symptoms. As the DAS increased, the non-congruency decreased for individuals with high negative SC (i.e., *high* DAS and *high* negative SC), thus the difference between the depressive symptoms for individuals with high and low stressors declined. It seems that as the individuals' negatively elaborated self-descriptions in the interpersonal domain is more in congruence with what these individuals say they believe in, or their attitudes toward self, they tend to experience less depressive symptoms over time. These individuals with congruent self-representations across propositions and structure seem to be more aware of or less defensive about their attitudes toward self. The individuals who have high negative SC and low DAS may be those who are defensive about their negative sense of self. While having a highly elaborated negative sense of self in interpersonal relationships, they still would like to hold a rather optimistic attitude toward self, thus may have higher expectations from interpersonal encounters. Then, they are bothered and disappointed more when there is a high stress that increases

the tension between how they describe themselves and what they say they believe in with respect to interpersonal relationships.

The congruence/incongruence between the way a person organizes negative information about self and the propositions that reflect attitudes about self in the same domain, was also implicated for the low SC group. Individuals with *low* negative SC and *high* DAS (i.e., non-congruent representations of self) experienced the highest depressive symptoms, under conditions of *high* interpersonal stress. On the other hand, under conditions of *low* stress, the incongruence led to lower depressive symptoms. For the low negative SC group, the lowest depressive symptoms were present for those with non-discrepant self-representations (*low* negative SC and *low* DAS) under the high stress condition rather than low stress condition. This may be explained via the self-regulation mechanisms of individuals who experience a threat to their self-representations. When individuals have less agreement with negative beliefs about themselves in interpersonal relationships and also have lower levels of negative SC in the same domain, then these individuals may perceive highly negative stressors as a threat to their incongruent self-representations, and thus discount or not react to these stressors as they would if there was a discrepancy. On the other hand, if these individuals with incongruent self-representations experience low levels of stress, they would not feel defensive and threatened, and thus would not actively deal with consequences of having stress, and experience higher levels of depression.

The pattern for the relationship between the schema variables and distal stressors (T1) was slightly different than that between the schema variables and proximal stressors (T3) (see Figure 3). The difference in the pattern of relationships among variables for this analysis was characterized by the absence of an interaction between the DAS and

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stress levels for the high SC group.   Again, individuals with high negative SC and discrepant interpersonal DAS (i.e., *high* negative SC and *low* DAS) experienced the highest level of depressive symptoms under *high* stress. There was a negative relationship between the DAS and depressive symptoms for the high stress condition, parallel to the relationship between the DAS and high SC group for high stress. Under high stress, the depression levels were higher than those in the low stress group. For both groups, as the discrepancy between the DAS and SC decreased, the depressive symptoms decreased by the same proportion for both high and low stress groups.   For the low SC group, the relationships between the DAS, depressive symptoms for different levels of stressors at T1 and T3 were the same.   However, the differences in relationships between the DAS and depressive symptoms as a function of low and high stress conditions were not significant for the low SC group nor for the high SC group.

Hypothesis 4: DAS-Positive SC-Stressors Link to Depressive Symptoms

The evidence in the literature for the relationship between positive SC and depressive symptoms has been equivocal (Gara et al., 1993; Woolfolk et al., 1999; Woolfolk, Novalany, et al., 1995). Present findings did not show any relationships between positive SC, stressors, and depressive symptoms. It seems that future research would benefit from using negative SC rather than positive SC in examining factors involved in the prediction of depressive symptoms.

Conclusions and Future Directions

A robust finding of the present study was the predictive power of negative SC with respect to depressive symptoms in a college sample. The DAS, on the contrary, failed to show a predictive value, but was concurrently related to depressive symptoms. Thus, negative SC, as a structural component of schemas, may be preferred in future

studies over the DAS when the prediction of depression is of interest. However, there are still unanswered questions about the construct validity of the DAS. Given the lack of findings supporting the predictive value of the DAS, the stability of the DAS need to be re-evaluated in future studies. Further, future studies need to evaluate different mood priming techniques for the activation of schema propositions as measured by the DAS in clinical as well as sub-clinical samples.

Overall, the present study did not provide supportive evidence for the cognitive schema, diathesis-stress model of depression. The inconsistent findings for the diathesis-stress model may be remedied by further changes to the design of longitudinal diathesis-stress studies, such as by using specific stressors that are measured objectively and controlling the time lag between the measurement of stressors, schema variables, and depressive symptoms. Of interest would be studies that examined diathesis-stress interactions, when depressive symptoms are assessed shortly after the measurement of stressors and at two week intervals thereafter.

Predictions related to the three-way interaction hypotheses of the study were not supported. However, although contrary to expectations, the pattern of relationships between interpersonal negative SC, DAS, and distal stressors that were measured concurrently with the SC and DAS, suggest promising avenues for future research. However, these results need to be replicated in future studies. If the findings are indeed replicated, it can be concluded that the relationship between different components of schemas and stressors change as a function of the discrepancy between self-related information reflected by the structural and propositional components of schemas. This may explain why the research literature is inconsistent in terms of supporting the two-way interactions.

There are certain limitations to the present study. First, it would have been ideal if the DAS and SC were measured at each follow-up. On the basis of high stability coefficients reported in prior studies, the assumption was that the schema variables are trait variables, an assumption that could have been tested by repeated assessments. Further, the instructions of the stress measure is vague in terms of the time period that respondents need to think about when rating the negativity of events that happened to them within the last month. It's not clear whether the respondents answered according to how they thought of stressors at the time of occurrence or with regard to the average effect of stress on their lives within the last month. This complicates the interpretation of results and the comparison with previous literature. Further, the h-statistic of negative SC may not be an optimal measure of SC, as was suggested in literature reviews about SC (e.g., Rafaeli-Mor & Steinberg, 2002). As it was the most widely used measure, it was chosen for the present study. However, improvements to the measure of the SC in future studies may be required to increase the validity of this construct.

This study is the first study attempting to explain the relationship of different components of schemas, stressors, and depressive symptoms. Future studies need to be carried out to replicate the present findings, particularly the three-way interaction. In future studies, the interactions examined in the present study need to be studied with respect to predicting onset, persistence, and recurrence of clinical levels of depression. Further, chronic stressors, need to be examined to determine whether such stressors have effects similar to those of acute stressors on levels of depression, when using the DAS and negative SC as diatheses.

There are several clinical implications of the present study. First, negative SC may be a potential measure of cognitive vulnerability of an individual with respect to

depressive symptoms. Further, if the three-way interaction between negative SC, DAS, and distal stressors is replicated in future studies, then the implications of self-discrepancy theory can inform cognitive-behavioral psychotherapy for individuals with depression. Accordingly, it may be important for therapists to focus on decreasing the discrepancy between how depressed individuals describe themselves across different roles in the interpersonal domain and what they say their beliefs are in terms of interpersonal relationships. According to present results, even when individuals' negative SC and DAS are both high, the congruency, compared to discrepancy, would lead to lower levels of depressive symptoms. Further, what individuals say they believe in and how they describe themselves are aligned, they may benefit more from cognitive restructuring work.

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Table 1

Demographic Characteristics of Baseline (N = 189), One Month Follow-Up (N = 163),

and Two Month Follow-Up (N = 121) Samples

Variable	Category	Baseline		One Month		Two Month	
		N	%	N	%	N	%
Sex	Male	52	27.5	42	25.8	31	25.6
	Female	137	72.5	121	74.2	90	74.4
Age	18 years	44	23.3	35	21.5	28	23.1
	19 years	62	32.8	55	33.7	41	33.9
	20 years	46	24.3	45	27.6	31	25.6
	21 years	27	14.3	20	12.3	15	12.4
	22 – 25 years	10	5.2	9	5.4	6	5
Race	Asian	9	4.7	6	3.7	6	4.9
	Pacific Islander	1	.5	1	.6	0	0
	African-American	15	7.9	11	6.7	7	5.8
	Hispanic	2	1	2	.12	2	.16
	Caucasian	154	81.5	137	84	102	84.3
	Bi/Multi-cultural or other	8	4.1	6	3.7	4	3.3

Variable	Category	Baseline		One Month		Two Month	
		N	%	N	%	N	%
Relationship Status	Single	97	51.3	83	50.9	63	52.1
	Married	3	1.6	3	1.8	2	.16
	Engaged	6	3.2	6	3.7	3	2.5
	In a Relationship	75	39.7	63	38.7	47	38.8
	Cohabiting	6	3.2	6	3.7	4	3.3
	Separated	1	.5	1	.6	1	.8
	Widowed	0	0	0	0	0	0
	Other	1	.5	1	.6	1	.8
Education	Freshman	83	43.9	71	43.6	56	46.3
	Sophomore	48	25.4	43	26.4	29	24
	Junior	37	19.6	30	18.4	22	18.2
	Senior	18	9.5	17	10.4	13	10.7
	5th or greater year	3	1.6	2	1.2	1	.8
	Graduate	0	0	0	0	0	0
Therapy status	In therapy	22	11.6	20	12.3	16	13.2
	No therapy	167	88.4	143	87.7	105	86.8

Table 2

Descriptives of, and Correlations between Variables at Baseline (N = 189)

Variable	Range	Mean	SD	D T1	Int DAS T1	Ach DAS T1	Ach S T1	Int S T1	Ach P SC T1	Ach N SC T1	Int P SC T1	Int N SC T1
Depr T1	10-36	20.31	5.24	--								
Int DAS T1	19-68	41.41	9.14	.25**	--							
Ach DAS T1	19-94	45.94	12.86	.38**	.47**	--						
Ach S T1	0-39	7.35	5.85	.26**	.19**	.20**	--					
Int S T1	0-34	9.91	5.74	.19**	.12	.15*	.41**	--				
Ach P SC T1	0-4.12	2.39	.75	.07	-.04	-.03	.15*	.10	--			
Ach N SC T1	0-3.58	.97	.78	.23**	.13	.24**	.24**	.19**	.23**	--		
Int P SC T1	.75-4.32	3.00	.75	.10	.08	.05	.12	.10	.54**	-.01	--	
Int N SC T1	0-3.78	1.48	.90	.34**	.20**	.31**	.23**	.13	.07	.57**	.12	--

Note. Ach S = Achievement stress; Int S = Interpersonal stress; Ach N SC = Achievement negative self-complexity; Int N SC = Interpersonal negative self-complexity; Ach P SC = Achievement positive self-complexity; Int P SC = Interpersonal positive self-complexity; Ach DAS = Achievement domain of the Dysfunctional Attitudes Scale; Int DAS = Interpersonal domain of the Dysfunctional Attitudes Scale; Depr = depression; T1 = baseline assessment.

$*p = <.05$. $**p < .01$.

Table 3

Descriptives of, and Correlations between Variables at One Month Follow-Up (N = 163)

Variable	Range	Mean	SD	D T2	Ach S T1	Ach S T2	Int S T1	Int S T2	Ach N SC T1	Int N SC T1	Ach P SC T1	Int P SC T1	Ach DAS T1	Int DAS T1
Depr T2	0-56	14.31	9.79	--										
Ach S T1	0-39	7.48	5.81	.19*	--									
Ach S T2	0-59	5.74	7.45	.19*	.39**	--								
Int S T1	0-34	10.22	5.88	.12	.42**	.06	--							
Int S T2	0-43	5.40	5.88	.25**	.29**	.77**	.12	--						
Ach N SC T1	0-3.58	.97	.81	.29**	.26**	.22**	.19*	.20**	--					
Int N SC T1	0-3.78	1.47	.94	.37**	.23**	.22**	.11	.20*	.58**	--				
Ach P SC T1	0-4.12	2.42	.78	.05	.19*	.04	.09	.11	.23**	.07	--			
Int P SC T1	.75-4.32	3.02	.78	.09	.15	.08	.11	.07	-.01	.12	.54**	--		
Ach DAS T1	19-94	46.21	13.18	.26**	.20*	.26**	.16*	.31**	.27**	.32**	-.02	.05	--	

Variable	Range	Mean	SD	D T2	Ach S T1	Ach S T2	Int S T1	Int S T2	Ach N SC T1	Int N SC T1	Ach P SC T1	Int P SC T1	Ach DAS T1	Int DAS T1
Int DAS T1	19-68	41.58	9.37	.16*	.18*	.03	-.09	-.05	.15	.22**	-.04	.08	.43**	--
D T1	10-36	20.57	5.06	.54**	.29**	.11	.20*	.20*	.39**	.27**	.07	.11	.38**	.24**

Note. Ach S = Achievement stress; Int S = Interpersonal stress; Ach N SC = Achievement negative self-complexity; Int N SC = Interpersonal negative self-complexity; Ach P SC = Achievement positive self-complexity; Int P SC = Interpersonal positive self-complexity; Ach DAS = Achievement domain of the Dysfunctional Attitudes Scale; Int DAS = Interpersonal domain of the Dysfunctional Attitudes Scale; D = depression; T1 = baseline assessment; T2 = assessment at Time 2.

p = <.05. **p* < .01.

Table 4

Descriptives of, and Correlations between Variables at Two Month Follow-Up (N = 121)

Variable	Range	Mean	SD	D T3	Ach S T1	Ach S T3	Int S T1	Int S T3	Ach N SC T1	Int N SC T1	Ach P SC T1	Int P SC T1	Ach DAS T1	Int DAS T1
D T3	0-41	13.13	9.07	--										
Ach S T1	0-39	7.62	5.88	.36**	--									
Ach S T3	0-51	4.72	6.60	.39**	.53**	--								
Int S T1	0-34	10.48	5.97	.14	.27**	.27**	--							
Int S T3	0-44	5.44	5.82	.39**	.57**	.74**	.27**	--						
Ach N SC T1	0-3.58	1.01	.84	.37**	.26**	.28**	.18*	.24**	--					
Int N SC T1	0-3.78	1.52	.97	.43**	.21*	.23*	.09	.24**	.55**	--				
Ach P SC T1	0-4.12	2.39	.75	.08	.18*	.07	.05	.06	.19*	.01	--			
Int P SC T1	.75-4.32	3	.77	-<.01	.15	.02	.06	.01	-.09	.07	.47**	--		
Ach DAS T1	19-94	46.74	13.09	.23**	.14	.21*	.21*	.20*	.26**	.30**	-.04	-.01	--	

Variable	Range	Mean	SD	D T3	Ach S T1	Ach S T3	Int S T1	Int S T3	Ach N SC T1	Int N SC T1	Ach P SC T1	Int P SC T1	Ach DAS T1	Int DAS T1
Int DAS T1	22-68	41.58	9.31	.15	.13	.14	.13	.10	.07	.16	-.11	-.01	.34**	--
D T1	11-34	20.79	4.95	.49**	.24**	.14	.19*	.12	.20*	.35**	.06	.05	.36**	.13

Note. Ach S = Achievement stress; Int S = Interpersonal stress; Ach N SC = Achievement negative self-complexity; Int N SC = Interpersonal negative self-complexity; Ach P SC = Achievement positive self-complexity; Int P SC = Interpersonal positive self-complexity, Ach DAS = Achievement dysfunctional attitudes; Int DAS = Interpersonal dysfunctional attitudes; D = depression; T1 = baseline assessment; T3 = assessment at Time 3.

p = <.05. **p* < .01.

Table 5

Independent t-Tests Comparing Mood Pre- and Post- Manipulation

Mood	*M*	*SD*	*t (188)*	*p*
Positive				
Pre-manipulation	14.83	3.66	12.48	<.01
Post-manipulation	11.78	3.87		
Negative				
Pre-manipulation	8.89	3.58	-3.87	<.01
Post-manipulation	9.73	3.67		
Overall				
Pre-manipulation	3.56	4.65	10.42	<.01
Post-manipulation	0	4.89		

Table 6

Hierarchical Multiple Regression: Depressive Symptoms at T3 Regressed on Achievement DAS and Negative SC and the Interaction Term (2-way Interaction)

Model	Variables	B	SE B	β	t	ΔR^2
Step 1	(Constant)	-5.40	3.13		-1.72	
	D T1	.89	.15	.49	6.08**	.24
Step 2	D T1	.79	.15	.43	5.20**	
	Ach DAS	-.01	.06	-.01	-.10	
	Ach N SC	3.04	.86	.28	3.52**	.08
Step 3	D T1	.75	.15	.41	5.05**	
	Ach DAS	-.04	.06	-.06	-.65	
	Ach N SC	3.41	.86	.32	3.96**	
	Ach DAS X Ach N SC	-.13	.05	-.19	-2.43*	.03

Note. The values for the predictor variables were centered.

Ach N SC = Achievement negative self-complexity; Ach DAS = Achievement dysfunctional attitudes; D = depression; T1 = baseline assessment.

*p = <.05. **p < .01.

Table 7

Hierarchical Multiple Regression: Depressive Symptoms at T3 Regressed on

Interpersonal DAS, Negative SC, and Stressors at T3 and the Interaction Terms (3-way

Interaction)

Model	Variables	B	SE B	β	t	ΔR²
Step 1	(Constant)	-5.40	3.31			
	D T1	.89	.15	.49	6.08**	.24
Step 2	D T1	.68	.14	.37	4.75**	
	Int DAS	.04	.07	.04	.53	
	Int N SC	2.13	.74	.23	2.86**	
	Int S T3	.44	.12	.28	3.80**	.11
Step 3	D T1	.72	.15	.39	4.93**	
	Int DAS	.02	.07	.02	.28	
	Int N SC	2.27	.74	.24	3.05**	
	Int S T3	.36	.14	.23	2.61**	
	Int DAS X Int N SC	.26	.13	.23	1.98*	
	Int DAS X Int S T3	-.02	.01	-.18	-1.71	
	Int N SC X Int S T3	-.01	.08	-.01	-.12	.02
Step 4	D T1	.69	.15	.38	4.80	
	Int DAS	.03	.07	.03	.42	
	Int N SC	2.53	.75	.27	3.37	
	Int S T3	.43	.14	.28	3.02	
	Int DAS X Int N SC	.42	.16	.36	2.68	

Model	Variables	B	SE B	β	t	ΔR²
	Int DAS X Int S T3	-.01	.02	-.07	-.58	
	Int N SC X Int S T3	-.05	.08	-.05	-.59	
	Int DAS X Int N SC X Int S T3	-.02	.01	-.28	-1.87[+]	.02

Note. The values for the predictor variables were centered.

Int S = Interpersonal stress; Int N SC = Interpersonal negative self-complexity; Int DAS = Interpersonal dysfunctional attitudes; D = depressive symptoms; T1 = baseline assessment; T3 = assessment at the second follow-up.

*p = <.05. **p < .01. [+]p = .07.

Table 8

Hierarchical Multiple Regression: Depressive Symptoms at T3 Regressed on Interpersonal DAS, Negative SC, and Stressors at T1 and the Interaction Terms (3-way Interaction)

Model	Variables	*B*	*SE B*	*β*	*t*	*ΔR²*
Step 1	(Constant)	-5.40	3.13		-1.72	
	D T1	.89	.15	.49	6.08**	.23
Step 2	D T1	.68	.15	.37	4.49**	
	Int DAS	.05	.08	.05	.67	
	Int N SC	2.69	.77	.29	3.48**	
	Int S T1	.06	.12	.04	.47	.08
Step 3	D T1	.67	.16	.37	4.34**	
	Int DAS	.04	.08	.04	.49	
	Int N SC	2.87	.80	.31	3.58**	
	Int S T1	.07	.12	.04	.55	
	Int DAS X Int S T1	-.01	.02	-.05	-.53	
	Int N SC X Int S T1	.16	.14	.10	1.14	
	Int DAS X Int N SC	.02	.09	.02	.26	.01
Step 4	D T1	.67	.15	.37	4.44**	
	Int DAS	.05	.08	.05	.68	
	Int N SC	3.78	.86	.40	4.39**	
	Int S T1	.14	.12	.09	1.10	
	Int DAS X Int S T1	-.01	.02	-.02	-.20	

Model	Variables	*B*	*SE B*	*β*	*t*	*ΔR²*
	Int N SC X Int S T1	.28	.14	.18	1.95*	
	Int DAS X Int N SC	.07	.09	.06	.73	
	Int DAS X Int N SC X Int S T1	-.03	.01	-.23	-2.54*	.04

Note. The values for the predictor variables were centered.

Int S = Interpersonal stress; Int N SC = Interpersonal negative self-complexity; Int DAS = Interpersonal dysfunctional attitudes; D = depressive symptoms; T1 = baseline assessment.

*p = <.05. **p < .01.

Table 9

Regression Equations and Simple Slope Coefficients (B), Standard Errors (SE B), and T-Tests for the Relationship between Levels of the SC and Stress at T1 to the Prediction of Depressive Symptoms at T3

	Y (Depressive Symptoms)	*B*	*SE B*	*t*	*p*
Hi SC, HI Stress	*(-.24)*X + (21.10)*	.19	.16	1.16	.25
Hi SC, Lo Stress	*(0.19)*X + (14.65)*	-.24	.19	-1.24	.22
Lo SC, Lo Stress	*(-0.1)*X + (8.98)*	-.01	.15	-.06	.95
Lo SC, Hi Stress	*(0.22)*X +(8.27)*	.22	.18	1.20	.23

Table 10

Hierarchical Multiple Regression: Depressive Symptoms at T3 Regressed on Interpersonal DAS, Negative SC, and Stressors at T3 and the Interaction Terms (3-way Interaction)

Model	Variables	*B*	*SE B*	*β*	*t*	*ΔR²*
Step 1	Int DAS	.07	.08	.07	.83	
	Int N SC	3.26	.77	.35	4.26*	
	Int S T3	.46	.13	.30	3.65*	.27
Step 2	Int DAS	.05	.08	.05	.65	
	Int N SC	3.40	.78	.36	4.38**	
	Int S T3	.46	.15	.29	3.03**	
	Int DAS X Int S T3	-.02	.02	-.15	-1.32	
	Int N SC X Int S T3	-.06	.08	-.06	-.73	
	Int DAS X Int N SC	.16	.15	.13	1.09	.02
Step 3	Int DAS	.06	.08	.06	.71	
	Int N SC	3.67	.78	.39	4.73**	
	Int S T3	.54	.15	.35	3.49**	
	Int DAS X Int S T3	< -.01	.02	-.02	-.14	
	Int N SC X Int S T3	.35	.08	-.10	-1.23**	
	Int DAS X Int N SC	-.10	.17	.30	2.06	
	Int DAS X Int N SC X Int S T3	-.03	.01	-.34	-2.09*	.03

Note. The values for the predictor variables were centered.

Int S = Interpersonal stress; Int N SC = Interpersonal negative self-complexity; Int DAS

= Interpersonal dysfunctional attitudes; T1 = baseline assessment.

p = <.05. **p* < .01.

Table 11

Regression Equations and Simple Slope Coefficients (B), Standard Errors (SE B), and T-Tests for the Relationship between Levels of the SC and Stress at T3 to the Prediction of Depressive Symptoms at T3

Y (Depressive Symptoms)		*B*	*SE B*	*t*	*p*
Hi SC, HI Stress	*(-.21)*X + 21.72*	-.21	.15	-1.38	.17
Hi SC, Lo Stress	*(-.21)*X + 11.52*	-.21	.15	-1.38	.17
Lo SC, Lo Stress	*(.02)*X + 8.34*	.31	.21	1.49	.14
Lo SC, Hi Stress	*(.31)*X + 10.65*	.02	.17	.10	.92

Figure Caption

Figure 1. Post-hoc analysis: Regression lines for the relationship between achievement DAS (Ach DAS) and depressive symptoms at T3 as moderated by negative achievement SC (Ach SC).

Figure 2. Post-hoc analysis: Regression lines for relationships between interpersonal DAS (Int DAS) and depression at T3 as moderated by high/low (hi/lo) interpersonal stress and hi/lo interpersonal SC (Int SC) groups. b = unstandardized regression coefficient (i.e., simple slope).

Figure 3. Post-hoc analysis: Regression lines for relationships between interpersonal \ DAS (Int DAS) and depressive symptoms at T3 (D T3) as moderated by high/low (hi/lo) interpersonal stress at T3 and hi/lo interpersonal SC (Int SC) groups. b = unstandardized regression coefficient (i.e., simple slope).

Figure 1. Post-hoc analysis: Regression lines for the relationship between achievement DAS (Ach DAS) and depressive symptoms at T3 as moderated by negative achievement SC (Ach SC).
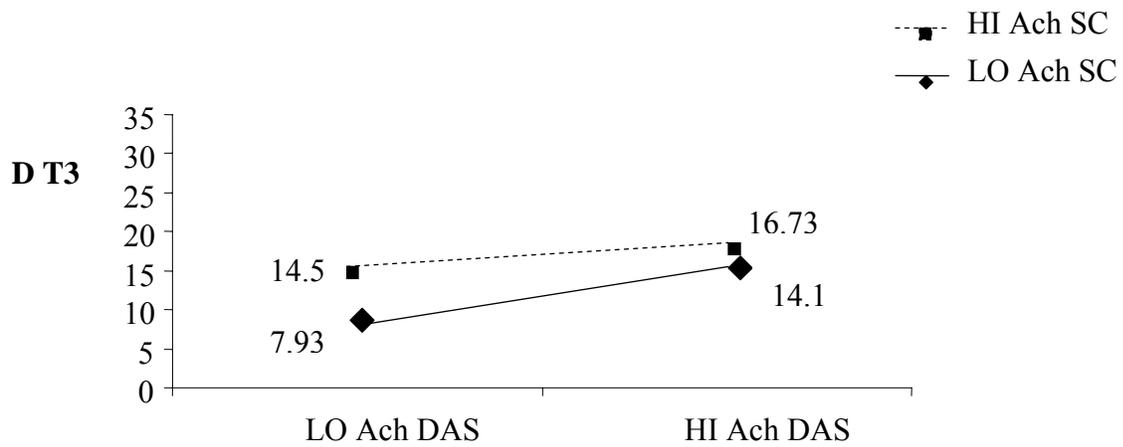
Figure 2. Post-hoc analysis: Regression lines for relationships between interpersonal DAS (Int DAS) and depression at T3 as moderated by high/low (hi/lo) interpersonal stress and hi/lo interpersonal SC (Int SC) groups. b = unstandardized regression coefficient (i.e., simple slope).
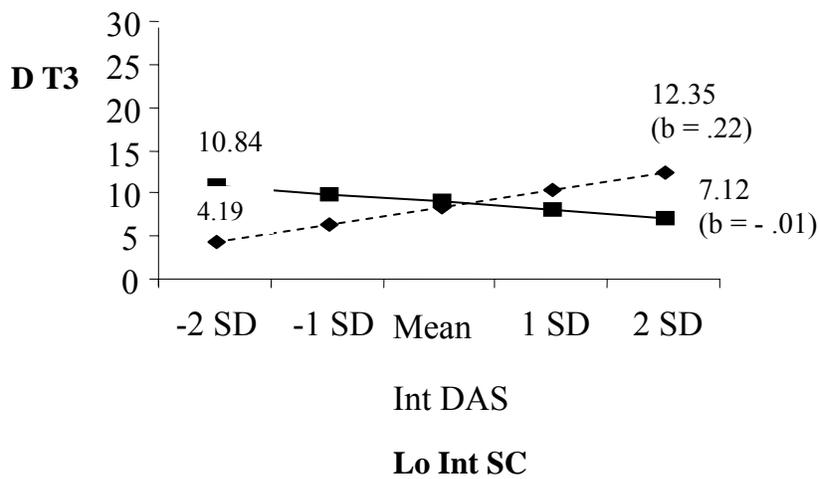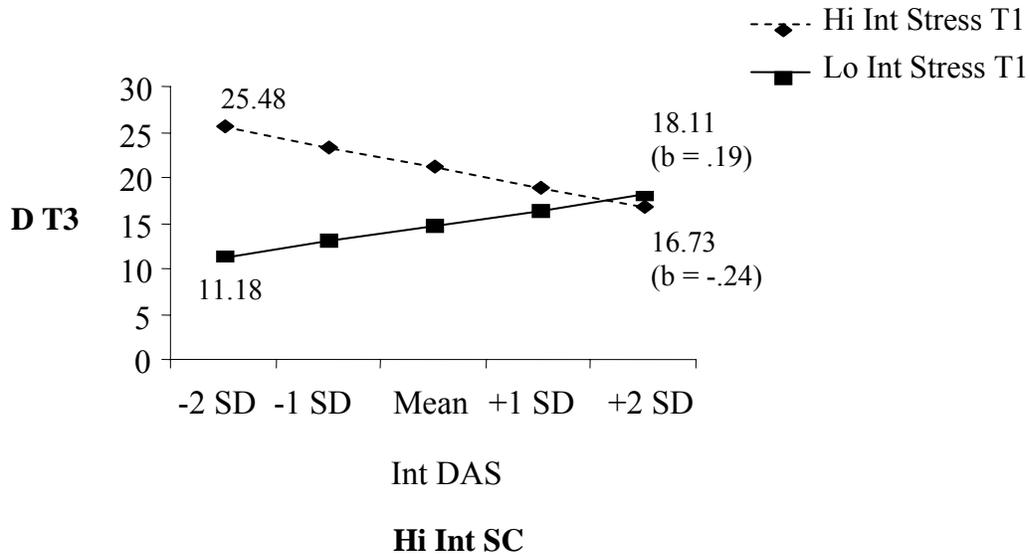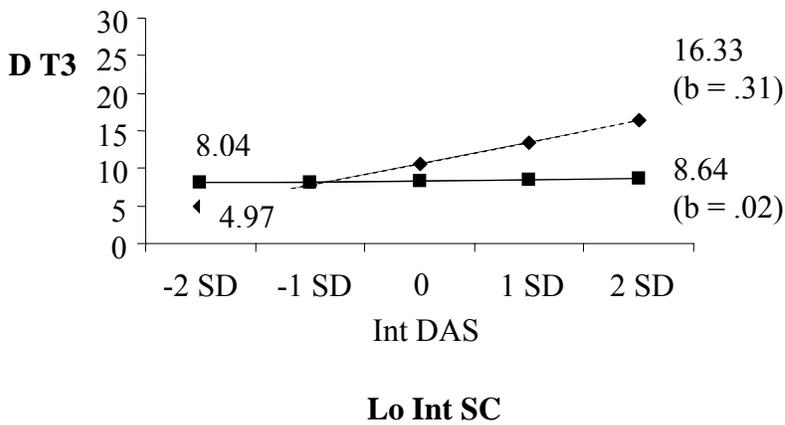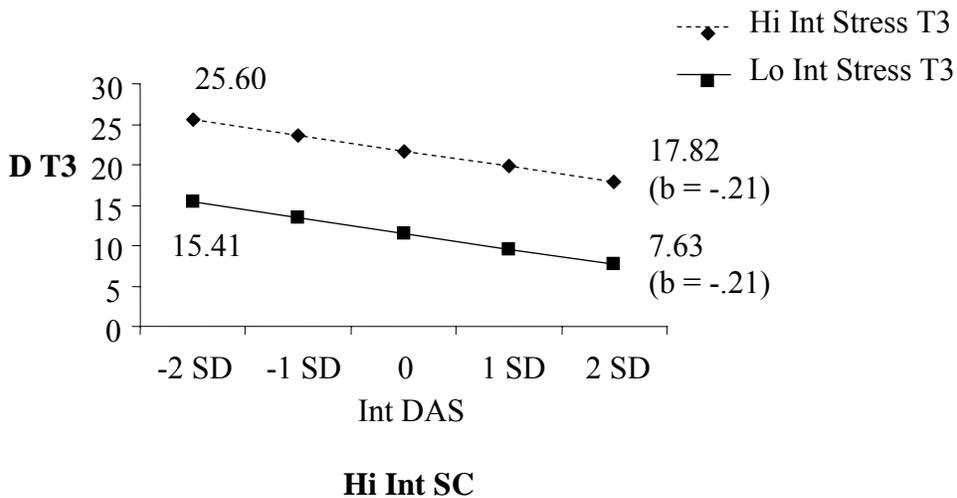
Figure 3. Post-hoc analysis: Regression lines for relationships between interpersonal

DAS (Int DAS) and depressive symptoms at T3 (D T3) as moderated by high/low (hi/lo)

interpersonal stress at T3 and hi/lo interpersonal SC (Int SC) groups. b = unstandardized

regression coefficient (i.e., simple slope).

Hi Int SC

Lo Int SC

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EDUCATION

- **Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA (2000-present)**
  Ph.D. Candidate in Clinical Psychology; Current GPA: 3.77

- **University of Illinois at Urbana-Champaign, IL (1998-1999)**
  Exchange student, Department of Psychology; GPA: 3.88

- **Bogazici University, Istanbul, Turkey (1994-1999)**
  B.S.: Psychology; GPA: 3.72
  Honors: High Honors
  Ranking: 2nd amongst 54 graduating psychology students

CLINICAL EDUCATION

- **Clinical Externship: Inpatient Units - Intensive Treatment Unit, Adult Unit, Child/Adolescent Unit, and Center for Recovery - at Lewis Gale Pavilion, Psychiatric Hospital, Salem, VA**

  July 2005–November 2005
  Major Supervisor: John Todd, Ph.D. An hour of supervision per week.
  Population: Inpatient adults, adolescents, and children, with insurance (e.g., Medicaid, Medicare, and Anthem) and also homeless, from suburbs and urban areas of Salem and Roanoke, VA.
  Duties: Carrying out psychosocial assessments of adults, adolescents, and children, a total of 70 hours; family therapy experience: a total of 15 families from the Adult, ITU, CFR, Child/Adolescent Unit (5 co-led); adult group therapy experience: process groups, a total of 30 groups (10 co-led); anger management, relaxation training, expressive therapy, depression education, coping skills, self-esteem, spirituality, AA meetings, relapse prevention for substance and alcohol abuse, and goals group, a total of 25 groups; adolescent group therapy on family issues, interpersonal relationships, coping skills, and stereotyping, a total of 30 groups (10 co-led); writing progress notes and doing support activities. A total of 240 hours.

- **Clinical Practicum: Community-Based Outpatient - Psychological Services Center, Virginia Polytechnic Institute and State University, VA**

  May 2004-May 2005
  Supervisor: Lee D. Cooper, Ph.D. 3 hours group supervision per week.
  Population: Outpatient adults and couples.
  Duties: Individual psychotherapy, a total of 106 hours; couple therapy, a total of 4 hours.

- **Clinical Practicum: Community-Based Outpatient - Psychological Services Center, Virginia Polytechnic Institute and State University, VA**

  August 2003-May 2004
  Supervisor: George A. Clum, Ph.D. 3 hours group supervision per week.
  Population: Outpatient adults.
  Duties: Providing peer supervision, a total of 60 hours; individual psychotherapy. A total of 11 hours.

- **Clinical Practicum in Group Therapy**: **Cook Counseling Center, Virginia Polytechnic Institute and State University, VA**

  August 2003-May 2004
  Supervisor: Brett Scofield, Intern Clinician. 1 hour individual supervision per week.
  Population: Outpatient college students.
  Duties: Observing process group therapy, writing progress notes of the group, and co-leading psycho-educational group on cognitive restructuring "Positive Thinking." A total of 140 hours.

- **Externship: Pediatric Physical Outpatient Clinic, Marmara University Medical School Hospital, Istanbul, Turkey**

  September 2002-December 2002
  Supervisor: Kemal Kuscu, M.D. 3 hours of group supervision, 2 hours of individual supervision per week.
  Population: Outpatient, low SES, children with developmental disorders like spina bifida and cerebral palsy and their families.
  Duties: Interviewing caregivers of children in physical therapy outpatient unit regarding social adversity and psychological well being; doing problem-focused, short-term therapeutic interventions with high risk caregivers using a reflecting team; participating in family systems therapy, 40 hours. A total of 320 hours.

- **Clinical Practicum: Community-Based Outpatient - Psychological Services Center, Virginia Polytechnic Institute and State University, VA**

  August 2001-May 2002

Supervisor: Lee D. Cooper, Ph.D. 2.5 hours group supervision and an hour individual supervision per week.
Population: Outpatient adults.
Duties: Individual psychotherapy, a total of 88 hours.

- **Clinical Practicum: Community-Based Outpatient - Psychological Services Center, Virginia Polytechnic Institute and State University, VA**

  August 2000-May 2001
  Supervisor*:* George A. Clum, Ph.D. 3 hours group supervision per week.
  Population: Outpatient adults.
  Duties: Individual psychotherapy, a total of 6 hours.

- *Workshops:*

  Young, J. (2004, November). *Cognitive therapy for personality disorders: A schema-focused approach.* The 38th Annual Convention of American Association of Behavioral Therapy, New Orleans, LA.

  Fairburn, C. (1999, May). Cognitive-behavioral therapy for bulimia nervosa. *Workshop at the 4. International Bakirkoy Congress, Istanbul, Turkey.*

  Slade, P. (1997, September). *Eating disorders: Theory and therapy.* Workshop at Bogazici University, Istanbul, Turkey.

- **Training Program on Family Therapy: Psycho-Med Private Psychological Services Center, Istanbul, Turkey**

  October 1999-May 2000

  Training director and instructor: Nusin Sarimurat Baydemir, M.D. Didactics and role-playing on theories of couple and family therapy, focus on family systems, structural, strategic and solution-focused family therapy. A total of 64 hours.

ADDITIONAL CLINICAL EXPERIENCES

- *Kuzguncuk Community Mental Health Center, Istanbul, Turkey*
  December 1999-February 2000

  Supervisor: Ahmet Arzik, M.D. 2 hours of individual supervision per week.
  Population: Adults and families with low SES from suburbs of Istanbul.
  Duties: Participating in the counseling of earthquake survivors. A total of 36 hours.

- **Consultation/Liaison Service: Physical Therapy and Oncology Units, Marmara University Medical School Hospital, Istanbul, Turkey**

September 1999-February 2000
Supervisor: Ahmet Arzik, M.D. 2 hours of individual supervision per week.
Population: Inpatient and outpatient adults and adolescents with physical disability and cancer.
Duties: Participating in the consultation/liaison service for the physical therapy inpatient and oncology unit. A total of 70 hours.

- **Adult Psychiatric Inpatient Unit, Marmara University Medical School Hospital, Istanbul, Turkey**

June-August 1997
Supervisor: Ahmet Arzik, M.D. 2 hours of individual supervision per week.
Population: Inpatient adults from the urban area and suburbs of Istanbul.
Duties: Assisting nurses in arranging and carrying out daily activities for patients, participating in grand rounds and multidisciplinary meetings, observing couple therapy, family systems and structural therapy, process observer in interpersonal group therapy. A total of 480 hours.

CLINICAL ASSESSMENT EXPERIENCE

- *Graduate Assistantship: Adult Assessment Clinic at the Psychological Services Center, Virginia Polytechnic Institute and State University, VA*

August 2001-May 2002
Faculty Supervisor: Lee D. Cooper, Ph.D. 1 hour of group supervision weekly.
Duties: Conducting adult psycho-educational assessment, scoring and report writing using the following assessment tools for the diagnosis of Learning Disability and Attention-Deficit/Hyperactivity Disorder: WAIS-III, WJ-III, WIAT-II and WMS-III; computerized tests; viz., CPT-II and PASAT; self-report measures; viz., SCL-90-R, CAARS-O, CAARS-S, WPRS and WURS; interview; viz., RSCI. 12 hours per week, a total of 432 hours, 12 clients.

RESEARCH EXPERIENCE

- **Disssertation, Virginia Polytechnic Institute and State University, VA (Proposed October, 2004)**
  "Diatheses to Depression: The Interactions of Schema- Propositions, Schema-Structure, and Negative Life Events"

May 2004-to present
Supervisor: George A. Clum, Ph.D.
Duties: Proposed a three-way interaction of self-complexity (schema-structure), dysfunctional attitudes (schema-propositions), and content-specific life events based on meta-cognitive construct model. The purpose is to examine the meta-cognitive construct model of schemas as it relates to depression. 18 hours per week.

- *Longitudinal Study on Cognitive Vulnerability Factors in Depression and the Effect of Social Stressors, Virginia Polytechnic Institute and State University, VA*

  August 2004-May 2005
  Supervisor: George A. Clum, Ph.D.
  Duties: Co-investigator; developed a computerized assessment package, completed data analysis and submit results for publication. 5 hours per week.

- **Project on Cognitive Processes Underlying Attention Deficit Hyperactivity Disorder,**
  Virginia Polytechnic Institute and State University, VA

  August 2004-Dec 2005
  Supervisor: Lee D. Cooper, Ph.D.
  Duties: Assisting the data analysis and preparation of the study for publication. 2 hours per week.

- **Research on Commitment Intervention on Adherence to Therapy, Psychological Services Center, Virginia Polytechnic Institute and State University, VA**

  September 2004-May 2005
  Supervisors: Jack Finney, Ph.D.; Brian Cowart, Graduate Clinician; Lee D. Cooper, Ph.D.
  Duties: Therapist assistant of the project. 1 hour per week.

- **Preliminary Exam, Virginia Polytechnic Institute and State University, VA (Defended May, 2004)**
  "Cognitive Schemas as Vulnerability Factors in Depression"

  August 2003-May 2004
  Supervisor: George A. Clum, Ph.D.
  Duties: Conducted a thorough literature review on the role of schemas as vulnerability factors in depression; being prepared for publication. The review was distinct in terms of its focus on schemas only, as vulnerability factors; and in terms of the emphasis on the potential differences in research results as a function of different measurement tools.

- **Study on Social Adversity and Psychological Well-Being of Caregivers of Children in a Physical Therapy Outpatient Unit, Marmara University Medical School Hospital, Istanbul, Turkey**

  December 2002-to present
  Supervisor: Kemal Kuscu, M.D.
  Duties: Project manager; supervision of two work study students; supervision of the progress, collection, entry, and analysis of data; preparation of a manuscript for publication. 10 hours per month.

September-December 2002
Supervisor: Kemal Kuscu, M.D.
Duties: Conducted interviews, administered questionnaires; entered and analyzed data. 20 hours per week.

- **Master's Thesis, Virginia Polytechnic Institute and State University, VA (Defended May, 2002)**
 "Psychosocial Factors, Early Maladaptive Schemas, and Levels of Depression in Young Adults: An Integration"

August 2000-May 2002
Supervisor: George A. Clum, Ph.D.
Duties: Conducted a study on the interaction between early maladaptive schemas as defined by Young (1994) and stressors to explain variance in depression among college students. 12 hours per week. Results are submitted for publication as the first author.

- **Meta-Analysis of Validity and Reliability Studies on the Scales of the Concept of Expressed Emotion, Virginia Polytechnic Institute and State University, VA**

January 2003-to present
Supervisor: George A. Clum, Ph.D.
Duties: Conducted a literature review on questionnaire-based measures of expressed emotion and did meta-analysis. Submitted for publication in September 2004.

- **Study on Couples' Communication Strategies During Receiving and Delivering Criticisms, University of Illinois at Urbana-Champaign, IL**

February-May 1999
Research Advisor: James V. Cordova, Ph.D.
Duties: Participated in the evaluation of a new coding system; coded videotapes of problem- solving sessions for Kelly Flanagan, senior student. 9 hours per week.

- **Study on Schizophrenia, University of Illinois at Urbana-Champaign, IL**

August-December 1998
Research Advisor: Howard Berenbaum, Ph.D.
Duties: Carried out experiments; administered questionnaires; data analyses for John Kerns, graduate student. 6 hours per week.

- **Study on Perception of Intimacy in Turkish Culture, Bogazici University, Istanbul, Turkey**

February-June 1998
Research Advisor: Brenda D. Townes, Ph.D.

Duties: Did a literature review of studies on intimacy in Western and non-Western cultures; analyzed previously-collected data; wrote a report on the results. 5 hours per week.

PUBLICATIONS

Cankaya, B., & Clum, G. (in press). Algilanan duygu ifadesi ve olcumu [Expressed emotion and its assessment]. In Kuscu K. (Ed.), *Duygu Ifadesi* [Expressed Emotion].

Cankaya, B. & Clum, G. (2005). *Scales of perceived expressed emotion: A meta-analysis.* Manuscript submitted for publication.

Cankaya, B., & Clum, G. (2005). *Validation and reliability study of a new scale: Impact of Loss.* Manuscript submitted for publication

Kuscu, K., & Cankaya, B. (2005). Children with developmental disabilities and maternal psychological adjustment: Impact of attachment style, child's impairment, and social support. Manuscript submitted for publication.

PROFESSIONAL PRESENTATIONS

- **Oral Presentation**

  Cankaya B. (2002, December). *Project on supporting the caregivers of children at the pediatric physical therapy outpatient unit.* Oral presentation at the 4th National Consultation–Liaison Psychiatry Congress, Istanbul, Turkey.

- **Poster Presentations**

  Cankaya, B., & Clum, G. A. (2005, November). *Diatheses to Depression: Test of a Meta- Construct Model of Schemas.* Poster accepted at the 39th Annual Convention of ABCT Convention, Washington, DC

  Cankaya, B., & Clum, G. A. (2005, May). *Young Schema Questionnaire and Dysfunctional Attitudes Scale: A longitudinal study of depression.* Poster presented at the 17th Annual Convention of American Psychological Association, Los Angeles, CA.

  Clum, G. A., & Cankaya, B. (2005, May). *Reliability and validity of Impact of Loss Scale.* Poster presented at the 17th Annual Convention of American Psychological Association, Los Angeles, CA.

  Cankaya, B., & Clum, G. A. (2004, November). *Interpersonal stressors and maladaptive*

cognitive schemas: Relationship to depression in young adults. Poster presented at the 38th Annual Convention of American Association of Behavioral Therapy, New Orleans, LA.

Francisco, J., Cankaya, B., & Cooper, L. D. (2004, November). *Adult ADHD, comorbidity, and differential process.* Poster presented at the 38th Annual Convention of American Association of Behavioral Therapy, New Orleans, LA

Cankaya B., & Clum, G.A. (2003, May). *Psychosocial factors, maladaptive schemas, and depression in young adults: An integration.* Poster presented at the 15th Annual Convention of American Psychological Society, Atlanta, GA.

Cankaya B., & Clum, G.A. (2003, May). *Scales of perceived expressed emotion: A critical review.* Poster presented at the 15th Annual Convention of American Psychological Society, Atlanta, GA.

TEACHING EXPERIENCE

- **Course Instructor: Department of Psychology, Virginia Polytechnic Institute and State University, VA**
  Supervisor: Jack Finney, Ph.D.

  August 2005-Dec 2005   Psychological Disorders of Children (55 students)
  Duties: Creating syllabus, preparing lecture materials, and teaching. 3 hours of lecture per week, a total of 15 hours of work per week.

  August 2003–May 2005   Abnormal Psychology (4 classes; 45-55 students)

  Duties: Creating syllabus, preparing lecture materials, and teaching. 3 hours of lecture per week, a total of 15 hours of work per week.

  May-July 2003   Social Psychology Lab (12 students).

  Duties: Creating syllabus, preparing lecture materials, and teaching. 2 hours of lecture per week, a total of 10 hours of work per week.

  January–May 2001   Recitation Classes for Introduction to Psychology (2 sessions, 75 students)

  Duties: Preparing lecture materials, and teaching. 2 hours of lecture per week, a total of 12 hours of work per week.

OTHER WORK EXPERIENCE

- *Graduate Assistant: Administrative Work, Community-Based Outpatient - Psychological Services Center, Virginia Polytechnic Institute and State University, VA*

  August 2003 - May 2004
  Clinic Director: Lee D. Cooper, Ph.D.
  Duties: Helping the director of the clinic in administrative work such as financial reports, orientation facilitator in program for first year clinical students, monthly chart reviews. 5 hours per week.

- *Graduate Assistant: Community-Based Outpatient - Psychological Services Center, Virginia Polytechnic Institute and State University, VA*

  January- May 2003
  Clinic Director: Lee D. Cooper, Ph.D.
  Duties: Prepared a manual for empirically-validated treatment resources available in the library of the center. 15 hours per week.

- *Graduate Teaching Assistant: Department of Psychology, Virginia Polytechnic Institute and State University, VA*

  August-December 2000
  Supervisor: Jack Finney, Ph.D.
  Duties: Assisting the graduate coordinator of Introduction to Psychology class. 12 hours per week.

PROFESSIONAL AFFILIATIONS

Student Member, Association of Advancement of Behavioral and Cognitive Therapy. 2004-to present.
Student Member, American Psychological Society. 2003–to present.
Student Member, Turkish Psychological Association. 1999-to present.