

Examining the Relations Between Rumination and Adjustment: A Focus on Ethnicity

by

William Tsai

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Advisor: Dr. Edward Chang

Abstract

While numerous studies have found significant findings on the maladaptive nature of rumination, few studies have examined ethnic variations and differences. Therefore, the present research sought to examine ethnic differences in rumination between Asian and European Americans. In Study 1, 184 Asian American and 238 European American college students participated in the study. Consistent with our expectations, Asian Americans were found to ruminate more than European Americans. However, despite Asian Americans' greater frequency of rumination, rumination in Asian Americans was found to have weaker associations with measures of psychological functioning (viz., affectivity, depressive symptoms, anxious symptoms, & life satisfaction) than rumination in European Americans. Additionally, regression analysis showed that rumination is a more unique and useful predictor of functioning in Asian Americans than European Americans. In Study 2, we sought to examine the mechanism through which rumination affects psychological functioning, as well as any potential cultural differences in rumination. In total, 125 Asian American and 150 European American college students participated in the study. Path-analytic results indicated that social problem-solving completely or partially mediated the link between rumination and psychological functioning for both Asian and European Americans. Overall, our findings demonstrate important ethnic differences and similarities in rumination that need to be considered in studying rumination in Asian Americans.

Examining the Relations between Rumination and Adjustment: A Focus on Ethnicity

Research and interest in rumination has grown steadily over the years, resulting in hundreds of scholarly articles and scientific publications to date (see Nolen-Hoeksema, 2008, for a review). As proposed by Nolen-Hoeksema's (1987) Response Styles Theory, rumination is characterized by self-reflection, as well as the repetitive and passive focus on one's own negative emotions (Nolen-Hoeksema, 1991, 2000). The ruminative response style refers to a stable tendency to respond to negative life events and negative mood states with ruminative thinking and negative thoughts, thus resulting in an increased vulnerability to experience prolonged and more severe episodes or symptoms of depression (Nolen-Hoeksema, Morrow, & Fredrickson, 1993). Consistently, research on rumination has shown it to be maladaptive in nature, often having significant associations with depressive symptoms (Nolen-Hoeksema, 2000), greater anxious symptoms (Abbott & Rapee, 2004), increased suicide ideation (Miranda & Nolen-Hoeksema, 2007), and greater hopelessness (Smith, Alloy, & Abramson, 2006). Additionally, rumination has been associated with less life satisfaction (Ysseldyk, Matheson, & Anisman, 2007), fewer expectations for positive events (Lyubomirsky & Nolen-Hoeksema, 1995), and lower levels of happiness (Elliott & Coker, 2008). While these studies provide significant and robust findings (Smith & Alloy, 2009), a crucial yet often neglected aspect in studying psychological constructs is the examination of these constructs across different cultural groups.

Indeed, within the rumination literature, few studies compare ethnicities. As the previously described studies have largely focused on Westerners, typically European Americans, there is reason to believe that those findings may not extend to all populations. In fact, research by Markus and Kitayama (1991) provide a compelling portrait of fundamental group differences between Easterners and Westerners. Historically, Eastern cultures foster a view of the individual

as interdependent with society, where fitting in is not only valued, but often required and expected. On the other hand, Western cultures foster a view of the individual as an independent, self-contained, autonomous entity that is the result of his or her own actions (Markus & Kitayama, 1991). More specifically, the difference lays in the perceived notion of the self: the Eastern view reflects interdependence, while the Western view reflects independence (Markus & Kitayama, 1991). Considering this difference in the fundamental perception of the self and pairing it with the idea that the self forms the basis of how individuals may act, feel, and ultimately behave, we can expect Easterners to differ from Westerners with regard to affect, cognitions, and behavior (Markus & Kitayama, 1991; Triandis, 1995).

Stemming from the contrasting views of interdependence versus independence, the notion of self-criticism versus self-enhancement, respectively, is introduced. From individualistic cultures that support self-enhancement, empirical research revealed that a heightened sense of self-efficacy and optimism often results in enhanced achievements (Taylor & Brown, 1988; Zimmerman, Bandura, & Martinez-Pons, 1992). While research suggests that self-enhancement, or a positive focus, may improve the self, research that is specifically cross-cultural in nature has found that a negative focus, such as self-criticism, may also be effective for improving oneself (Heine et al., 2001). Instead of assuming that all self-critical behaviors are maladaptive, research by Kitayama, Markus, Matsumoto, and Norasakkunkit (1997) found that self-criticism can be a constructive process for the Japanese. More specifically, Kitayama et al. (1997) argued that by being self-critical, Japanese individuals obtain information vital for maintaining and supporting the group, as well as helping oneself focus on areas of weakness. In addition, researchers have found that Easterners tend to have a pessimistic bias, whereas Westerners to have a more optimistic bias (Chang & Asakawa, 2003). In further support of

group differences, greater pessimism was associated with greater problem-solving activity when Easterners faced stressful situations, while greater pessimism was associated with lesser problem-solving when Westerners faced similar situations (Chang, 1996).

Recent cross-cultural studies have found differences between Easterners' and Westerners' levels of affectivity and various psychological constructs (Chang, Sanna, & Yang, 2003; Okazaki, 2002). For example, Asian Americans score significantly higher on popular measures of depressive symptoms (Okazaki, 2002) and measures of pessimism (Chang et al., 2003). In aggregate, previous research may suggest an elevated level of rumination for Asian Americans. Specifically, Asian Americans may report greater frequencies of rumination given their tendency to self-criticize, whereas European Americans may report relatively lesser frequencies of rumination given their tendency to self-enhance. Indeed, in a study of anger rumination, Maxwell, Sukhodolsky, Chow, and Wong (2005) found that Chinese students reported greater anger rumination than British students. However, because their study focused on anger rumination, and not rumination associated with negative mood (Nolen-Hoeksema, 2000), direct implications toward the present research cannot be made. Therefore, the function of rumination in Asian Americans remains unclear.

Similar to the findings of Kitayama et al. (1997) that not all self-critical behaviors and cognitions are maladaptive, Okazaki (2002) and Chang (1996) found that increased levels of depressive symptoms and pessimistic bias do not translate to more maladjustment. Instead, these findings suggest a difference in the baseline level of these psychological constructs. On a broader level, rumination has been found to be significantly associated with depressive symptoms (e.g., $r_s = .33$ to $.63$; Chang, 2003; Ciesla & Roberts, 2007; Nolen-Hoeksema, 2000; Spasojevic & Alloy, 2001). In an experimental study by Lyubomirsky and Nolen-Hoeksema

(1995), dysphoric participants induced to ruminate endorsed negatively biased interpretations of hypothetical situations, were more pessimistic about positive events in the future, and generated less effective solutions to interpersonal problems than participants who were induced to be distracted from their mood. However, non-dysphoric participants who were induced to ruminate did not show differences in post-test scores. As a result, dysphoria can be inferred as an important precursor for rumination to be effective in bringing about depressive symptoms in individuals. By extension, given the importance of dysphoria in the functionality of rumination, the existing disparities between Asian and European Americans in research on negative affectivity and depressive symptoms may suggest functional differences in rumination between the two groups.

Given the elevated levels of depressive symptoms in Asian Americans, it is unclear whether induced rumination on already dysphoric Asian Americans will impair social problem-solving. In other words, if dysphoria for Asian Americans does not posit greater maladjustment, then rumination may not impact social problem-solving as well. According to D’Zurilla, Nezu, and Maydeu-Olivares (2004), social problem-solving refers to problem-solving as it occurs in the real world. As social problem-solving is defined as the self-generated, cognitive-affective-behavioral process by which a person attempts to discover effective ways of coping, its relationship with rumination seems inseparable. Therefore, it may be useful to investigate a model of functioning involving social problem-solving. While research has shown that rumination may impair social problem-solving in European Americans, rumination and social problem-solving may utilize similar processes and mechanisms that serve as an adaptive coping style for Asian Americans.

Overall Goals of the Present Research

Given the potential differences between Easterners and Westerners on rumination, the purpose of the present research is to examine ethnic group differences between Asian and European Americans. In Study 1, we sought to examine ethnic differences in the experience of rumination and the involvement of rumination in adjustment (e.g. anxious symptoms & life satisfaction), as well as to determine if rumination adds to prediction models of adjustment even after controlling for fundamental dimensions of mood (e.g. positive & negative affectivity). In Study 2, we sought to further develop the model of functioning for both Asian and European Americans by investigating the role of social problem-solving as a potential mediator between rumination and psychological functioning.

Study 1

In this study, we examined ethnic differences and similarities between Asian and European Americans in the relationship between rumination and psychological functioning. By finding mean and correlational differences, we sought to paint a clearer picture of the maladaptive effects of rumination. While positive and negative affectivity have been found to be significantly associated with positive and negative adjustment, respectively, studies have rarely investigated whether or not rumination is a unique predictor beyond these adjustment variables. As such, in this study, we also examined the unique predictability of rumination beyond positive and negative affectivity on various adjustment variables (c.f. depressive & anxious symptoms).

Given the ethnic differences in cognitive styles found in past research, we expected to find significant ethnic differences in the experience and function of rumination. More specifically, given the role of self-criticism among Easterners and self-enhancement among Westerners, we expected Asian Americans to ruminate at a higher frequency than European Americans. However, given the adaptive functions of self-criticism in Easterners, we expected

rumination to serve a weaker role in maladjustment (e.g., have weaker associations with depressive symptoms), or possibly serve a positive role in adjustment (e.g., have positive associations with life satisfaction) in Asian Americans. Lastly, given the focus on Westerners in studies of rumination, we expected rumination to play a greater role in prediction models of adjustment for European Americans.

Method

Participants. Participants were 184 (80 men & 104 women) Asian American and 238 (75 men & 163 women) European American college students attending a large Midwestern University. Of the 422 participants, 95 participants were recruited to participate in the survey study from classrooms and libraries. The other 327 participants were recruited from a randomly generated list of undergraduates obtained from the registrar's office. Individuals from the list were e-mailed and asked to participate in the study by filling out the online-version of the survey. No differences were found between the two groups on age and sex.

Measures.

Rumination. The Ruminative Responses Scale (RRS; Nolen-Hoeksema & Morrow, 1991) was used to measure rumination. The RRS (see Appendix A) is a 21-item self-report measure used to assess dispositional tendencies to ruminate. Respondents are asked to rate their responses on a 4-point Likert scale ranging from 1 (*almost always respond in this way*) to 4 (*almost never respond in this way*). The RRS measures responses to sad moods that are focused on the self (e.g. "Think what am I doing to deserve this?"), on symptoms (e.g., "Think about how hard it is to concentrate), as well as behavioral responses to dysphoria (e.g., "Go someplace alone to think about your feelings). A higher score on the RRS indicates a stronger disposition to

ruminate. Evidence for the construct validity of the RRS has been reported in previous research (e.g., Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Parker, & Larsen, 1994).

Positive and negative affectivity. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess positive and negative affectivity. The PANAS (see Appendix B) is a 20-item self report measure of positive and negative affectivity, with 10 items to assess for positive affectivity (PA; e.g., “interested”) and 10 items to assess for negative affectivity (NA; e.g., “scared”). Respondents are asked to rate the way they feel *on average* for each item using a 5-point Likert scale ranging from 1 (*very slightly*) to 5 (*extremely*). Higher scores on PA and NA indicate higher levels of positive affectivity and negative affectivity, respectively. Evidence for the construct validity of the PANAS has been reported in previous research (e.g., Watson et al., 1988).

Positive and negative psychological functioning. Negative psychological functioning was measured by the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988). Positive psychological functioning was measured by the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985).

The BDI (see Appendix C) is a commonly used 21-item self-report measure of the severity of depressive symptoms. Using a 4-point Likert scale, respondents are asked to rate the extent to which they have experienced *in the past week, including today*, specific depressive symptoms (e.g. “0 = *I have not lost interest in other people*” to “3 = *I have lost all of my interests in other people*”). Higher scores on the BDI indicate a higher level of depressive symptoms. Support and evidence for the construct validity of the BDI can be found in Beck, Steer, and Garbin (1998).

The BAI (see Appendix D) is a 21-item self-report measure of common symptoms of anxiety (e.g., “Fear of the worst happening”). Respondents rate the extent to which they have experienced each symptom *over the past week* using a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*severely*). Higher scores on the BAI generally indicate more severe levels of anxious symptoms. Evidence for the construct validity of the BAI has been reported in previous research (Beck et al., 1988).

The SWLS (see Appendix E) is a 5-item self-report measure of general life satisfaction (e.g. “I am satisfied with my life”), rather than any specific domains. Respondents are asked to rate the extent of their agreement to the items using a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores on the SWLS reflect greater life satisfaction. Evidence for the construct validity of the SWLS has been reported in previous research (Diener et al., 1985).

Procedure. For 95 participants, all study measures were administered in the form of a paper-pen survey that was completed upon verbal consent. The participants were solicited at libraries, as well as at various club events on the university’s campus. The survey was described to be a study on general cognitions and well-being. For 327 participants, the survey was completed online through e-mailing a random list of undergraduates generated by the registrar. The participants were not made aware of the purpose of the study until after they had completed all measures. The participant’s anonymity was protected by having only ID numbers placed on the instruments. Furthermore, all the test data are kept strictly confidential.

Results and Discussion

Zero-order correlations for all the study measures are presented in Table 1 for Asian Americans (outside of parenthesis) and European Americans (inside parenthesis). As the table

shows, the expected pattern of associations was similar across both Asian and European Americans. For example, greater rumination was associated with greater depressive symptoms for both Asian Americans ($r = .45$) and European Americans ($r = .61$). However, the magnitude of the associations was found to be significantly different for 12 of the 15 pairs of correlations. For example, the correlation between rumination and positive affect was found to be weaker for Asian Americans ($r = -.25$) than for European Americans ($r = -.48$), $z = 2.71$, $p < .01$. Similarly, the correlation between depressive symptoms and positive affect was found to be weaker for Asian Americans ($r = -.32$) than for European Americans ($r = -.61$), $z = 3.81$, $p < .01$. Furthermore, significantly weaker associations emerged for Asian Americans as compared to European Americans between rumination and depressive symptoms ($r_s = .45$ vs. $.61$, respectively; $z = -2.27$, $p < .05$), rumination and anxious symptoms ($r_s = .40$ vs. $.59$, respectively; $z = -2.57$, $p < .01$), and between depressive symptoms and positive affect ($r_s = -.32$ vs. $-.61$, respectively; $z = 3.81$, $p < .01$). Indeed, the table shows differences in the correlations involving the study variables between Asian and European Americans.

Table 2 presents results of t tests comparing cultural differences in rumination, depressive symptoms, anxious symptoms, positive and negative affectivity, and life satisfaction between Asian and European Americans. As expected, Asian Americans reported significantly greater rumination than European Americans ($M_s = 46.23$ vs. 42.94 , $SD_s = 12.08$ vs. 13.20 , respectively, $t(420) = 2.63$, $p = .01$). Similarly, Asian Americans reported significantly greater depressive symptoms than European Americans ($M_s = 10.14$ vs. 7.57 , $SD_s = 8.97$ vs. 7.71 , respectively, $t(420) = 3.16$, $p < .01$). Interestingly, no significant differences emerged for positive ($M_s = 29.28$ vs. 30.88 , $SD_s = 8.28$ vs. 8.77 , respectively) and negative affectivity ($M_s = 18.46$ vs. 19.08 , $SD_s = 6.90$ vs. 6.66 , respectively). This was unexpected, since these findings were not consistent

with the mapping of self-criticism on Asian Americans and self-enhancement on European Americans. Lastly, no significant differences emerged for anxious symptoms ($M_s = 8.12$ vs. 8.36 , $SD_s = 7.66$ vs. 8.42 , respectively) between Asian and European Americans. To examine if rumination is a unique predictor above and beyond positive/negative affectivity, we conducted a hierarchical regression analysis to predict three adjustment outcomes: depressive symptoms, anxious symptoms, and life satisfaction. Results of these regression analyses are presented in Table 3. To examine whether positive/negative affectivity and rumination scores accounted for a small, medium, or large amount of the variance in various adjustment variables, we used Cohen's (1977) convention for small ($f^2 = .02$), medium ($f^2 = .15$), and large effects ($f^2 = .35$).

For Asian Americans, positive/negative affectivity was found to account for a large ($f^2 = .38$) 28% of the variance in the prediction of depressive symptoms. As a second step to this predictor set, rumination scores were found to account for a small ($f^2 = .06$) 6% of additional variance in predicting depressive symptoms. Within this predictor set, rumination ($\beta = .27$) was found to be a significant predictor beyond positive/negative affectivity. In predicting anxious symptoms, positive/negative affectivity was found to account for a large ($f^2 = .56$) 36% of the variance. Additionally, rumination scores were found to account for a small ($f^2 = .02$) 2% of additional variance in predicting anxious symptoms. Within this predictor set, rumination ($\beta = .16$) was found to be a significant predictor beyond positive/negative affectivity. Furthermore, in predicting life satisfaction, positive/negative affectivity was found to account for a large ($f^2 = .54$) 35% of variance. Lastly, rumination scores were found to account for a small ($f^2 = .02$) 2% of additional variance in predicting life satisfaction. Within this predictor set, rumination ($\beta = -.17$) was found to be a significant predictor beyond positive/negative affectivity.

For European Americans, positive/negative affectivity was found to account for a large ($f^2 = 1.78$) 64% of the variance in the prediction of depressive symptoms. As a second step to this predictor set, rumination scores were found to account for a small ($f^2 = .01$) 1% of additional variance. However, rumination was not a significant unique predictor for depressive symptoms in this predictor set. In predicting anxious symptoms, positive/negative affectivity was found to account for a large ($f^2 = 1.44$) 59% of the variance in anxious symptoms. As a second step to this predictor set, rumination scores were found to account for a small ($f^2 = .01$) 1% of additional variance. Within this predictor set, rumination ($\beta = .14$) was found to be a significant predictor beyond positive/negative affectivity. Lastly, in predicting life satisfaction, positive/negative affectivity was found to account for a large ($f^2 = .96$) 49% of variance. As a second step to this predictor set, rumination scores did not account for additional variance beyond positive/negative affectivity.

In summary, these results show significant ethnic differences, implying that rumination may be less dysfunctional for Asian Americans than European Americans. Despite showing greater rumination (see Table 1) for Asian Americans, no significant differences were found for life satisfaction and affectivity. Similarly for Asian Americans, greater rumination did not lead to greater, but instead, lesser magnitudes in associations with maladjustment (see Table 2). Lastly, the regression model further suggests cultural differences in the role of rumination in functioning (see Table 3).

Study 2

While findings from Study 1 point to a less dysfunctional role of rumination in adjustment for Asian Americans than European Americans, they do not provide much explanation for the possible mechanisms behind these differences. Accordingly, Study 2 was

conducted to examine a mediation model involving social problem-solving as a mediator between rumination and psychological functioning (viz., depressive symptoms, anxious symptoms, life satisfaction, & positive/negative affectivity) to further clarify ethnic differences in our models of functioning for Asian and European Americans.

In examining a useful model of functioning for Asian and European Americans, it may be beneficial to consider the role of social problem-solving. Social problem-solving is defined as the self-generated, cognitive-affective-behavioral process by which a person attempts to discover effective ways of coping (D’Zurilla et al., 2004). Indeed, similar to rumination and its association with maladjustment, a plethora of studies have found poor social problem-solving skills to be significantly associated with maladjustment, including depression (Nezu, 1987) and a greater occurrence of stressful life events (Nezu & Ronan, 1985). With regards to rumination, Nolen-Hoeksema and her colleagues (1993) proposed that as rumination increases negative thoughts, appraisals of problem situations may become more difficult and distorted, and therefore the ability to select adaptive solutions decreases. Indeed, induced rumination on dysphoric participants has been consistently found to exacerbate negative mood and impair social problem-solving (Donaldson & Lam, 2004; Lyubomirsky & Nolen-Hoeksema, 1995).

Overall, the purpose of Study 2 is to test the validity and generalizability of a model involving social problem-solving as a mediator of the link between rumination and psychological functioning in Asian and European Americans (Figure 1). A social problem-solving mediation model involving the link between rumination and psychological functioning is presented in Figure 1. Because Study 1 showed cross-cultural differences between rumination and psychological functioning, we expect to see ethnic differences in the role of social problem-solving as a potential mediator.

Method

Participants. Participants were 125 (45 men & 80 women) Asian American and 150 (35 men & 115 women) European American college students attending a large Midwestern University. The participants were recruited from a randomly generated list of undergraduates obtained from the registrar's office. Individuals from the list were e-mailed and asked to participate in the study by filling out the online-version of the survey. No differences were found between the two groups based on age and sex.

Measures. The measures included in Study 2 were identical to those in Study 1, with the exception of one additional measure. A measure was added to assess social problem-solving.

Social problem-solving. Social problem-solving was measured by the Social Problem-Solving Inventory Revised – Short Version (SPSI-R; D'Zurilla, Nezu, & Maydeu-Olivares, 2002). The SPSI-R (see Appendix F) is a commonly used 25-item self-report multidimensional measure of social problem-solving derived from the original Social Problem-Solving Inventory (D'Zurilla & Nezu, 1990). Consisting of five subscales that measure different problem-solving dimensions, the SPSI-R includes positive problem orientation (PPO, viewing problems as opportunities to benefit from in some way & to perceive oneself as able to solve problems effectively), negative problem orientation (NPO, viewing problems as major threats to one's well-being & to ineffectively manage negative emotions that may arise in response to stressful situations), rational problem-solving (RPS, using a cognitive-behavioral style of systematically attempting to cope with a problem), avoidance style (AS, tendency to avoid, procrastinate, & depend on others to solve problems), and impulsive/careless style (ICS, tendency to engage in impulsive, hurried, & incomplete attempts to solve problems). A higher score on each subscale

represents higher levels of that particular subscale. Evidence for the construct validity of the SPSSI-R has been reported in previous research (D’Zurilla et al., 2002).

Procedure. The survey was completed online through e-mailing a random list of undergraduates generated by the registrar. The participants were not made aware of the purpose of the study until after they had completed all measures. The participant’s anonymity was protected by having only ID numbers placed on the instruments. Furthermore, all the test data are kept strictly confidential.

Results and Discussion

Comparing Asian and European Americans, we examined a mediation model in which the hypothesized influence of rumination on psychological functioning was believed to be differentially mediated by social problem-solving. Following the general guidelines of Baron and Kenny (1986) to establish evidence for the proposed mediation model, it would be necessary to meet three conditions. First, rumination must be shown to be significantly associated with psychological functioning. Second, social problem-solving must be shown to be significantly associated with both rumination and psychological functioning. Lastly, the significance of the association between rumination and psychological functioning should become reduced when controlling for the influence of social problem-solving. Complete mediation would be indicated if the association between rumination and social problem-solving and the association between social problem-solving and psychological functioning were significant, but the previously significant association between rumination and psychological functioning became nonsignificant after controlling for social problem-solving. Alternatively, partial mediation would be indicated if the association between rumination and psychological functioning became reduced, and remained significant, after controlling for social problem-solving. Lastly, the Sobel (1982) test

was conducted to test the magnitude and significance of the reduction in variance resulting from the inclusion of social problem-solving as a mediator in the analyses.

Results of conducting these analyses for Asian Americans are presented in Figures 2A through 2E. As Figure 2A shows, the previously significant link between rumination and positive affectivity for Asian Americans ($\beta = -.30, p < .001$) became nonsignificant ($\beta = -.08, p > .05$) and was found to be completely mediated by social problem-solving ($\beta = .51, p < .001$), indicating a reduction of 20.9% of the variance in positive affectivity (Sobel's statistic = 4.04, $p < .001$). For this group, the resulting model involving rumination and social problem-solving accounted for 30.1% of the variance in positive affectivity, $F(2, 122) = 26.21, p < .001$. For depressive symptoms, as Figure 2B shows, the previously significant link between rumination and depressive symptoms ($\beta = .59, p < .001$) was not completely mediated by social problem-solving ($\beta = -.20, p < .001$). However, evidence supporting partial mediation was found, indicating a reduction of 3.3% of the variance in depressive symptoms (Sobel's statistic = 2.51, $p < .05$). For this group, the resulting model involving rumination and social problem-solving accounted for 49.7% of the variance in depressive symptoms, $F(2, 122) = 60.38, p < .001$. For satisfaction with life, as Figure 2C shows, the previously significant link between rumination and satisfaction with life ($\beta = -.34, p < .001$) was not completely mediated by social problem-solving ($\beta = .23, p < .001$). However, evidence supporting partial mediation was found, indicating a reduction of 4.2 % of the variance in life satisfaction (Sobel's statistic = 2.33, $p < .05$). For this group, the resulting model involving rumination and social problem-solving accounted for 23.3% of the variance in satisfaction with life, $F(2, 122) = 18.56, p < .001$. For negative affectivity, as Figure 2D shows, the previously significant link between rumination and negative affectivity ($\beta = .53, p < .001$) was not mediated by social problem-solving ($\beta = -.15, p > .05$). Similarly, for

anxious symptoms, as Figure 2E shows, the previously significant link between rumination and anxious symptoms ($\beta = .52, p < .001$) was not mediated by social problem-solving ($\beta = -.11, p > .05$).

The results of conducting similar path analyses for European Americans are presented in Figures 3A through 3E. For positive affectivity, as Figure 3A shows, the previously significant link between rumination and positive affectivity ($\beta = -.25, p < .001$) was not completely mediated by social problem-solving ($\beta = .50, p < .001$). However, evidence supporting partial mediation was found, indicating a reduction of 18.7% of the variance in positive affectivity (Sobel's statistic = 5.06, $p < .001$). For this group, the resulting model involving rumination and social problem-solving accounted for 44.3% of the variance in positive affectivity, $F(2, 147) = 58.42, p < .001$. For depressive symptoms, as Figure 3B shows, the previously significant link between rumination and depressive symptoms ($\beta = .57, p < .001$) was not completely mediated by social problem-solving ($\beta = -.33, p < .001$). However, evidence supporting partial mediation was found, indicating a reduction of 7.9% of the variance in depressive symptoms (Sobel's statistic = 4.47, $p < .001$). For this group, the resulting model involving rumination and social problem-solving accounted for 63.3% of the variance in depressive symptoms, $F(2, 147) = 127.02, p < .001$. For satisfaction with life, as Figure 3C shows, the previously significant link between rumination and satisfaction with life ($\beta = -.59, p < .001$) was not completely mediated by social problem-solving ($\beta = .34, p < .001$). However, evidence supporting partial mediation was found, indicating a reduction of 8.4% of the variance in satisfaction with life (Sobel's statistic = 3.94, $p < .001$). For this group, the resulting model involving rumination and social problem-solving accounted for 43.6% of the variance in satisfaction with life, $F(2, 147) = 56.82, p < .001$. For negative affectivity, as Figure 3D shows, the previously significant link between

rumination and negative affectivity ($\beta = .43, p < .001$) was not completely mediated by social problem-solving ($\beta = -.32, p < .001$). However, evidence supporting partial mediation was found, indicating a reduction of 7.3% of the variance in negative affectivity (Sobel's statistic = 3.71, $p < .001$). For this group, the resulting model involving rumination and social problem-solving accounted for 42.1% of the variance in negative affectivity, $F(2, 147) = 53.51, p < .001$. Lastly, for anxious symptoms, as Figure 3E shows, the previously significant link between rumination and anxious symptoms ($\beta = .54, p < .001$) was not completely mediated by social problem-solving ($\beta = -.31, p < .001$). However, evidence supporting partial mediation was found, indicating a reduction of 7% of the variance in anxious symptoms (Sobel's statistic = 3.53, $p < .001$). For this group, the resulting model involving rumination and social problem-solving accounted for 36.5% of the variance in anxious symptoms, $F(2, 147) = 42.32, p < .001$.

As the results show, social problem-solving is a useful explanatory variable for Asian Americans (See Figures 2A through 2E) in accounting for the links between rumination and positive affectivity, rumination and depressive symptoms, and rumination and satisfaction with life, but not for rumination and negative affectivity or rumination and anxious symptoms. On the other hand, social problem-solving is a useful explanatory variable for European Americans (See Figures 3A through 3E) in accounting for the links between rumination and all psychological functioning variables. Overall, these results indicate ethnic differences in how the association between rumination and psychological functioning may be mediated by social problem-solving.

General Discussion

The findings of these two studies have major implications with regard to the functions of rumination for Asian and European Americans in creating theory-driven and empirically-based

models of functioning. These studies aimed to clarify previously established associations between rumination and adjustment, and more importantly, identify potential cultural variations.

Study 1 examined the experiences and functions of rumination in Asian American and European American college students. Overall, three patterns of cross-cultural differences emerged. First, consistent with past research demonstrating the tendency for Asian Americans to self-criticize, Asian Americans were found to report greater rumination than European Americans. This finding is consistent with numerous past studies investigating cross-cultural differences, including greater reports of anger rumination amongst Easterners than Westerners (Maxwell et al., 2005), greater self-critical or pessimistic orientation by Asian Americans than European Americans (Chang, 1996), and greater levels of depressive symptoms amongst Asian Americans than European Americans (Okazaki, 2002).

Second, despite the greater tendency for Asian Americans to ruminate compared to European Americans, the former group may not necessarily be more maladjusted than the latter group. Our findings suggest that for Asian Americans, rumination may be less maladaptive or less dysfunctional than it is for European Americans. For example, despite reporting greater rumination, Asian Americans were found to be just as satisfied with their lives as European Americans. However, with regard to affectivity, surprisingly, no significant differences emerged. As previously mentioned, we expected Asian Americans to show more negative affectivity due to previous research on self-criticism. Although no differences emerged for scores of positive and negative affectivity, self-report may not always correspond to the actual behavior across ethnic groups. Furthermore, the associations between rumination and adjustment were consistently found to be stronger for European Americans compared to Asian Americans. Interestingly, the direction of the change in magnitude is inconsistent with previous research on

rumination. Instead of showing greater maladjustment with the greater scores of rumination, Asian Americans showed less dysfunction. For example, the correlations between rumination and depressive symptoms in Asian Americans are significantly less in magnitude than those in European Americans. Thus, these findings suggest that rumination may be less involved in adjustment for Asian Americans than European Americans. Given these differences in associations, it appears that the function of rumination varies between Asian and European Americans. For Asian Americans, reflecting on past negative events and moods may not elicit as much psychological harm or maladjustment as it has been consistently found for European Americans. Our findings suggest that in a clinical setting, when working with Asian Americans, it would be useful for therapists to identify the function and role of rumination before planning to reduce or eliminate the tendency to ruminate.

Consistent with the idea of rumination being less dysfunctional for Asian Americans, an on-going debate has surfaced regarding the possibility that rumination may be multidimensional, with both an adaptive and maladaptive component (Joorman et al., 2006; Vassilopoulos & Watkins, 2009; Watkins, 2008). Parallel to the idea that rumination may be multidimensional in Asian Americans, past research has found differences in how the Eastern and Western culture differ in their perceived idea of happiness (see Uchida, Norasakkunkit, & Kitayama, 2004, for a review). For Western cultures, maximizing happiness and functioning, and reducing negative experiences and emotions are the key to happiness (Wong, 2009). On the other hand, for Eastern cultures, by integrating and balancing both positive and negative experiences, as opposed to achieving the highest levels of happiness along with the lowest levels of sadness, happiness can be achieved (Wong, 2009). Therefore, similar to past research on happiness, our findings suggest an emphasis on utilizing the adaptive components of rumination for Asian Americans

compared to European Americans. More importantly, future research should clarify and identify these possible adaptive components of rumination.

Lastly, we conducted a hierarchical regression analysis to test a model of functioning involving rumination and affectivity. Interestingly, we found rumination to be a distinct and unique predictor for Asian Americans, but not for European Americans. This finding suggests that when looking at models of functioning for Asian Americans, it would be important to include rumination beyond affectivity. Thus, future research investigating functioning in Asian Americans may yield more fruitful findings when examining a model with rumination as an additional predictor. Furthermore, because rumination failed to account for significant additional variance in functioning beyond negative affectivity for European Americans, a predictive role of rumination in functioning is suggested. Similarly, Chang (2002) found pessimism and optimism to lose significance in predicting depressive and anxious symptoms once affectivity was introduced in the regression model. This finding may suggest that past studies on rumination and functioning need to be reevaluated when considering the concomitant role of affectivity in accounting for functioning for European Americans.

In Study 2, we tested the validity and generalizability of a model involving social problem-solving as a mediator of the link between rumination and psychological functioning in Asian and European Americans. Results of a series of path analyses conducted to test our mediation model indicated that the role of social problem-solving differs between Asian and European Americans. For example, social problem-solving completely mediated the association between rumination and positive affectivity for Asian Americans, whereas social problem-solving only partially mediated the association for European Americans. However, social problem-solving was not a significant mediator between rumination and negative affectivity for

Asian Americans, whereas the rumination and negative affectivity association was partially mediated by social problem-solving for European Americans. Likewise, the same pattern of nonsignificance for Asian Americans and partial mediation for European Americans was found for the role of social problem-solving as a mediator of the association between rumination and anxious symptoms. Additionally, for both Asian and European Americans, social problem-solving partially mediated the association between rumination and satisfaction with life, and between rumination and depressive symptoms. Our findings suggest that for European Americans, social problem-solving is a useful explanatory mechanism that accounts for the relationship between rumination and psychological functioning, whereas for Asian Americans, social problem-solving only serves as a useful explanatory mechanism for the relationship between rumination and positive affectivity, satisfaction with life, and depressive symptoms. Interestingly, while social problem-solving as a mechanism failed to show support for explaining the less dysfunctional association between rumination and depressive symptoms in Asian Americans, social problem-solving completely mediated the association between rumination and positive affectivity. Therefore, to explain the association between rumination and depressive symptoms, other mediators that are significant in personality research, such as stress (Chang, Watkins, & Banks, 2004), or affectivity (Chang, 2004), should be considered for Asian Americans in future studies.

Importantly, our findings point to potential clinical implications. Due to past research on rumination, greater rumination has been perceived as a key indicator of maladjustment, and therefore has been treated as such. However, based on our findings, Asian Americans may utilize the act of rumination differently, and in some cases, perhaps even adaptively. As such, clinicians may need to heed caution when treating rumination in Asian Americans. For example,

based on our regression analysis, rumination accounted for significant variance beyond affectivity for Asian Americans, but not for European Americans. Therefore, it may be more important for therapists to work on improving positive affect, reducing negative affect, and reducing dysfunctional rumination for Asian Americans. Additionally, social problem-solving was found to completely mediate the relationship between rumination and positive affectivity for Asian Americans, but only partially mediate the relationship for European Americans. Therefore, our findings suggest the importance of increasing social problem-solving ability in order to increase positive affectivity for Asian Americans, whereas both increasing social problem-solving ability and reducing rumination is important for European Americans. All in all, more research is needed to replicate and further clarify this relationship to avoid mistreating and misperceiving this cognitive style in Asian Americans.

Limitations

In addition to the above discussion, it is important to note several potential limitations of this study. First, the present study utilizes college students, and therefore may not be generalized to all adults. Second, as our sample is non-clinical, it may be important to replicate this data with a clinical sample. Specifically, due to the ethnically different nature and function of dysphoria, research on a clinical population would be useful to further clarify the relationships between rumination and psychological functioning between the two groups. For example, rumination's less dysfunctional role in adjustment may be magnified in an Asian American clinical population compared to a college student sample. Thirdly, cultural variations were expected in the present study due to the presumed differences in collectivism and individualism. In future studies, using measures of collectivism and individualism would provide more concrete evidence of these theories and additional insights. Furthermore, it would be interesting to

identify cultural values (e.g., emotional self-control & humility; Park & Kim, 2008) that are associated with rumination that allow for lesser maladjustment in Asian Americans.

Additionally, it would be useful to determine in future studies whether rumination differentially affects various Asian American sub-groups (ie. Japanese, Chinese, & Korean, etc). Lastly, given the cross-sectional design of the study, causal inferences could not be made. A prospective study which assesses all the current variables, as well as additional adjustment variables across different time points, would further clarify the findings from this study.

Concluding Thoughts

In this study, we found important ethnic differences in rumination between Asian and European Americans. Specifically, we found that Asian Americans ruminated more than European Americans. However, the tendency to ruminate more in Asian Americans did not reflect greater maladjustment. Indeed, although rumination is still associated with maladjustment, rumination appears to be less harmful for Asian Americans. In an attempt to identify mechanisms that cause rumination to be less dysfunctional for Asian Americans, we found ethnic differences in the role of social problem-solving. Social problem-solving partially mediated the relationships between rumination and psychological functioning for European Americans; however, social problem-solving failed to mediate the relationship between rumination and negative affectivity, and the relationship between rumination and anxious symptoms for Asian Americans. Thus, it may be that for Asian Americans, rumination represents a more complex process that involves both adaptive and maladaptive components. In sum, our study demonstrated the need for future research to replicate and clarify the experiences and functions of rumination in Asian Americans.

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Author Note

William Tsai, Department of Psychology, University of Michigan, Ann Arbor.

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Table 1

Zero-order Correlations between Rumination and all Adjustment variables for European Americans (n = 238) and Asian Americans (n = 184)

Variable	1	2	3	4	5	6
1. Rumination	-					
2. Depressive symptoms	.61** (.45)**	-				
3. Anxious symptoms	.59** (.40)**	.70** (.54)**	-			
4. Positive affectivity	-.48** (-.25)**	-.61** (-.32)**	-.39** (-.28)**	-		
5. Negative affectivity	.65** (.42)**	.71** (.47)**	.75** (.58)**	-.38** (-.19)**	-	
6. Life satisfaction	-.48** (-.38)**	-.66** (-.39)**	-.48** (-.26)**	.65** (.51)**	-.48** (-.40)**	-
α	.94 (.89)	.90 (.91)	.92 (.80)	.89 (.92)	.88 (.87)	.91 (.86)

Note. ** $p < .01$. Bolded correlations are significant at $p < .05$. Results inside parenthesis are for Asian Americans.

Table 2

Mean difference of Rumination, Positive Affectivity, Negative Affectivity, Depressive Symptoms, Anxious Symptoms, and Satisfaction with Life for Asian Americans (n = 184) and European Americans (n = 238)

	Asian Americans		European Americans		<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Rumination	46.26	12.08	42.94	13.20	< .01	.26
Positive affectivity	29.28	8.28	30.88	8.77	n.s.	.19
Negative affectivity	18.46	6.90	19.08	6.66	n.s.	.09
Depressive symptoms	10.14	8.97	7.57	7.71	< .01	.31
Anxious symptoms	8.12	7.66	8.36	8.42	n.s.	.03
Life satisfaction	23.98	6.40	23.92	6.93	n.s.	.01

Table 3

Hierarchical Regression Analyses of European Americans (n = 238) and Asian Americans (n = 184) Showing Amount of Variance Predicted by Rumination Over Positive and Negative Affectivity

Outcome	β	R^2	ΔR^2	df	F
Asian American					
Depressive symptoms					
Step 1		.28	--	2,181	34.34***
Positive affectivity	-.24**				
Negative affectivity	.42**				
Step 2		.32	.06	1,180	16.06***
Rumination	.27***				
Anxious symptoms					
Step 1		.36	--	2,181	51.73***
Positive affectivity	-.17***				
Negative affectivity	.55***				
Step 2		.38	.02	1,180	5.55*
Rumination	.16*				
Life satisfaction					
Step 1		.35	--	2,181	48.90***
Positive affectivity	.45***				
Negative affectivity	-.31***				
Step 2		.37	.02	1,180	6.78***
Rumination	-.17**				
European American					
Depressive symptoms					
Step 1		.64	--	2, 235	210.12***
Positive affectivity	-.40***				
Negative affectivity	.56***				
Step 2		.64	.01	1, 234	3.75**
Rumination	.10				
Anxious symptoms					
Step 1		.59	--	2, 235	162.51***
Positive affectivity	-.12***				
Negative affectivity	.71***				
Step 2		.59	.01	1, 234	6.08*
Rumination	.14*				
Life satisfaction					
Step 1		.49	--	2,235	112.39***
Positive affectivity	.54***				
Negative affectivity	-.28***				
Step 2		.49	.00	1,234	1.39
Rumination	-.08				

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

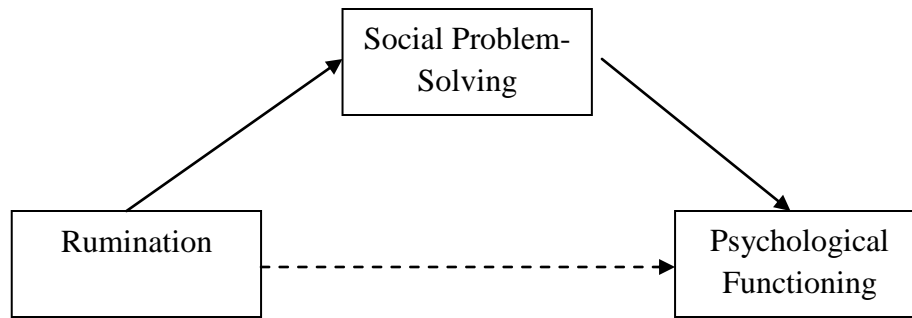
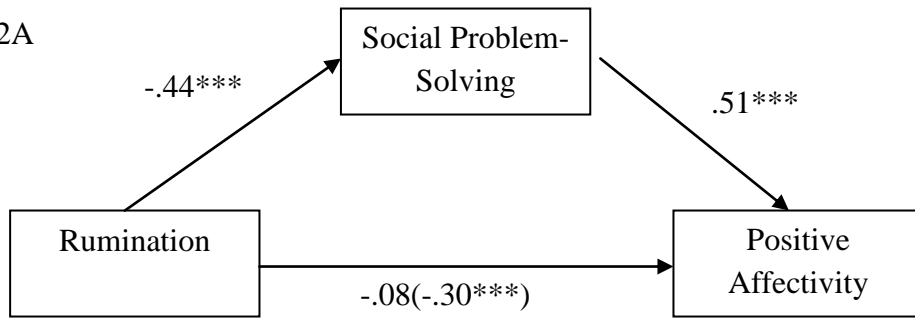
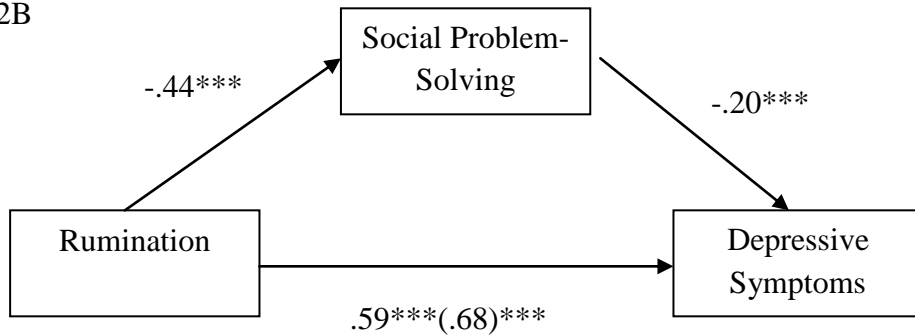


Figure 1. A hypothesized model of how social problem-solving may mediate the association between rumination and psychological functioning.

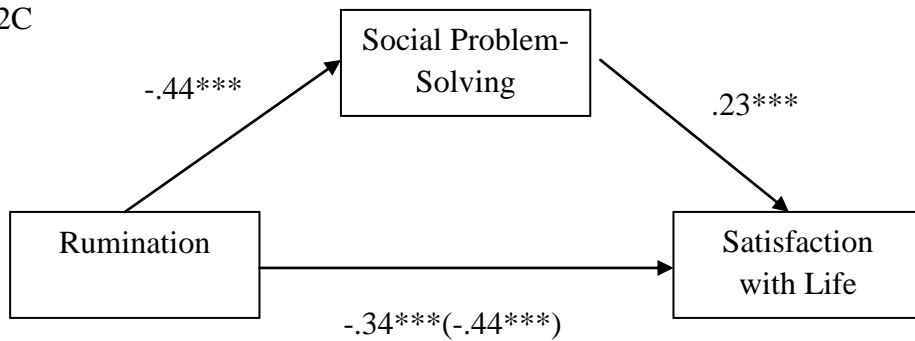
Panel 2A



Panel 2B



Panel 2C



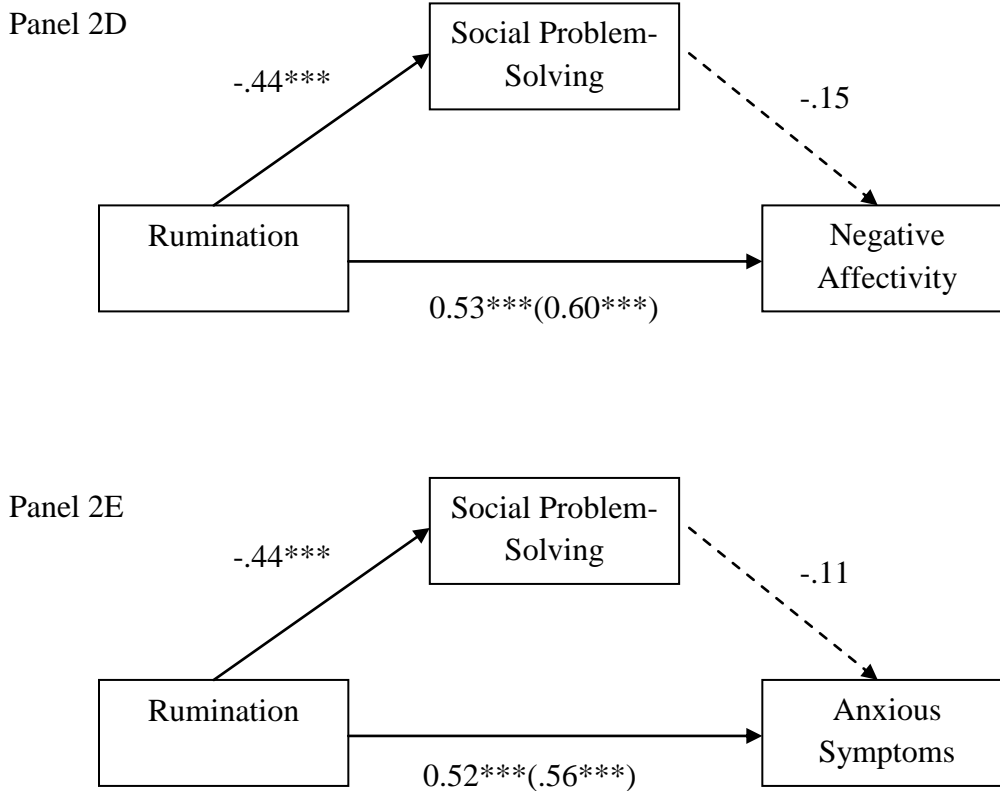
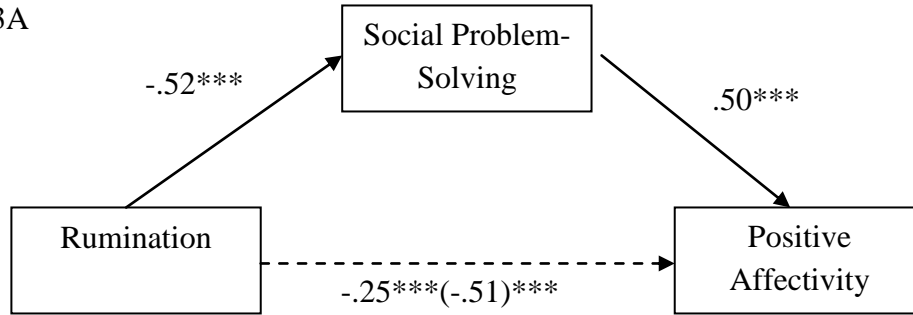
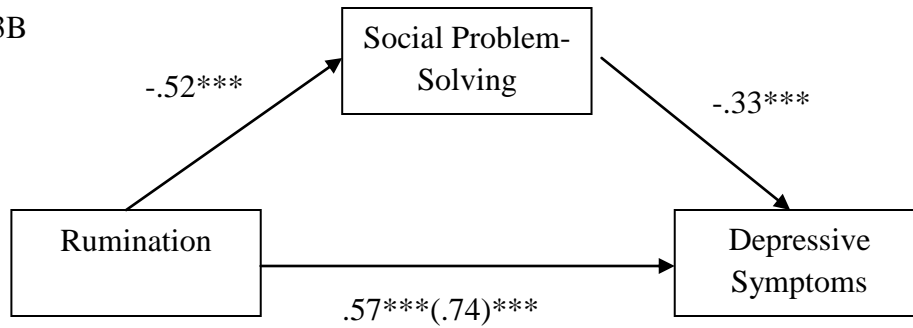


Figure 2. Results of the path analyses delineating those paths found to be significant for Asian Americans ($n = 125$) in looking at positive and negative indices of psychological functioning. The path found to be nonsignificant is indicated by a broken line. All numbers represent standardized beta weights. Numbers within parentheses are standardized beta weights of the association between rumination and psychological functioning before controlling for social problem-solving. * $p < .05$. ** $p < .01$. *** $p < .001$.

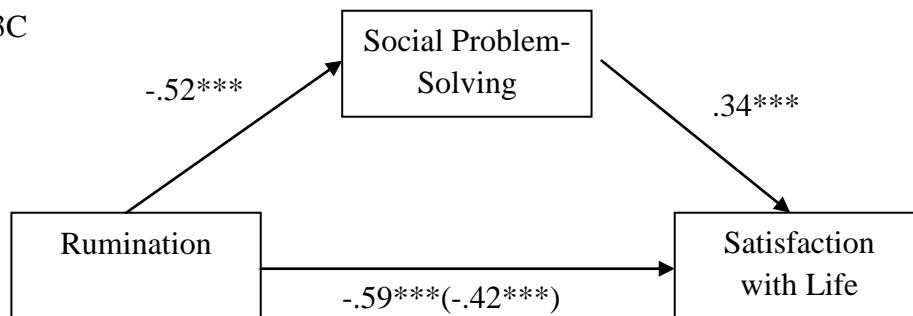
Panel 3A



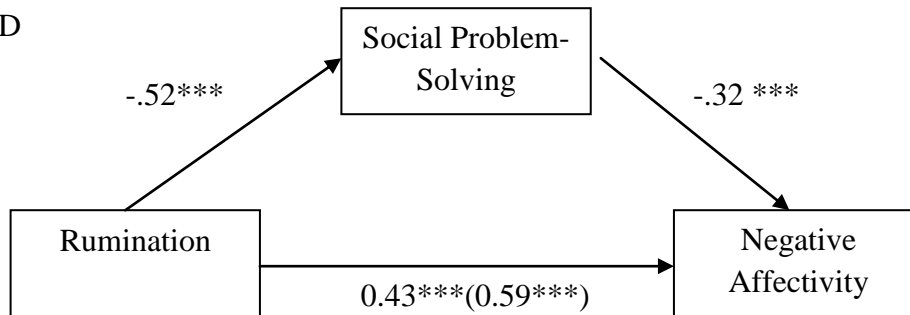
Panel 3B



Panel 3C



Panel 3D



Panel 3E

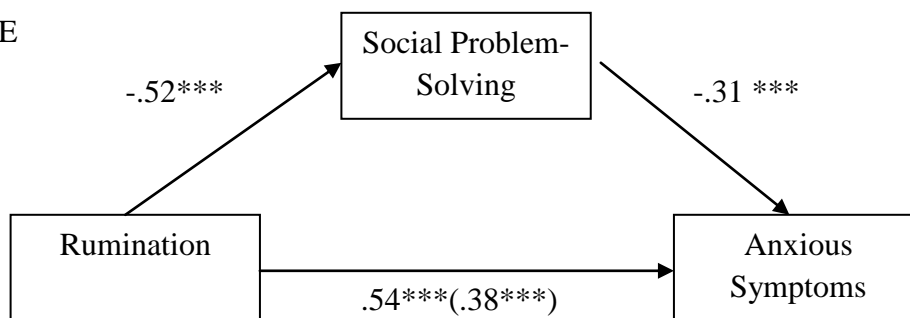


Figure 3. Results of the path analyses delineating those paths found to be significant for European Americans ($n = 150$) in looking at positive and negative indices of psychological functioning. The path found to be nonsignificant is indicated by a broken line. All numbers represent standardized beta weights. Numbers within parentheses are standardized beta weights of the association between rumination and psychological functioning before controlling for social problem-solving. $*p < .05$. $**p < .01$. $***p < .001$.

Appendix A

Ruminative Responses Scale

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you *generally* do, not what you think you should do.

1 almost never 2 sometimes 3 often 4 almost always

- | | | | | | |
|---|---|---|---|-----|---|
| 1 | 2 | 3 | 4 | 1. | Think about how alone you feel |
| 1 | 2 | 3 | 4 | 2. | Think "I won't be able to do my job if I don't snap out of this" |
| 1 | 2 | 3 | 4 | 3. | Think about your feelings of fatigue and achiness |
| 1 | 2 | 3 | 4 | 4. | Think about how hard it is to concentrate |
| 1 | 2 | 3 | 4 | 5. | Think "What am I doing to deserve this?" |
| 1 | 2 | 3 | 4 | 6. | Think about how passive and unmotivated you feel. |
| 1 | 2 | 3 | 4 | 7. | Analyze recent events to try to understand why you are depressed |
| 1 | 2 | 3 | 4 | 8. | Think about how you don't seem to feel anything anymore |
| 1 | 2 | 3 | 4 | 9. | Think "Why can't I get going?" |
| 1 | 2 | 3 | 4 | 10. | Think "Why do I always react this way?" |
| 1 | 2 | 3 | 4 | 11. | Go away by yourself and think about why you feel this way |
| 1 | 2 | 3 | 4 | 12. | Write down what you are thinking about and analyze it |
| 1 | 2 | 3 | 4 | 13. | Think about a recent situation, wishing it had gone better |
| 1 | 2 | 3 | 4 | 14. | Think "I won't be able to concentrate if I keep feeling this way." |
| 1 | 2 | 3 | 4 | 15. | Think "Why do I have problems other people don't have?" |
| 1 | 2 | 3 | 4 | 16. | Think "Why can't I handle things better?" |
| 1 | 2 | 3 | 4 | 17. | Think about how sad you feel. |
| 1 | 2 | 3 | 4 | 18. | Think about all your shortcomings, failings, faults, mistakes |
| 1 | 2 | 3 | 4 | 19. | Think about how you don't feel up to doing anything |
| 1 | 2 | 3 | 4 | 20. | Analyze your personality to try to understand why you are depressed |
| 1 | 2 | 3 | 4 | 21. | Go someplace alone to think about your feelings |
| 1 | 2 | 3 | 4 | 22. | Think about how angry you are with yourself |

Appendix B

Positive and Negative Affect Schedule

Instructions: Listed below are a number of words that describe different feelings or emotions. Read each item and then indicate to what extent you generally feel this way, this is, **how you feel on the AVERAGE**, by writing a number in the blank next to each feeling. Use the scale below.

	1	2	3	4	5
	<i>very slightly</i>	<i>a little</i>	<i>moderately</i>	<i>quite a bit</i>	<i>extremely</i>
	<i>or not at all</i>				
___ interested	___ excited	___ strong	___ scared	___ enthusiastic	
___ distressed	___ upset	___ guilty	___ hostile	___ proud	
___ irritable	___ ashamed	___ nervous	___ attentive	___ active	
___ alert	___ inspired	___ determined	___ jittery	___ afraid	

Appendix C and Appendix D which reproduced the *Beck Depression Inventory* (BDI) and the *Beck Anxiety Inventory* (BAI), have been removed at the request of the copyright holder.

Appendix E

Satisfaction with Life Scale

Below are some statements with which you may agree or disagree. Use the scale below to show your agreement with each item. Place the number on the line for that item. Please be open and honest in your answers.

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<i>Strongly</i>	<i>Disagree</i>	<i>Slightly</i>	<i>Neither Agree</i>	<i>Slightly</i>	<i>Agree</i>	<i>Strongly</i>
<i>Disagree</i>		<i>Disagree</i>	<i>Nor Disagree</i>	<i>Agree</i>		<i>Agree</i>

_____ 1. In most ways my life is close to my ideal.

_____ 2. The conditions of my life are excellent.

_____ 3. I am satisfied with my life.

_____ 4. So far I have gotten the important things I want from life.

_____ 5. I am generally pleased with the life I lead.

Appendix F

Social Problem-Solving Inventory – Revised

INSTRUCTIONS: Below are a series of statements that describe how some people might think, feel, and act when faced with **PROBLEMS** in everyday living. In this questionnaire, a problem is something important in your life that bothers you so much. Read each statement carefully and choose one of the numbers below that indicates how true the statement is of you. Consider yourself as you typically think, feel, and act when you are faced with **important problems** these days. Place the number that you choose on the line before the statement. *There are no right or wrong answers.*

Please choose a number from this scale:

0 = Not at all true of me 1 = Slightly true of me 2 = Moderately true of me

3 = Very true of me 4 = Extremely true of me

- ___ 1. I feel threatened and afraid when I have an important problem to solve.
- ___ 2. When making decisions, I do not evaluate all of my options carefully enough.
- ___ 3. I feel nervous and unsure of myself when I have an important decision to make.
- ___ 4. When my first efforts to solve a problem fail, I know if I persist and do not give up too easily, I will be able to find a good solution eventually.
- ___ 5. When I have a problem, I try to see if as a challenge, or opportunity to benefit in some positive way from having the problem.
- ___ 6. I usually wait to see if a problem will resolve itself first, before trying to solve it myself.
- ___ 7. When my first efforts to solve a problem fail, I get very frustrated.
- ___ 8. When I am faced with a difficult problem, I often doubt that I will be able to solve it on my own no matter how hard I try.
- ___ 9. Whenever I have a problem, I usually believe that it can be solved.
- ___ 10. I go out of my way to avoid having to deal with problems in my life.
- ___ 11. Difficult problems make me very upset.
- ___ 12. When I have a decision to make, I try to predict the positive and negative consequences of each option.
- ___ 13. When problems occur in my life, I like to deal with them as soon as possible.
- ___ 14. When I am trying to solve a problem, I usually go with the first good idea that comes to mind.
- ___ 15. When I am faced with a difficult problem, I believe I will be able to solve it on my own if I try hard enough.
- ___ 16. When I have a problem to solve, one of the things I do is get as many facts about the problem as possible.
- ___ 17. I often put off solving problems until it is too late to do anything about them.
- ___ 18. I spend more time avoiding my problems than solving them.
- ___ 19. Before I try to solve a problem, I set a specific goal so that I know exactly what I want to accomplish.
- ___ 20. When I have a decision to make, I do not take the time to think of the pros and cons of each option.
- ___ 21. After carrying out my solution to a problem, I try to evaluate as carefully as possible how much the situation has changed for the better.
- ___ 22. When a problem occurs in my life, I usually put off trying to solve it for as long as possible.
- ___ 23. When I am trying to solve a problem, I think of as many options as possible until I cannot come up with any more ideas.
- ___ 24. When making decisions, I usually go with my “gut feelings” without thinking too much about the consequences of each option.
- ___ 25. I am too impulsive when it comes to making decisions.