



Loneliness special Issue. Loneliness and Depressive Symptoms: The Mediating and Moderating Role of Uncontrollable Ruminative Thoughts

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LONELINESS SPECIAL ISSUE

Loneliness and Depressive Symptoms:

The Mediating and Moderating Role of Uncontrollable Ruminative Thoughts

For Peer Review

Abstract

Although feelings of loneliness often are accompanied by depressive symptoms, little is known about underlying mechanisms in this association. The present study sampled 370 college freshmen and investigated whether rumination (and its components of uncontrollability, causal analysis, and understanding) functioned as a mediator or moderator in the relationship between two types of loneliness (as experienced in the relationship with parents and with peers, respectively) and depressive symptoms. Results indicated that rumination partially mediated the relationship between peer-related loneliness and depressive symptoms, and moderated the relationship between parent-related loneliness and depressive symptoms. In addition, the uncontrollable nature, rather than the content of these ruminative thoughts about parent- and peer-related loneliness, was particularly harmful in the development of depressive symptoms. Implications and suggestions for future research are discussed.

Experiencing loneliness ([i.e., the negative emotional response to a discrepancy between the desired and achieved quality of one's social network; Peplau & Perlman, 1982](#)) is strongly associated with depressive symptoms ([i.e., cognitive, somatic, and psychological markers of depression; Radloff, 1977](#)) in adolescence ([for a review, see Mahon, Yarcheski, Yarcheski, Cannella, & Hanks, 2006](#)). However, very few studies focused on explaining this relationship. An exception is the study by Vanhalst, Luyckx, and Goossens (2009) which demonstrated that loneliness predicted depressive symptoms over time and that this relationship was mediated by maladaptive emotion regulation strategies. Emerging adults experiencing loneliness seemed to rely on maladaptive ways to cope with these feelings (e.g., by blaming themselves), which, in turn, made them more vulnerable for depressive symptoms.

The present study tried to expand on this finding in three important ways. First, the present study focused on a more specific aspect of maladaptive cognitive coping (i.e., rumination and its subcomponents) crucial for the development of depressive symptoms (Aldao, Nolen-Hoeksema, & Schweizer, 2009). Second, we not only examined mediation in the relationship between loneliness and depressive symptoms, but also moderation. More specifically, mediation implies that loneliness gives rise to depressive symptoms *because* the former is generally associated with rumination, whereas moderation implies that loneliness gives rise to depressive symptoms *only or especially when* it is accompanied by rumination. Third, we investigated whether these underlying processes occurred for different aspects of loneliness, because loneliness may have a different meaning in different relationships. So far, most studies used general measures of loneliness (which have been shown to capture peer-related loneliness; Goossens et al., 2009), or specific measures of peer-related loneliness when linking loneliness to depressive symptoms. In the present study, both peer-related and parent-related loneliness are considered.

It is particularly relevant to investigate the interplay between loneliness, rumination, and depressive symptoms during the transition to college because this is a turbulent period in terms of maintaining the quality of social relationships and subsequent social and emotional adjustment (Montgomery & Côté, 2003; Shaver, Furman, & Buhrmester, 1985). Freshmen not only have to adapt to a new academic environment, most of them also have to adapt to a new living situation. Most freshmen can no longer rely on their social network of friends and family and have to deal with many life changes and choices, which may cause feelings of loneliness and depression (Kenny & Sirin, 2006; Oswald & Clark, 2003; Stroebe, van Vliet, Hewstone, & Willis, 2002). Furthermore, the transition to college might also be a risk period for increased ruminative thoughts. Specifically, substantial changes in the lives of adolescents (such as transitioning to college) are often accompanied by a struggle of finding a balance between striving for autonomy and safeguarding feelings of connectedness to peers and parents, which was expected to induce rumination (Peled & Moretti, 2007).

Peer- and Parent-Related Loneliness

Loneliness has a different meaning in parent versus peer relationships (Goossens et al., 2009), suggesting that there are different consequences of both types of loneliness for well-being. We hypothesized that, in college students, peer-related loneliness would be more strongly associated with depressive symptoms than parent-related loneliness, mainly for two reasons. First, emerging adults devote more time outside and less time inside the family and increasingly turn to peers (Nelis & Rae, 2009). In that way, peer-related loneliness may be more stressful than parent-related loneliness, and, as such, may be more strongly related to the development of depressive feelings. Second, the close relationship theory (Laursen & Bukowski, 1997) states that parent relationships are permanent, whereas peer relationships are potentially impermanent. In permanent relationships, the ties that bind individuals together are largely unrelated to interaction outcomes. In impermanent relationships, partners tend to

Deleted: Loneliness is generally defined as the negative emotional response to a *discrepancy* between the desired and achieved quality of one's social network (Peplau & Perlman, 1982). Ruminative thinking, on the other hand, is typically conceptualized as a *discrepancy-based processing style*, aimed at the solution or 'closure' of discrepancies experienced between a current/actual state, and a desired/ideal state (e.g., Martin and Tesser, 1996; see also Shoofs, Hermans, & Raes, 2010).

participate as long as interactions remain mutually advantageous, so the threat of relationship dissolution is omnipresent. Hence, loneliness may be more threatening in a possibly impermanent peer relationship than in a permanent parent relationship.

Rumination and its Subcomponents

A growing literature shows the existence of both adaptive and maladaptive forms of self-focused attention in general (e.g., Trapnell & Campbell, 1999) and of rumination as a specific type of self-focused attention, in particular (e.g., Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Rumination is defined here as repetitively and passively focusing on symptoms of distress (such as feelings of loneliness) and on the possible causes and consequences of these symptoms (Nolen-Hoeksema, 1991). Recently, researchers have started to emphasize the importance of distinguishing different forms or subcomponents of rumination. For example, Treynor et al. (2003) distinguished a brooding and a reflective form of rumination. Several studies have shown that the brooding facet of rumination, compared to the reflection subcomponent, represents the more maladaptive form of rumination (e.g., Raes & Hermans, 2008; Treynor et al., 2003). This maladaptive form, referred to as brooding, is a passive comparison of one's actual situation to one's ideal situation and is motivated by perceived threats, losses, or injustices. Specifically, several studies showed that brooding is a stronger within-time and over-time predictor of depressive symptoms than reflection is (Arney et al., 2009; Grassia & Gibb, 2008).

More recently, Raes, Hermans, Williams, Bijttebier, and Eelen (2008) distinguished three components of rumination, including not only different aspects of rumination itself, but also different beliefs or appraisals about the process of rumination. First, Causal analysis refers to the process of figuring out what may be the causes of one's distress, and is viewed as the component most closely related to reflection. The second component, Uncontrollability, concerns the experience (i.e., its repetitive nature) rather than the content of rumination and

refers to the experience that ruminative thinking processes are difficult to stop. This component appears to be the most maladaptive form of rumination, as demonstrated by its high association with depressive symptoms and with the cognitive risk factor of thought suppression (Raes et al., 2008). Third, Understanding refers to the process of trying to understand oneself and the meaning of one's distress, and lies somewhat in between the other two rumination components. Hence, in the present study, we hypothesized that the subcomponent Uncontrollability is a particularly important mechanism in the link between loneliness and depressive symptoms, more so than Causal Analysis or Understanding are.

Loneliness and Depressive Symptoms: Rumination as Modulating Variable

Forming and maintaining social relationships are important sources of life satisfaction, and numerous studies have indicated that loneliness is related to symptoms of poor mental health such as depression (Heinrich & Gullone, 2006). Specifically, the relation between loneliness and depressive symptoms is in the range of a large effect size ($r = .61-.62$), as revealed by a meta-analysis conducted on 33 adolescent samples (Mahon et al., 2006). Loneliness was found to predict depressive symptoms both within time (e.g., Hagerty & Williams, 1999) and across time (e.g., Heikkinen & Kauppinen, 2004). In addition, the importance of feelings of loneliness as a key role in the etiology of depressive symptoms has frequently been acknowledged by leading theories. For instance, attachment theory states that insecurely attached individuals are more susceptible to depression because of their negative views of themselves and their relationships with others (Bowlby, 1973). Cognitive theories put forth that some individuals define their self-worth by means of their relationships, which makes them more vulnerable to depression in response to interpersonal difficulties (Blatt, 1990). Behavioral theories posit that certain individuals are vulnerable to depression because they have poor social skills, making it difficult for them to elicit positive reinforcement from others and deal with relationship stressors (Lewinsohn, 1974). These theoretical assumptions

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are confirmed by empirical research showing an association between loneliness and depressive symptoms, both within (Mahon et al., 2006) and across time (Joiner, 1997).

We consider rumination as a prime candidate to mediate or moderate this strong relationship between loneliness and depressive symptoms, because rumination causes people to remain fixated on their negative experiences (such as loneliness), and impairs problem solving (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). We anticipate that rumination is likely to occur when feeling lonely, because loneliness has been found to affect cognitive thinking (Heinrich & Gullone, 2006). Lonely people tend to have maladaptive attributional styles (Anderson, 1999) and inflexible friendship beliefs (Lavalley & Parker, 2009), both of which are related to rumination. Also, ruminative thinking is a discrepancy-based processing style, as people often start ruminating when they are confronted with a painful discrepancy between a current and a desired situation (e.g., Martin & Tesser, 1996; Schoofs, Hermans, & Raes, 2010). Recall that loneliness can be seen as the result of such an instance of a painful discrepancy, namely between the current and desired quality of one's social network (Peplau & Perlman, 1982). Furthermore, previous research suggests that rumination plays a key role in maintaining negative mood following interpersonal harm (Wade, Vogel, Liao, & Goldman, 2008). Particularly in the first weeks of college, freshmen might be increasingly aware and concerned about being accepted and their self-presentation. Feeling lonely, therefore, is likely to evoke ruminative thinking in these individuals. For example, research about homesickness among freshman college students suggested that students who missed their friends and family were found to ruminate about loneliness, which was associated with depressive symptoms (Stroebe et al., 2002).

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Whereas the link between loneliness and ruminative thoughts is rather unexplored, a vast amount of research demonstrated the association between rumination and depressive symptoms (for reviews, see Nolen-Hoeksema et al., 2008; Smith & Alloy, 2009). Specifically,

prospective longitudinal studies showed that adolescents engaging in rumination when distressed were more likely to develop depressive disorders (e.g., Nolen-Hoeksema, Stice, Wade, & Bohon, 2007), and that rumination played an important role in the maintenance of depression (e.g., Grassia & Gibb, 2008).

In sum, the present study examined whether rumination (and, more specifically, its subcomponents Causal analysis, Understanding, and Uncontrollability) mediates or moderates the relationship between (peer- and parent-related) loneliness and depressive symptoms. We tentatively hypothesized that mediation would mainly occur in the relationship between peer-related loneliness and depressive symptoms, and moderation would mainly occur in the relationship between parent-related loneliness and depressive symptoms, based on the titration hypothesis in the vulnerability-stress model discussed in hopelessness theory (Abramson, Alloy, & Hogan, 1997). This hypothesis states that the less negative a person's cognitive style (or, applied to our study, the less one ruminates), the more negative an event must be to interact with ruminative thoughts and give rise to depressive symptoms. Recall that loneliness is expected to be more stressful in the relationship with peers than in the relationship with parents (Laursen & Bukowski, 1997; Nelis & Rae, 2009). Altogether, at lower levels of stress (i.e., parent-related loneliness) only cognitively vulnerable individuals may ruminate and become depressed, whereas at high levels of stress (i.e., peer-related loneliness) both cognitively vulnerable and non-vulnerable individuals may start ruminating and become depressed. Furthermore, we expected the rumination subcomponent Uncontrollability to be a stronger mediator or moderator in the association between loneliness and depressive symptoms, more so than Causal Analysis or Understanding.

Method

Participants and Procedure

Deleted: Statistically, mediation is most suitable in the case of a strong relationship, whereas moderation is most suitable in the case of a weak relation between the predictor and criterion variable (Baron & Kenny, 1986). Because we expected the relationship between peer-related loneliness and depressive symptoms to be stronger than the relationship between parent-related loneliness and depressive symptoms (as discussed previously), we might find mediation in the former relationship (i.e., between peer-related loneliness and depressive symptoms), and moderation in the latter relationship (i.e., between parent-related loneliness and depressive symptoms).

Participants were psychology students from a large university in Belgium, attending college for just one month. This university mainly attracts Caucasian students from middle-class backgrounds. A total of 370 students ($M_{age} = 18.22$, $SD = 1.21$) participated (83.5% female). Of these, 26% lived with their parents, and 74% lived mainly on their own (typically in a student facility). Students participated during group sessions and received course credit for their participation. All participants signed an informed consent form.

Measures

Depressive symptoms. Depressive symptoms were measured using the well-known Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), ~~that was~~ translated into Dutch by Hooge, Decaluwé, and Goossens (2000). To avoid item overlap with the loneliness measures, the item “During the last week, I felt lonely” was dropped and we proceeded with a 19-item version. Each item asks participants to indicate how often they experienced symptoms of depression during the week prior to assessment, by using a 4-point Likert-type rating scale ranging from 0 (*seldom*) to 3 (*most of the time or always*). Cronbach’s alpha for the 19-item version was .88.

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Loneliness. Two subscales – parent-related loneliness and peer-related loneliness – of the Loneliness and Aloneness Scale for Children and Adolescents (LACA; Marcoen, Goossens, & Caes, 1987) were used to capture loneliness. Both subscales contain 12 items answered on a 4-point Likert-type scale ranging from 1 (*never*) to 4 (*often*). Because the questionnaire was developed for school-aged children and adolescents, some of the items were adapted to make them more appropriate for a college population (e.g., “I feel left out by my classmates” was changed to read “I feel left out by my fellow students”). Sample items are “I have the feeling that I belong to my parents” (parent-related loneliness, reverse coded), and “I think I have fewer friends than others have” (peer-related loneliness). Cronbach’s alphas were .92 and .88, respectively. Confirmatory factor analysis (CFA) indicated that a two-factor

model fitted the data adequately: SBS- χ^2 (251) = 617.211 ($p < .001$), CFI = .96, RMSEA = .06. Standardized pattern coefficients ranged from .53 to .82 ($ps < .001$).

Rumination. Rumination was measured using the Leuven Adaptation of the Rumination on Sadness Scale (LARSS; Raes et al., 2008), capturing three rumination components: Causal analysis (5 items), Understanding (6 items), and Uncontrollability (6 items). These three subscales can be summed to yield a composite measure of rumination. In the original version of the LARSS, participants are asked to indicate what they think when feeling sad (i.e., rumination on sadness). We adapted this instruction to what they think when feeling “left outside, lonely, or not supported by peers, fellow students, or family” (i.e., rumination on loneliness), using a 5-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). Sample items read “I keep asking myself what could have contributed to this feeling” (Causal Analysis), “I repeatedly think about what might be the meaning of my feelings” (Understanding), and “I have difficulty getting myself to stop thinking about how lonely I am” (Uncontrollability). Cronbach’s alphas were .95 for the total measure, and .88, .88, and .93 for Causal analysis, Understanding, and Uncontrollability, respectively. CFA confirmed the three-dimensional structure: SBS- χ^2 (116) = 439.084 ($p < .001$), CFI = .97, RMSEA = .09. Standardized pattern coefficients ranged from .54 to .89 ($ps < .001$).

To further strengthen the validity of the LARSS, we correlated the LARSS with the well-validated Rumination and Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999), tapping into an adaptive and maladaptive form of self-attentiveness, that is, rumination and reflection. Sample items are “I always seem to be rehashing in my mind recent things I’ve said or done” and “I love exploring my inner self”, respectively. Both subscales contain 8 items answered on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach’s alpha in our sample was .87 for the subscale rumination and .85 for reflection. The subscales rumination and reflection of the RRQ correlated .65 and .44,

respectively, with our total LARSS-score, and their difference was significant ($t(367) = 11.07; p < .001$). Partial correlations of both RRQ scales with the LARSS scale (i.e., correlations with reflection controlled for rumination, and vice versa) yielded similar results, that is, $r = .65$ for rumination and $r = .43$ for reflection. Hence, the total LARSS scale is more indicative of maladaptive rumination than it is of adaptive reflection. With respect to partial correlations of both RRQ subscales with the three LARSS subscales, Uncontrollability is more strongly correlated with rumination ($r = .71; p < .001$) than with reflection ($r = .13; p < .05; t(367) = 12.13; p < .001$). The same results, although to a lesser extent, hold for Causal analysis ($r = .51; p < .001$; and $r = .41; p < .001; t(367) = 7.54; p < .001$). The subscale Understanding, on the contrary, has more in common with reflection ($r = .54; p < .001$) than with rumination ($r = .44; p < .001; t(367) = 6.51; p < .001$), although the difference is rather small. Because the RRQ was merely used to validate the LARSS, this measure was dropped from all subsequent analyses.

Results

Preliminary Analyses

To investigate multivariate effects of participants' age, gender, and living arrangement, a MANCOVA was performed, with age as covariate, gender and living arrangement as fixed factors, and all study variables as dependent variables. This yielded a significant multivariate effect of gender (Wilks' $\lambda = .92; F(7,342) = 3.99, p < .001$), but no overall age effects (Wilks' $\lambda = .98; F(7,342) = .89, ns$) or effects of living arrangement (Wilks' $\lambda = .99; F(7,342) = .34, ns$). Follow-up analyses indicated that women scored higher than men on depressive symptoms and all rumination measures (except for the subscale Understanding) (see Table 1).

[Insert Table 1 about here]

Table 2 presents correlations among loneliness, depressive symptoms, and rumination components. As expected, we found a high correlation between peer-related loneliness and depressive symptoms ($r = .58, p < .001$), and a lower ($t(367) = 8.53, p < .001$), but still significant correlation between parent-related loneliness and depressive symptoms ($r = .23, p < .001$). Additionally, peer-related loneliness had a significant positive correlation with all rumination subscales, whereas parent-related loneliness was unrelated to these rumination subscales. Furthermore, the three rumination subscales were highly associated with each other and with the total rumination score. Finally, peer-related loneliness and depressive symptoms were more strongly associated with Uncontrollability than with Causal analysis (for peer-related loneliness: $t(367) = 9.77, p < .001$; for depressive symptoms: $t(367) = 6.99, p < .001$) and with Understanding (for peer-related loneliness: $t(367) = 5.92, p < .001$; for depressive symptoms: $t(367) = 3.28, p < .001$).

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[Insert Table 2 about here]

Mediation Analyses

The intervening role of rumination in the relationship between loneliness and depressive feelings was examined by means of path analysis using LISREL 8.54 (Jöreskog & Sörbom, 1993). Gender was controlled for by allowing paths from gender to all other variables in the model. Three models were estimated and compared: (a) a direct effects model including the direct effects of loneliness on depressive symptoms; (b) a full mediation model in which loneliness is only indirectly related to depressive symptoms through the hypothesized mediator (i.e., rumination); and (c) a partial mediation model including direct paths from loneliness to depressive symptoms and indirect paths through rumination.

The direct effects model (a) was saturated (i.e., it had zero degrees of freedom), and, by definition, provided a perfect fit to the data. In this model, peer-related loneliness ($\beta = .54; p < .001$) was a stronger predictor of depressive symptoms than parent-related loneliness ($\beta =$

.16; $p < .01$). Next, we tested the full mediation model (b) by including paths from parent- and peer-related loneliness to rumination and from rumination to depressive feelings. This model showed an insufficient fit to the data ($SBS-\chi^2(2) = 37.90$ ($p < .001$); CFI = .42; RMSEA = .23). Subsequently, the partial mediation model (c) was tested, by adding paths from parent- and peer-related loneliness to depressive feelings. Allowing these direct paths resulted again in a saturated model with perfect fit. However, the path from parent-related loneliness to rumination did not reach significance, and, subsequently, was trimmed from the model. This final model, represented in Figure 1a, had a near-perfect fit to the data ($SBS-\chi^2(1) = 0.38$ (*n.s.*); CFI = 1.00; RMSEA < .01). To assess the significance of the indirect effect of peer-related loneliness over rumination on depressive feelings, the Sobel (1982) test was performed, which resulted in a significant value ($z = 3.30$; $p < .001$). In sum, the strong association between peer-related loneliness (but not parent-related loneliness) and depressive symptoms was partially explained by rumination.

[Insert Figure 1 about here]

To investigate which rumination subscale (i.e., Causal analysis, Understanding, or Uncontrollability) acted as the strongest mediator in the relationship between loneliness and depressive feelings, we repeated the mediation analysis with the separate rumination subscales as mediators. The full mediation model showed a less than optimal fit to the data ($SBS-\chi^2(2) = 40.14$ ($p < .001$); CFI = .87; RMSEA = .23), and the partial mediation model resulted in a saturated model. Inspection of the individual paths in the partial mediation model showed that only peer-related loneliness (and not parent-related loneliness) predicted all three rumination components significantly. However, only the subscale Uncontrollability showed a significant path towards depressive symptoms. The non-significant paths were trimmed from the model, resulting in the more parsimonious model as shown in Figure 1b ($SBS-\chi^2(5) = 8.16$ (*n.s.*); CFI = 1.00; RMSEA = .04). The Sobel (1982) test indicated that the indirect effect

of peer-related loneliness over Uncontrollability on depressive feelings was significant ($z = 3.93; p < .001$). In sum, the rumination subscale Uncontrollability (and not Causal analysis or Understanding) was found to be a partial mediator in the relationship between loneliness and depressive symptoms.

Because directionality cannot be empirically tested in a cross-sectional design, we tested an alternative model in which ruminative thoughts predicted depressive symptoms, which, in turn, predicted parent- and peer-related loneliness. This alternative model was compared to our final model, using the Akaike information criterion (AIC; Keith, 2006), where a smaller AIC value indicates a better fit. Based on Raftery's (1995) criterion, suggesting that an AIC difference of 10 points or more is strong, we rejected the alternative model in favor of our final model ($\Delta AIC = 24.58$).

Moderation Analyses

We conducted hierarchical regression analyses with two-way interaction terms to investigate whether rumination could act as a moderator between feelings of loneliness and depressive symptoms. Loneliness and rumination scores were centered, and interaction terms were computed by multiplying the centered means (Aiken, West, & Reno, 1991).

In a first step, gender was entered as a control variable, which resulted in a significant prediction of depressive symptoms ($\beta = .16; p < .01$). In a second step, main effects of parent- and peer-related loneliness on depressive symptoms were examined. Both main effects explained an additional significant portion of the variance in depressive symptoms, with peer-related loneliness ($\beta = .54; p < .001$) acting as a stronger predictor than parent-related loneliness ($\beta = .17; p < .001$). In a third step, the moderator variable (i.e., rumination) was included, which also added significantly to the prediction of depressive symptoms ($\beta = .22; p < .001$). In a last step, both interaction terms (that involved rumination and parent- and peer-related loneliness, respectively) were entered. Only the interaction term with parent-related

loneliness ($\beta = .09$; $p < .05$) reached significance. Thus, rumination interacted with parent-related loneliness, but not with peer-related loneliness, in the prediction of depressive symptoms.

To interpret this interaction, simple slopes of parent-related loneliness predicting depressive symptoms were examined at low (1 *SD* below the mean) and high (1 *SD* above the mean) levels of the moderator (i.e., rumination). Whereas parent-related loneliness did not significantly predict depressive symptoms at low levels of rumination (simple slope = 0.08; $t = 1.30$; *n.s.*), parent-related loneliness did significantly predict depressive symptoms at high levels of rumination (simple slope = .24; $t = 4.00$; $p < .001$). In other words, loneliness in the relationship with parents is associated with depressive feelings only when accompanied by a high amount of ruminative thinking about these feelings of loneliness. Figure 2 gives a graphical representation of these simple slopes.

[Insert Figure 2 about here]

In an ancillary set of analyses, we explored which of the three rumination subscales (i.e., Causal analysis, Understanding, and Uncontrollability) acted specifically as a moderator in the relationship between parent-related loneliness and depressive feelings. Therefore, we performed a set of three moderator analyses (i.e., one for each rumination subscale), following the same four steps as described above. Including the three subscales as a moderator in Step 3 added significantly to the prediction of depressive symptoms in each analysis, with, as expected, Uncontrollability ($\beta = .44$; $p < .001$) being a stronger predictor than Causal analysis ($\beta = .23$; $p < .001$) and Understanding ($\beta = .22$; $p < .001$). Interaction terms of parent-related loneliness with each rumination subscale were entered at Step 4. The interaction terms with Causal analysis ($\beta = .11$; $p < .05$) and Uncontrollability ($\beta = .13$; $p < .01$) reached significance, whereas the interaction term with Understanding ($\beta = .07$; *n.s.*) did not. Simple slopes analyses showed that parent-related loneliness only predicted depressive symptoms at

high levels of Causal analysis (simple slope = 0.27; $t = 4.43$; $p < .001$) and Uncontrollability (simple slope = 0.26; $t = 5.60$; $p < .001$), and not at low levels of Causal analysis (simple slope = 0.08; $t = 1.29$; $p < .001$) or Uncontrollability (simple slope = .05; $t = .10$; *n.s.*). We can conclude, therefore, that two out of the three subscales moderated the relationship between parent-related loneliness and depressive symptoms.

Discussion

This study was the first to explore whether rumination acted as a mediator or moderator in the relationship between loneliness and depressive symptoms, measuring both loneliness and rumination in multidimensional fashion. More specifically, we examined loneliness in the relationship with both peers and parents (Goossens et al., 2009) and we investigated the separate role of three components of rumination: Causal analysis, Understanding, and Uncontrollability (Raes et al., 2008). Our results indicated that rumination partially mediated the relationship between peer-related loneliness and depressive symptoms, and moderated the relationship between parent-related loneliness and depressive feelings. In addition, our results revealed that the most harmful component of rumination was Uncontrollability, suggesting that the process of rumination itself is more important than the actual content of one's ruminative thoughts. Finally, as expected, we found that both types of loneliness were experienced very differently, with peer-related loneliness having a greater negative impact on students' well-being than parent-related loneliness.

Rumination as a Mediator and Moderator Between Loneliness and Depression

Our mediation analyses indicated that when college students felt lonely in their relationship with peers, they tended to ruminate about it, which was associated with depressive symptoms. In addition, this was especially the case when these ruminative thoughts were perceived as uncontrollable. Our moderation analyses showed that when college students felt lonely in the relationship with their parents and when, on top of that, they

could not help but ruminating about the causes of these feelings, they were more vulnerable to depressive symptoms. Taken together, our results suggest that ruminative thoughts about loneliness may be an important element in understanding what makes lonely adolescents vulnerable for depressive symptoms.

The differences we found between the three components of rumination demonstrated the need to consider rumination as a multifaceted construct. The fact that we found the uncontrollability – rather than the content – of ruminative thoughts about parent- and peer loneliness to be particularly harmful, is in line with previous research (e.g., Raes et al., 2008), and supports the idea that this component is most closely related to the maladaptive aspects of rumination. This finding is also in line with the notion that beliefs that ruminators hold about their own thinking style (i.e., meta-rumination) can play an important role in determining the outcomes of rumination (Papageorgiou & Wells, 2003). More specifically, individuals can initially engage in rumination because they believe in the benefits of rumination (e.g., to find the causes of one's loneliness). However, this engagement can result in harmful consequences of ruminating and the experience that this ruminative thinking is beyond their own control. The meta-rumination theory states that especially these negative beliefs about rumination will in turn increase depressive feelings (Papageorgiou & Wells, 2003). Trying to understand oneself and one's loneliness, on the contrary, was more related to adaptive reflection than to maladaptive rumination, which could explain why Understanding did not function as a mediator or moderator between loneliness and depression in the present study. Indeed, previous research investigating rumination and reflection as a mediator between childhood emotional abuse and depressed mood showed that only rumination, and not reflection, functioned as a mediator (Raes & Hermans, 2008). Further research is needed to replicate these findings.

Differences Between Parent- and Peer-Related Loneliness

Our results clearly indicated that parent-related and peer-related loneliness need to be distinguished in emerging adulthood. As expected, depressive symptoms were more strongly associated with peer-related loneliness than with parent-related loneliness. In addition, all rumination subcomponents were significantly associated with peer-related loneliness, whereas there were no associations with parent-related loneliness. This finding is in line with the assumption that peer-related loneliness is a more stressful problem than parent-related loneliness because of the typical relationship shifts in this age period (Oswald & Clark, 2003; Stroebe et al., 2002). This result is also consistent with the close relationship theory (Laursen & Bukowski, 1997), which argues that loneliness may be more threatening in a possibly impermanent peer relationship than in a permanent parent relationship.

The fact that mediation (and not moderation) occurred in the relation between peer-related loneliness and depression and moderation (and not mediation) in the relation between parent-related loneliness and depression, can be explained both theoretically and statistically. Theoretically, our results are in line with the titration hypothesis forwarded in the vulnerability-stress model (Abramson et al., 1997), as discussed in the Introduction. Statistically, and closely related to the previous explanation, mediation is most suitable in the case of a strong relationship, whereas moderation is most suitable in the case of a weak relation between the predictor and criterion variable (Baron & Kenny, 1986). Indeed, in our study, we found rumination to mediate the strong direct relationship between peer-related loneliness and depression, and we found rumination to moderate the weaker relationship between parent-related loneliness and depressive symptoms.

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Clinical Implications

Provided that the present findings are replicated in independent samples, the present study can have implications for clinical prevention and intervention programs. Our results stressed the importance of ruminative thoughts about one's loneliness for the development of

depressive symptoms, especially when these ruminative thoughts are perceived as beyond one's control. More specifically, uncontrollable ruminative thoughts can partly explain why peer-related loneliness gives rise to more depressive symptoms, and they are a condition under which parent-related loneliness brings about depressive symptoms. Therefore, reducing uncontrollable ruminative thoughts about loneliness, or changing people's perceptions about the control over their ruminative thoughts, should be an important goal in intervention programs of loneliness, or in prevention programs of depression. Reducing uncontrollable ruminative thoughts about loneliness (or sadness) might end the vicious circle that results in continued feelings of loneliness or sadness. Given the fact that the transition to college life is a risk period in terms of experiencing loneliness and depressive symptoms (Kenny & Sirin, 2006; Stroebe et al., 2002), more attention should be given to students' emotional support and counseling.

Limitations and Suggestions for Future Research

Although the present paper revealed several interesting findings, some limitations need to be mentioned. First, participants were mainly Caucasian female college students. A more balanced sample in terms of gender, educational level, and ethnic background would be more appropriate to generalize our findings to the broader population of emerging adulthood. Also, our research questions would be interesting to investigate in a clinical population. Second, our study relied exclusively on self-report measures. Such an approach can cause shared method variance, which, in turn, might partially account for the effects obtained. However, the variables of interest in this paper are internal and subjective processes, which are most appropriate to be investigated by use of self-report measures. Third, other mediators or moderators that modulate the relationship between loneliness and depressive symptoms should be investigated, given the fact that rumination only explains a small part of the association between loneliness and depressive symptoms. Fourth, [the instructions of our](#)

rumination on loneliness measure could be further improved in future research, as they may emphasize the role of peers in one's sense of loneliness, relative to family members. Finally, a cross-sectional design was used, making it impossible to make statements about the direction of effects. In this study, loneliness is assumed to be an antecedent of depressive symptoms, in accordance with the dominant path described in the literature, that goes from social vulnerability and loneliness to depressive symptoms. Nevertheless, other theories recognize the importance of the opposite path, which states that depressive episodes produce an array of interpersonal problems and cause damage in close relationships, which might give rise to loneliness (Joiner, 2000). Empirical evidence on the dynamics between loneliness and depressive symptoms is scarce and shows mixed results (e.g., Cacioppo, Hawkley, & Thisted, 2010; Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Lasgaard, Goossens, & Elklit, in press; Weeks, Michela, Peplau, & Bragg, 1980). Hence, longitudinal research on this topic is needed.

Despite these limitations, the present study indicated that rumination acted as an underlying mechanism in the association between loneliness and depressive symptoms in first-year college students. Specifically, rumination partially mediated the relationship between peer-related loneliness and depressive symptoms, and moderated the relationship between parent-related loneliness and depressive symptoms. Uncontrollability was found to be the most harmful subcomponent of rumination, suggesting that lonely adolescents are particularly vulnerable to depressive symptoms when they experience their ruminative thoughts about loneliness as beyond their control.

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Table 1

Mean Differences as a Function of Gender

	Full sample	Men	Women	<i>F</i> (1,353)
Scale	Mean (SD)	Mean (SD)	Mean (SD)	
Parent-related loneliness	1.55 (0.51)	1.65 (0.49)	1.53 (0.51)	3.20
Peer-related loneliness	1.71 (0.49)	1.63 (0.51)	1.73 (0.49)	1.87
Depressive symptoms	0.60 (0.42)	0.45 (0.34)	0.63 (0.43)	9.43**
Rumination (Total)	2.70 (0.87)	2.42 (0.64)	2.76 (0.89)	7.39**
Causal analysis	2.99 (0.90)	2.72 (0.69)	3.04 (0.93)	6.17*
Understanding	2.45 (0.92)	2.42 (0.70)	2.46 (0.96)	0.07
Uncontrollability	2.72 (1.06)	2.16 (0.81)	2.82 (1.07)	19.15***

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

Table 2

Intercorrelations Among Loneliness, Depressive Symptoms, and Rumination

Deleted: Study Variables

Variable	2	3	4	5	6	7
1. Parent-related loneliness	.13*	.23***	.06	.02	.09	.05
2. Peer-related loneliness		.58***	.26***	.19***	.17**	.32***
3. Depressive symptoms			.37***	.26***	.24***	.47***
4. Rumination (Total)				.93***	.89***	.89***
5. Rumination (Causal Analysis)					.80***	.74***
6. Rumination (Understanding)						.62***
7. Rumination (Uncontrollability)						

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

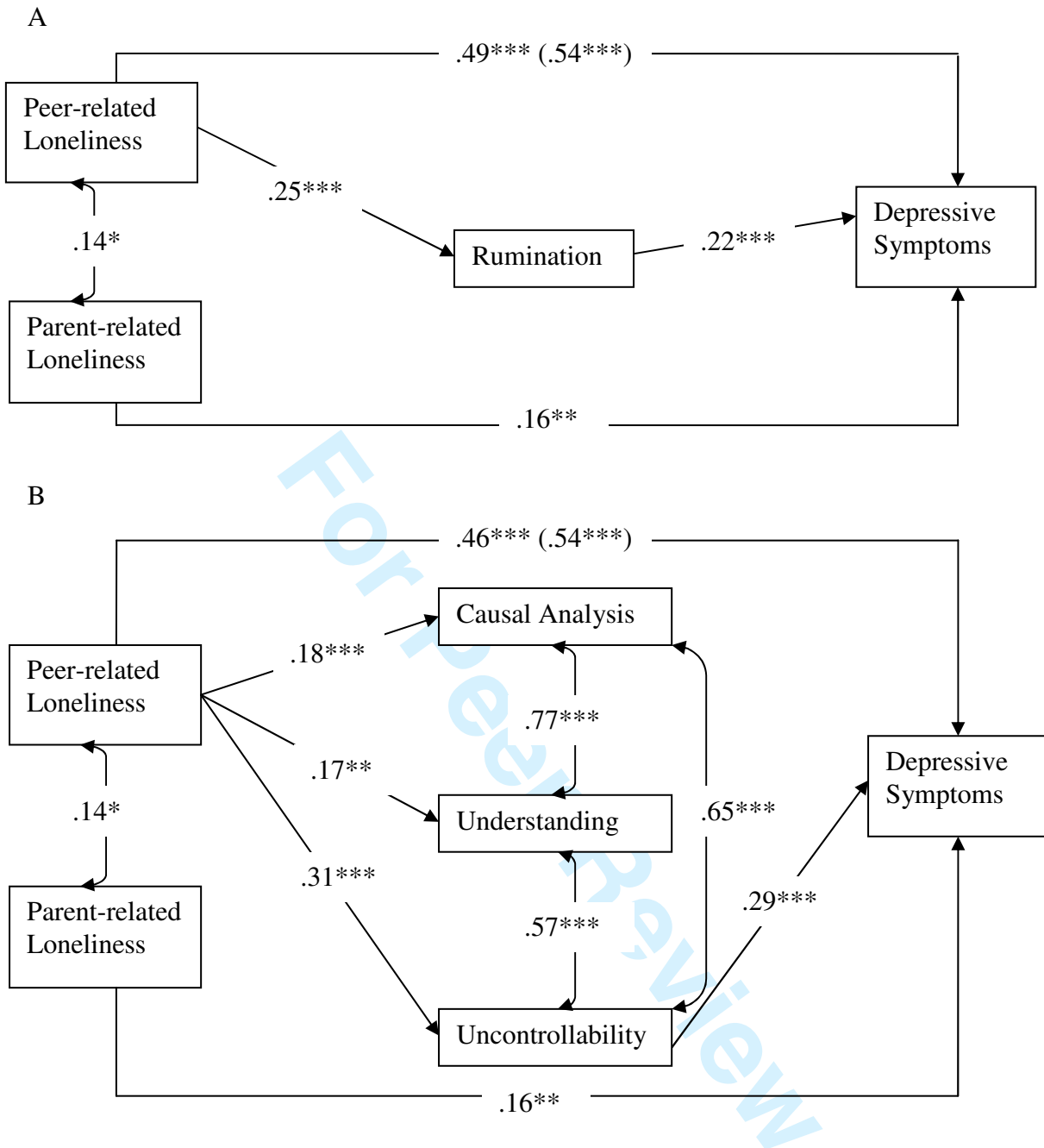


Figure 1. Trimmed partial mediation model with total rumination scale (panel A) and three rumination subscales (panel B) as mediator.

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

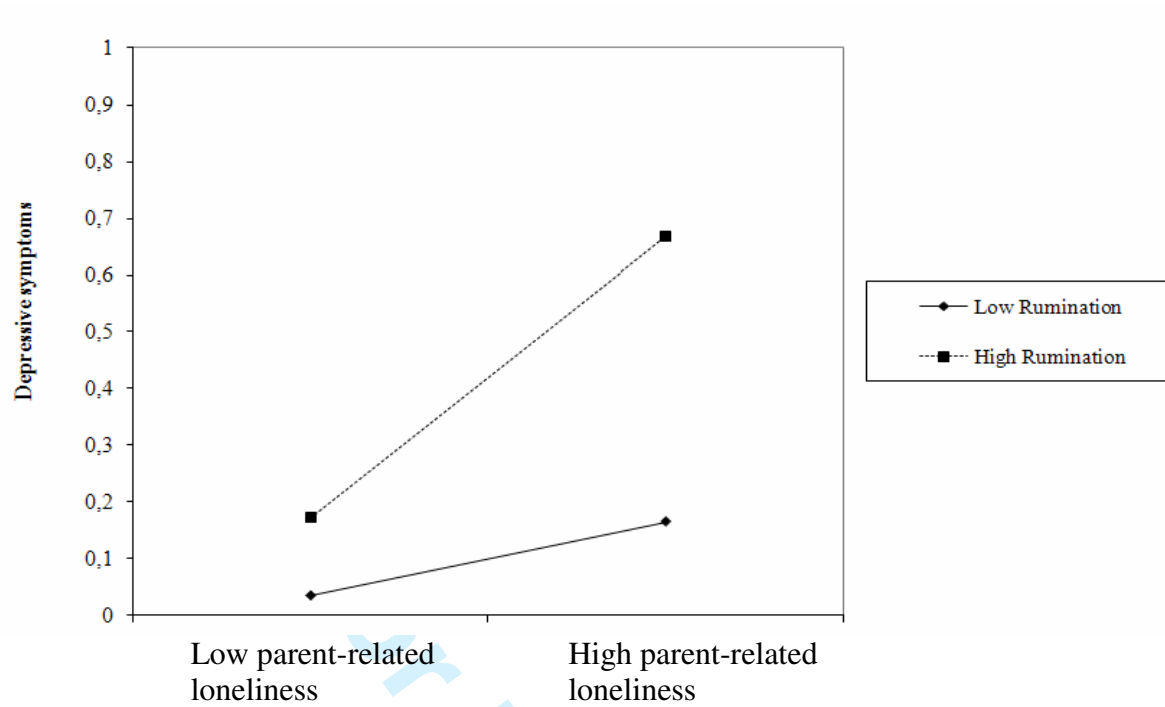


Figure 2. Simple slopes of parent-related loneliness predicting depressive symptoms at low (1 SD below the mean) and high (1 SD above the mean) levels of ruminative thinking.