

Running head: INCREASED FOCUS ON MOTHER AND DEPRESSIVE SYMPTOMS

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**Repetitive thinking about the mother during distress moderates the link between children’s attentional breadth around the mother and depressive symptoms in middle childhood**

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### **Abstract**

It has been suggested that an increased attentional focus on the mother should be maladaptive in middle childhood. However, the effect of a more narrow attentional field around the mother may depend on the mother-child relationship. The current study tested whether a more narrow attentional field around the mother is mainly maladaptive for children who tend to think repetitively about their mother (RTm) during distress. More specifically, it investigates whether RTm during distress provides the context in which an increased attentional focus on the mother is linked to depressive symptoms in middle childhood. RTm was measured using a self-report questionnaire. The breadth of children's attentional field around the mother was measured with the Attentional Breadth Task. This computer task assesses the extent to which children have a more narrow attentional field around the mother compared to unfamiliar women. Results of the current study ( $N = 157$ ) support the hypothesis that 9 to 12 year old children who have a more narrow attentional field around the mother and who at the same time report more RTm during distress, have more depressive symptoms.

Keywords: repetitive thinking about the mother; attentional breadth; increased focus on the mother; depressive symptoms; middle childhood

**Repetitive thinking about the mother during distress moderates the link between children's attentional breadth around the mother and depressive symptoms in middle childhood**

There is increasing research focusing on vulnerability factors involved in the development of depressive symptoms, one of the leading (mental) health problems in youth (Cuijpers & Smit, 2002; World Health Organization [WHO], 2014; Wulsin, Vaillant, & Wells, 1999). Depressive symptoms become more prevalent from middle childhood onwards (Hammen & Rudolph, 2003; Weller & Weller, 2000) and are, among other factors, influenced by the quality of the relationship with mother (Wenar & Kerig, 2005). Different relationship characteristics can contribute uniquely to children's depressive symptoms, such as children's overdependence in interactions with mother (Allen et al., 2006; Allen, Hauser, Eickholt, Bell, & O'Connor, 1994). Children are considered to be overly dependent on mother when they display an elevated need to remain close to mother at the expense of healthy exploration in non-threatening circumstances (Cassidy, 1994). The same is true when they overly rely on mother during challenges which their cognitive maturation should allow them to autonomously solve (Mayseless, 2005). It has been argued that overdependence can for example be observed as children's increased tendency to focus their attention on the mother (Cassidy & Berlin, 1994; Main, 2000). This is proposed to be part of a maladaptive relational strategy on which children rely to regulate distress (Bowlby, 1973; Cassidy, 1994). Especially in middle childhood an increased attentional focus on the mother has always been considered to be a developmental risk factor because in this age period becoming autonomous is a crucial developmental task (Koehn & Kerns, 2015; Mayseless, 2005). However, recent research, in which the increased attentional focus on the mother was measured as the breadth of children's attentional field around mother, suggests that children's relational context determines whether this focus is maladaptive (Bosmans, Koster, Vandevivere, Braet, &

De Raedt, 2013; Claes, De Raedt, Van de Walle, & Bosmans, 2016). Identifying possible moderators in the relationship between an increased attentional focus on the mother and depressive symptoms is fundamental to improve theory and inform clinical interventions. The current study aims to investigate whether this relationship is moderated by children's repetitive thinking about their mother during distress (see Figure 1). These concepts and this research question will be explained in the following paragraphs.

### **An increased attentional focus on the mother and the breadth of children's attentional field around the mother**

An increased attentional focus on the mother has been studied at different ages in the context of attachment research. In infancy, it can be observed in some insecurely attached infants' behavior as heightened monitoring of the mother and increased looking at the mother in proximity of a stranger (Ainsworth, Blehar, Waters, & Wall, 1978; Cassidy & Berlin, 1994; Main, 2000). Throughout middle childhood, attachment behavior becomes less overt and observable (Mayselless, 2005). Instead, the attachment system is supposed to operate increasingly on the level of covert, cognitive processes, such as cognitive schemas and scripts, cognitive styles and strategies, and information processing like the increased attentional focus on the mother (Bosmans & Kerns, 2015; Main, Kaplan, & Cassidy, 1985). In an attempt to operationalize an increased focus on the mother in middle childhood, Bosmans et al. (2009) measured the breadth of children's attentional field around their mother. This refers to the amount of peripheral information a child encodes when the caregiver is presented as a stimulus centrally in the attentional field (Bosmans, Braet, Koster, & De Raedt, 2009; Easterbrook, 1959). In pre-attentive stages of processing (measurable at stimulus presentations of 34 ms) the motivational or emotional relevance of the mother can narrow this attentional field. This is called the attentional

narrowing effect and can be compared to tunnel vision (Derryberry & Tucker, 1994; Easterbrook, 1959).

In middle childhood, normally developing children direct their attention increasingly away from mother in favor of exploration, in order to promote autonomy and other developmental tasks in adolescence (Koehn & Kerns, 2015; Mayseless, 2005). In contrast, theory proposes that children may be increasingly at risk of displaying depressive symptoms when they maintain the attentional focus on the mother. This focus could reduce cognitive capacity needed to succeed in adolescent developmental tasks (Heylen et al., 2015). First, it is supposed to impair their ability to explore (Bosmans, Dujardin, Field, Salemink, & Vasey, 2015; Dujardin, Bosmans, De Raedt, & Braet, 2015). Second, it is supposed to intensify distress about potential lack of maternal support (Cassidy, 1994; Shaver & Mikulincer, 2002).

Research on the attentional narrowing effect found first indications that a more narrow attentional field around the mother is a maladaptive feature of the mother-child relationship in middle childhood as it has been linked with reduced support seeking behavior during distress (e.g., Bosmans, Braet, Heylen, & De Raedt, 2015). However, additional research suggested that, instead of being a uniformly maladaptive feature, the effect of a more narrow attentional field around the mother on children's adjustment depends on how children perceive the relationship with their mother. For example, it was repeatedly demonstrated that a more narrow attentional field around the mother can be found in children with high as well as low levels of trust in maternal support and that these levels predicted the nature of its effect (Bosmans et al., 2013; Claes et al., 2016). More specifically, only when individuals had a more narrow attentional field around the mother, trust in maternal support predicted the prevalence of emotional and behavioral problems in middle childhood (replicated in two samples in Bosmans et al., 2013), and non-suicidal self-injury in young adults (Claes et al., 2016). So, children with a more narrow

attentional field and at the same time less trust in maternal support had more emotional and behavioral problems whereas children with a more narrow attentional field and at the same more trust in maternal support had less emotional and behavioral problems. Bosmans et al. (2013) explained the finding as follows:

This suggests that a strong attentional focus on mother when she is expected to be unavailable could reflect maladaptive rumination, while the same focus on a mother that is considered as available might guide children to seek her adaptive support more easily. (p.836)

This moderation effect might on the one hand reflect the fact that an increased attentional focus on the mother is a protective factor for children who are confident that they can seek their mother's support during distress. This hypothesis is in line with other areas of attentional narrowing research where awareness increases that the meaning of cognitive narrowing and broadening depends on the motivational goal reflected by the stimulus in the center of the attentional field (for a review, see Kaplan, Van Damme, & Levine, 2012). More specifically, they found that whether a more narrow cognitive focus is elicited depends on the relevance of the stimulus for attaining a goal (or prevent a loss), independently from the positive or negative valence of the stimulus. On the other hand, these authors proposed that an increased attentional focus on the mother could be a risk factor for children who perceive their mother as unavailable during distress and, therefore, have to rely on maladaptive regulation strategies. So, whether an increased attentional focus on the mother is a risk or a protective factor might be determined by children's relational strategies to regulate distress. Given this line of reasoning on conditional effects of attentional narrowing outcomes, the current study decided to directly test the hypothesis that children's repetitive thinking about the mother during distress moderates the association between attentional narrowing around the mother and depressive symptoms.

### **Children's repetitive thinking about the mother**

However, the previous studies did not allow drawing such conclusions because they relied on a measure of trust in maternal support that did not directly reflect children's relational strategies to regulate distress. Interestingly, Van de Walle, Bijttebier, De Raedt, Heylen, & Bosmans (2014) and Van de Walle, Bijttebier, Braet, & Bosmans (2016) investigated in two independent samples whether children's repetitive thinking about the mother (RTm) during distress could be a mechanism in the link between less trust in maternal support and depressive symptoms. Segerstrom, Stanton, Alden, and Shortridge (2003) defined repetitive thought as the "process of thinking attentively, repetitively or frequently about one's self and one's world" (p. 909). This is supposed to be a general, maladaptive cognitive process as it interferes with individuals' adaptive ability to flexibly shift their focus between different stimuli and thoughts (Ottaviani, Shapiro, & Couyoumdjian, 2013). Convergent evidence shows that repetitive thinking is involved in the onset and maintenance of depressive symptoms (Ehring & Watkins, 2008; Watkins, 2008). Van de Walle, Bijttebier, De Raedt, et al. (2014) and Van de Walle, Bijttebier, Braet, et al. (2016) demonstrated that the link between less trust in maternal support and more depressive symptoms was partially mediated by more RTm during distress. More specifically, children with less trust indicated that, during distress, they had more frequent thoughts about the mother that they experienced as repetitive, intrusive, and difficult to disengage from, as capturing cognitive capacity, and as being unproductive. Moreover, RTm during distress explained a substantial percentage of shared variance in the link between less trust and depressive symptoms (Van de Walle, Bijttebier, Braet, et al., 2016; Van de Walle et al., 2014), even over and above repetitive thinking about negative affect (Van de Walle, Bijttebier, Braet, et al., 2016). This suggests that RTm and repetitive thinking about negative affect are related, but different,

maladaptive cognitive regulation processes. Consequently, it seems reasonable to assume that the maladaptive effect of a more narrow attentional field around the mother could depend on the extent that children are caught in thoughts about their mother when they are distressed.

### **The current study**

Therefore, RTm during distress may be a more adequately operationalized indicator to test the hypothesis that the association between the attentional narrowing effect and depressive symptoms depends on how cognitively occupied children are with their mother during distress. In the current study, we measured in a group of 9 to 12 year old children a) the breadth of their attentional field around the mother, and b) RTm during distress. We predicted that a more narrow attentional field around the mother would be significantly more maladaptive in the context of RTm during distress. As a consequence, we predict most depressive symptoms for children who simultaneously show a more narrow attentional field around the mother and report more RTm during distress. Additionally, children's depressive symptoms were reported by multiple informants, namely mother and child, to evaluate inflation of the results by reporter bias. Finally, analyses were repeated with a compound score for depressive symptoms that was calculated across the informants to reflect the overall extent of child depressive symptoms both informants agreed upon.

## **Method**

### **Participants**

In this study, 157 children (52% girls) aged 9 to 12 years old ( $M = 10.93$ ,  $SD = 0.88$ ) and their mothers participated. This is the same sample as in Study 2 of Van de Walle et al. (in press).



Most of the children lived with both parents (76%). Mother was a primary caregiver in the first three years of life for 97% of the participating children. With regard to education, 21% of the mothers had an elementary school or high school degree, 36% did specialization studies after high school, and 43% had a university degree, whereas of the fathers, 31% had an elementary school or high school degree, 24% did specialization studies after high school, and 46% had a university degree. The majority of the children and mother were from Belgium (91.1% and 87.2% respectively). The other mothers were originally from Germany (1), Ireland (1), Iran (1), The Netherlands (14), Ukraine (1), Venezuela (1), and South-Korea (1). The other children were originally from Qatar (2), China (1), Iran (1), The Netherlands (8), Venezuela (1), and Vietnam (1).

## Measures

**Attentional narrowing effect.** We used the Attentional Breadth Task (ABT; Bosmans et al., 2009), which was programmed in INQUISIT Millisecond. This computerized experimental task involved a dual-task paradigm. Children were seated in front of a 19" CRT computer screen at a distance of 27 cm using a chin rest. Children were instructed to look at the center of the computer screen.

**Presentation of trials.** In each trial, a picture of the mother or an unfamiliar woman was presented in the center of the computer screen (central stimulus). A target stimulus appeared simultaneously with the picture. For each trial, children first had to identify whether the central stimulus was a picture of the mother or of an unfamiliar woman. Then, they had to indicate on which of eight axes the target stimulus was presented (see Figure 2). Children were presented with 24 practice trials and 128 test trials. For the practice trials, eight trials were presented for 250 ms, and 16 trials were presented for 34 ms. During these trials, the researcher encouraged the

child and gave the child positive feedback when a central and target stimulus were correctly identified. For the test trials, trials were organized in two blocks of 64 stimulus presentations for 34 ms, separated by a short break.

*Stimuli.* For the central stimulus, all pictures were 3 cm wide by 4 cm high, zoomed in on the face, and showed neutral facial expressions and no teeth to prevent salience effects. There were 10 pictures of 10 different unfamiliar women and 10 different pictures of the mother. The target stimulus was a smaller black circle (diameter of 1.3 cm). This was presented in one of 16 grey dots (diameter of 2 cm), which were arranged in pairs on eight imperceptible axes around the picture. This way, the target stimulus could appear either close to (at 4.5 cm, visual angle of  $10^\circ$ ) or far from (at 11.2 cm, visual angle of  $25^\circ$ ) the picture. By combining two picture types and two distances, there were four target stimulus presentation categories: mother close, mother far, unfamiliar woman close, and unfamiliar woman far. Each category contained 16 test trials that were randomly presented per block.

*Calculation.* To calculate the attentional narrowing effect, several steps had to be taken. First, all trials in which the child identified the picture incorrectly were deleted. As the correct identification of the central stimulus is only possible when children looked at the center of the screen, deleting trials with incorrectly identified central stimuli ensured that no trials were used in which the child might have coincidentally or purposefully gazed at the target stimulus' location. Then, the proportion of correct responses was calculated for each target stimulus presentation category: mother close, mother far, unfamiliar women close, and unfamiliar women far. For mother and unfamiliar women trials separately, the proportion of correct responses on far trials was subtracted from the proportion of correct responses on close trials. This resulted in two attentional narrowing indices, one for the mother and one for unfamiliar women. Higher attentional narrowing indices reflected that target stimuli were less often correctly located in far

trials compared to close trials, and thus, a more narrow attentional field. The assumption was that target stimuli were in general more difficult to correctly locate in far than in close trials, but also that there would be individual differences in the extent to which central stimuli could increase errors in locating target stimuli in far trials. Finally, the attentional narrowing effect that was used in the analyses was calculated by subtracting the attentional narrowing index for the unfamiliar women from the attentional narrowing index for the mother. This way, the attentional narrowing effect reflected the difference between the breadth of children's attentional field around the mother compared to the breadth of their attentional field around unfamiliar women. Higher levels of the attentional narrowing effect imply a more narrow attentional field around the mother compared to unfamiliar women.

**Repetitive thinking about the mother (RTm).** The Perseverative Thinking about Mother Questionnaire (PTMQ; Van de Walle et al., in press) captured the process characteristics (e.g. repetitiveness, intrusiveness and difficulty to disengage) and the dysfunctional effects of thinking about the mother in unpleasant times or when experiencing some problems. The child scored 15 items (e.g. When I am going through an unpleasant time or am experiencing some problems: "...I feel as if I must keep thinking about my mother.", "...I keep thinking about my mother all the time.", "...I think about my mother without it helping me solve any of these problems.", "...my thoughts about my mother prevent me from focusing my attention on other things.") on a 5-point Likert scale ranging from 0 (*almost never*) to 4 (*almost always*), which were averaged to a mean RTm score. Van de Walle et al. (in press) found that a one-factor solution fitted the data best. Moreover, RTm was related to repetitive thinking about negative affect, but explained a unique proportion of the variance in depressive symptoms in middle childhood. In the current, same sample, the internal consistency of RTm ( $\alpha = .90$ ) was very good according to the criteria of DeVellis (2003).

**Depressive symptoms.** Self-reported depressive symptoms were assessed with the Children's Depression Inventory (CDI; Kovacs, 2003; Dutch translation by Timbremont & Braet, 2002). For each of the 27 items of this questionnaire the participants were asked to choose the option that fitted best over the past two weeks from three descriptions (e.g. "I feel like crying every day/many days/sometimes."). The items were scored on a 3-point rating scale ranging from 0 to 2, with higher scores reflecting a more severe cognitive, affective or behavioral symptom of depression. A mean score for self-reported depressive symptoms was calculated across all 27 items. This mean score can discriminate children with major depressive disorders from non-depressed children (Kovacs, 2003). A cut-off mean score of 0.59 maximizes the specificity and sensitivity of the Dutch version of the CDI (Theuwis, Braet, Roelofs, Stark, & Vandevivere, 2013). Overall, the CDI is a reliable and valid questionnaire (Kovacs, 2003; Saylor, Finch, Spirito, & Bennett, 1984). In the current sample, self-reported depressive symptoms had a very good internal consistency ( $\alpha = .81$ ).

Mother-reported depressive symptoms of the child were assessed with The Withdrawn-Depressed subscale of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). The whole questionnaire was administered but only this subscale was used. For each of the 8 items (e.g., "There is little that he/she likes."), mothers indicated the frequency of the problem behavior on a 3-point scale (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or often true*). These 8 items were averaged so that a higher mean score reflected more mother-reported depressive symptoms. This score can discriminate children with major depressive disorder or dysthymic disorder from children without these diagnoses (Ebesutani et al., 2010). Overall, the CBCL is a valid and reliable questionnaire (Achenbach & Rescorla, 2001). In the current sample, mother-reported depressive symptoms had a respectable internal consistency ( $\alpha = .73$ ).

To calculate a multi-informant compound score, a principal component analysis was performed in SPSS based on the mean scores for self-reported (CDI) and mother-reported (Withdrawn-Depressed scale of the CBCL) depressive symptoms (see Braet, Van Vlierberghe, Vandevivere, Theuwis, & Bosmans, 2013). One factor with an eigenvalue higher than 1 (1.31) was extracted with both informants' scores loading .81 on this factor. Individual scores on this factor reflected the common variance between the means for self-reported and mother-reported depressive symptoms, or in other words, the overall extent of child depressive symptoms upon which children and their mothers agreed.

## **Procedure**

To invite children and their mothers to our study, we distributed flyers with information about the study in the classrooms of the 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> grade of 16 Belgian primary schools. Because both mother and child had to come to either of two research locations for an assessment that was part of a broader study on attachment, attachment-related information processing biases and depression, letters were only distributed in schools in the vicinity of these locations. Free parking and a reward for participating (two movie theatre tickets and the chance of getting an mp3-player) were promised to each mother-child dyad. To this flyer 178 mothers and children responded, requesting more information about the study. Of these 178 mothers and children, 157 participated after being contacted (88% of the mothers and children who responded). Upon arrival, active informed consent was obtained from both the child and the mother. Then, pictures of the mother for the ABT were taken with a digital camera. The measures for the child were administered in a fixed order (ABT, CDI, and PTMQ), among the other measures of the broader assessment. The local ethics committee approved the study design.

## Results

### Preliminary analyses

All ABT trials in which the child identified the picture incorrectly were excluded from analyses. This way, 7% of the ABT trials were removed. For self-reported depressive symptoms, 6.2% of the children scored equal to or above the cut-off score. For mother-reported depressive symptoms, 7.6% of the children scored in the subclinical range, and 4.5% scored in the clinical range. There were 0.55% of the values missing on the questionnaire items. A total score was not computed for questionnaire scales with missing values. This way, listwise deletion would reduce the sample by 18 cases, as only 139 cases had complete data. Little's MCAR test was not significant ( $X^2(11) = 9.758, p = .552$ ), indicating that the values on the scales relevant to this study were missing completely at random. Therefore, expectation maximization was used to estimate and replace these missing values, resulting in  $N = 157$  for all subsequent analyses.

### Associations between the attentional narrowing effect, RTm and depressive symptoms

In Table 1, descriptive statistics and zero-order correlations between all the variables are presented<sup>1</sup>. The mean, standard deviation, minimum and maximum for the attentional narrowing effect were in line with previous studies. There were no significant correlations with age, nor were there any gender differences. The attentional narrowing effect did not correlate with any of the variables. RTm correlated positively with self-reported depressive symptoms, but not with mother-reported depressive symptoms. However, the correlation between RTm and the multi-informant compound score for depressive symptoms was significant.

### **Interaction between the attentional narrowing effect and RTm in the prediction of depressive symptoms**

Hierarchical multiple regression analyses were conducted in SPSS to test for the interaction between the attentional narrowing effect and RTm in the prediction of depressive symptoms. To increase interpretability of the findings, all variables were first standardized. Three separate regression analyses were conducted predicting depressive symptoms according to self-report, according to mother-report, and according to the multi-informant compound score respectively. As expected and in line with previous research (Bosmans et al., 2013; Claes et al., 2016), results showed that there were no main effects of the attentional narrowing effect for depressive symptoms. There was a main effect of RTm for self-reported depressive symptoms, and the multi-informant compound score for depressive symptoms, but not for mother-reported depressive symptoms ( $\beta = .13, t(153) = 1.65, p = .10$ ). The predicted interaction effect between the attentional narrowing effect and RTm was found for self-reported depressive symptoms and for the multi-informant compound score for depressive symptoms. There was no significant interaction effect between the attentional narrowing effect and RTm for mother-reported depressive symptoms ( $\beta = .12, t(153) = 1.48, p = .14$ ). The standardized regression weights and their effect sizes for the prediction of self-reported depressive symptoms and the multi-informant compound score can be found in Table 2.

To follow-up and visualize these interaction effects, the macro ‘PROCESS’ (Hayes, 2013) was used in SPSS (see Figures 3 and 4). At high levels of RTm (at the value of  $M + 1 SD$ ), the slope was marginally significantly positive for the regression of the attentional narrowing effect on self-reported depressive symptoms and not significant for the regression of the attentional narrowing effect on the multi-informant compound score. At low levels of RTm (at the value of

$M - 1 SD$ ), the slope was significantly negative for the regression of the attentional narrowing effect on self-reported depressive symptoms and on the multi-informant compound score. At high levels of the attentional narrowing effect (at the value of  $M + 1 SD$ ), the slope was significantly positive for the regression of RTm on self-reported depressive symptoms ( $b = 0.17$ ,  $t(153) = 6.34$ ,  $p < .001$ ) and on the multi-informant compound score ( $b = 0.84$ ,  $t(153) = 5.20$ ,  $p < .001$ ). At low levels of the attentional narrowing effect (at the value of  $M - 1 SD$ ), the slope was significantly positive for the regression of RTm on self-reported depressive symptoms ( $b = 0.07$ ,  $t(153) = 2.55$ ,  $p = .012$ ), but not on the multi-informant compound score ( $b = 0.25$ ,  $t(153) = 1.61$ ,  $p = .109$ ).

Children who report more RTm and at the same time show a more narrow attentional field around the mother, have more depressive symptoms. In contrast, when children report less RTm and at the same time show a more narrow attentional field around the mother, they have less depressive symptoms.

## Discussion

Previous research on the breadth of children's attentional field around their mother showed inconsistent evidence regarding the proposition that adaptive development is at risk when children maintain an increased focus on the mother. The aim of the current study was to investigate whether an increased attentional focus on the mother (the attentional narrowing effect) is specifically a vulnerability factor when children tend to think repetitively about their mother when feeling distressed (RTm). This hypothesis was tested in middle childhood because at this age, children are supposed to be able to direct attention away from mother to foster age-appropriate exploration. Results of the current study supported the prediction that RTm during



distress moderates the link between the attentional narrowing effect and depressive symptoms. However, the effects were informant-dependent.

Self-reported depressive symptoms were significantly linked to the interaction between the attentional narrowing effect and RTm: depressive symptoms were most prevalent in children who had a more narrow attentional field around their mother and who at the same time reported more RTm during distress. Additionally, when children reported lower levels of RTm during distress, a more narrow attentional field appeared to protect children against depressive symptoms. In contrast, mother-reported depressive symptoms were not linked with the interaction between the attentional narrowing effect and RTm. This could be because parents are generally less accurate reporters of their child's depressive symptoms (Angold et al., 1987; De Los Reyes & Kazdin, 2005). In support of the hypothesis that less valid mother-report might have suppressed the effects, analyses with the multi-informant depressive symptoms compound score as dependent variable replicated the effects found for child-reported depressive symptoms. As this compound score reflects the overall extent of depressive symptoms children and their mothers agree upon, it is less likely that the effects can be merely contributed to informant bias. Moreover, the multi-method nature of the current study's design further decreases the likelihood that the findings are only a reporter-related artefact.

The current study further supports existing evidence that it is important to nuance the claim that an increased attentional focus on the mother is linked with depressive symptoms in middle childhood. Previous attentional breadth research showed that the maladaptive effect of a more narrow attentional field around the mother is moderated by how children perceive the relationship with their mother (Bosmans et al., 2013; Claes et al., 2016). However, because the latter moderator did not reflect children's relational strategy to regulate distress, it was difficult to interpret these findings. The current study adds to these previous findings by demonstrating that

the association between the attentional narrowing effect and depressive symptoms is moderated by RTm. Regarding RTm, Van de Walle et al. (in press, 2014) already demonstrated that children who think more repetitively about mother are more at risk to display depressive symptoms. The current findings suggest that RTm during distress might be the cognitive background against which a more narrow attentional field is more maladaptive. These findings also contribute to attachment research: the finding that an increased attentional focus on the mother is maladaptive when children remain caught in thoughts about their mother, seems a middle childhood equivalent to Cassidy and Berlin's (1994) and Main's (2000) observation of an increased, inflexible focus on the mother in some insecurely attached infants. However, attachment theory, research, and related interventions have been limited by concerns about precise definition and measurement of these constructs (Bosmans, 2016; Rutter, 2014; Thompson, 2008). The current line of research could help to define more concretely which attachment-related cognitive processes might be involved in the prevalence of psychopathology and how.

The results might also be understood from the vast literature on repetitive thinking showing that repetitive thinking during distress interferes with adaptive problem solving (Ehring et al., 2011; Lyubomirsky, Kasri, & Zehm, 2003; Sari, Koster, & Derakshan, 2016). Following these arguments, the current findings could indicate that an increased attentional focus on the mother additionally depletes the capacity to self-regulate of children that think repetitively about their mother during distress. One reason for this interpretation might be that for these children attentional narrowing around their mother is an information processing mechanism that does not accommodate strategies needed to resolve distress. Instead, as repetitive thinking is known to reflect an inflexible, and therefore maladaptive thought process (Ehring et al., 2011; Ottaviani et al., 2013), the attentional narrowing around the mother observed in children with more RTm

during distress might add to this inflexibility, enhancing overall focus on the mother at the expense of successfully regulating distress.

Additionally, a more narrow attentional field around the mother was linked to significantly less depressive symptoms when children reported lower levels of RTm during distress. While interpreting this finding it is important to be aware that the attentional narrowing effect was measured under emotionally neutral conditions. One possible explanation for this finding is that children with low RTm during distress and a more narrow attentional field around the mother more easily seek support during distress. Such an interpretation is in line with the observation that reduced repetitive thinking creates the cognitive capacity individuals need to rely on adaptive coping strategies (Ehring et al., 2011; Lyubomirsky et al., 2003; Sari et al., 2016). Applied to the current finding, previous research has shown that distress automatically activates individuals' need to be close to primary caregivers (Shaver & Mikulincer, 2007). When faced with distress, children who have a more narrow attentional field around the mother without thinking repetitively about her, can more easily act upon this need. They have the required cognitive capacity to engage upon this urge and formulate constructive appeals for maternal support. Although this seems a reasonable interpretation of this positive effect of attentional narrowing around the mother, future research should further investigate these hypotheses. Interestingly, the moderating effect of RTm on the link between the attentional narrowing effect and depressive symptoms can be understood from dual process models. Both predictors might reflect an increased focus on the mother on different levels of automaticity, or the degree that they are "unintentional, uncontrolled/uncontrollable, goal independent, autonomous, purely stimulus driven, unconscious, efficient, and fast" (Moors & De Houwer, 2006, p. 297). While the attentional narrowing effect occurs so fast (at 34 ms) that it can be considered as reflecting an automatic increased focus on the mother (Bosmans et al., 2009), RTm is measured using self-

report, and might tap into a potentially more controllable increased focus on the mother (Beevers, 2005; Segerstrom et al., 2003; Van de Walle, Bijttebier, Braet, et al., 2016). According to dual process models, while an antagonizing controllable cognitive process can correct an automatic one, congruency between an automatic and controllable cognitive process amplifies their effect on developmental outcomes (Beevers, 2005; Gawronski & Creighton, 2013). Thus, the potentially maladaptive effect of a more narrow attentional field around the mother (automatic process) could be enhanced by RTm during distress (controllable process). Supporting this prediction, the current study found that the combination of a more automatic and more controllable increased focus on the mother predicts the largest prevalence of depressive symptoms. Consequently, this finding contributes to the literature on the maladaptive effect of an increased attentional focus on the mother (e.g. Cassidy & Berlin, 1994; Main, 2000) by demonstrating that this focus consists of different components and that the interplay between these components determines whether such an increased focus on the mother is a liability or a protective factor.

### **Limitations**

Although the current study sheds new light on the role of an increased focus on the mother in the prediction of depressive symptoms, this study has some methodological limitations. As the study had a cross-sectional design, no conclusions can be drawn about the direction or causality of the findings. Longitudinal and experimental designs could inform on the developmental pathways and temporal dynamics of these mechanisms, and thus, possible reverse effects. For example, Grol, Hertel, Koster, and De Raedt (2015) have already successfully applied a procedure in which they manipulated repetitive thinking to examine its influence on attentional breadth around self- and other-related information. This procedure could easily be

adjusted to examine the joint effect of depressive symptoms and RTm on children's attentional field around the mother.

Furthermore, the breadth of children's attentional field was measured under emotionally neutral conditions. This potentially limits the interpretation of the findings with regard to the function of attentional breadth during actual distress. An interesting direction for future research might be to use the original ABT after a stress induction. This way, the breadth of children's attentional field around the mother could be examined under threat- or attachment-related distress.

Also, comparing children's attentional field around their mother to the attentional field around unfamiliar women does not ensure that effects are specific to mother. Instead, it is possible that effects are due to differences between familiar and unfamiliar faces. However, if the current results only reflect familiarity effects, this would not contradict our hypotheses completely: it would still suggest that children cannot direct their attention away from what is familiar and are not able to explore. Nevertheless, it remains important to look for improved research designs in future research to overcome this limitation.

With regard to the RTm questionnaire, there is first promising support of the validity of this novel research instrument in two different samples (Van de Walle, Bijttebier, Braet, et al., 2016; Van de Walle et al., 2014). However, despite these interesting findings, the current study was conducted on the same sample as Van de Walle et al. (in press). This implies that more research in other samples is needed to further establish this measure's reliability and validity. For example, RTm could be distinguished from general proneness for repetitive thought, from other types of repetitive thinking like worry, and from maladaptive cognitive styles.

Also, there was no measure of family history of maternal depression or anxiety disorders. For example, children's concerns about their mother's psychopathology might increase their

attentional focus on the mother and at the same time put them more at risk to develop own symptoms of psychopathology (e.g. Connell & Goodman, 2002; Martins & Gaffan, 2000). As it might be that the currently found interaction effect is strongly driven by such children it would be important to measure this in future research. Moreover, whereas the current study addressed children's depressive symptoms, the attentional narrowing effect and RTm could also be relevant for anxiety disorders like, for example, Separation Anxiety Disorder (SAD) or General Anxiety Disorder (GAD). Repetitive thinking about threats or attentional biases like an increased focus on threats are often observed in anxiety disorders. Moreover, prior research does show how children with elevated concerns about mothers' unavailability are more at risk to develop anxiety-related avoidance behavior induced by mother (Bosmans, Dujardin, et al., 2015). Thus, investigating the role of the attentional narrowing effect and possibly RTm in the prediction of anxiety disorders can be an interesting direction for future research.

Moreover, the generalizability of the findings might be limited in at least two ways. First, as the study was conducted in a general population sample, it might be difficult to generalize the results to clinical samples. However, the mean of depressive symptoms and the percentage of children displaying (sub)clinical levels of depressive symptoms were in line with the prevalence rates that are on average found in general population samples of this age-group (Roelofs et al., 2010; Twenge & Nolen-Hoeksema, 2002). Thus, although no inferences can be made for clinical samples, the current sample seems appropriate to answer our research question about the general population. With regard to the measurement of depression, the current study only measured depressive symptoms, but did not assess clinical depression. As a previous study found different effects in a normal versus clinical sample (Bosmans et al., 2013), for future research, it would be interesting to investigate whether RTm during distress moderates the link between the attentional narrowing effect and clinical depression.

Secondly, the findings might not be generalizable to father-child relationships. Although the quality of the father-child relationship plays an important role in children's development (Grossman, Grossman, Kindler, & Zimmermann, 2008), mother-child relationship characteristics, like overdependence on mother, seem more consistently linked with depressive symptoms than father-child relationship characteristics, like overdependence on father (Allen et al., 1994; Brumariu & Kerns, 2010; Wenar & Kerig, 2005). Nevertheless, future research is needed to investigate whether these effects might differ with regard to mother or father.

### **Clinical implications**

Contrary to general belief, these findings suggest that an increased attentional focus on the mother is not by definition a problematic characteristic of the mother-child relationship. It is only when children are caught in thoughts about their mother during distress that children with a more narrow attentional field around their mother are the most vulnerable to depressive symptoms. According to the results, these children might profit from therapy targeting RTm. The main effect of RTm on depressive symptoms indicates that RTm during distress heightens the risk for depressive symptoms for all children, regardless of the breadth of children's attentional field around the mother. Therefore, reducing RTm during the treatment of depressive symptoms might be beneficial for a substantial number of children. Interventions that have been successful in reducing other types of repetitive thinking, like rumination-focused cognitive behavior therapy (RFCBT; Watkins et al., 2007) and Mindfulness Based Cognitive Therapy (MBCT; Teasdale et al., 2000), might be useful and could be easily adapted to reduce RTm. Moreover, children with a more narrow attentional field around their mother who initially experience less trust in maternal support or more RTm during distress seem more vulnerable to depressive symptoms. Possibly, these children might also be more responsive to an increase in trust or a decrease in RTm because

a more narrow attentional field around the mother also seems to protect against depressive symptoms in children who experience more trust or less RTm. Additionally, according to previous research (Van de Walle et al., in press), more trust in maternal support is related to less RTm. Moreover, it is increasingly argued that child and adolescent CBT effects might be boosted by adding treatment focus on promoting secure attachment relationships (Bosmans, in press). This can be achieved by therapeutic interventions targeting general mother-child relationship difficulties and aiming to repair attachment bonds like Attachment-Based Family Therapy (Diamond et al., 2010), or by preventative interventions to foster trust in maternal support like Circle of Security (Marvin, Cooper, Hoffman, & Powell, 2002) or Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD; Van Zeijl et al., 2006). Nevertheless, clinicians should also bear in mind that children with a broader attentional field around mother might benefit little from reducing RTm alone. It is well possible that these children also need to learn focus on mother to ensure optimal adaptation.

In sum, results of the current study supported the prediction that the (mal)adaptive effect of a more narrow attentional field is conditional upon the extent to which children think repetitively about the mother during distress. Depressive symptoms were most prevalent in children who had a more narrow attentional field around their mother and who at the same time reported more RTm during distress. Additionally, when children reported lower levels of RTm during distress, a more narrow attentional field appeared to protect children against depressive symptoms. This finding is both theoretically and clinically important as it calls for a more nuanced evaluation of children's tendency to be focused on mother in middle childhood



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### Footnotes

<sup>1</sup> The mean, standard deviation, minimum and maximum for children's sum scores across all the items for the questionnaire scales were as follows: for RTm  $M = 16.12$ ,  $SD = 9.70$ ,  $Min = 0.00$ ,  $Max = 56.00$ ; for self-reported depressive symptoms  $M = 6.64$ ,  $SD = 4.62$ ,  $Min = 0.00$ ,  $Max = 22.00$ ; and for mother-reported depressive symptoms  $M = 1.75$ ,  $SD = 2.14$ ,  $Min = 0.00$ ,  $Max = 13.00$ .

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Table 1

*Means, Standard Deviations, and Correlation Coefficients Among the Variables (n = 157)*

		1	2	3	4	5
1	ANE	-				
2	RTm	.03	-			
3	Depressive symptoms S	-.00	.44***	-		
4	Depressive symptoms M	-.05	.13	.31***	-	
5	Depressive symptoms C	-.03	.35***	.81***	.81***	-
	<i>M</i>	0.04	1.07	0.25	0.22	0.00
	<i>SD</i>	0.13	0.65	0.17	0.27	1.00
	<i>Min</i>	-0.24	0.00	0.00	0.00	-1.40
	<i>Max</i>	0.40	3.73	0.81	1.63	4.51

*Note.* ANE = Attentional narrowing effect; RTm = Repetitive thinking about the mother; Depressive symptoms S = Self-reported depressive symptoms; Depressive symptoms M = Mother-reported depressive symptoms; Depressive symptoms C = compound score for self-reported and mother-reported depressive symptoms.

\*\*\*  $p < .001$

Table 2

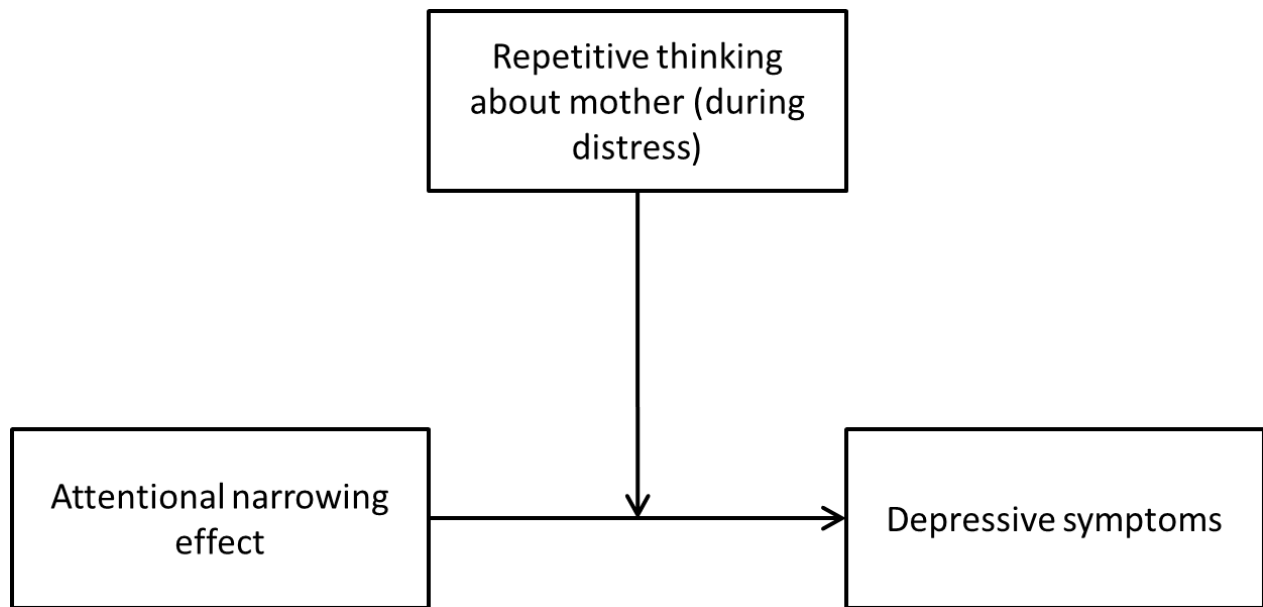
*Multiple hierarchical regression analyses predicting self-reported depressive symptoms and the multi-informant compound score for depressive symptoms from RTm, ANE and the interaction between RTm and ANE*

	<i>R</i> <sup>2</sup> -change	<i>F</i> -change	<i>df</i>	$\beta$	<i>f</i> <sup>2</sup>
Prediction of self-reported depressive symptoms					
Step 1	.19	18.07***	2,154		
RTm				.44***	.05
ANE				-.03	.00
Step 2	.04	7.98**	1,153		
RTm x ANE				.20**	.02
Prediction of the multi-informant compound score for depressive symptoms					
Step 1	.12	10.71***	2,154		
RTm				.36***	.03
ANE				-.05	.00
Step 2	.04	7.06**	1,153		
RTm x ANE				.20**	.01

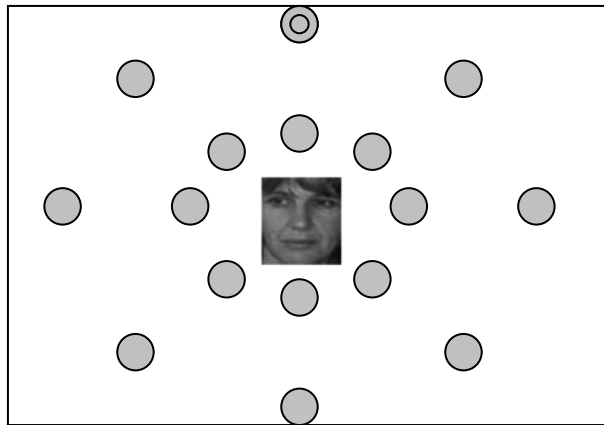
*Note:* RTm = Repetitive thinking about the mother; ANE = Attentional narrowing effect.

All reported  $\beta$  are values at Step 2 of analysis.

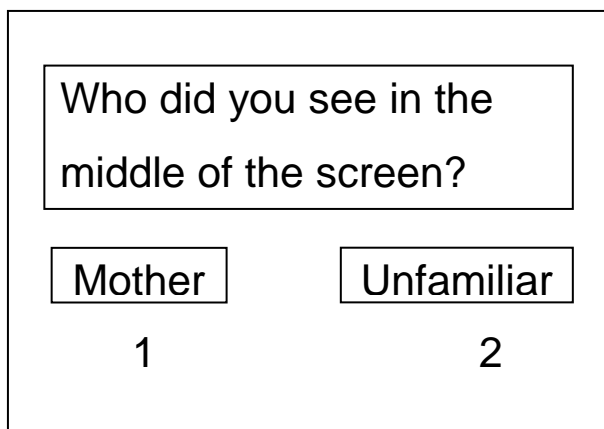
\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$



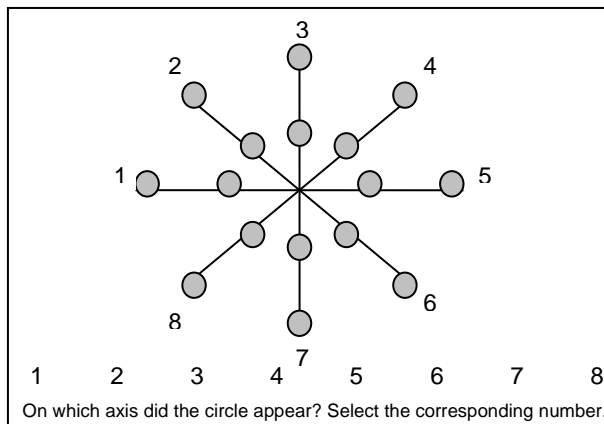
*Figure 1.* Conceptual model of the interaction between the attentional narrowing effect and repetitive thinking about mother (during distress) in the prediction of depressive symptoms



Screen 1 (far trial)



Screen 2



Screen 3

Figure 2. Stimulus presentation of the ABT. From "Attachment security and attentional breadth toward the caregiver in middle childhood" by G. Bosmans, C. Braet, E. Koster and R. De Raedt, 2009, *Journal of Clinical Child & Adolescent Psychology*, 38, p. 875.



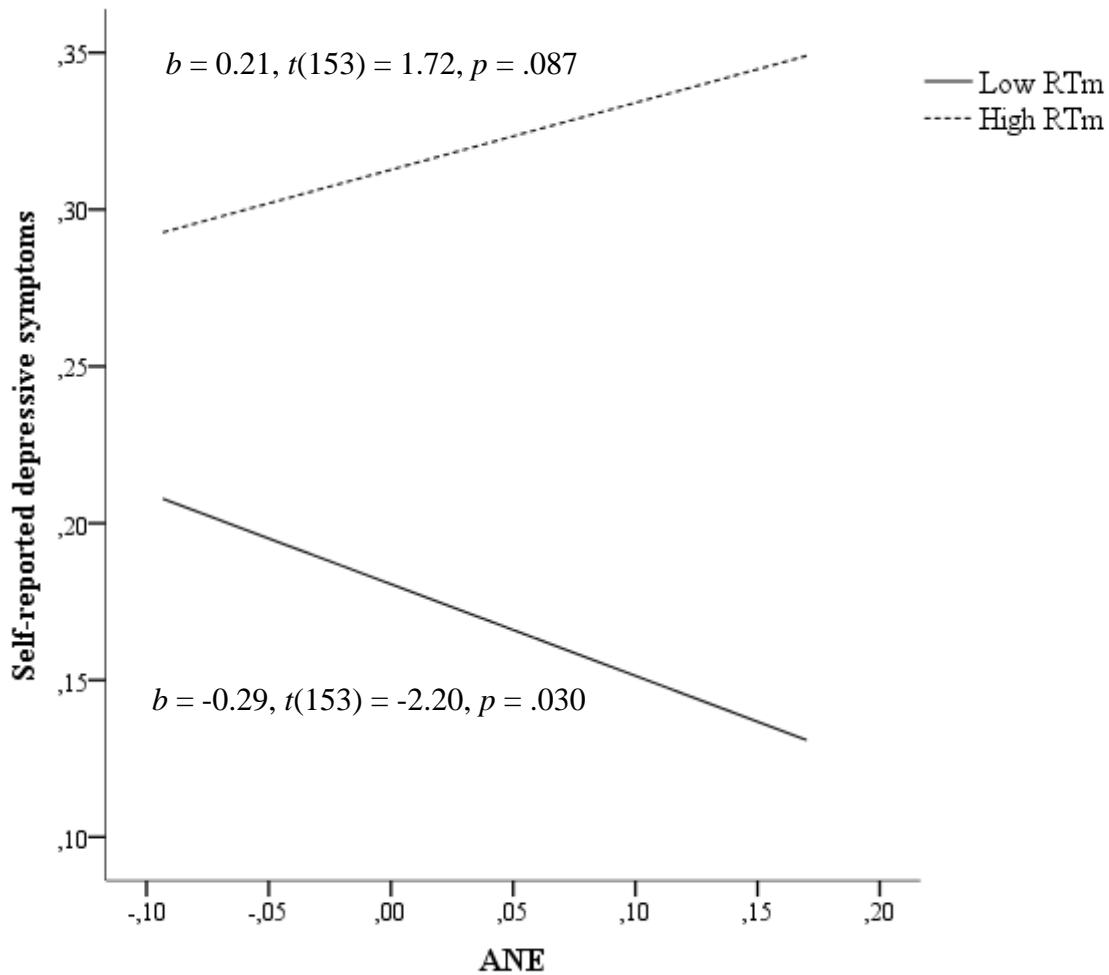


Figure 3. Moderation by RTm in the relationship between the attentional narrowing effect (ANE) and self-reported depressive symptoms

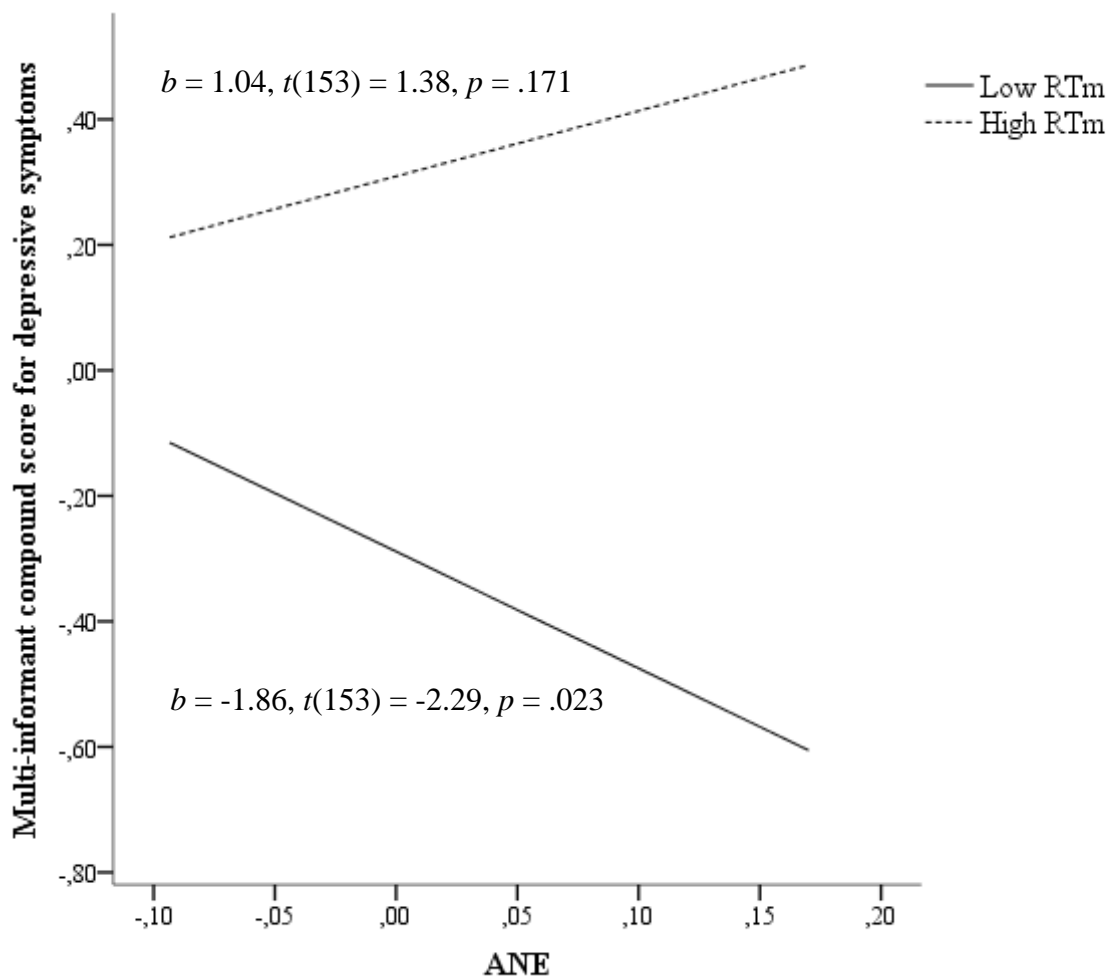


Figure 4. Moderation by RTm in the relationship between the attentional narrowing effect (ANE) and the multi-informant compound score for depressive symptoms