



# The Mediating Role of Positive Rumination and Negative Rumination in The Relationship between Intolerance of Uncertainty and Interpersonal Problem Solving<sup>1</sup>

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## Article Info

## ABSTRACT

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### Keywords:

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The mediating roles of positive rumination and negative rumination in the relationship between intolerance of uncertainty and interpersonal problem solving were examined. Data were collected from the participants (n=983) using the Interpersonal Problem-Solving Scale, Positive and Negative Rumination Scale, and Intolerance of Uncertainty Scale. The indirect effect of intolerance of uncertainty on approaching problems in a negative way, constructive problem solving, insistent-persevering approach through the mediation of positive rumination was significant. The indirect effect of intolerance of uncertainty on lack of self-confidence and unwilling to take responsibility through the mediation of positive rumination was not significant. The indirect effect of intolerance of uncertainty on approaching problems in a negative way, lack of self-confidence, and unwilling to take responsibility through the mediation of negative rumination was significant. The indirect effect of intolerance of uncertainty on constructive problem solving and insistent persevering approach through the mediation of negative rumination was not significant. The findings of the study were discussed within the framework of the relevant literature and recommendations were made for future studies.

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## INTRODUCTION

Interpersonal problems are situations where at least one of the interacting individuals notices the difference between the ideal interaction and the existing one and experiences tension, and the steps he takes to eliminate the situation are unsuccessful due to the obstacles he encounters (Öğülmüş, 2006). When students transition from high school education to university, they enter into a more populous environment with more interpersonal relations and also are in contact with their peers coming from different regions for many university students (Santrock, 2011). During this period, many university students are included in different social environments by leaving their families and run up against situations that require numerous interpersonal interactions such as making new friends and managing social relations. In the literature, numerous studies have been conducted on the problems encountered by university (Aluede et al., 2006; Donat et al., 2019; Erkan et al., 2012; Kacur & Atak, 2011; Şahin et al., 2009; Schweitzer, 1996; Topkaya & Meydan, 2013.). There are also studies investigating the variables related to interpersonal problem solving / social problem (D’Zurilla et al., 1998; Polat, 2020; Topal, 2011; Arslan et al., 2012; Arslan, 2010; Koç & Arslan, 2017; Hasegawa et al., 2015; Hasegawa et al., 2016). When the literature was reviewed, it was found that approaching problems in a negative way was positively associated with depression, suicide risk, and hopelessness (D’Zurilla et al., 1998). Moreover, another study reported that approaching problems in a negative way, lack of self-confidence, and unwilling to take responsibility, which are the subscales of interpersonal problem solving, were positively correlated with depression, anxiety, and stress (Polat, 2020). Therefore, determining the factors affecting interpersonal problem solving is important in terms of preventing negative approaches to interpersonal problem solving and guiding the development of intervention programs to develop constructive problem-solving skills.

### **Intolerance of Uncertainty and Problem Solving**

Intolerance of uncertainty is defined as one’s tendency to see an unfavorable event as unacceptable, and when considering that daily life is full of difficult situations, individuals who are intolerant to uncertainty can perceive many unacceptable and disturbing events in a single day (Dugas et al., 2001). Freeston et al., (1994) stated that intolerance of uncertainty interferes the problems by causing impulsive behaviors that reduce uncertainty but do not solve problems, creating dysfunctional emotional states, preventing problem-focused behavior, and requiring a high level of evidence before making a decision. Individuals who have a high level of intolerance of uncertainty might feel paralyzed due to the uncertainty of life and become inactive while facing the difficulties during daily life and might be highly anxious. Afterwards, these individuals may experience many difficulties they encounter in daily life by making impulsive decisions. While this impulsivity temporarily reduces the hassle they experience, it negatively reinforces impetuous decision-making and poor problem-solving strategies, resulting an ongoing cycle of anxiety (Zlomke & Jeter, 2014). In the literature, there are not only studies (Norr et al., 2013; Dugas et al., 2005; Patrick, 2016) reporting that the intolerance of uncertainty is positively correlated with worry but also the studies supporting the correlation between intolerance of uncertainty and anxiety (Patrick 2016; Tantan-Ulu & Yaka, 2020). Furthermore, while numerous studies have analyzed the relationship between worry and different aspects of problem-solving have been (Davey, 1994; Davey et al., 1996; Dugas et al., 1995; Clarke et al., 2017; Barahmand, 2010; Parkinson & Creswell, 2011; Wilson & Hughes, 2011; Belzer et al., 2002), there are few studies on the correlation between intolerance of uncertainty and various aspects of problem-solving. When international literature is reviewed, several studies revealing the correlation between approaching problems in a negative way dimension of problem- solving and intolerance of uncertainty have been encountered. When the studies are examined, it has been observed that intolerance of uncertainty is positively associated with approaching problems in a negative way (Robichaud et al., 2003; Bottesi et al., 2016; Fergus & Wu, 2010; Fergus & Wu, 2011; Clarke et al., 2017).

## **Intolerance of Uncertainty and Rumination**

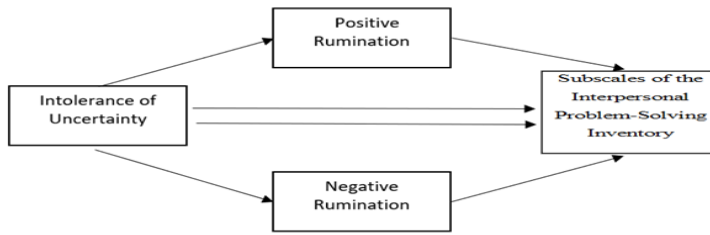
Ward et al. (2003) mention that as well as the harms of rumination on thinking and problem-solving, self-focused rumination increases uncertainty and thus prevents instrumental behaviors and might result in more rumination and behavioral inaction. In addition, it is stated in the literature that individuals may engage in rumination when they feel uncertainty (Liao & Wei, 2011), there are also studies reporting that intolerance of uncertainty is positively correlated with rumination (Satici et al., 2020; Yook et al., 2010).

### **Rumination and Problem Solving**

Among the initial studies on rumination, Nolen-Hoeksema (1991) determined that individuals are rethinking about their depressive symptoms and their possible causes and consequences. Yang et al., (2018), on the other hand, pointed out that the studies on rumination are on either negative affect (Nolen-Hoeksema, 1991) or positive emotional states (Feldman et al., 2008) and defined rumination as repeated thoughts about positive and negative affect which function positively or negatively in terms of psychological adjustment (Yang et al., 2018). Hasegawa et al., (2015) state that as rumination is a cognitive-behavioral set that aims to avoid negative environmental and special events, and due to the abstract and evaluative nature of depressive rumination, it may disrupt or deteriorate social problem-solving. Moreover, the authors stated that the abstract nature of rumination might explain the negative relationship between social problem-solving and rumination, and poor problem-solving might prevent individuals from solving their own problems and lead to disruption in their environment and continuous rumination about their problems. In their study, Ward et al., (2003) examined the relationship between rumination and the possibility of initiating action-oriented problem solving and found that individuals who ruminated were less satisfied with the solution of the problems and had less confidence and less commitment to these solutions. In addition, the authors suggest that rumination is destructive in developing instrumental behaviors such as applying solutions to problems. When the national literature is examined, one study examining the relationship between rumination and problem-solving, which is a broader concept than interpersonal problem-solving (Neziroğlu, 2010), it was concluded that as the university students' scores on the brooding subscale of the rumination scale increased, their problem-solving skills were less sufficient, and as their scores on the reflection subscale increased, their problem-solving skills increased.

### **The Present Study**

When the literature is analyzed, it is seen that individuals may engage in rumination when they feel uncertain (Liao & Wei, 2011), negative thinking caused by rumination may also occur in the problem-solving processes, resulting in negative problem orientation, and these negative comments may lead to an avoidance style that prevents individuals from solving their problems and this problem-solving style will work to create continuous rumination about one's problems (Hasegawa et al., 2018). In this context, in line with the above-mentioned information, it is aimed to examine the related model considering that intolerance of uncertainty may be associated with interpersonal problem solving and rumination has a mediation effect in this relationship. No study was encountered in the literature examining the relationship between the forms of rumination (positive and negative rumination) and analyzing the interpersonal problem-solving as discussed in this study. Additionally, there has been no study addressing the relationship between university students' interpersonal problem-solving approaches and behaviors and intolerance of uncertainty and rumination together. It is thought that identifying the mediating role of rumination in the relationship between intolerance of uncertainty and interpersonal problem-solving behaviors and approaches would make considerable contributions to the field. It is also important to search for this pattern of relationship among university students who have to cope with many interpersonal problems related to university life.



**Figure 1.** Hypothesis Model for Interpersonal Problem Solving

In this study, answers were sought to the following research questions to test the proposed model shown in Fig. 1:

1. Does intolerance of uncertainty significantly predict the positive rumination subscale of the Positive and Negative Rumination Scale?
2. Does intolerance of uncertainty significantly predict the negative rumination subscale of the Positive and Negative Rumination Scale?
3. Does the positive rumination subscale of the Positive and Negative Rumination Scale, significantly predict the subscales of the Interpersonal Problem-Solving Inventory (approaching problems in a negative way, constructive problem solving, lack of self-confidence, unwilling to take responsibility, insistent persevering approach)?
4. Does the negative rumination subscale of the Positive and Negative Rumination Scale significantly predict the subscales of the Interpersonal Problem-Solving Inventory (approaching problems in a negative way, constructive problem solving, lack of self-confidence, unwilling to take responsibility, insistent persevering approach)?
5. Does intolerance of uncertainty significantly predict the subscales of the Interpersonal Problem-Solving Inventory (approaching problems in a negative way, constructive problem solving, lack of self-confidence, unwilling to take responsibility, insistent persevering approach)?
6. Does intolerance of uncertainty significantly predict the subscales of the Interpersonal Problem-Solving Inventory (approaching problems in a negative way, constructive problem solving, lack of self-confidence, unwilling to take responsibility, insistent persevering approach) through positive rumination subscale of the Positive and Negative Rumination Scale?
7. Does intolerance of uncertainty significantly predict the subscales of the Interpersonal Problem-Solving Inventory (approaching problems in a negative way, constructive problem solving, lack of self-confidence, unwilling to take responsibility, insistent persevering approach) through negative rumination subscale of the Positive and Negative Rumination Scale?

## METHOD

In this section, information about the research design, participants, instruments and data analysis are presented.

### Research Design

This study, which tested whether or not positive and negative rumination has a mediation effect on the relationship between university students' intolerance of uncertainty and their interpersonal problem-solving, was conducted in the correlation model. The purpose of correlation models is to determine the existence and level of alteration jointly between two or more variables (Karasar, 2014).

### Participants

The sample group consisted of 983 university students. 708 (72%) were female and 275 (28%) were male. They studied at various universities in Turkey during the 2021-2022 academic year. The ages of the participants ranged from 17 to 33, with an average age of 20.40 and were calculated with a standard deviation

of 1.91. The distribution of the sample group also according to the university year was that 255 (25.9%) were attending the preparatory class, 214 (21.8%) were the first-year students, 198 (20.1%) were the second-year students, 227 (23.1%) were the third-year students, and 88(9%) were the fourth-year students and 1 student (0.1%) was a fifth-year student. Informed consent was obtained from all the participants.

### **Instruments**

The data for this research were collected through the "Interpersonal Problem Solving Inventory", "Intolerance of Uncertainty Scale", and "Positive and Negative Rumination Scale" detailed below.

#### ***Interpersonal Problem-Solving Inventory (IPSI)***

The Interpersonal Problem-Solving Inventory, developed by Çam & Tümkaya (2007), consists of 50 items (e.g. I feel helpless when I have a problem) and five subscales. This inventory is a five-point Likert (1- not at all suitable, 2- somewhat suitable, 3- suitable, 4- mostly suitable, 5- completely suitable) type scale. A high score calculated for the subscales of the inventory signifies a high level of interpersonal problem-solving characteristic. As a result of the factor analysis performed on the inventory, five factors (Approaching Problems in a Negative Way (APNW), Constructive Problem Solving (CPS), Lack of Self-Confidence (LSC), Unwilling to Take Responsibility (UTR), and Insistent-Persevering Approach (IPA)) were obtained, explaining 38.38% of the variance that was related to problem solving. The correlation values calculated with the total scores of the subscales also vary between .22 and .74. Cronbach's alpha coefficients for the subscales of the inventory were determined as APNW=.91, CPS =.88, LSC =.67, UTR=.74, and IPA=.70.

Cronbach's alpha internal consistency coefficient for this study was calculated as .91 for approaching problems in a negative way, .89 for constructive problem solving, .77 for lack of self-confidence, .74 for unwilling to take responsibility, and .73 for insistent-persevering approach.

#### ***Intolerance of Uncertainty Scale (IUS-12)***

Intolerance of Uncertainty Scale was developed by Carleton et al., (2007) and its Turkish adaptation study was conducted by Sariçam et al., (2014). The scale, which consists of 12 items (e.g. Uncertainty prevents me from living life to the fullest.), is a 5-point (1- Not at all suitable for me, 2- Slightly suitable for me, 3- Somewhat suitable for me, 4- Very suitable for me, and 5- Completely suitable for me) Likert type scale. The fit index values of the scale were calculated as ( $\chi^2=147.20$ ,  $sd=48$ ,  $RMSEA=.073$ ,  $CFI=.95$ ,  $IFI=.95$ ,  $GFI=.94$ , and  $SRMR=.046$ ). The Cronbach's alpha internal consistency coefficient is .88 for the overall scale. In this study, Cronbach's alpha internal consistency coefficient was calculated as .87 for the overall scale.

#### ***Positive and Negative Rumination Scale (PNRS)***

The Positive and Negative Rumination Scale was developed by Yang et al. (2018) and adapted to Turkish by Demirci & Arslan (2022). The participants were asked how often they think like the expressions in the items (e.g. Think "I will not be always so lucky/ Think "I am a useless person") when they experience positive emotions such as happiness, excitement or enthusiasm or negative emotions such as sadness, anger or embarrassment. They were asked to rate their responses between 1 (never) point to 4 (always) points. As a result of the first-level confirmatory factor analysis applied to the 23-item scale, it was determined that the five-factor structure including enjoy happiness, suppress happiness, negative attribution, positive coping, and self-deny showed an adequate fit ( $\chi^2/df=2.313$ ,  $NFI=.92$ ,  $NNFI=.95$ ,  $IFI=.95$ ,  $RFI=.91$ ,  $CFI=.95$ ,  $GFI=.87$ ,  $RMR=.054$ ,  $RMSEA=.065$ ,  $SRMR=.067$ ). In addition, in order to examine the factor structure of the Positive and Negative Rumination Scale, the second-level confirmatory factor analysis was applied for 2-factor second-level model in which enjoy happiness and positive coping were loaded to positive rumination (PR) and suppress happiness, negative attribution and self-deny were loaded to negative rumination (NR). As a result of the analysis, it was observed that adequate adaptation of the 2-factor second-level structure ( $\chi^2/df=2.375$ ,  $NFI=.92$ ,  $NNFI=.94$ ,  $IFI=.95$ ,  $RFI=.91$ ,  $CFI=.95$ ,  $GFI=.87$ ,  $AGFI=.84$ ,  $RMR=.058$ ,  $RMSEA=.067$ ,  $SRMR=.072$ ) and the original factor structure of the scale were consistent with the factor structure of its Turkish version. For the subscales of the scale, Cronbach's alpha internal consistency reliability coefficient

varies between .65 and .88 and the test-retest correlation varies between .61 and .74.

In this study, Cronbach's alpha was calculated as .81 for the positive rumination subscale and .87 for the negative rumination subscale.

### Data Analysis

Write down the data analysis of your research without changing the format. Write down the data analysis of your research without changing the format. In the study, null items were determined with the frequencies and the missing value analysis was done. Mahalanobis distances were calculated to determine the extreme values in the preliminary analysis. Then, it was examined whether or not the data were normally distributed. Skewness and kurtosis values were calculated to examine the normality distribution. Then, the Pearson Correlation Coefficient was calculated to determine the correlation between the variables. All these analyses were performed using the IBM SPSS Statistics 26.0 software. Then, the mediation model proposed in the study was examined. Mediation analysis is frequently used to test hypotheses examining causal effects. Here, the mediator variable helps researchers better understand the relationship between independent and dependent variables (Sürücü et al., 2021). Regression analysis based on the bootstrap method was performed to test whether or not there is a mediating role. SPSS Process macro 4.1 was used to analyze the models created to examine the mediation effects of positive and negative rumination in the intolerance of uncertainty and interpersonal problem-solving relationship (Hayes, 2022). In the analysis, 5000 resampling options were preferred with the bootstrap technique. As a result of the bootstrap analysis, it was determined whether or not there was a mediation effect by examining the values, at the confidence interval of 95%. Accordingly, if the lower and upper confidence interval values corresponding to the indirect effect (a.b) value do not cover the zero value, the indirect effect is considered as significant and it is determined that there is a mediation effect. If the confidence interval includes 0 (zero), it is understood that a.b value is not significant and has no mediation effect (Gürbüz, 2021; Zhao et al., 2010). According to the modern approach, if a.b value is significant as a result of the bootstrap test, the mediation model is considered as validated and no other test is needed (Gürbüz & Bayık, 2018). The analysis of mediation models was carried out separately for the subscales of approaching problems in a negative way, constructive problem solving, lack of self-confidence, unwilling to take responsibility and insistent-persevering approach by using Model 4 in the SPSS PROCESS macro.

### RESULTS

To determine the extreme values, Mahalanobis distances were calculated and 8 extreme values of  $p < .001$  were removed from the data set. Then, the normal distributions of the variables were evaluated with skewness and kurtosis values. Considering the skewness and kurtosis values of the variables in terms of normal distribution evaluation angle, it was observed that the skewness values varied between  $-.180$  and  $.877$ ; and the kurtosis values varied between  $-.287$  and  $.628$ . George & Mallery (2016) state that  $\pm 1$  value is excellent for skewness and kurtosis values, depending on the application and values between  $\pm 2$  are acceptable in most cases. Therefore, it was concluded that the dataset did not have a distributed skewness and kurtosis values and showed a normal distribution. Afterwards, Pearson Correlation Analysis was used for the bilateral relations between the variables. Table 1 shows the correlations between the variables.

**Table 1.** Descriptive statistics and relations between variables

	APNW	CPS	LSC	UTR	IPS	PR	NR	IU
APNW	1							
CPS	-.01	1						
LSC	.56**	-.03	1					
UTR	.42**	-.13**	.54**	1				
IPS	.13**	.61**	.03	-.06*	1			
PR	-.22**	.43**	-.17**	-.12**	.33**	1		
NR	.61**	-.10**	.44**	.35**	-.02	-.30**	1	
IU	.54**	.07*	.28**	.34**	.14**	-.11**	.51**	1
Mean	44.46	57.38	14.51	12.80	21.40	29.74	33.43	40.78
Sd	13.71	10.29	5.05	4.41	4.36	5.32	8.18	9.59

Note. \*\* $p < .01$ , \* $p < .05$ ; APNW approaching problems in a negative way; CPS constructive problem solving; LSC lack of self-confidence; UTR unwilling to take responsibility; IPS insistent-persevering approach; PR positive rumination; NR negative rumination; IU intolerance of uncertainty

### Findings Regarding the Mediation Model

When Fig. 2 is examined, it was observed that intolerance of uncertainty affected positive rumination significantly and negatively ( $b = -.060$ , 95% CI  $[-.0948, -.0257]$ ,  $t = -3.418$ ,  $p < .01$ ). Furthermore, intolerance of uncertainty affected negative rumination significantly and positively ( $b = .434$ , 95% CI  $[.3879, .4800]$ ,  $t = 18.497$ ,  $p < .001$ ).

Positive rumination affected the approaching problems in a negative way significantly and negatively ( $b = -.148$ , 95% CI  $[-.2750, -.0217]$ ,  $t = -2.299$ ,  $p < .05$ ), constructive problem solving significantly and positively ( $b = .834$ , 95% CI  $[.7201, .9482]$ ,  $t = 14.354$ ,  $p < .001$ ), insistent-persevering approach significantly and positively ( $b = .283$ , 95% CI  $[.2327, .3330]$ ,  $t = 11.078$ ,  $p < .001$ ). Moreover, positive rumination did not have a significant effect on lack of self-confidence ( $b = -.042$ , 95% CI  $[-.0976, .0140]$ ,  $t = -1.469$ ,  $p = .1422$ ) and unwilling to take responsibility ( $b = -.024$ , 95% CI  $[-.0736, .0264]$ ,  $t = -.926$ ,  $p = .3547$ ) (Fig. 2).

Negative rumination, on the other hand, affected the approaching problems in a negative way ( $b = .725$ , 95% CI  $[.6297, .8199]$ ,  $t = 14.952$ ,  $p < .001$ ), lack of self-confidence ( $b = .241$ , 95% CI  $[.1993, .2831]$ ,  $t = 11.294$ ,  $p < .001$ ) and unwilling to take responsibility ( $b = .124$ , 95% CI  $[.0864, .1616]$ ,  $t = 6.473$ ,  $p < .001$ ) significantly and positively. Moreover, negative rumination did not have a significant effect on constructive problem solving ( $b = -.047$ , 95% CI  $[-.1331, .0383]$ ,  $t = -1.0861$ ,  $p = .2777$ ) and insistent-persevering approach ( $b = -.002$ , 95% CI  $[-.0394, .0359]$ ,  $t = -.090$ ,  $p = .9284$ ) (Fig. 2).

In the absence of positive rumination and negative rumination, intolerance of uncertainty had a positive and significant effect on approaching problems in a negative way ( $b = .768$ , 95% CI  $[.6923, .8435]$ ,  $t = 19.945$ ,  $p < .001$ ); constructive problem solving ( $b = .078$ , 95% CI  $[.0105, .1446]$ ,  $t = 2.270$ ,  $p < .05$ ); lack of self-confidence ( $b = .148$ , 95% CI  $[.1160, .1793]$ ,  $t = 9.151$ ,  $p < .001$ ); unwilling to take responsibility ( $b = .157$ , 95% CI  $[.1302, .1844]$ ,  $t = 11.397$ ,  $p < .001$ ) and insistent-persevering approach ( $b = .065$ , 95% CI  $[.0364, .0928]$ ,  $t = 4.495$ ,  $p < .001$ ) (Fig. 2).

It was found that the indirect effect of intolerance of uncertainty on approaching problems in a negative way ( $b = .009$ , 95% CI  $[.0009, .0200]$ ), constructive problem solving ( $b = -.050$ , 95% CI  $[-.0814, -.0200]$ ), insistent-persevering approach ( $b = -.017$ , 95% CI  $[-.0281, -.0067]$ ) through the mediation of positive rumination was significant. This is because the bootstrap lower and upper confidence intervals obtained by the percentile method did not contain 0 (zero) value.

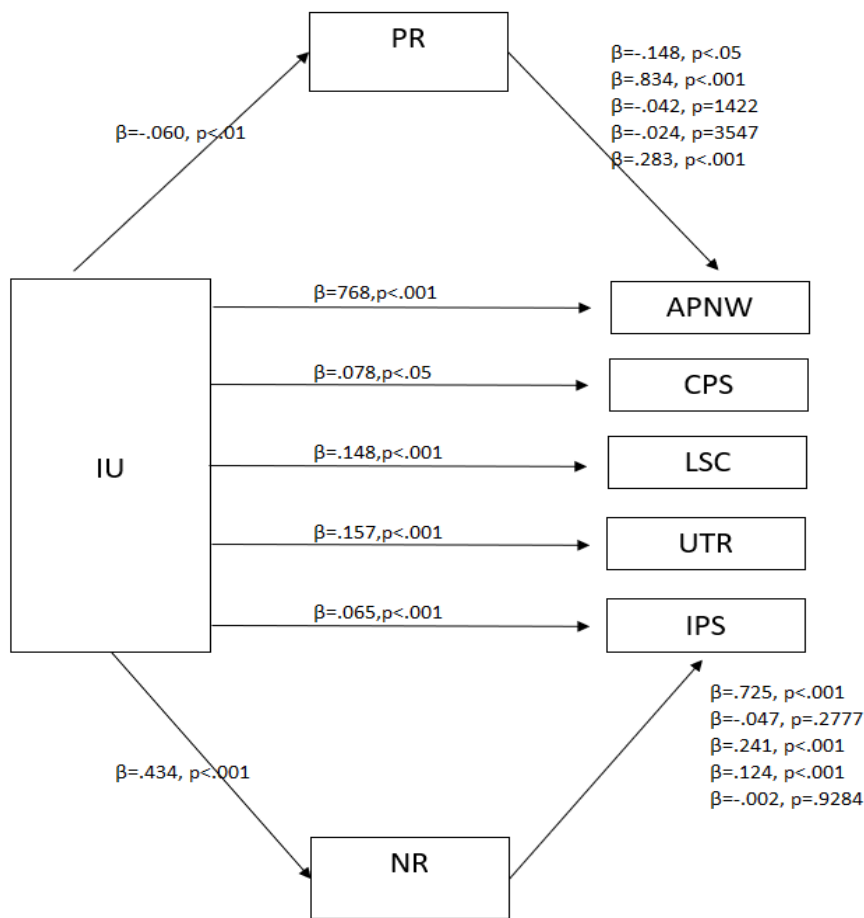
In addition, the indirect effect of intolerance of uncertainty on lack of self-confidence ( $b = .003$ , 95% CI  $[-.0010, .0069]$ ) and unwilling to take responsibility ( $b = .001$ , 95% CI  $[-.0016, .0053]$ ) through the mediation of positive rumination was not significant. This is because the bootstrap lower and upper confidence intervals obtained by the percentile method contained 0 (zero) value.

In summary, positive rumination in college students mediated the correlation between intolerance of uncertainty and approaching problems in a negative way, constructive problem solving and insistent-persevering approach. If the effect size is close to .01, it is interpreted as low effect; if is close to .09, it is medium effect, and if it is close to .25, it is high effect (Preacher & Kelly, 2011). The fully-standardized effect sizes of the mediation effect were .006 (an effect size close to a low value), respectively; -.047 (an effect size close to the medium value), and -.038 (an effect size close to the low value).

It was found that the indirect effect of intolerance of uncertainty on approaching problems in a negative way ( $b = .315$ , 95% CI  $[.2637, .3709]$ ), lack of self-confidence ( $b = .105$ , 95% CI  $[.0830, .1284]$ ), and unwilling to take responsibility ( $b = .054$ , 95% CI  $[.0369, .0708]$ ) through the mediation of negative rumination was significant. This is because the bootstrap lower and upper confidence intervals obtained by the percentile method did not contain 0 (zero) value.

In addition, the indirect effect of intolerance of uncertainty on constructive problem solving ( $b=-.0206$  95% CI  $[-.0587,.0178]$ ) and insistent-persevering approach ( $b=-.001$  95% CI  $[-.0175,.0155]$ ) through the mediation of negative rumination was not significant. This is because the bootstrap lower and upper confidence intervals obtained by the percentile method contained 0 (zero) value.

In summary, negative rumination in university students mediated the correlation between intolerance of uncertainty and approaching problems in a negative way, lack of self-confidence and unwillingness to take responsibility. When interpreting effect sizes, if the effect size is close to .01, it is interpreted as low effect, if it is close to .09, it is interpreted as medium effect, and if it is close to .25, it is interpreted as high effect (Preacher & Kelly, 2011). Fully standardized effect sizes of the mediation effect were .220 (an effect size close to the highest value), .199 (an effect size close to the highest value) and .117 (an effect size close to a medium value), respectively.



Note. \*\* $p < .01$ , \* $p < .05$ ; APNW approaching problems in a negative way; CPS constructive problem solving; LSC lack of self-confidence; UTR unwilling to take responsibility; IPS insistent-persevering approach; PR positive rumination; NR negative rumination; IU intolerance of uncertainty

**Figure 2.** The mediating role of positive and negative rumination in the relationship between intolerance of uncertainty and interpersonal problem solving.

### DISCUSSION, CONCLUSION, RECOMMENDATIONS

The findings of the study revealed that intolerance of uncertainty predicted the subscales of approaching problems in a negative way, constructive problem solving, lack of self-confidence, unwilling to take responsibility, and insistent-persevering approach significantly and positively, without mediating variables. Intolerance of uncertainty can directly affect problem-solving dynamics of individuals (Parmaksız, 2021). There are studies reporting a positive correlation between intolerance of uncertainty and negative problem orientation (Robichaud et al., 2003; Bottesi et al., 2016; Fergus & Wu, 2010; Fergus & Wu, 2011; Clarke et



al., 2017). One study found that there was a significant negative correlation between intolerance of uncertainty and confidence in problem solving (Patrick, 2016); another study reported a positive and significant correlation between lack of social self-confidence and intolerance of uncertainty (Erol, 2020). Furthermore, it was found that intolerance of uncertainty had a significant negative correlation with the feature of responsibility personality in the five-factor personality (Güvenç, 2019) in addition intolerance of uncertainty had a significant positive correlation with non-assertive behaviors (Erol, 2020). It can be asserted that similar study findings support the findings of the study. According to the results of the study, intolerance of uncertainty affected positive rumination significantly and negatively. Moreover, intolerance of uncertainty influenced negative rumination significantly and positively. In the literature, it is reported that intolerance of uncertainty is significantly and positively related to rumination (Satici et al., 2020; Yook et al., 2010). Armutlu (2019) determined that there was a significant positive correlation between intolerance of uncertainty and brooding and reflection subscales of rumination. The researcher stated a hypothesis that intolerance of uncertainty is negatively correlated with reflection, but as a result of the study, he concluded that there was a positive correlation between them. These studies indicated that intolerance of uncertainty was correlated with the rumination assessed using scales addressing rumination from various aspects. In the current study, the relationship between intolerance of uncertainty and rumination was investigated using a scale that deals with positive and negative rumination, and it was found that as expected, positive rumination levels lowered and negative rumination levels elevated as the intolerance of uncertainty increased.

As a result of the study, it was observed that positive rumination affected the approaching problems in a negative way significantly and negatively. Positive rumination significantly and positively affected the insistent persevering approach and constructive problem solving. In addition, the direct effect of positive rumination on lack of self-confidence and unwillingness to take responsibility was not significant. Negative rumination, on the other hand, affected approaching the problems in a negative way, lack of self-confidence and being unwilling to take responsibility significantly and positively. In addition, the direct effect of negative rumination on constructive problem solving and insistent-persevering approaches was not significant. Hasegawa et al., (2016) found that there was a significant positive correlation between approaching the problems in a negative way and the total score of the rumination scale and brooding subscale. In addition, while no significant correlation could not be found between reflection and negative orientation to the problem, a significant positive correlation was found between reflection and positive orientation to the problem. Based on these findings, the authors explained a positive correlation between reflection and positive orientation to the problem and rational problem solving, as an important part of active problem solving of reflection. As expected in the current study, it was determined that the approaching problems in a negative way may decrease with the increase of positive rumination and the approaching problems in a negative way may increase with the increase of negative rumination. Similarly, it can be thought that positive rumination is a part of active problem solving. Also, in their study, Hasegawa et al., (2016) observed that there was a significant positive correlation between rational problem-solving and rumination scale total score, brooding score and reflection score. The authors explained the positive correlation between reflection and positive problem-orientation and rational problem-solving in the way that reflection is an important part of active problem solving. Similarly, the positive correlation between positive rumination and constructive problem-solving in the current study can be interpreted as positive rumination, an important element of active problem-solving. Hasegawa et al., (2016) explained the positive correlation of brooding and rumination scale total score with negative orientation to the problem and avoidant style by saying that rumination is a cognitive behavioral set that works to avoid negative private events and environments. The result of the current study indicating that unwillingness to take responsibility may increase with the increase of negative rumination can be interpreted as the fact that negative rumination may be a cognitive behavioral set that works towards avoidance by being unwilling to take responsibility for negative events and environments.

When the indirect effects of the model were examined, it was found that the indirect effect of intolerance of uncertainty on approaching problems in a negative way, constructive problem solving, insistent-persevering

approach through the mediation of positive rumination was significant. In addition, the indirect effect of intolerance of uncertainty on lack of self-confidence and unwilling to take responsibility through the mediation of positive rumination was not significant. The indirect effect of intolerance of uncertainty on approaching problems in a negative way, lack of self-confidence, and unwilling to take responsibility through the mediation of negative rumination was significant. Moreover, the indirect effect of intolerance of uncertainty on constructive problem solving and insistent-persevering approach through the mediation of negative rumination was not significant.

Although there has been no study examining the mediation effect of intolerance of uncertainty, rumination and interpersonal problem-solving variables, the links between the information in the literature and the variables obtained from similar studies can be explained. In the literature, it can be seen that individuals may engage in rumination when they feel uncertainty (Liao & Wei, 2011), negative thinking caused by rumination may also appear in the problem-solving processes of individuals and may result in negative problem orientation, and these negative comments may lead to an avoidance style that prevents individuals from solving their problems and the problem-solving style may also work to create continuous rumination about the person's problems (Hasegawa et al., 2018).

When the studies in the literature are reviewed, it has been determined that intolerance of uncertainty has an indirect effect on mental well-being through rumination (Satici et al., 2020). In another study, it was found that brooding and reflection subscales and total score of rumination mediated the correlation between intolerance of uncertainty and depression (Huang et al., 2019). In another study, it was observed that the indirect effect of intolerance of uncertainty on anxiety through the mediation rumination was not significant, while rumination completely mediated the correlation between intolerance of uncertainty and depression (Yook et al., 2010). Yang et al. (2018) defined rumination as repetitive thoughts about both positive and negative effects and stated that these thoughts functioned positively or negatively in terms of psychological adjustment. Intolerance of uncertainty can cause preoccupation with positive and negative rumination -- both of which can have a positive or negative effect on how people deal with interpersonal issues. When these studies are reviewed, it is seen that the correlation between intolerance of uncertainty and depression, which is one of the negative indicators of psychological adjustment, is mediated by rumination (Huang et al., 2019; Yook et al., 2010). In addition, the indirect effect of intolerance of uncertainty on mental well-being, which is one of the positive indicators of psychological adjustment through rumination, is also significant (Satici et al., 2020).

The results of this study are important in terms of extending the literature on university students' interpersonal problem-solving skills. However, some limitations need to be taken into account when evaluating the results of the study. It is primarily limited to the sample group, the participants of the study. Therefore, it is not possible to generalize the results of the study to all university students. This study was conducted using self-report assessment tools for the variables of intolerance of uncertainty, positive and negative rumination, and interpersonal problem-solving. Participants may have acted haphazardly when answering these scales, ignored them, or given answers that did not reflect themselves in order to gain social approval. In this regard, further qualitative studies can be conducted through techniques such as interviews and observation in order to contribute to the pattern between these variables. As a result of the study, it was observed that as the intolerance of uncertainty increased, negative rumination increased and positive rumination decreased. As negative rumination increased, approaching problems in a negative way, lack of self-confidence, and unwillingness to take responsibility increased. In a study examining the effect of positive rumination training on mental health, it was found that positive rumination increased and negative rumination, depression and anxiety decreased significantly in participants who received positive rumination training. Results of the study showed that positive rumination group training can improve the wellness of mental health (Yang & Guan, 2022). As a result of the current study, it was determined that constructive problem-solving may increase with the increase of positive rumination in university students. In line with these findings, positive rumination training programs can be developed similar to the training program developed by Yang and Guan (2022) (which includes the

topics of thinking positively about negative events and learning to think positively about events, oneself, the past, the present and the future). In line with these findings, similarly positive rumination training programs can be developed. These programs can be applied in group counseling sessions by mental health professionals working in psychological counseling units within universities. The effects of these programs on the interpersonal problem-solving approaches and behaviors of university students can be investigated with experimental studies. The research was conducted by considering the positive and negative rumination dimensions of the Positive and Negative Rumination Scale. More detailed data can be obtained by conducting a similar study with the five subscales of the Positive and Negative Rumination Scale, which will cover rumination more comprehensively. Only university students were included in this study. For this reason, it is recommended to carry out similar studies in different age groups (such as adolescents and middle age groups).

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