Integrating Negative Affect Measures in a Measurement Model: Assessing the Function of Negative Affect as Interference to Self-Regulation

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Abstract

The present study investigated the composition of negative affect and its function as inhibitory to thought processes such as self-regulation. Negative affect in the present study were composed of anxiety, worry, thought suppression, and fear of negative evaluation. These four factors were selected based on the criteria of negative affect by Hopko, Hunt, and Armento (2005) and Smith and Kirby (2001). Four different scales were used to measure these factors. The factor structure of the negative affect was tested using Confirmatory Factor Analysis. Results showed that all items as indictors were significant and all the four factors of negative affect were significantly related. The inhibitory function of the negative affect on self-regulation was further tested using Structural Equations Modeling. The results showed that as negative affect's increase, there was a reduction of 4% variance on self-regulation. The model showing the inhibitory function of negative affect also attained an adequate fit.

There is a need to clarify the role of emotions on inhibiting the thinking processes such as self-regulation. Many studies have demonstrated that emotional stability predicts performance (e. g., Covington, 1992; Jagacinski & Nicholls, 1987; Sansone & Harackiewiez, 1996; Weiner, 1985; Wigfield & Eccles, 1989). The role of affect on self-regulation is explained in the mood-behavior model by Gendolla (2000) where affective character is central in the constitution of action preferences as well as the mobilization of action resources. This model views affect as having a positive impact and facilitating self-regulatory behavior which is a very common perspective in published researches in the field of educational psychology (Baumann & Kuhl, 2002; Beal, White, & Barros, 2005; Efklides, 2005; Turner, Thorpe, & Meyer, 1998). However, a different perspective is shown in personality theory studies where affect can be conceptualized as inhibitory to self-regulation undermining learning (Bolte, Goschke, & Kuhl, 2002; Kuhl, 1994; Kuhl, 2000; Kuhl & Beckman, 1994; Sideridis, 2006). The varying perspectives in viewing the influence of affect on self-regulation are brought about by the nature of affect as activation or inhibition in the process of learning. In the present study, negative affect is hypothesized as an inhibition to self-regulation.

When predicting self-regulatory processes, the social cognitive theory focuses more on cognitive, attitudinal, and dispositional variables alone. The present study includes negative affect to see how they interact and affect self-regulation. Negative affect is used as an interference system to the factors of activation and self-regulation. The factors of negative affect are worry, anxiety, fear of negative evaluation, and thought suppression. Worry is a tendency to engage in thought characterized by predominantly negative cognitions of the self and personal

problems (Wells, 1994). On the other hand, students who are anxious have the motive to withdraw from the situation and there is a reduction on task-related effort (Geen, 1987). Fear of negative evaluation reflects fear of the loss of social approval (Leary, 1983). The study hypothesized that the factors of negative affect are inhibitory systems that interfere with self-regulation.

Self-regulation is undermined when an individual adapts a defensive reaction to efforts to protect their self-image by withdrawing or avoiding opportunities to learn and perform (Zimmerman, 2002; Schunk & Zimmerman, 1998). These defensive reactions come in the form of negative affect that impact self-regulation (Efklides, 2005). According to Pekrun, Goetz, and Titz (2002), negative affect can profoundly affect students' thoughts, motivations, and actions although there are not many studies in the field of educational psychology investigating these factors. The studies that demonstrate the impact of negative affect varies on their outcome measures such as coherent and intuitive judgment (Baumann & Kuhl, 2002), beliefs and behaviors that include deep strategy use, preference for difficulty, action and self-efficacy (Turner, Thorpe, & Meyer, 1998). The outcome variables in these studies do not directly measure self-regulation. There is a need to demonstrate the effect of negative affect on self-regulation since the path of its effect is clear. Turner, Thorpe, and Meyer (1998) explained that negative affect occurs when academically challenged students feel making mistakes, the greater would be their efforts at creating illusions of ability by lessening effort and concentrating on less strategic tactics. The outcome of negative affect is explained as self-regulation like strategic thinking but in the actual study Turner, et al. used different sets of beliefs and behaviors. The experiment of Bauman and Kuhl (2002) showed that when negative mood is high, the action control is decreased. They explained this result through the PSI theory where negative affect impairs access to extension memory including its representation of the integrated self. Accessing the extension memory also requires self-regulation strategy although it is not directly explained. The role of affect on self-regulation is supported in the explanation of Frijda (1993) where emotions in the same way as information, they are stored in memory with declarative and procedural knowledge and used in appraising situations. When a negative emotion is used in appraising an event or situation, strategic thinking and other self-regulatory measures are impaired. Moreover, negative affect carries performance consequences that co-occur with a task where it interferes with the current performance activity (Beal, Weiss, Barros, & MacDermid, 2005). This interference of activity is described as opposition to learning facilitation.

According to Smith and Kirby (2001), specific negative affect is identified through appraisal. These specific negative affects are characterized by ruminations. Examples of negative affects that are ruminative to thought processes are goal blockage, anger, worry, and anxiety (Berkowitz, 1989; Carver & Scheier, 1998; Kelly & Barsade, 2001; Martin & Tesser, 1996). Rumination of thoughts occur when (1) goals are halted, (2) emotion is unrelated to current performance episodes, and (3) when it is an additional cognitive demand that interferes with performance. Beal, Weiss, Barros, & MacDermid (2005) acknowledged that affect plays an important role in the initiation and persistence of ruminative thoughts.

The negative affect factors used in the present study that ruminate self-regulatory thoughts are anxiety, worry, fear of negative evaluation, and thought suppression. According to Hopko, Hunt, and Armento (2005) these negative affect states are (1) physiological states (such as anxiety and worry), (2) negative cognitions (such as fear of negative evaluation), (3) escape from and/or avoidance of performance-related situations (such as thought suppression), and (4) when an individual cannot avoid or escape the situation, they serve as performance deficits. These dimensions by Hopko, Hunt, and Armento (2005) provides a clear basis on the selection of specific negative affect states for the present study. These factors are good combinations in composing a negative affect measure since they have consistent and robust negative impact on performance and thought processes in different studies (Cassady & Johnson, 2002; Harris & Cumming, 2003; Powers, 2001; Seipp, 1991; Smith & Smith, 2002). Because of the consistent findings, Eysenck and Calvo (1992) in their processing efficiency theory primarily accentuate state and trait anxiety as the central variables that negatively impact performance. Although in the present study, the performance refers to thought process in the form of self-regulation and not outcome performance such as test results.

Anxiety and worry are two separate constructs but they are related as evidenced in various studies (Davey, Hampton, Farrell, & Davidson, 1992; Davey, 1993; Gana, Martin, & Canouet, 2001). Worry is defined as a stream of negative thoughts (Kelly & Miller, 1999) while anxiety tends to include somatic tension, fear, and a subjective sense of unease (Barlow, 2002). The study of Kelly (2004) looked into the resemblance and difference of worry and anxiety and found that worry can be measured as a factor of anxiety. When anxiety was extracted with factors they did not strongly predict worry which indicates that the two constructs measure different things. Thought suppression is defined by Wegner and Zanakos (1994) as efforts to avoid unwanted thoughts and ideas. This construct is usually a characteristic of obsessive compulsive symptoms where unwanted thoughts keep on intruding and effort is suppressed. The study of McKay and Greisberg (2002) shows that thought suppression is related with worry and anxiety. Fear of negative evaluation is characterized by persisting self-devaluations and fear that others will scrutinize a person's actions in social or performance situations (Leichsenring, Beutel, & Leibing, 2007). Fear of negative evaluation is also marked by the fear of possible scrutiny by others (Geangu & Reid, 2006). Fear of negative evaluation is termed in some studies as social anxiety or social phobia (Spence, Rapee, McDonald, & Ingram, 2001).

Learning Anxiety. Anxiety is a common variable of study in the field of clinical, counseling, personality and social psychology. In educational psychology, anxiety studies are mostly in the context of testing. Anxiety is described as a negative activating experience. Learning anxiety is treated in the current study as domain specific to learning and there are two studies that support this claim. Marsh (1988) investigated experiences of anxiety during instruction and found a disattenuated correlation of rd=.04 between anxiety in mathematics and English lessons. Marsh and Yeung (1996) examined anxiety in four academic domains (mathematics, sciences, social studies, and English) by analyzing data from the

National Educational Longitudinal Survey of 1988 among eighth graders. Using confirmatory factor analyses, they showed that academic anxiety in school-aged children is organized in a domain-specific way. They found very weak inter-correlations between domain-specific anxiety ratings, with the strongest relationships found between anxiety in conceptually similar academic domains (e.g., mathematics and science). Moreover, anxiety showed a greater degree of domain specificity than academic achievement in these domains (with grades as well as standardized test scores). Gottfried (1982) investigated anxiety among 141 fourth and seventh graders in four academic domains (reading, mathematics, social studies, and sciences). Significant negative correlations were found between anxiety and intrinsic motivation within domains (e.g., intrinsic motivation and anxiety involving mathematics) but not between domains (e.g., intrinsic motivation in mathematics and anxiety related to reading).

In a meta-analysis of 51 studies by Hembree (1990) using the Mathematics Anxiety Rating Scale (MARS), a mean correlation of $r = -.06$ between mathematics anxiety and verbal performance is reported, as well as a correlation coefficient of $r = -.34$ between the MARS scores and mathematical performance. This finding points to the domain specificity of anxiety based on the premise that, if anxiety were organized in a domain-transcending manner, then higher MARS scores would predict more anxiety in verbal domains, which would translate into significantly poorer verbal performance than evidenced by Hembree's nonsignificant correlation. Goetz, Frenzel, Pekrun, and Hall (2006) used confirmatory multitrait-multimethod factor analysis of the two-faceted dataset (emotions and domains) corroborated assumptions of domain specificity for learning anxiety. Furthermore, using multilevel analysis, the authors found that emotions were significantly more domain-specific than students' grades, with enjoyment being the most domain-specific of the three other emotions under investigation (anxiety, boredom, and anger).

Worry. Individuals who worry engage in thoughts characterized by predominantly negative cognitions of the self and personal problems (Wells & Matthews, 1996). Furthermore, Cartwright and Wells (1997) described that worrying is a syndrome of self-focused attention, negative self-appraisal, ruminative coping, and impairment of attention to the external world. Sarason, Sarason, & Pierce (1995) explained that in states of worry, self-referent processing functions withdraw attentional resources from other mental activities leading to performance decrements on attentionally demanding tasks. There is cognitive interference when an individual experiences worry. Individuals worrying become intolerant to uncertainty. This means that worrying makes a person unable to make decisions necessary for adaptive functions. This was demonstrated in the study of de Bruin, Rassin, and Muris (2006) where they found significant relationship between the Intolerance of Uncertainty Scale and state worry in a situation that elicits low to medium levels of uncertainty. They concluded that only under certain conditions intolerance uncertainty-related personality characteristics seem to be predictive of worrisome thoughts. Malpass, O'Neil, and Hocevar (1999) came up with a model showing the effects of gender, self-efficacy, learning goal orientation, self-regulation,

and worry on high-stakes mathematics achievement in a sample of mathematically gifted, primarily Asian American, high school students. They found that worry negatively correlated with self-efficacy, learning goal, and self-regulation. This supports other research showing that high worry is associated with low cognitive performance (Hembree, 1990; Pajares & Urdan, 1996; Seipp, 1991). Seipp (1991) recommended that studies predicting academic achievement would be better served by using only the worry component.

Thought Suppression. Thought suppression is triggered by various conditions including attempts of: (1) avoiding negative emotions, (2) controlling unwanted behaviors, (3) not revealing certain secrets or unwanted thoughts, (4) preventing thoughts that result in decreased performance, and (5) blocking mental contents that are unacceptable in themselves (Wegner, 1994). In the process of thought suppression, individuals become hypersensitive to the unwanted thoughts that lead to disruption of self-regulation. Purdon (1999) suggested that the suppression of thoughts increase in frequency due to: (1) the hyperaccessibility of other negative thoughts used as distracters; (2) the limited mental resources of the subjects; (3) the fact that deliberate attempts of altering an emotional state lead to a heightened importance of cues suggesting that the desired state has not been reached, so that efforts to block a negative state by replacing it with a positive one will prove counterproductive. Oaten and Cheng (2005) studied how self-regulation is depleted in relation to thought suppression. They found that when individuals are exposed to a stressful exam, impaired performance happens and self-regulation decreases because thought suppression is adapted.

Fear of Negative Evaluation. According to Clark's model, fear of negative evaluation in adults is experienced when the individual seems to acquire a set of dysfunctional assumptions about the significance of social situations (Clark & Wells, 1995; Clark, 2001). These social situations are having (1) excessively high personal standards for social performance, (2) conditional beliefs concerning the consequences of performing in a certain way, and (3) unconditional negative beliefs about the self. The approach of a relevant social situation activates these assumptions. This leads to a perceived social danger, the prediction of personal failure and to the fallacious interpretation of benign or ambiguous social stimuli as signs of negative evaluation by others. This leads to increased levels of anxiety and the processing of the self as a social object involving both reduced processing of social cues and negatively biased processing of the external social situation. Some manifestations include internal sensation with negative observation by others, the presence of safety behaviors such as generally avoiding social situations and avoiding eye contact prevents the disconfirmation of these distortions, maintaining and strengthening them over time. The study of Schwartz, Snidman, and Kagan (1999) showed that temperamental characteristics such as behavioral inhibition or shyness are highly predictive of later social anxieties. They found that 61% of children categorized as highly inhibited at the age of two manifest fear of negative evaluation. Issues associating with how fear of negative evaluation affects self-regulatory processes are not yet been addressed and more research is needed. The

fear of negative evaluation by others leads to distorted cognitive processing of the information. The closest study that demonstrates this idea is the study of Horley, Williams, Gonsalvez, and Gordon (2004) where individuals with social phobia displayed hyperscanning of emotional expressions, such that they scanned the face more than control subjects but, relative to controls, they avoided foveal fixations on the eyes.

When individuals with fear of negative evaluation enter an anxiety-provoking social situation, their attention is focused on the perceived danger of failing to act appropriately and competently. The heightened social anxiety experienced in social situations is not simply a result of distorted self-perception but it is also due, in part, to the presence of distorted other-perception-the extent to which the individual believes that everyone will be (or is) watching, judging and rejecting (Beck, Emery, & Greenberg, 1985; Wells, 1997). Fear of negative evaluation is considered as a negative affect since socially anxious individuals tend to interpret social information in negative ways (Ledley & Heimberg, 2006).

The present study integrates the factors of anxiety, worry, thought suppression, and fear of negative evaluation in a measurement model as representations for negative affect. These factors are stringed together based on their commonality presented by Hopko, Hunt, and Armento (2005) and Smith and Kirby (2001). These factors also have consistent effects on self-regulation across studies that define their functions as inhibitory. The inhibitory function of the negative affect factors are tested in the present study as the hypothesized reduction of variance on self-regulation.

Method

Participants

The participants in the study were 1454 college students ages 16 to 21 from different courses who are studying in different colleges and universities in the National Capital Region (NCR). The participants are college students from different universities in the National Capital Region of the Philippines. Among the participants, 57.96% are females and 42.04% are males.

In the sampling, 2000 participants were given the survey questionnaire who qualified to be included in the selection criteria. The number of participants was reduced because some were not able to complete the questionnaire during the second wave of assessment. The participants who did not answer the specific self-regulation method that they use in the questionnaire were also excluded. Those who missed to answer several items on a subscale in the measures were also excluded. The residuals were obtained for each participant and those with residuals greater than 7.0 were excluded in the analysis because their scores are very far from the regression line. A total of 1454 participants were left for analysis which is 72.7% of the original sample.

Instruments

Self-Regulated Learning Interview Schedule (SRLIS). The SRLIS instrument was constructed by Zimmerman and Martinez-Pons (1986) with eight open-ended questions and scales. Each participant would rate the questions in terms of how frequent they use the strategy. The measure is composed of eight self-regulation strategies that include rehearsing and memorizing, organizing and transforming, seeking information, self-evaluation, goal-setting and planning, keeping records and monitoring, self-consequencing, and environmental structuring. Six different learning contexts were described to each student: in classroom situations, when studying at home, when completing writing assignments, when completing mathematics assignments, when preparing for and taking tests, and when poorly motivated to complete homework.

In answering the SRLIS, the participant is tasked to report the self-regulation method they use in each situation in an open ended question. If the student failed to give an answer, a probe is given about any particular method use if they are having difficulty in the situation encountered. If the student failed to suggest any self-regulating learning strategies, questioning was discontinued for that learning context. After responding, the participant rated how frequent is method used. If the student mentioned one or more strategies, they are instructed to rate the consistency with which each strategy was used according to the presented 4-point scale with categories ranging from seldom (1) to most of the time (4). The responses on the strategy given by the participants for each questions were coded under the specific self-regulation that they belong.

In the studies of Zimmerman, the measure has gone construct validation specifically convergent validity of the RSSRL scale and standardized measures of students' achievement. Principal-components analysis was performed followed by an oblique factor rotation. The correlation between rotated Factors I and II was .57; between rotated Factors I and III, it was .43; and between rotated Factors II and III, it was .36. Initial research on various scoring systems for the SRLIS indicated that a consistency-weighted score for each reported strategy was optimally predictive of students' achievement. Those results were reported along with definitions and examples of each of the 14 strategies by Zimmerman and Martinez-Pons (1986).

Academic Emotion Questionnaire (AEQ). The anxiety subscale of the AEQ developed by Pekrun, Goetz, and Perry (2005) was used in the study. The anxiety scale is composed of six-items used to assess college students' anxiety about their academic performance in the course. An example of an item is "I get so nervous that I don't even want to begin to study." Students responded to each item using a four-category Likert scale (1 = not at all true, 4 = completely true; Cronbach's α = .81). A five-month test–retest reliability estimate based on a separate sample revealed acceptable stability over time, $r(632) = .61$, $p < .01$.

Fear of Negative Evaluation (FNE). The FNE by Watson & Friend (1969) in its full version is originally composed of 30 items designed to measure the fear of receiving negative evaluation from others. Scores on the FNE essentially reflect a

fear of loss of social approval. The items measure ineffective social behavior that would incur disapproval of others. An example of an item is "I am afraid that people will not approve of me." The short version of the FNE by Leary (1983) is used with 12 items responded in a four-point scale (1=not at all characteristic of me, 2=slight characteristic of me, 3=very characteristic of me, 4=extreme characteristic of me). The average item total score correlation is .72. Internal consistency is .94 for a sample of 205 college students and .96 for a separate sample of 154 respondents. It remained stable with a test-retest correlation of .78 over a month period and .94 from a separate sample of 29 respondents. A known-group validity was demonstrated by comparing a sample of subjects who scored in the upper 25 percentile of the FNE with respondents from the lower 25 percentile. The high FNE group sought more approval from others and avoided disapproval. The short version was correlated with the full version of the FNE and the correlation was .96. Criterion-related validity was shown with the scores of FNE correlated with anxiety, avoidance, and the degree to which respondents were bothered by an unfavorable evaluation from others.

Penn State Worry Questionnaire (PSWQ). The PSWQ by Meyer, Miller, Metzger, and Borkovec (1990) is a 16-item instrument designed to measure trait worry. An example of an item is "When there is nothing more I can do about a concern, O worry about it more." The PSWQ measures worry as a construct independent of anxiety and depression. The norm reported a mean of 48.8, SD=13.8 (Females=51.2, Males=46.1). Higher scores suggest a stronger worry. The internal consistency of the items is high with an alpha of .93. With a one-month test-retest correlation on a separate sample of 73 undergraduate students, a coefficient of .93 is obtained. The PSWQ has been shown to correlate in predicted directions with other emotional disturbances questionnaires such as self-esteem, perfectionism, and environmental stress. The PSWQ does not appear to be affected by social desirability resources.

White Bear Suppression Inventory (WBSI). The WBSI by Wegner and Zanakos (1994) is a 15 item questionnaire designed to measure thought suppression. It identifies whether individuals exposed to emotion producing thoughts will fail to habituate them overtime. An example of an item is "I have thoughts that I cannot stop." The norm indicates a mean score of 45.8 among university men and 47.6 among university women. The items are answered in a Likert scale (4=strongly agree, 3=agree, 2=disagree, 1=strongly disagree). The internal consistency is high with alphas ranging from .87 to .89. Test-retest correlation of .92 with one week interval was obtained. The WBSI has excellent convergent validity with significant correlations with the Beck Depression Inventory, Maudsley Obsessive Compulsive Inventory, Sensitization Subscale of the Repression-Sensitization scale, State-Trait Anxiety Inventory, and Anxiety Sensitivity Inventory.

Procedure

Students from selected colleges and universities in the NCR were requested to answer a series of questionnaires. In the actual administration, informed consent was obtained from the college respondents. Those who were willing to participate in the study were also given the set of questionnaires to be answered. The respondents were monitored while answering the questionnaires in case questions would arise. The set of questionnaires were given to the students' professors who administered it in class. The administration of the scales took one hour to complete. After completing the answers for all the questionnaires, the students were thanked and debriefed about the purpose of the study.

The administration of the two sets of instruments took place on two different time frames. In the first wave, the learning anxiety subscale of the Academic Emotion Questionnaire, Fear of Negative Evaluation, Penn State Worry Questionnaire, and the White Bear Suppression Inventory were administered. After two weeks, the Self-Regulated Learning Interview Schedule was administered to the same respondents for the second wave. The same respondents were tested during the second wave administration by repeated measures.

Data Analysis

All the factors of the measures were intercorrelated to establish their relationship. The covariance among the variables were also obtained and entered as part of the procedure to conduct the Structural Equations Modeling.

The Structural Equations Modeling was used as the major analysis in the study. The measurement models of the negative affect were first established to show that the four measures can be integrated in a measurement model. Then Structural Equations modeling was used to test the effects of the negative affect as single latent factor on self-regulation.

Noncentrality and Single Sample Fit Indices were also used to evaluate the goodness of fit of the models tested.

The noncentrality measures represent a change of emphasis in assessing model fit. Instead of testing the hypothesis that the fit is perfect, it tests how bad is the fit of the model in reference to the statistical population and how accurate is the population badness-of-fit from the sample data. The obtained Root Mean Square Error Approximation (RMSEA) measure was used to determine the best fitting model. Values of the RMSEA index below .05 indicate good fit, and values below .01 indicate outstanding fit (Steiger, Shapiro, & Browne, 1985). The RMSEA compensates for model parsimony by dividing the estimate of the population noncentrality parameter by the degrees of freedom.

Single sample goodness of fit indices was also used to evaluate the models. The noncentrality fit indices used to assess the three models are Joreskog (GFI and AGFI: Values above .95 indicate good fit), Bentler-Bonett, Relative Fit Index/Bollen's rho (RFI: values close to 1 indicate a relatively good fit), Incremental Fit Index/Bollen's delta (IFI: values close to 1 indicate a relatively good fit), and Comparative Fit Index/McDonald's Fit index (CFI: values close to 1

indicate a relatively good fit, values above .95 are acceptable) (Browne & Cudeck, 1989).

Results

The Means and Standard Deviations of the factors of the negative affect and self-regulation are shown. These factors are also intercorrelated using the Pearson r. A measurement model was tested for negative affect having a four factor structure. A structural model was tested showing the inhibition of self-regulation. The goodness of fit indices of the models were also reported.

	N	M	SD	Cronbach's alpha
Self-regulation (SRL)				.81
Rehearsing and Memorizing	1454	3.31	0.70	
Organizing and Transforming	1454	3.08	0.72	
Seeking Information	1454	3.28	0.73	
Self-evaluation	1454	3.19	0.75	
Goal-setting and Planning	1454	3.34	0.71	
Keeping Records and Monitoring	1454	3.38	0.69	
Self-consequencing	1454	3.22	0.76	
Environmental Structuring	1454	3.30	0.74	
Negative Affect (Inhibition)				
Learning Anxiety	1454	2.67	0.42	.77
Fear of Negative Evaluation	1454	2.73	0.48	.86
Worry	1454	2.66	0.44	.83
Thought Suppression	1454	2.74	0.37	.80

The means for the factors of the self-regulation are all high as compared to the means obtained for the negative affect factors. All of the means for the self-regulation is within M=3.08 to M=3.38 which indicates that the self-regulation factors are most of the time used. The mean values for the negative affect range from M=2.66 to 2.74. For anxiety, the mean indicates that the participants agree on the items (M=2.67). For fear of negative evaluation, the mean is interpreted as very characteristic of the participants (M=2.73). For worry, the mean of the scores is somewhat typical (M=2.66). And for thought suppression, the mean is indicates that the participants agree in on the items (M=2.74).

The standard deviation indicates that the scores in all the factors are not highly dispersed. The reliabilities of the scales for the negative affect have high internal consistencies ranging from .77 to .86. The scale for self-regulation has a high internal consistency with a Cronbach's alpha of .81.

Table 2
Correlations among Self-regulation, Activation System, and Negative Affect

Self-regulation	Negative Affect			
	Anxiety	Fear of Negative Evaluation	Worry	Thought Suppression
Rehearsing and Memorizing	-0.10*	-0.03	-0.05*	0.01
Organizing and Transforming	-0.06*	-0.01	-0.05	-0.01
Seeking Information	-0.06*	-0.02	-0.07*	-0.01
Self-evaluation	-0.05	0.00	-0.01	0.00
Goal-setting and Planning	-0.10*	-0.03	-0.08*	-0.05*
Keeping Records and Monitoring	-0.07*	0.01	-0.07*	0.00
Self-consequencing	-0.11*	-0.01	-0.05*	0.00
Environmental Structuring	-0.12*	-0.04	-0.07*	-0.01

*$p < .05$

The correlation coefficients among the factors of self-regulation and negative affect are all significant, $p < .05$, although the strengths are from weak to moderate. For the negative affect, anxiety and worry have significant correlation coefficients with most self-regulation components, $p < .05$. Thought suppression had only one significant correlation and fear of negative evaluation have no significant relationship with any of the self-regulation factors. The relationship among the factors of self-regulation that is significant with the negative affect factors has a negative magnitude. This shows that the lower the negative affect such as anxiety and worry, the higher the use of self-regulation strategies. Many of the correlation coefficient values have weak to moderate strength.

Figure 1
*Measurement Model Integrating Negative Affect Factors*
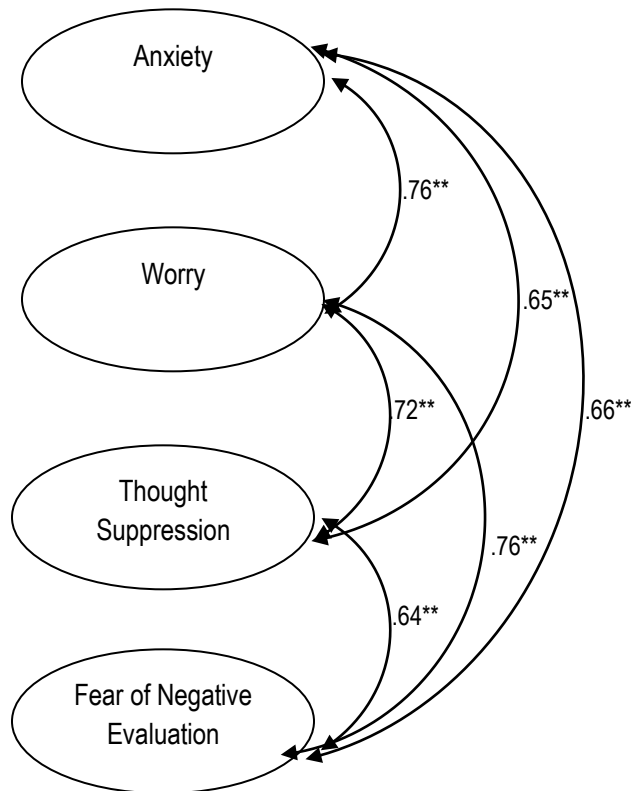
Note. All indicators used for this measurement model are the items in the scale which were all significant, *p*<.001. Anxiety (11 items), Fear of Negative Evaluation (12 items), Worry (16 items), Thought Supression (15 items).

The factors anxiety, worry, thought suppression, and fear of negative evaluation was structured in a four factor measurement model, all paths were significant. Their indicators which were the items were all significant at .001 alpha level (see Appendix). The goodness of fit of the model was also adequate as indicated by χ^2=6300.42, df=1371, RMSEA=.05, Joreskog GFI=.92, Bentler-Bonnett Nonrmed Fit Index=.92, and McDonald's Noncentrality Index=.91. This indicates that these four factors can be used as representation for negative affect.

A structural model was also tested where the effects of a negative affect as a single latent construct on self-regulation. The indicators used for the negative affect were the four factors that were tested in the initial measurement model (see Figure 1).

Figure 1
The Effect of Negative Affect on Self-regulation
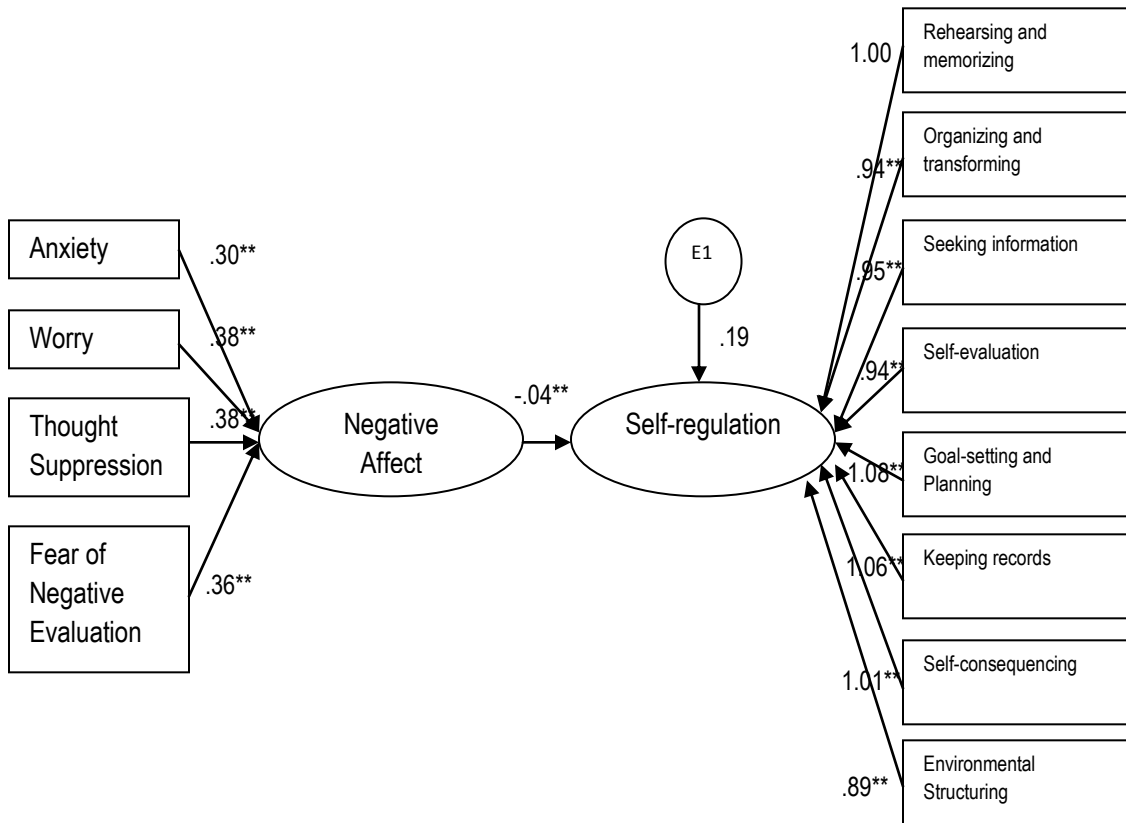
The results of the structural model show that all manifest variables of negative affect and self-regulation were significant at .001 alpha level. The effects show that as the variance of negative affect increase by 1.00, self-regulation decreases by .04 points. This proves the function of negative affect as inhibition to self-regulation. The model also attained an adequate fit as indicated by χ^2=184.93, df=53, RMSEA=.04, Joreskog GFI=.98, Bentler-Bonnett Normed Fit Index=.97, and McDonald's Noncentrality Index=.96.

Discussion

The results show that the correlations of the negative affect factors on self-regulation were negative. No significant relationship was found between fear of negative evaluation on any of the self-regulation factors. When the four factors of negative affect were integrated in a measurement model, all items were significant and the fit was adequate. When the function of negative affect as inhibition to self-regulation was tested, the hypothesis was proven and the SEM likewise showed an adequate fit.

The experience of the negative affect is more consistent indicating that they can cause intrusions to self-regulation (high Cronbach's alpha). The relationship among the factors of negative affect and self-regulation as examined using the Pearson's r is not very high although most are significant. This indicates that these factors act independently and they are best studied in a causal model. In the results of the correlation analysis, self-regulation decreases significantly with the factors for negative affect. For the factors of negative affect, only anxiety and worry decreases as self-regulation increases. This further demonstrates that when anxiety and worry are high, the use of self-regulation is not optimal. In these findings, anxiety and worry served as inhibitors for self-regulation. But the correlation coefficient as an analysis is not strong enough to conclude on the role of both the activation and negative affect factors on self-regulation. The Structural Equations Modeling, a more powerful analysis tool can provide a stronger basis for elucidating the role of the factors understudy as activation and inhibitions for self-regulation.

The correlations also indicate that some factors of negative affect were negatively correlated with the factors of action control while others did not significantly correlate. Anxiety is consistent in having a negative and significant relationship with all self-regulation measures. This supports the processing theory where anxiety at high levels decreases performance such as self-regulation (Eysenck & Calvo, 1992; Hopko, Hunt, & Armento, 2005). Worry also had a significant and negative correlation with all factors of self-regulation except for organizing and transforming and self-evaluation. Organizing and transforming is not related to worry because this strategy does not take much effort to execute. Even under states of worry, individuals can still engage in organizing and transforming activities. Self-evaluation is also not crucially affected by states of worry. Individuals can evaluate themselves without too much worrying because this strategy is attributed on the self and others are not involved in the process of evaluation. There is no risk of offending other people because the individual only evaluate him/herself safely. Thought suppression and fear of negative evaluation are not significantly related with the factors of self-regulation except for goal setting and planning resulting to a negative magnitude.

The structural model tested sowed that negative affect with factors of anxiety, worry, thought suppression, and fear of negative evaluation decreases the use of self-regulation. The effect of negative affect on self-regulation supports the processing theory where negative affect negatively impacts performance (Eysenck & Calvo, 1992; Hopko, Hunt, & Armento, 2005). This result is consistent across different studies and confirms that states of negative affect not only decreases performance but the ability and processes to perform task such as self-regulation. When negative affect impacts self-regulation negatively, it plays its role as an inhibitor of self-regulation. Negative affect as an inhibition becomes a hindrance for an individual to engage in processes that would execute performance effectively such as goal setting and monitoring which are self-regulation processes. The combined feelings of anxiety, worry, fear of negative evaluation, and thought suppression serve their function to intrude thought processes because self-regulation is not used or used in low frequency. The inhibitive role of negative affect is further proven in the present study.

The present study contributes to literature by establishing further the construction of negative affect as a variable. Negative affect in previous studies is conceptualized a specific emotionality variable. The present study was able to establish its composition and proved its structure using a Confirmatory Factor Analysis. Not only is the factor structure shown but the functionality of negative affect as an inhibitory variable to thoughts is further tested. The results were consistent to past studies and further proven the inhibitory function of negative affect.

References

Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). New York: Guilford Press.

Baumann, N., & Kuhl, J. (2002). Intuition, affect, and personality: Unconscious coherence judgments and self-regulation of negative affect. *Journal of Personality and Social Psychology, 83*, 1213-1223.

Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of Applied Psychology, 90*, 1054-1068.

Beck, A. T., Emery, G., & Greenberg, R. L. (1985). *Anxiety disorders and phobias: A cognitive perspective*. New York: Basic Books.

Berkowitz, L. (1989). Frustration-aggression hypothesis: Examination and reformulation. *Psychological Bulletin, 106*, 59-73.

Bolte, A., Goschke, T., & Kuhl, J. (2002). *Emotion and intuition: Effects of positive and negative mood on implicit judgments of semantic coherence.* Manuscript submitted for publication.

Cartwright, S. & Wells, A. (1997). Beliefs about worry and intrusion: The metacognitions questionnaire and its correlates. *Journal of Anxiety Disorder, 11*, 279-296.

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior.* New York: Cambridge University Press.

Cassaday, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary Educational Psychology, 27*, 270–295.

Clark, D.M. & Wells, A., (1995). A cognitive model of social phobia. In Heimberg, R.G., Liebowitz, M., Hope, D.A. and Schneier, F., (Eds.). *Social phobia: diagnosis, assessment and treatment.* Guilford: New York.

Clark, D.M., (2001). A cognitive perspective on social phobia. In: Crozier, W.R. and Alden, L.E., (Eds.). *International handbook of social anxiety: concepts, research and interventions relating to the self and shyness.* Wiley: Chichester, UK.

Covington, M. (1992). *Making the grade: A self-worth perspective on motivation and school reform.* New York: Cambridge University Press.

Davey, C. L., Hampton, J., Farrell, J., & Davidson, S. (1992). Some characteristics of worrying: Evidence for worrying and anxiety as separate constructs. *Personality and Individual Differences, 13*, 133-147.

Davey, G. C. L. (1993). A comparison of three worry questionnaires. *Behaviour Research and Therapy, 31*,51-56.

de Bruin, G. O., Rassin, E., & Muris, P. (2006). Worrying in the lab: Does intolerance of uncertainty have predictive value?. *Behaviour Change, 23*, 138-148.

Efklides, A. (2005). Introduction to the special section: Motivation and affect in the self-regulation of behavior. *European Psychologist, 10*, 173-174.

Eysenck, M. W., & Calvo, M. G. (1992). Anxiety and performance: The processing efficiency theory. *Cognition and Emotion, 6*, 409–434.

Frijda, N. H. (1993). Moods, emotion episodes and emotions. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 381-403). New York: Guilford Press.

Gana, K., Martin, B., & Canouet, M. (2001). Worry and anxiety: Is there a causal relationship? *Psychopathology, 34*, 221-229.

Geangu, E., & Reid, V. M.(2006). What can early social cognition teach us about the development of social anxieties? *Comportament, 10*, 543-558.

Geen, R. G. (1987). Test anxiety and behavioral avoidance. *Journal of Research in Personality, 21*, 481-488.

Gendolla, G.H.E. (2000). On the impact of mood on behavior: An integrative theory and a review. *Review of General Psychology, 4*, 378-408.

Goetz, T., Frenzel, A. C., Pekrun, R., & Hall, N. C. (2006). The domain specificity of academic emotional experiences. *The Journal of Experimental Education, 75*, 5-26.

Gottfried, A. E. (1982). Relationships between academic intrinsic motivation and anxiety in children and young adolescents. *Journal of School Psychology, 20*, 205-215.

Harris, L. M., & Cumming, S. R. (2003). An examination of the relationship between anxiety and performance on prospective and retrospective memory tasks. *Australian Journal of Psychology, 55*, 51–55.

Hembree, R. (1990). The nature, effects, and relief of mathematics anxiety. *Journal for Research in Mathematics Education, 21*, 33-46.

Hembree, R. (1990). The nature, effects, and relief of mathematics anxiety. *Journal for Research in Mathematics Education, 21*, 33-46.

Hopko, D. R., Hunt, M. K., & Armento, M. E. (2005). Attentional task aptitude and performance Anxiety. *International Journal of Stress Management, 12*, 389-408.

Horley, K., Williams, L.M., Gonsalvez, C., & Gordan, E. (2004). Face to face: visual scanpath evidence for abnormal processing of facial expressions in social phobia. *Psychiatry Research, 127*, 43-53.

Jagacinski, C. M., & Nicholls, J. G. (1987). Competence and affect in task involvement and ego involvement: The impact of social comparison information. *Journal of Educational Psychology, 79*, 107-114.

Kelly, J. R., & Barsade, S. G. (2001). Mood and emotions in small groups and work teams. *Organizational Behavior & Human Decision Processes, 86*, 99-130.

Kelly, W. E. (2004). Examining the relationship between worry and trait anxiety. *College Student Journal, 38*, 370-374.

Kelly, W. E., & Miller, M. J. (1999). A discussion of worry with suggestions for counselors. *Counseling and Values, 44,* 55-66.

Kuhl, J. (1994). Action versus state orientation: Psychometric properties of the Action Control Scale (ACS-90). In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation* (pp. 47-59). Göttingen, Germany: Hogrefe.

Kuhl, J. (2000). A functional-design approach to motivation and self-regulation: The dynamics of personality systems interactions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Self-regulation: Directions and challenges for future research* (pp. 111-169). New York: Academic Press.

Kuhl, J., & Beckmann, J. (1994). *Volition and personality: Action versus state orientation.* Göttingen, Germany: Hogrefe.

Leary, M. R. (1983). A brief version of the fear of negative evaluation Scale. *Personality and Social Psychology Bulletin, 9,* 371-375.

Leary, M. R. (1983). A brief version of the fear of negative evaluation Scale. *Personality and Social Psychology Bulletin, 9,* 371-375.

Ledley, D. R. & Heimberg, R. G. (2006). Cognitive vulnerability to social anxiety. *Journal of Social and Clinical Psychology, 25,* 755-779.

Leichsenring, F., Beutel, M. & Leibing, E. (2007). Psychodynamic psychotherapy for social phobia: A treatment manual based on supportive-expressive therapy. *Bulletin of the Menninger Clinic, 71,* 56-84.

Malpass, J. R., O'Neil, H. F., & Hocevar, D. (1999). Self-regulation, goal orientation, self-efficacy, worry, and high-stakes math achievement for mathematically gifted high school students. *Roeper Review, 21,* 281-289.

Marsh, H. W. (1988). The content specificity of math and English anxieties: The high school and beyond study. *Anxiety Research, 1,* 137-149.

Marsh, H. W., & Yeung, A. S. (1996). The distinctiveness of affects in specific school subjects: An application of confirmatory factor analysis with the National Educational Longitudinal Study of 1988. *American Educational Research Journal, 33,* 665-689.

Martin, L. L., & Tesser, A. (1996). Some ruminative thoughts. In R. S. Wyer, Jr. (Ed.), *Advances in social cognition* (Vol. 9, pp. 1-47). Mahwah, NJ: Erlbaum.

McKay, D. & Greisberg, S. (2002). Specificity of measures of thought control. *The Journal of Psychology, 136,* 149-161.

Meyer, T. J., Miller, M. L., & Borkovec, T. D. (1990). Development and validation of the Pen State Worry Questionnaire. *Behavior, Research, and Therapy, 28,* 487-495.

Oaten, M. & Cheng, K. (2005). Academic examination stress impairs self-control. *Journal of Social and Clinical Psychology, 24,* 254-280.

Pajares, F.. & Urdan. T. (1996). Exploratory factor analysis of the mathematics anxiety scale. *Measurement and Evaluation in Counseling and Development, 29,* 35-47.

Pekrun, R., Goetz, T., & Perry, R. P. (2005). *Achievement emotions questionnaire: User's Manual.* Germany: German American Research Council.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist, 37*, 91–105.

Powers, D. E. (2001). Test anxiety and test performance: Comparing paper-based and computer-adaptive versions of the Graduate Record Examination (GRE) General Test. *Journal of Educational Computing Research, 24*, 249–273.

Purdon, C.A. (1999). Thought suppression and psychopathology. *Behaviour Research and Therapy, 37*, 1029-1054.

Sansone, C., & Harackiewicz, J.M. (1996). "I don't feel like it": The function of interest in self-regulation. In L. Martin & A. Tesser (Eds.), *Striving and feeling: The interaction of goals and affect* (pp. 203-228). Mahwah, NJ: Erlbaum.

Sarason, I. G., Sarason, B. R. & Pierce, G. R. (1995). Cognitive interference: At the intelligence-personality crossroads. In D. H. Saklofske & M. Zeidner (Eds.), *International Handbook of Personality and Intelligence* (pp.285-296). New York: Plenum.

Schunk, D.H., & Zimmerman, B.J. (1998). *Self-regulated learning: From teaching to self-reflective practice.* New York: Guilford Press.

Schwartz, C., Snidman, N., & Kagan, J., (1999). Adolescent social anxiety as an outcome of inhibited temperament in childhood. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*, 1008-1015.

Seipp, B. (1991). Anxiety and academic performance: A meta-analysis of the findings. *Anxiety Research, 4*, 27-41.

Seipp, B. (1991). Anxiety and academic performance: A meta-analysis of the findings. *Anxiety Research, 4*, 27-41.

Sideridis, G. D. (2006). Achievement goal orientations, "oughts," and self-regulation in students with and without learning disabilities. *Learning Disability Quarterly, 29*, 3-19.

Smith, C. A., & Kirby, L. D. (2001). Affect and cognitive appraisal processes. In J. P. Forgas (Ed.), *Handbook of social cognition* (pp. 75-92). Hillsdale, NJ: Erlbaum.

Smith, L. F., & Smith, J. K. (2002). Relation of test-specific motivation and anxiety to test performance. *Psychological Reports, 91*, 1011–1021.

Spence, S.H., Rapee, R., McDonald, C., & Ingram, M. (2001). The structure of anxiety symptoms among preschoolers. *Behaviour Research and Therapy, 39*, 1293-1316.

Turner, J. C., Thorpe, P. K., Meyer, D. K. (1998). Students' Reports of Motivation and Negative Affect: A Theoretical and Empirical Analysis. *Journal of Educational Psychology, 90*, 758-771.

Watson, D. & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33*, 448-457.

Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality, 62*, 616-639.

Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality, 62*, 616-639.

Wegner, D.M. (1994). Ironic processes of mental control. *Psychological Review, 101*, 34-52.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548-573.

Wells, A. & Matthews, G. (1996). Modeling cognition in emotional disorder: S-REF model. *Behavior, Research, and Therapy, 34*, 881-888.

Wells, A. (1987). A cognitive model of generalized anxiety disorder. *Behavior Modification, 23*, 526-555.

Wells, A. (1994). A multidimensional measure of worry: Development and preliminary validation of the anxious thoughts inventory. *Anxiety, Stress, and Coping, 6*, 289-299.

Wigfield, A., & Eccles, J. S. (1989). Test anxiety in elementary and secondary school students. *Educational Psychologist, 24*, 159-183.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice, 41*, 64-72.

Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal, 23*, 614-628.

Appendix
Parameter Estimates of the Items of Each Negative Affect Factor

	Parameter Estimates	Standard Errors	t value	P value
(anxiety)-1->[item 1]	0.275**	0.02	13.956	0.00
(anxiety)-2->[item 2]	0.344**	0.022	15.636	0.00
(anxiety)-3->[item 3]	0.412**	0.021	19.693	0.00
(anxiety)-4->[item 4]	0.347**	0.019	18.723	0.00
(anxiety)-5->[item 5]	0.41**	0.021	19.436	0.00
(anxiety)-6->[item 6]	0.373**	0.021	18.001	0.00
(anxiety)-7->[item 7]	0.438**	0.023	19.206	0.00
(anxiety)-8->[item 8]	0.333**	0.021	15.727	0.00
(anxiety)-9->[item 9]	0.348**	0.02	17.321	0.00
(anxiety)-10->[item 10]	0.395**	0.021	18.703	0.00
(anxiety)-11->[item 11]	0.355**	0.023	15.647	0.00
(Fear of Negative Evaluation)-12->[item 1]	0.466**	0.021	21.93	0.00
(Fear of Negative Evaluation)-13->[item 2]	0.379**	0.019	20.461	0.00
(Fear of Negative Evaluation)-14->[item 3]	0.414**	0.019	21.915	0.00
(Fear of Negative Evaluation)-15->[item 4]	0.415**	0.019	22.338	0.00
(Fear of Negative Evaluation)-16->[item 5]	0.445**	0.019	23.585	0.00
(Fear of Negative Evaluation)-17->[item 6]	0.426**	0.019	22.064	0.00
(Fear of Negative Evaluation)-18->[item 7]	0.407**	0.02	20.271	0.00
(Fear of Negative Evaluation)-19->[item 8]	0.464**	0.02	23.06	0.00
(Fear of Negative Evaluation)-20->[item 9]	0.475**	0.018	25.694	0.00
(Fear of Negative Evaluation)-21->[item 10]	0.48**	0.019	24.969	0.00

Cont. Appendix

(Fear of Negative Evaluation)-22->[item 11]	0.471**	0.02	24.039	0.00
(Fear of Negative Evaluation)-23->[item 12]	0.463**	0.019	24.249	0.00
(Worry)-24->[item 1]	0.35**	0.021	16.808	0.00
(Worry)-25->[item 2]	0.37**	0.019	19.251	0.00
(Worry)-26->[item 3]	0.316**	0.02	15.943	0.00
(Worry)-27->[item 4]	0.439**	0.021	20.892	0.00
(Worry)-28->[item 5]	0.425**	0.019	22.304	0.00
(Worry)-29->[item 6]	0.421**	0.02	20.579	0.00
(Worry)-30->[item 7]	0.393**	0.019	20.973	0.00
(Worry)-31->[item 8]	0.442**	0.021	21.309	0.00
(Worry)-32->[item 9]	0.406**	0.02	20.412	0.00
(Worry)-33->[item 10]	0.427**	0.019	22.022	0.00
(Worry)-34->[item 11]	0.456**	0.021	21.584	0.00
(Worry)-35->[item 12]	0.464**	0.022	21.257	0.00
(Worry)-36->[item 13]	0.394**	0.02	19.922	0.00
(Worry)-37->[item 14]	0.447**	0.02	22.592	0.00
(Worry)-38->[item 15]	0.443**	0.02	21.833	0.00
(Worry)-39->[item 16]	0.397**	0.02	20.148	0.00
(Thought Suppression)-40->[item 1]	0.319**	0.02	15.749	0.00
(Thought Suppression)-41->[item 2]	0.341**	0.019	18.163	0.00
(Thought Suppression)-42->[item 3]	0.412**	0.02	21.085	0.00
(Thought Suppression)-43->[item 4]	0.412**	0.019	21.28	0.00
(Thought Suppression)-44->[item 5]	0.304**	0.019	16.076	0.00
(Thought Suppression)-45->[item 6]	0.391**	0.02	19.348	0.00
(Thought Suppression)-46->[item 7]	0.323**	0.02	16.445	0.00
(Thought Suppression)-47->[item 8]	0.212**	0.021	9.868	0.00
(Thought Suppression)-48->[item 9]	0.349**	0.019	18.849	0.00
(Thought Suppression)-49->[item 10]	0.29**	0.019	15.05	0.00
(Thought Suppression)-50->[item 11]	0.318**	0.021	15.283	0.00
(Thought Suppression)-51->[item 12]	0.312**	0.02	15.235	0.00
(Thought Suppression)-52->[item 13]	0.37**	0.019	19.17	0.00
(Thought Suppression)-53->[item 14]	0.316**	0.02	15.457	0.00
(Thought Suppression)-54->[item 15]	0.293**	0.021	14.222	0.00

Note. The variables enclosed in parenthesis ( ) are latent constructs while the ones enclosed in braces [ ] are manifest variables.

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