Gratitude: A Resilience Factor for More Securely Attached Children

Veronica Scott[1], Martine Verhees[2], Rudi De Raedt[3], Patricia Bijttebier[4], Michael W. Vasey[5],

Magali Van de Walle[2], Theodore E.A. Waters[6], & Guy Bosmans[2]

[1]University of Kentucky, USA

[2]Clinical psychology, KU Leuven, Belgium

[3]Department of Experimental Clinical and Health Psychology, Ghent University, Belgium

[4]School Psychology and Child and Adolescent Development, KU Leuven, Belgium

[5]Department of Psychology, Ohio State University, USA.

[6]Department of Psychology, New York University – Abu Dhabi, Abu Dhabi, UAE

Corresponding author: Guy Bosmans: guy.bosmans@kuleuven.be; Address: L.

Vanderkelenstraat 32, 3000 Leuven, Belgium; Phone: +32 16 32 61 87

Abstract

Research on the association between childhood attachment and depressive symptoms has primarily focused on the role of risk factors. This resulted in a lack of research on the role of potential resilience factors. In the current study, we suggest that middle childhood secure attachment is linked to adolescents' trait gratitude, which is linked to the enhanced resilience against the development of depressive symptoms in adolescence. In a longitudinal study, we measured 157 children's (9-12 years old, 48% boys) attachment appraisals (anxiety, avoidance, and trust), attachment representations (secure base script knowledge, and coherence) and depressive symptoms at baseline, and gratitude and depressive symptoms at follow-up two years later. Results supported our hypotheses that middle childhood attachment was robustly linked with adolescent trait gratitude. Moreover, trait gratitude indirectly linked middle childhood attachment avoidance, trust, and secure base script knowledge to change in depressive symptoms over time. These findings may help explain why more securely attached children are less likely to develop depressive symptoms.

Keywords: *Resilience, Gratitude, Attachment, Depression, Middle childhood*

Highlights

- Middle childhood secure attachment links to more trait gratitude in adolescence
- Associations were found both for self-reported attachment appraisals and attachment representations derived from narratives
- Trait gratitude indirectly linked attachment appraisals and representations to longitudinal changes in depressive symptoms
- Trait gratitude is a resilience feature of more securely attached children.

Introduction

Depression is one of the most common and urgent mental health issues in adolescence (Lee et al., 2010; Murray & Lopez, 1996; Saluja et al., 2004). Depressive symptoms, which are the similarly damaging precursors of clinical depression (Cuijpers & Smit, 2002; Lewinsohn et al., 2000), increase considerably throughout childhood to adolescence (Brooks-Gunn & Petersen, 1991; Dujardin et al., 2016; Petersen et al., 1993). The development of these symptoms is connected to a variety of intra- and interpersonal factors. One important interpersonal factor is children's (in)secure attachment, which refers to their (lack of) trust in their primary caregivers' support. Although the link between attachment and depressive symptoms has been repeatedly demonstrated, little is known about the mechanisms explaining this association (Brumariu & Kerns, 2010). Most research has focused on how vulnerability factors, such as maladaptive schemas, mediate the relationship between insecure attachment and depressive symptoms (e.g. Roelofs et al., 2011). However, little is known about resilience factors that could explain why a more securely attached child has a reduced risk of developing these symptoms. The current study focused on trait gratitude as one potential resilience factor mediating the association between more secure attachment and reduced risk of developing depressive symptoms.

The Association Between Attachment And Depressive Symptoms

According to attachment theory, interactions with a primary caregiver influence children's level of attachment security within the relationship (Bowlby, 1980). Consistent, responsive caregiving supports the development of a secure attachment. This increases their trust in parental support and the likelihood that they seek support during distress (Bosmans et al., 2020). When children fail to develop secure attachment and trust in caregiver support, they can become more anxiously or more avoidantly attached (Brennan et al., 1998; Mikulincer & Shaver, 2007). More anxiously attached children seek parental proximity and support during distress, but constantly fear being rejected or losing care and support. More avoidantly attached children no longer seek parental proximity and support during distress. Instead they prefer to distance themselves from others and to avoid potential sources of distress (Cassidy, 1994).

It is becoming increasingly clear that attachment is a complex construct consisting of appraisals and mental representations (Bosmans & Kerns, 2015). At the level of attachment-related appraisals, children appear to be able to reflect upon the amount of trust they hold in parental support, the extent to which they fear parental rejection (attachment anxiety) and the extent to which they prefer to autonomously solve distress (attachment avoidance),

which is directly related to children's inclination to seek support during distress (Bosmans et al., 2015). At the level of mental representations, more securely attached children more likely develop a Secure Base Script (H.S. Waters, & Waters, 2006). If children develop such a script, this means that shared elements in memories of care-related interactions get simultaneously activated in a set of expectations that are organized as a scenario. A child with a secure base script expects that when distressed, their signal for assistance will be met with a caregiver's comforting and regulating support, which will then enable them to overcome the challenge (T.E.A. Waters et al., 2015). Although children cannot reflect upon the content of their attachment representations (they cannot say whether they have a secure base script or not), they display more secure base script knowledge when discussing care-related interactions during distress (T.E.A. Waters, Facompré, Dujardin, et al., 2019) and they are able to more coherently discuss their attachment-related experiences (T.E.A. Waters et al., 2013; T.E.A. Waters, Facompré, Van de Walle et al., 2019).

Meta-analyses and literature reviews have found cross-sectional and longitudinal associations between insecure attachment and depressive symptoms (Gumley et al., 2014; Madigan et al., 2013). Research that has attempted to explain these associations is inconclusive (Brumariu & Kerns, 2010), and many proposed mediators are depressive symptom-related risk factors like maladaptive schemas (Bosmans et al., 2010), or dysfunctional emotion regulation (Kullik & Petermann, 2013). Although secure attachment is often considered a promotive factor in child development (McGoron et al., 2012; Rutter, 1987), there is a lack of research identifying resilience factors that could explain why more securely attached children are better protected against the development of depressive symptoms.

The Association Between Attachment And Trait Gratitude

Trait gratitude is a factor which might help explain the promotive role of secure attachment in child development. Mikulincer and colleagues (2006) specified that gratitude is a positive response to an "other" upon receiving a personal benefit that the other gave intentionally. Trait gratitude, then, is the consistent experience of this feeling (Alkozei et al., 2017). Though the feeling was considered "one of the most unstudied emotions" (Wood et al., 2010, p. 891), gratitude has become a focal point of recent research, particularly amongst positive psychologists who see its therapeutic merit (Gulliford et al., 2013; Watkins et al., 2009; Wood et al., 2010). Trait gratitude is a valuable factor to examine because unlike most other proposed mediators of the attachment-depression connection, gratitude is a resilience factor that can be applied to clinical intervention. A recent meta-analysis showed that asking people to

list things for which they are grateful several times a week significantly increases their psychological well-being (Davis et al., 2016).

It has been suggested that secure attachment promotes trait gratitude. Children develop secure attachments with caregivers if they repeatedly experience support in response to their needs. Each individual experience may elicit a sense of gratitude that can get associated with the attachment figure. Over time, this may result in trait-like links between secure attachment and gratitude (Emmons & McCullough, 2004). In the same vein, it has been argued that a secure attachment figure may feel like a "gift" that activates gratitude in the recipient (Shaver et al., 2016). Although this link between attachment and trait gratitude is well-supported by theory, research examining this link is sparse. There is especially little research during childhood, the period in which this association is expected to develop.

In adulthood, three studies known to the authors found support for a connection between attachment and trait gratitude (Mikulincer et al., 2006; Dwiwardani et al., 2014; Zhang et al., 2017). However, these studies were mainly cross-sectional by design and could not agree whether the attachment-gratitude association is stronger for more anxious attachment or for more avoidant attachment. At younger ages, research is even more scarce. We found only one study with adolescents (Kraus et al., 2015), which revealed a positive longitudinal correlation between attachment to parents and trait gratitude but did not test for differential effects of attachment anxiety versus attachment avoidance. Moreover, the study started after the onset of adolescence. Given the possibility of a middle childhood attachment figure as an important precursor of gratitude in adolescence, it may be important to examine these variables in a longitudinal design starting in middle childhood. To overcome the limitations in the literature, the current study employed longitudinal data to replicate past findings and further explore their implications amongst a younger cohort. In this study, attachment was measured from the first wave onwards, while trait gratitude was measured two years later at follow up. With this data, we tested a first prediction that individual differences in middle childhood attachment are linked to differences in trait gratitude at follow-up.

The Association Between Trait Gratitude And Depressive Symptoms

Whereas trait gratitude is positively correlated with attachment, it is negatively correlated with depressive symptoms (Lin, 2015). Trait gratitude can naturally decrease depression over time (Lambert et al., 2012; Wood et al., 2008), and mitigates against depressive symptoms (Fredrickson et al., 2003) and suicidal ideation (Kleiman et al., 2013a; Kleiman et al., 2013b). This may be because gratitude can produce more positive emotions and positive

reframing, which are factors associated with fewer depressive symptoms (Lambert et al., 2012). Trait gratitude and its expression may also facilitate relational quality/satisfaction (Lambert et al., 2010), which may serve as a buffer against depression (Cramer, 2004; Greenberger & Chen, 1996; La Greca & Harrison, 2005).

Because attachment is theoretically linked to trait gratitude and trait gratitude is linked to depression, one could argue that more securely attached children show higher levels of trait gratitude in adolescence and this enhances their resilience against depressive symptoms. However, to date, no research has studied the indirect effect of gratitude on the association between secure attachment and the development of depressive symptoms over time. Consequently, our second prediction proposes that trait gratitude will indirectly link differences in attachment at baseline to different levels of change in depressive symptoms over time.

The Current Study

In summary, per hypothesis 1, we predicted that middle childhood attachment will be associated with levels of adolescent trait gratitude. Per hypothesis 2, we predicted that trait gratitude will indirectly link middle childhood attachment and change in depressive symptoms over time. Given the complexity of the attachment construct we described above, we decided to test these hypotheses for different aspects of attachment. Links with attachment-related appraisals were evaluated through self-reported attachment anxiety, attachment avoidance, and trust. Links with attachment representations were evaluated through secure base script knowledge and attachment coherence. Appraisals and representations differ with regard to the extent to which they occur at a more strategic level of processing (children can more easily reflect on appraisals and actively adjust their response to what they see as the most desired or appropriate response) or at a more automatic level of processing (representations are less easily accessed and therefore indicators of representations cannot be easily manipulated in service of preferred self-presentation; Bosmans and Kerns, 2015). It has been shown that strategic and automatic processes linked to the same psychological construct can diverge within one individual (Gawronksi & Creighton, 2013). Correlations between both types of processes are typically limited and correlations with outcome variables can be found for one type of process and less for another (Gawronski & Creighton, 2013). Hence, it was important to test our hypotheses for both attachment appraisals and representations to understand for which levels of processing our predictions are relevant.

Methods

Participants

Participants were 157 Flemish children (76 boys and 81 girls) from the general population. The children were in fourth to sixth grade at baseline, with ages ranging from 9-12 (M_{years}=10.93, SD_{years}=.94). Of these children, 75.2% (118) lived in families where the parents were together, 15.3% (24) lived in families where the parents were divorced, 5.7% (9) lived in a reconstituted family after divorce, and 3.8% (6) lived in other family structures. Two years later, family composition was largely unchanged, except for four families who reported a divorce. In total, 97.4% of the children had primarily been cared for by their mother in the first three years of their lives. The majority of mothers had a Master degree (42.7%) or a Bachelor degree (36.3%), though 20.4% of mothers instead attended some form of secondary school, and 1 (0.6%) attended only primary school. The majority of the fathers had a Master degree (45.9%) or a Bachelor degree (23.6%), while the other 29.9% of fathers attended some form of secondary school.

Measures

Attachment Style was measured with a shortened version of the Experiences of Close Relationships-Revised Child over mother (Brenning et al., 2014). The questionnaire items were originally developed and psychometrically validated in Dutch (Brenning et al., 2011). The scale uses 12 items to evaluate a child's dimensions of both attachment anxiety and attachment avoidance in the child-mother relationship. Six anxiety items (e.g. "I'm worried that my mother might want to leave me") and 6 avoidance items (e.g. "I prefer not to get too close to my mother") are rated on a 7-point likert scale from "not at all" to "very much." Previous research has confirmed both the strong internal structure and the construct and predictive validity of the ECR-RC (Brenning et al. 2011a, 2011b). Cronbach's Alpha in the current study was high (α=.79 for anxious attachment; α=.74 for avoidant attachment).

Trust was measured with a Dutch version (Bosmans et al., 2009) of the Trust subscale of the People in My Life Questionnaire (PIML; Ridenour et al., 2006). The original English questionnaire was translated into Dutch, back translated into English by a master in German languages, checked for convergence with the original items by a native English scholar, and frequently validated in Dutch speaking children (e.g., Bosmans et al., 2015). The PIML is a middle childhood version of the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg 1987) and assesses children's self-reported attachment relationships. In the current study, only questions regarding the maternal attachment relationship were used (e.g. "I can count on my mother to help me when I have a problem"). To determine whether participants experienced their mother as available or responsive, participants responded to 10 items on a 4-point scale that ranged from 1 ("Almost never true") to 4 ("Almost always true"). The current use of the

trust subscale mirrors previous research on the scale's use and reliability (e.g., Bosmans et al., 2015). Chronbach's Alpha in the current study was good (α=.80).

   Secure Base Script knowledge was measured with the Middle Childhood Attachment Script Assessment (MC ASA) for which the Dutch version was developed in collaboration with the scholars who developed the English version and for which research showed that the Dutch version was equivalent to the original English version (T.E.A. Waters et al., 2015; T.E.A. Waters, Facompré, Dujardin et al., 2019). The MC ASA consists of three attachment-related prompt word outlines featuring mother-child dyads. The prompt word outlines each contain twelve words or statements and are grouped into four columns that suggest a beginning (column 1), middle (columns 2 and 3), and end of a story (column 4; see Table 1). The outlines describe familiar scenarios and depict an element of distress that would trigger the child to seek out his or her secure base (e.g., *scary dog in the yard, injury at the beach*, losing a *soccer game)*. Children are instructed to assume the role of narrator and speak in the first person, as if the stories are about themselves and their parent. Each story is assigned a score ranging from 1 to 7. Scores between 4 and 7 indicate the presence of secure base script knowledge, with higher scores in this range reflecting greater elaboration on elements central to the secure base script (e.g., seeking support when distressed, receiving effective instrumental support and emotional comfort). Scores of 3 are given for event focused narratives with minimal secure base script content, whereas scores ranging between 1 and 2 are given to stories that include odd or atypical content (e.g., mother shaming the child for getting hurt at the beach and ruining the trip).

   The stories were coded by three raters, all graduated masters in clinical psychology and PhD students at the time of the study. They were trained by the lab head and received further supervision and support by the original developers of the ASA. Inter-rater reliability was established by independently scoring a subset of 40 MC ASA stories from each story line (i.e., dog, beach, and soccer). Intraclass correlation coefficients (ICC) were calculated using a two-way mixed model and absolute agreement for single measures. ICC's for the three coders ranged between .71 and .93 for the dog story, between .90 and .92 for the beach story, and between .82 and .90 for the soccer story. Overall ICC's for the three coders were respectable to very good for the dog story (α = .79), the beach story (α = .91), and the soccer story (α = .85). After establishing reliability, all remaining stories were randomly assigned to the three different coders in equal sets. As a result, each remaining story was independently coded by one coder.

Coherence was measured with the Child Attachment Interview (CAI; Target et al., 2003) at Wave 1. The CAI is a reliable and well-validated measure of attachment representations in middle childhood (Borelli et al., 2016; Shmueli-Goetz et al., 2008; Venta et al., 2014). Adapted from the Adult Attachment Interview (AAI) for children age 8-15 years (George et al., 1985), the CAI is a semi-structured interview in which children describe their current relationship with their parents and discuss recent attachment-related events. The original English interview was translated into Dutch, back translated into English by a master in German languages, and approved by the developers of the CAI. The interviews are coded, resulting in 8 scale scores: Preoccupied Anger, Idealisation, Dismissal, Emotional Openness, Balance of Positive and Negative References to Attachment Figures, Use of Examples, Resolution of Conflict, and Coherence. Each scale ranges from 1 (low score) to 9 (high score on that scale). In line with other studies using attachment narrative coherence as the primary mode of assessment in middle childhood (e.g., Borelli et al., 2010), we applied a coherence based dimensional assessment of secure attachment mental representations (Shmueli-Goetz, 2014). The coherence score is based on the scores on all the other scales, together with a consideration of the overall consistency, development, and reflection observed during the interview. A low score is given to children showing marked idealization, poor use of examples, and strong involving anger. A high score indicates an absence of distortions, together with positive qualities of emotional openness, use of examples, balance of representations, and conflict resolution (Shmueli-Goetz, 2014). Because it accounts for the other scales, the coherence dimension gives an indication of the overall quality of children's attachment representations.

The three coders who coded the MC ASA stories also coded the CAI. They were all certified CAI coders. All stories and CAIs were anonymized and randomly distributed over the coders in such a way that no coder had to code MC ASA stories and CAIs of the same participant. This was done to minimize any possibility for rater effects to influence the results. So, both tests were fully independently coded. For the CAIs in the current study, interrater reliability was established on a subset of 30 interviews. We conducted a running reliability check such that coding discrepancies were discussed following every tenth interview. The ICC for coherence in the final 10 CAIs was calculated using a two-way mixed model and absolute agreement for single measures and were sufficiently high. The ICCs for the 3 coders ranged between .70 and .91 with an overall ICC of .81. After interrater reliability was established, the remaining interviews were divided for coding between the three coders. As a result, each remaining interview was independently coded by one coder.

Trait gratitude was measured using children's responses to the Gratitude Questionnaire-6 (GQ-6; McCullough et al., 2002). The originally English questionnaire was translated into Dutch, back translated into English by a bilingual psychologist, and evaluated as convergent with the original version by ▮▮▮▮▮▮, a native English-speaking professor in Clinical Psychology. The questionnaire consists of 6 questions (e.g. "I am grateful to a wide variety of people") rated on a 7-point Likert scale from "strongly disagree" to "strongly agree." In addition to converging with observer reports and a similar, adjective rating scale, the GQ-6 has demonstrated high internal consistency (McCullough et al., 2002). Moreover, the measure has been used before in this age group and was found to be valid in comparison to other measures of gratitude and relevant outcomes (Froh et al., 2011).

Cronbach's alpha was moderate (α=.58). This might raise the concern that the analyses could have been affected by error variance. The moderate Cronbach alpha increases error variance which suppresses effects. Therefore, it becomes harder to interpret null findings. In contrast, the interpretation of significant regression coefficients is not affected by the moderate alpha as error only decreases associations and cannot increase associations (Cohen et al., 2003; Zuckerman et al., 1993). To further check the extent to which error variance might have affected the results, we also calculated a factor score based on a factor analysis in which we extracted one factor. The six item loadings ranged from .32-.85. We redid the bivariate correlations, linear regression, and mediation analyses with this factor score and it did not change the findings. Secondly, we evaluated whether we could increase Cronbach's alpha by removing less adequate items. Analysis showed that only Item 5 slightly suppressed the alpha. However, removing that item only slightly increased the alpha (.62). Nevertheless, we repeated all the analyses reported in the results section after having removed Item 5, but also in these analyses, results remained largely the same. Thus, to stay in line with other research on this measure, we reported the analyses which used the original questionnaire. Hinton and colleagues (2004) consider an alpha of .58 to be moderate, further supporting the decision to use the original version.

Depressive Symptoms were reported by the children through the Dutch version (Timbremont & Braet, 2002) of the Children's Depression Inventory (CDI). The CDI (Kovacs, 1985), an adaptation of the Beck Depression Inventory, includes 27 items covering themes related to depression (e.g. self-blame, sadness, and interpersonal relationships). It is designed for children aged 7-17 to choose one of three responses per item, selecting the response which best fits (e.g. "I feel like crying every day/many days/sometimes"). The CDI has demonstrated sufficient internal consistency in both typically developing and clinical populations, as well as test-retest reliability across long

intervals (Saylor et al., 1984). The Dutch version of the CDI was developed in close collaboration with the original developer following a translation/back translation procedure (Timbremont & Braet, 2002). Cronbach's Alpha in the current study was acceptable at baseline (α=.81) and at follow-up (α=.84).

Procedure

The current study is part of a larger study (see also: Van de Walle et al., 2016; Van de Walle et al., 2017). Participants were invited to participate through flyers distributed in 16 schools located both in rural and urban areas. Children in the fourth, fifth, and sixth grade were offered the opportunity to participate in the study, and children and mothers who were interested were personally informed about content, procedure, and consent.

For the current study, baseline and two-year follow up data were used that were collected from the child in a longitudinal study. In the current study, we used attachment data measured at baseline, depressive symptoms measured at baseline and follow-up, and gratitude measured at follow-up. When participants arrived at the research location (either at our lab or at a room we were allowed to use in participating schools), they were guaranteed confidentiality and gave active informed consent to the researchers. The child and mother were separated for data collection, in which they completed multiple assessments. At each wave of data collection, mother and child were compensated for their time with two movie tickets and the chance to win an mp3-player. To match the data of the two study waves, we created a password protected file in which the identifiers (participants' names, dates of birth and date on which data was collected) were linked to the participants' unique code. This code was used to merge that data of both waves in one master file. The university's ethical committee approved the full study procedure.

Plan Of The Analyses

In order to test the first hypothesis that there is a longitudinal association between attachment and trait gratitude, we calculated the correlations between the attachment and trait gratitude measures. Subsequently, we conducted regression analyses with attachment as independent variable and trait gratitude as dependent variable while controlling for confounding effects of age and gender. Additionally, we conducted regression analyses while controlling whether the link between attachment and trait gratitude did not merely reflect the shared effect of depressed mood. More specifically, if less securely children have more depressive symptoms, they could be in a negative mood state due to which they could feel less grateful in general. However, in our data, such an effect of depressive symptoms effect could be found both due to baseline associations with attachment as well as due to follow up associations with gratitude. Therefore, we conducted three analyses per each attachment measure

(attachment anxiety, attachment avoidance, trust, secure base script knowledge, and coherence). First, we controlled for baseline depressive symptoms. Second, we controlled for follow up depressive symptoms. Third, we controlled for depressive symptoms both at baseline and at follow up. Lastly, we tested for attachment anxiety and avoidance specifically whether they were uniquely linked to trait gratitude by including them simultaneously as predictor in a regression analyses with trait gratitude as dependent variable.

In order to test the second hypothesis that attachment is linked to change in depressive symptoms through the indirect effect of trait gratitude, regression analyses were conducted whereby attachment measured at baseline was used as predictor in separate analyses for attachment anxiety, attachment avoidance, trust, secure base script knowledge, and coherence. Gratitude measured two years later was used as mediator. To investigate change in depressive symptoms over time, we used depressive symptoms measured at follow-up as dependent variable, while controlling for depressive symptoms as measured at baseline. In each analysis, the model was also controlled for age, and gender. In line with Mackinnon, Lockwood, and Williams' (2004) recommendation, PROCESS was used to perform a bias-corrected bootstrapping procedure (Preacher & Hayes, 2004) with 5,000 resamples and a 95% confidence interval for the indirect pathway (i.e. insecure attachment effecting depressive symptoms through gratitude). The technique is a nonparametric resampling method which uses empirics to determine the magnitude of the indirect effect. This approach allows for greater precision in mediation analyses and also helps prevent a binary "significant/nonsignificant" understanding of the results (MacKinnon et al., 2004; Wei et al., 2005).

<div align="center">Results</div>

Preliminary Analyses

We managed to keep 81% of the baseline sample at follow-up. Dropout effects were ruled out by a multivariate drop-out analysis on all current study's baseline variables, $F(6, 121) = 0.77$, $p = .599$. After accounting for the drop-outs, only 2% of the data was missing. Little's MCAR test on the current study's longitudinal data set revealed that data were not missing at random, $\chi^2(161) = 199.35$, $p < .05$. We evaluated whether the planned analyses were affected by different strategies to handle missing data. First, we conducted our analyses using listwise deletion. Second, we repeated the analyses after imputing data with expectation maximization. All the results were the same for the analyses with and without imputed data. This suggests that the results could not be contributed to any identifiable bias due to missing data. We decided to report the results after pairwise deletion, which is the most conservative solution. It has the advantage that we only base our conclusions on actually observed data. Table 2

shows descriptive statistics of the variables including mean, standard deviation, and Pearson's bivariate correlations. Age was correlated with secure base script knowledge ($r = .21$, $p < .01$), coherence ($r = .22$, $p < .01$), and follow up depressive symptoms ($r = .26$, $p < .01$). A multivariate test demonstrated a gender effect on the data, $F(8, 97) = 2.99$, $p < .01$, driven by secure base script knowledge, $F(1, 104) = 7.57$, $p < .01$, and coherence, $F(1, 104) = 21.34$, $p < .001$. In addition, Table 2 shows that attachment measures that tapped into more strategic processes (attachment anxiety, attachment avoidance, and trust) were strongly linked and a similarly high intercorrelation was found between the measures that tapped into automatic processes (secure base script knowledge and coherence). However, associations between the more strategic and the more automatic attachment measures were hardly significant, which is in line with what could be expected from dual process theories (Gawronski & Creighton, 2013).

Hypothesis 1: Is Attachment Related To Trait Gratitude?

Table 2 shows that all the bivariate attachment - trait gratitude correlations were significant and in the predicted direction. More attachment anxiety and avoidance were related to less trait gratitude. More trust, secure base script knowledge, and coherence were related to more trait gratitude. The additional analyses showed that after controlling for age and gender, trait gratitude remained significantly related to attachment anxiety ($\beta = -.32$, $p < .001$), attachment avoidance ($\beta = -.36$, $p < .001$), trust ($\beta = .30$, $p < .001$), secure base script knowledge ($\beta = .23$, $p = .044$), and coherence ($\beta = .25$, $p = .017$).

After controlling for baseline depressive symptoms, trait gratitude remained significantly related to attachment anxiety ($\beta = -.23$, $p = .016$), attachment avoidance ($\beta = -.27$, $p = .005$), trust ($\beta = .23$, $p = .017$), secure base script knowledge ($\beta = .24$, $p = .015$), and coherence ($\beta = .19$, $p = .053$). Also controlling for follow up depressive symptoms, did not alter the results: attachment anxiety ($\beta = -.29$, $p = .002$), attachment avoidance ($\beta = -.35$, $p < .001$), trust ($\beta = .29$, $p = .002$), secure base script knowledge ($\beta = .26$, $p = .005$), and coherence ($\beta = .25$, $p = .007$). Moreover, controlling for both baseline and follow up depressive symptoms did not alter the results: attachment anxiety ($\beta = -.21$, $p = .031$), attachment avoidance ($\beta = -.29$, $p = .003$), trust ($\beta = .24$, $p = .015$), secure base script knowledge ($\beta = .27$, $p = .006$), and coherence ($\beta = .21$, $p = .031$). Finally, the regression analysis that simultaneously included attachment anxiety and attachment avoidance as predictors showed unique relationships between both attachment styles and trait gratitude (attachment anxiety: $\beta = -.19$, $p = .041$; attachment avoidance: $\beta = -.29$, $p = .002$).

Hypothesis 2: Does Trait Gratitude Indirectly Link Attachment To Depressive Symptoms?

Table 3 summarizes the indirect effect analyses conducted for each attachment predictor separately. Results confirmed our second hypothesis about the indirect effect of trait gratitude in the association between attachment and change in depressive symptoms over time. Figure 1 shows the regression weights of each pathway in each indirect effect model. Indicators of secure attachment (trust, secure base script knowledge, and coherence) were related to higher levels of trait gratitude two years later. Indicators of insecure attachment (attachment anxiety and avoidance) were related to lower levels of trait gratitude two years later. Trait gratitude, in turn, was related to less increase in depressive symptoms over time in comparison to children's baseline levels of depressive symptoms. In all the models, there was no association between gender and follow up depressive symptoms (rs < .05, ps > .525). The link between baseline depressive symptoms, and age and follow up depressive symptoms was significant in all the models (baseline depressive symptoms: rs > .37, ps < .001; age: rs > .28, ps < .001).

To rule out alternative mediation models, we tested whether change in depressive symptoms over time indirectly linked attachment to trait gratitude at follow up as dependent variable. For all of these models, zero was included in the 95% CI around the indirect effect. To explore whether our results might have been overestimated by the fact that the mediator and outcome variable were assessed at the same time-point, we did follow-up analyses with 85 participants of whom we also collected depressive symptom data one year later. Because of the considerable drop-out, we decided to only report this as supplementary analyses. The online supplementary file shows that the effects were replicated in this fully longitudinal version of the design.

Evaluating The Effect of Multiple Testing

In spite of the strengths of our approach to account for all attachment measures separately, evaluating in detail the links at the level of both attachment appraisals and representations, this resulted in five separate tests of our hypotheses. This increased the risk for Type-I error due to multiple testing. To reduce the risk that we would interpret Type-I errors, we applied Bonferroni correction for both research hypotheses. Given the fact that we conducted five tests per hypothesis, the p-value should be .01 or smaller to conclude that effects are significant. For Hypothesis 1, Table 1 shows that all correlations between attachment and gratitude hold account for this correction. Second, we also explored a different approach to reduce the number of tests. More specifically, we calculated two latent attachment scores. To calculate an attachment appraisal factor score, we conducted principal component analysis on the three attachment appraisal variables (trust, attachment anxiety, attachment avoidance). One factor had an eigenvalue higher than 1 (2.03) and explained 67.63% of the variance with trust loading .86, attachment anxiety

loading -.80, and attachment avoidance loading -.80 on the factor. To calculate an attachment representation factor score, we conducted principal component analysis on the two attachment representation variables (coherence and secure base script knowledge). One factor had an eigenvalue higher than 1 (1.44) and explained 72.02% of the variance with both indicators loading .85 on the factor. Finally, we conducted one single Multiple Regression Analysis using both latent factor scores as unique predictors of trait gratitude and found that both predictors were significantly related to trait gratitude (attachment appraisals: $\beta = .34$, $p < .001$; attachment representations: $\beta = .20$, $p = .036$). Both additional analysis strategies further supported the robustness of the hypothesis that middle childhood attachment links with adolescent gratitude.

For Hypothesis 2, we first applied Bonferroni correction by calculating 99%CIs for every indirect effect analysis (equivalent to $p < .01$). Results showed that the indirect effects in the models with attachment anxiety and coherence were no longer significant ($-.16 < \beta < .02$; $-.02 < \beta < .18$). Nevertheless, in the other models, the indirect effects remained significant after controlling for multiple testing: attachment avoidance, $.003 < \beta < .21$; trust, $-.17 < \beta < -.002$; and secure base script knowledge, $-.19 < \beta < -.02$. Also the mediation analyses held when just using the latent factor scores (attachment appraisals: $.03 < \beta < .26$; attachment representations: $.18 < \beta < .002$). Both additional analysis strategies further supported the hypothesis that both middle childhood attachment appraisals and representations are indirectly linked to adolescent depressive symptoms through adolescent gratitude, although the indirect effects calculated for attachment anxiety and coherence were not robust.

Discussion

The current longitudinal study on the relationship between middle childhood attachment, trait gratitude, and changes in depressive symptoms over time tested two hypotheses. First, we predicted that more secure levels of attachment would be longitudinally associated with higher trait gratitude. Secondly, we predicted that trait gratitude would indirectly link attachment with change in depressive symptoms over time. Results fully supported the first hypothesis, suggesting that attachment is linked with trait gratitude. The second hypothesis was most convincingly supported for attachment avoidance, trust, and secure base script knowledge. This suggested that trait gratitude could be a valuable factor explaining more securely attached children's resilience against the development of depressive symptoms.

Preliminary analyses showed, in line with our expectations, that the attachment measures clustered around the assessed type of process. Measures that tapped into more strategic processes (attachment anxiety, attachment

avoidance, and trust) were strongly linked. Like in prior research, children who reported more trust also reported less attachment anxiety and less attachment avoidance (Brenning et al., 2011b). A similarly high intercorrelation was found between the measures that tapped into automatic processes (secure base script knowledge and coherence). This finding reflects the fact that narrative coherence as measured with attachment interviews can be explained by secure base script knowledge (T.E.A. Waters et al., 2013).

Associations between the more strategic and the more automatic attachment measures were hardly significant. This was expected because both types of processes can diverge within subjects, suppressing correlations (Gawronksi & Creighton, 2013). This does not render one process less relevant than the other, but only means that both processes reflect different relevant aspects of the same phenomenon (Gawronksi & Creighton, 2013). Building on this literature, Bosmans and Kerns (2015) argued that the same holds for attachment measures. One reason why attachment appraisals and representations are less strongly related might be that they have a different developmental dynamic. For example, it has been assumed that it takes time before cognitive scripts become a crystallized feature of the individual (Muris, 2006), whereas attachment-related appraisals more directly follow recent learning experiences (Bosmans et al., 2019). So, it could be that the individual differences in secure base script knowledge we measured in the current sample not only reflected recent learning experiences, but also children's maturation and timing of the development of their attachment representations. As a result, not all the children with lower scores on secure base script knowledge will eventually emerge as insecurely attached. Consequently, this could have suppressed the correlations between the more strategic and the more automatic attachment measures in the current study. On the one hand, the fact that there was a small correlation between coherence and trust does support the claim that both types of processes are at least to some extent linked to the same underlying construct. On the other hand, the fact that these correlations were small to non-significant does underscore the relevance of investigating our hypotheses for both types of processes, as this could have yielded different results.

Hypothesis 1: Is Attachment Related To Trait Gratitude?

Results largely supported our first hypothesis that middle childhood attachment and trait gratitude are linked. We demonstrated this link for all the middle childhood attachment measures. The effects were robust as they remained after controlling for gender and age. Moreover, they remained after controlling for depressive symptoms at baseline, follow up, and at both measurement times, which suggests that the link between attachment and trait gratitude does not merely reflect children's emotional state. These results are in line with past research findings

(Dwiwardani et al., 2014; Kraus et al., 2015; Mikulincer et al., 2006; Zhang et al., 2017), but they significantly add to this literature for three reasons.

First, this is the youngest age-group for which the association between attachment and trait gratitude has been demonstrated. Research in such younger age-groups is highly relevant. If gratitude develops in the context of attachment relationships, these associations should already exist earlier in life. Future research should try to replicate these effects and test whether attachment at younger ages equally predicts gratitude at later ages. Nevertheless, the current results provide promising support for the idea that trait gratitude is grounded in childhood interpersonal attachment learning experiences. Second, this was one of the first longitudinal studies on the link between attachment and trait gratitude. Longitudinal connections are hard to establish in research and diminish as the time between two measurement points increases. Our measurement points spanned two years and included a developmental shift from middle childhood to puberty. Because these characteristics of our study all decreased the odds of finding these associations, the current study provides important support for the predicted association between attachment and trait gratitude. Third, our study's first hypothesis was tested for both attachment appraisals and representations and showed that the effects were robust across strategic and automatic attachment-related processes. This suggests that the different aspects of the complex attachment construct are associated with trait gratitude, pointing at the relevance of attachment to study trait gratitude. Moreover, both attachment-related processes were measured with very distinct measurement methods. This decreases the likelihood that the associations we found can merely be explained by shared method variance. This further strengthens the support for the hypothesized link between middle childhood attachment and adolescent trait gratitude. Importantly, all effects held after Bonferroni correction. Also, when we reduced the number of tests using two latent factors scores in a single analysis, both attachment appraisals and representations were uniquely linked with trait gratitude. This further supported the reliability of our results.

Notably, focusing on the insecure attachment styles and gratitude, significant relationships were found for both the anxious and avoidant attachment styles. The gratitude – avoidant attachment link was also found by Mikulincer et al. (2006). However, contrary to the current results, the latter study did not find an association with anxious attachment. Mikulincer et al. (2006) explained their results suggesting that avoidant attachment reflects a social learning history that consists of more consistently negative care-related experiences with others. They argued that more avoidant attachment would therefore result in a significant reduction in gratitude. For anxious attachment

they argued that this reflects a learning history that consists of inconsistent care-related experiences with others rendering the association with trait gratitude less straightforward (Mikulincer et al., 2006). One reason why the current study found a significant association between anxious attachment and trait gratitude in contrast to this previous study, might be due to the different ages in both studies. In middle childhood, there is still substantial attachment development (Waters, Facompré et al., 2019). Consequently, different attachment styles in middle childhood may be more fluid than in adulthood. Although more research is needed to see whether this pattern of results replicates in middle childhood and whether this pattern replicates in measures of anxious and avoidant attachment that rely less on self-report, the current study suggests that, at least at younger ages, decreased gratitude is linked to both self-reported insecure attachment styles.

Hypothesis 2: Does Trait Gratitude Indirectly Link Attachment To Depressive Symptoms?

As predicted, trait gratitude indirectly linked attachment to change in depressive symptoms over time. We found evidence for this link for all the middle childhood attachment measures. More specifically, children with less attachment anxiety, less attachment avoidance, more trust, more secure base script knowledge, and more coherence all showed more trait gratitude two years later, which in turn was linked to less risk of developing depressive symptoms over time. The fact that we found these associations again for both attachment appraisals and attachment representations, suggests that we might have revealed an important mechanism that could help explain why more securely attached children are more protected against the development of depressive symptoms later in life.

However, the number of tests we conducted, again increased the risk for Type 1 errors. After Bonferroni correction, the indirect effect of trait gratitude was not significant for the models with attachment anxiety and coherence. The result for attachment anxiety resonates with Mikulincer et al.'s (2006) finding that trait gratitude is more strongly related to attachment avoidance than to anxiety. The result for coherence could be due to the fact that narrative coherence measures not only differences in attachment, but also child-related temperamental factors like effortful control (Pallini et al., 2018). This could have suppressed the effects. Supporting this explanation, Figure 1 shows that the path between coherence trait gratitude was no longer significant, suggesting that the indirect effect of trait gratitude was suppressed due to its decreased association with coherence.

Nevertheless, in the other models, the indirect effects remained significant after controlling for multiple testing and the additional analyses with the two latent factor scores supported again the hypothesis. This continues to suggest that the indirect effect of trait gratitude in the association between attachment and change in depressive

symptoms is robust over attachment appraisals and attachment representations. Our findings are in line with a growing literature showing an association between trait gratitude and depression (e.g., Lin, 2015), but significantly adds to the existing literature suggesting that trait gratitude indirectly links attachment to the development of depressive symptoms. Our findings suggest that this mechanism might have value to understand how the parent-child relationship creates a context that increases children's resilience against the development of depressive symptoms. Whereas prior research mostly studied maladaptive mechanisms linking attachment to depressive symptoms, such as maladaptive emotion regulation strategies (e.g., Brenning et al., 2012; Van de Walle et al., 2017) or early maladaptive cognitive schemas (Bosmans et al., 2010), the current study demonstrated a mechanism that could explain why more securely attached children are better protected against the development of depressive symptoms. Future research should expand this endeavor looking for other protective factors that could explain the attachment-depression link. Known resilience factors that could be linked to secure attachment are, for example, viewing change as an opportunity, tolerance of negative affect, optimism, commitment, recognition of limits to control (Conner & Davidson, 2003).

Limitations And Future Research

In spite of the apparent robustness of the findings in the current study, there are limitations and opportunities for future research. First, although data on depressive symptoms was collected and analyzed at multiple time-points, the gratitude measure was only introduced later in the data collection. Without information on baseline gratitude, it is unknown whether the longitudinal link represents a previously established link or whether this link developed over time. However, longitudinal associations are typically hard to find, so the robustness of the current effects points at least to a very strong association between attachment and gratitude. Additionally, mediation analyses ruled out the alternate model in which attachment and gratitude were indirectly linked by change in depressive symptoms over time, providing further support for our hypothesized model. Nevertheless, the data remain correlational and, therefore, it is not possible to claim that attachment has a causal effect on the development of trait gratitude. For example, it could be that children's trait gratitude is affected by observing parents' gratitude and by direct parental instruction. It is not unlikely that this occurs more in parent-child relationships that also increase the likelihood that children develop secure attachments. Future research could disentangle this further by measuring parents' trait gratitude and by assessing the extent to which parents instruct children to be grateful.

The current study examined the mother-child attachment relationship in-depth, however, future inquiry could examine the father-child attachment relationship. Finally, the sample consists of children from the general population, and prior research has indicated that links between attachment and developmental outcomes might be different in children from a clinical population (see Zeijlmans Van Emmichoven et al., 2003). Therefore, to fully appreciate the role of gratitude in these relationships, more research with clinical samples is needed. Additionally, most children came from relatively educated families. Therefore, the study's sample may not be sufficiently representative. Again, this suggests that more research in more diverse samples is needed to support drawing general conclusions about the link between attachment and trait gratitude and the indirect effect of trait gratitude in the association between attachment and depressive symptoms.

Theoretical And Clinical Implications

Whereas most research on the link between attachment and the development of psychopathology focuses on the role of risk factors linked with insecure attachment, the current study suggests that resilience factors linked with secure attachment are important as well. In the current study, we showed that more securely attached children may be more resilient because they display more trait gratitude. Although the current study did not test why securely attached children develop more trait gratitude, the findings are in line with the theory that, over time, repeated experiences with supportive parents activates state gratitude that eventually crystallizes into trait gratitude.

The fact that trait gratitude plays such a promotive role in child development calls for more research on its link with attachment, particularly because finding causal associations could have significant clinical importance. To date, the efficacy of interventions that target gratitude has been convincingly documented (Bolier et al., 2013). The questions can thus be raised whether restoring patients' attachment relationships might make gratitude interventions more effective, and whether gratitude interventions might be effective in helping to insulate insecurely attached children from the progression of depressive symptoms in middle childhood.

<div align="center">**References**</div>

Alkozei, A., Smith, R., & Killgore, W. D. (2017). Gratitude and subjective wellbeing: a proposal

of two causal frameworks. *Journal of Happiness Studies*, *An Interdisciplinary Forum on*

Subjective Well-Being, 19, 1519–1542. https://doi.org/10.1007/s10902-017-9870-1

Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, *16*, 427-454.

Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: a meta-analysis of randomized controlled studies. *BMC public health*, *13*, 119. https://doi.org/10.1186/1471-2458-13-119

Borelli, J. L., Crowley, M. J., David, D. H., Sbarra, D. A., Anderson, G. M., & Mayes, L. C. (2010). Attachment and emotion in school-aged children. *Emotion*, *10*, 475–485. https://doi.org/10.1037/a0018490

Borelli, J. L., Somers, J., West, J. L., Coffey, J. K., De Los Reyes, A., & Shmueli-Goetz, Y. (2016). Associations between attachment narratives and self-report measures of attachment in middle childhood: Extending evidence for the validity of the Child Attachment Interview. *Journal of Child and Family Studies*, *25*, 1235–1246. https://doi.org/10.1007/s10826-015-0310-8

Bosmans, G., Braet, C., Heylen, J., & De Raedt, R. (2015). Children's attentional processing of mother and proximity seeking. *PLoS One*, *10*, e0124038.

Bosmans, G., Braet, C., Koster, E., & De Raedt, R. (2009). Attachment security and attentional breadth toward the attachment figure in middle childhood. *Journal of Clinical Child & Adolescent Psychology*, *38*, 872-882.

Bosmans, G., Braet, C., & Van Vlierberghe, L. (2010). Attachment and symptoms of psychopathology: Early maladaptive schemas as a cognitive link? *Clinical Psychology & Psychotherapy*, *17*, 374-385.

Bosmans, G., Bakermans-Kranenburg, M., Vervliet, B., Verhees, M., van IJzendoorn, M. (2020). A learning theory of attachment: Unraveling the black box of attachment development. *Neuroscience And Biobehavioral Reviews, 113,* 287-298. doi: 10.1016/j.neubiorev.2020.03.014

Bosmans, G., Waters, T.E A., Finet, C., De Winter, S., Hermans, D. with Bosmans, G. (2019). Trust Development as an Expectancy-learning Process: Testing Contingency Effects. *Plos One*, *14*, Art.No. e0225934. doi: 10.1371/journal.pone.0225934.

Bosmans, G., & Kerns, K. A. (2015). Attachment in middle childhood: Progress and prospects. In G. Bosmans & K. A. Kerns (Eds.), Attachment in middle childhood: Theoretical advances and new directions in an emerging field. *New Directions for Child and Adolescent Development*, *148*, 1-14.

Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss, sadness and depression*. New York: Basic Books.

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J.A. Simpson & W. S. Roles (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford Press.

Brenning, K., Soenens, B., Braet, C., & Bosmans, G. (2011a). The role of depressogenic personality and attachment in the intergenerational similarity of depressive symptoms: A study with early adolescents and their mothers. *Personality and Social Psychology Bulletin*, *37*, 284-297.

Brenning, K., Soenens, B., Braet, C., & Bosmans, G. (2011b). An adaptation of the experiences in close relationships scale-revised for use with children and adolescents. *Journal of Social and Personal Relationships*, *28*, 1048-1072.

Brenning, K., Van Petegem, S., Vanhalst, J., & Soenens, B. (2014). The psychometric qualities of a short version of the Experiences in Close Relationships Scale–Revised Child version. *Personality and Individual Differences*, *68*, 118-123.

Brooks-Gunn, J., & Petersen, A. C. (1991). Studying the emergence of depression and depressive symptoms during adolescence. *Journal of Youth and Adolescence*, *20*, 115-119.

Brumariu, L. E., & Kerns, K. A. (2010). Parent–child attachment and internalizing symptoms in childhood and adolescence: A review of empirical findings and future directions. *Development and Psychopathology*, *22*, 177-203.

Cassidy, J. (1994). Emotion regulation: Influences of attachment relationships. *Monographs of the Society for Research in Child Development*, *59*, 228-249.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences (3rd ed.)*. New York: Routledge.

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). Depression and Anxiety, 18, 76-82. doi: 10.1002/da.10113

Cramer, D. (2004). Satisfaction with a romantic relationship, depression, support and conflict. *Psychology and Psychotherapy: Theory, Research and Practice*, *77*, 449-461.

Cuijpers, P., & Smit, F. (2002). Excess mortality in depression: A meta-analysis of community studies. *Journal of Affective Disorders*, *72*, 227–236.

Davis, D. E., Choe, E., Meyers, J., Wade, N., Varjas, K., Gifford, A., Quinn, A., Hook, J. N., Van Tongeren, D. R., Griffin, B. J., & Worthington, E. L., Jr. (2016). Thankful for the little things: A meta-analysis of gratitude interventions. *Journal of Counseling Psychology, 63,* 20–31. https://doi.org/10.1037/cou0000107

De Cuyper, K., De Houwer, J., Vansteelandt, K., Perugini, M., Pieters, G., Claes, L., & Hermans, D. (2017). Using Indirect Measurement Tasks to Assess the Self-concept of Personality: A Systematic Review and Meta-analyses. *European Journal of Personality*, *31*, 8-41.

Dujardin, A., Santens, T., Braet, C., De Raedt, R., Vos, P., Maes, B., & Bosmans, G. (2016). Middle childhood support-seeking behavior during stress: Links with self-reported attachment and future depressive symptoms. *Child Development*, *87*, 326-340.

Dwiwardani, C., Hill, P. C., Bollinger, R. A., Marks, L. E., Steele, J. A., Doolin, H. N., ... & Davis, D. E. (2014). Virtues develop from a secure base: Attachment and resilience as predictors of humility, gratitude, and forgiveness. *Journal of Psychology & Theology*, *42*, 83-90.

Emmons, R. A., & McCullough, M. E. (Eds.). (2004). *The psychology of gratitude*. Oxford University Press.

Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crisis? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology*, *84*, 365-376.

Froh, J. J., Emmons, R. A., Card, N. A., Bono, G., & Wilson, J. A. (2011). Gratitude and the reduced costs of materialism in adolescents. *Journal of Happiness Studies, 12,* 289–302. doi:10.1007/s10902-010-9195-9

Gawronski, B., & Creighton, L. A. (2013). Dual process theories. In D. E. Carlston (Ed.), *The Oxford handbook of social cognition* (pp. 282–312). Oxford, England: Oxford University Press.

George, C., Kaplan, N., & Main, M. (1985). The Adult Attachment Interview. Unpublished manuscript, University of California at Berkeley.

Greenberger, E., & Chen, C. (1996). Perceived family relationships and depressed mood in early and late adolescence: A comparison of European and Asian Americans. *Developmental Psychology*, *32*, 707-716.

Gulliford, L., Morgan, B., & Kristjánsson, K. (2013). Recent work on the concept of gratitude in philosophy and psychology. *The Journal of Value Inquiry*, *47*, 285-317.

Gumley, A. I., Taylor, H. E. F., Schwannauer, M., & MacBeth, A. (2014). A systematic review of attachment and psychosis: measurement, construct validity and outcomes. *Acta Psychiatrica Scandinavica*, *129*, 257-274.

Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling.

Hinton, P. R., McMurray, I., & Brownlow, C. (2004). *SPSS explained*. Routledge.

Kenny, D. A. (2018). Mediation. Retrieved from http://www.davidakenny.net/cm/mediate.htm

Kleiman, E. M., Adams, L. M., Kashdan, T. B., & Riskind, J. H. (2013a). Grateful individuals are not suicidal: Buffering risks associated with hopelessness and depressive symptoms. *Personality and Individual Differences*, *55*, 595-599.

Kleiman, E. M., Adams, L. M., Kashdan, T. B., & Riskind, J. H. (2013b). Gratitude and grit indirectly reduce risk of suicidal ideations by enhancing meaning in life: Evidence for a mediated moderation model. *Journal of Research in Personality*, *47*, 539-546.

Kovacs, M. (1985). The children's depression inventory (CDI). *Psychopharmacology Bulletin*, *21*, 995-998.

Kraus, R., Desmond, S. A., & Palmer, Z. D. (2015). Being thankful: Examining the relationship between young adult religiosity and gratitude. *Journal of Religion and Health*, *54*, 1331-1344.

Kullik, A., & Petermann, F. (2013). Attachment to parents and peers as a risk factor for adolescent depressive disorders: The mediating role of emotion regulation. *Child Psychiatry & Human Development*, *44*, 537-548.

La Greca, A. M., & Harrison, H. M. (2005). Adolescent peer relations, friendships, and romantic relationships: Do they predict social anxiety and depression? *Journal of Clinical Child and Adolescent Psychology*, *34*, 49-61.

Lambert, N. M., Clark, M. S., Durtschi, J., Fincham, F. D., & Graham, S. M. (2010). Benefits of expressing gratitude: Expressing gratitude to a partner changes one's view of the relationship. *Psychological Science*, *21*, 574-580.

Lambert, N. M., Fincham, F. D., & Stillman, T. F. (2012). Gratitude and depressive symptoms: The role of positive reframing and positive emotion. *Cognition & Emotion*, *26*, 615-633.

Lee, A., Hankin, B. L., & Mermelstein, R. J. (2010). Perceived social competence, negative social interactions, and negative cognitive style predict depressive symptoms during adolescence. *Journal of Clinical Child and Adolescent Psychology*, *39*, 603–615.

Lewinsohn, P. M., Solomon, A., Seeley, J. R., & Zeiss, A. (2000). Clinical implications of "subthreshold" depressive symptoms. *Journal of Abnormal Psychology*, *109*, 345–351.

Lin, C. (2015). The relationships among gratitude, self-esteem, depression, and suicidal ideation among undergraduate students. *Scandinavian Journal of Psychology*, *56*, 700-707.

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*, *39*, 99-128.

Madigan, S., Atkinson, L., Laurin, K., & Benoit, D. (2013). Attachment and internalizing behavior in early childhood: A meta-analysis. *Developmental Psychology*, *4*, 672.

McGoron, L., Gleason, M. M., Smyke, A. T., Drury, S. S., Nelson, C. A., Gregas, M. C., ... & Zeanah, C. H. (2012). Recovering from early deprivation: Attachment mediates effects of caregiving on psychopathology. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*, 683-693.

McCullough, M. E., Emmons, R. A., & Tsang, J. A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, *82*, 112-127.

Mikulincer, M., & Shaver, P. (2007). *Attachment in adulthood: Structure, dynamics, and change*. New York: Guilford Press.

Mikulincer, M., Shaver, P. R., & Slav, K. (2006). Attachment, mental representations of others, and gratitude and forgiveness in romantic relationships. In M. Mikulincer & G. S. Goodman (Eds.), *Dynamics of romantic love: Attachment, caregiving, and sex* (pp. 190-215). New York: Guilford Press.

Muris, P. (2006). Maladaptive schemas in non-clinical adolescents: Relations to perceived parental rearing behaviours, Big Five personality factors and psychopathological symptoms. *Clinical Psychology & Psychotherapy, 13,* 405–413. DOI: 10.1002/cpp.506

Murray, C. J. L., Lopez, A. D. (1996). *The global burden of disease: A comprehensive assessment of mortality and disability from disease, injuries, and risk factors in 1990 and projected to 2020: Summary.* Cambridge: Harvard University Press.

Petersen, A. C., Compas, B. E., Brooks-Gunn, J., Stemmler, M., Ey, S., & Grant, K. E. (1993). Depression in adolescence. *American Psychologist, 48,* 155–168.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*, 717-731.

Ridenour, T. A., Greenberg, M. T., & Cook, E. T. (2006). Structure and validity of people in my life: A self-report measure of attachment in late childhood. *Journal of Youth and Adolescence*, *35*, 1037-1053.

Roelofs, J., Lee, C., Ruijten, T., & Lobbestael, J. (2011). The mediating role of early maladaptive schemas in the relation between quality of attachment relationships and symptoms of depression in adolescents. *Behavioural and Cognitive Psychotherapy*, *39*, 471-479.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry*, *57*, 316.

Saluja, G., Iachan, R., Scheidt, P. C., Overpeck, M. D., Sun, W., & Giedd, J. N. (2004). Prevalence of and risk factors for depressive symptoms among young adolescents. *Archives of Pediatrics & Adolescent Medicine*, *158*, 760-765.

Saylor, C. F., Finch, A. J., Spirito, A., & Bennett, B. (1984). The Children's Depression Inventory: A systematic evaluation of psychometric properties. *Journal of Consulting and Clinical Psychology*, *52*, 955-967.

Shaver, P. R., Mikulincer, M., Gross, J. T., Stern, J. A., & Cassidy, J. (2016). A lifespan perspective on attachment and care for others: Empathy, altruism, and prosocial behavior. In J. Cassidy & P. R. Shaver (Eds.). *Handbook of attachment: Theory, research, and clinical applications* (3rd ed., pp 878-916). New York: Guilford Press.

Shmueli-Goetz, Y. (2014). The Child Attachment Interview (CAI). In S. Farnfield & P. Holmes (Eds.), *The Routledge Handbook of Attachment: Assessment.* (pp. 119–132). New York, NY: Routledge/Taylor & Francis Group.

Shmueli-Goetz, Y., Target, M., Fonagy, P., & Datta, A. (2008). The Child Attachment Interview: A psychometricstudy of reliability and discriminant validity. *Developmental Psychology*, *44*, 939-956.

Target, M., Fonagy, P., & Shmueli-Gotez, Y. (2003). Attachment representations in school-age children: the development of the child attachment interview (CAI). *Journal of Child Psychotherapy*, *29*(2), 171–186. https://doi.org/10.1080/0075417031000138433

Timbremont, B., & Braet, C. (2002). *Children's Depression Inventory, Nederlandstalige versie: Handleiding.* Lisse, The Netherlands: Swets & Zeitlinger.

Van de Walle, M., Bijttebier, P., Braet, C., & Bosmans, G. (2016). Attachment anxiety and depressive symptoms in middle childhood: The role of repetitive thinking about negative affect and about mother. *Journal of Psychopathology and Behavioral Assessment*, *38*, 615-630.

Van de Walle M., Bijttebier P., De Raedt R., Bosmans G. (2017). Repetitive thinking about the mother during distress moderates the link between children's attentional breadth around the mother and depressive symptoms in middle childhood. *Behaviour Research and Therapy, 90*, 137-146.

Venta, A., Shmueli-Goetz, Y., & Sharp, C. (2014). Assessing attachment in adolescence: A psychometric study of the Child Attachment Interview. *Psychological Assessment*, *26*, 238–255. https://doi.org/10.1037/a0034712

Waters, T. E. A., Bosmans, G., Vandevivere, E., Dujardin, A., & Waters, H. S. (2015). Secure base representations in middle childhood across two Western cultures: Associations with parental attachment representations and maternal reports of behavior problems. *Developmental Psychology*, *51*, 1013-1025.

Waters, T. E., Brockmeyer, S. L., & Crowell, J. A. (2013). AAI coherence predicts caregiving and care seeking behavior: Secure base script knowledge helps explain why. *Attachment & Human Development*, *15*, 316-331.

Waters, H. S., & Rodrigues-Doolabh, L. (2001, April). Are attachment scripts the building blocks of attachment representations. In *biennial meeting of the Society for Research in Child Development, Washington, DC*.

Waters, H. S., & Waters, E. (2006). The attachment working models concept: Among other things, we build script-like representations of secure base experiences. *Attachment & Human Development*, *8*, 185-197.

Waters, T.E A., Facompre, C.R., Van de Walle, M., Dujardin, A., De Winter, S., Heylen, J., Santens, T., Verhees, M., Finet, C., Bosmans, G. (2019). Stability and Change in Secure Base Script Knowledge During Middle Childhood and Early Adolescence: A 3-Year Longitudinal Study. *Developmental Psychology*, 55, 2379-2388. doi: 10.1037/dev0000798

Waters, T.E A., Facompré, C.R., Dujardin, A., Van De Walle, M., Verhees, M., Bodner, N., Boldt, L.J., Bosmans, G. (2019). Taxometric analysis of secure base script knowledge in middle childhood reveals categorical latent structure. *Child Development, 90 ,* 694-707. doi: 10.1111/cdev.13229

Watkins, P. C., Van Gelder, M., & Frias, A. (2009). Furthering the science of gratitude. In C. R. Snyder & S. J. Lopez (Eds.). *Oxford handbook of positive psychology* (pp. 437-445). Oxford: Oxford University Press.

Wei, M., Shaffer, P. A., Young, S. K., & Zakalik, R. A. (2005). Adult attachment, shame, depression, and loneliness: The mediation role of basic psychological needs satisfaction. *Journal of Counseling Psychology*, *52*, 591.

Wood, A. M., Froh, J. J., & Geraghty, A. W. (2010). Gratitude and well-being: A review and theoretical integration. *Clinical Psychology Review*, *30*, 890-905.

Wood, A. M., Maltby, J., Gillett, R., Linley, P. A., & Joseph, S. (2008). The role of gratitude in the development of social support, stress, and depression: Two longitudinal studies. *Journal of Research in Personality*, *42*, 854-871.

Zeijlmans Van Emmichoven, I. A., Van IJzendoorn M. H., de Ruiter, C., & Brosschot, J. F. (2003). Selective processing of threatening information: Effects of attachment representation and anxiety disorder on attention and memory. *Development & Psychopathology, 15*, 219-237.

Zhang, L., Zhang, S., Yang, Y., & Li, C. (2017). Attachment orientations and dispositional gratitude: The mediating roles of perceived social support and self-esteem. *Personality and Individual Differences*, *114*, 193-197.

Zuckerman, M., Hodgins, H. S., Zuckerman, A., & Rosenthal, R. (1993). Contemporary issues in the analysis of data: A survey of 551 psychologists. *Psychological Science, 4,* 49–53.

Compliance with Ethical Standards

None of the authors have conflicts of interest to report. The study was conducted with human participants who all gave their active informed consent.

Table 1: Example MC ASA Item Scary Dog in the Yard

Scary Dog in the Yard

outside	sniff	mom	dog gone
play	bark	broom	go inside
big dog	I cry	chase	play

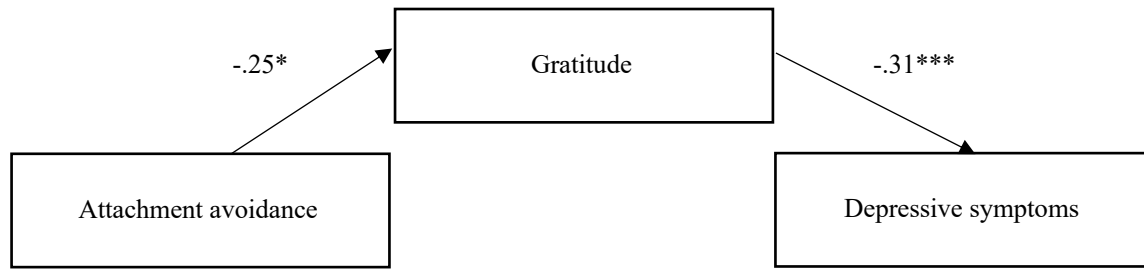*Table 2: Correlations and Descriptive Statistics*

	1	2	3	4	5	6	7	8
Baseline Measures								
1. Attachment Anxiety	1							
2. Attachment Avoidance	.43***	1						
3. Trust	-.60***	-.55***	1					
4. Secure Base Script	-.05	-.07	.10	1				
5. Coherence	-.11	-.12	.18*	.44**	1			
6. Depressive Symptoms	.51***	.36***	-.50***	.10	-.05	1		
Follow Up Measures								
7. Gratitude	-.33***	-.38***	.31**	.23**	.25**	-.19*	1	
8. Depressive Symptoms	.25**	.08	-.24**	.09	-.01	.48***	-.33***	1
M	1.49	2.81	3.58	3.90	5.73	0.24	5.40	0.27
SD	0.71	1.16	0.35	0.74	1.33	0.18	0.75	0.20

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

Table 3: Summary of the Indirect Effect Analyses

Predictor	C-path	C'-path	IE	SE	LLCI	ULCI	F	R^2
Attachment Anxiety	.12	.04	.08	.04	.02	.15	10.19	.37***
Attachment Avoidance	-.03	-.12	.09	.04	.03	.16	10.19	.37***
Trust	-.08	-.01	-.07	.04	-.14	-.02	13.61	.38***
Secure Base Script Knowledge	-.04	.04	-.08	.03	-.14	-.04	13.60	.38***
Coherence	-.04	.02	-.06	.04	-.12	-.06	13.40	.39***

Note: C-path = the direct effect of Attachment on change in depressive symptoms; C'-path is the direct effect after controlling for the Indirect Effect; IE = Indirect Effect of Gratitude; SE = Standard Error of the Indirect Effect; LLCI = Lower Limit of the 95% Confidence Interval; ULCI = Upper Limit of the 95% CI. If zero is not included in the 95% CI, the indirect effect is considered as significant. The C-path, C'-path, IE, LLCI, ULCI values are all completely standardized. SE was calculated for the completely standardized effects. F- and $R2$-values reflect the significance of the full model containing the predictor, mediator, and control variables. *** $p < .001$

	Gratitude	
Attachment anxiety	-.27*	-.31*** Depressive symptoms

	Gratitude	
Attachment avoidance	-.25*	-.31*** Depressive symptoms

	Gratitude	
Trust	.24*	-.31*** Depressive symptoms

	Gratitude	
Secure Base Script	.27**	-.31*** Depressive symptoms

	Gratitude	
Coherence	.20[†]	-.30*** Depressive symptoms
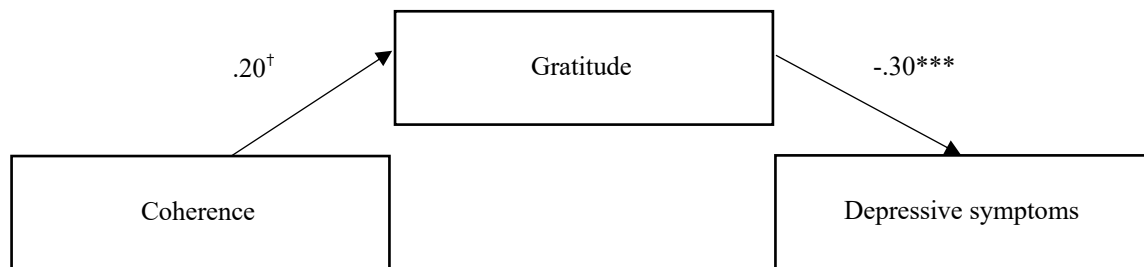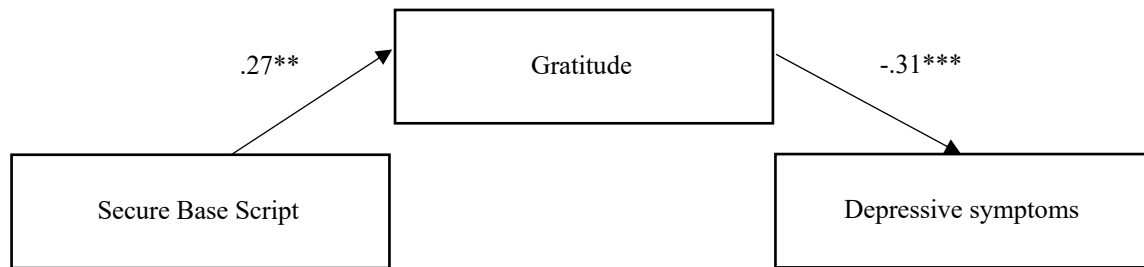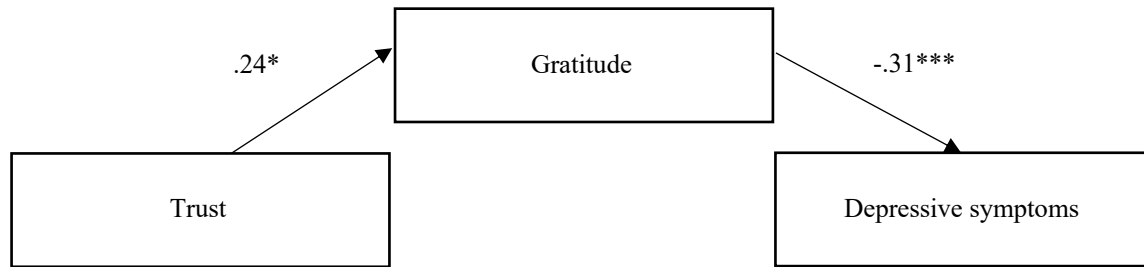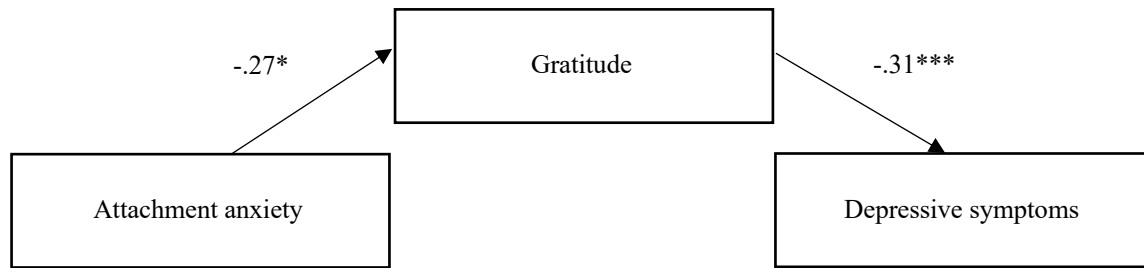
[†] $p = .06$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note: in all the presented models, attachment was measured at baseline, gratitude and depressive symptoms were measured at follow-up two years later. In all the analyses, we controlled for depressive symptoms at baseline, gender, and age. In the analysis with attachment anxiety as predictor, we additionally controlled for attachment avoidance. In the analysis with attachment avoidance as predictor, we additionally controlled for attachment anxiety. All values are standardized regression coefficients. Regression coefficients reflecting the direct association between attachment and depressive symptoms (with and without controlling for the indirect effect) are presented in Table 3.

Figure 1: Indirect Effect Analyses

Supplementary File

In addition, we were able to collect depressive symptoms of a smaller part of the sample ($n = 85$) one year later. Although drop-out analyses did not suggest that it could have affected the results, we considered the reduction in participants as a reason to focus on the waves reported in this manuscript. However, it seemed worthwhile to report that the indirect effect remained significant when testing models model with Baseline Attachment – Follow up Gratitude – Depressive Symptoms one year later (controlling for Baseline Depressive Symptoms). For anxious attachment, the indirect effect ($b = .03$) was between .006 and .063 with a 95% CI. For avoidant attachment, $b = .02$ was between .004 and .046 with a 95% CI. For trust, $b = -.034$ was estimated to be between -.089 and -.005 with a 95% CI. For SBS, $b = -.021$ was estimated to be between -.054 and -.003 with a 95% CI. For coherence, $b = -.010$, was estimated to be between -.025 and -.0003 with a 95% CI. Because for all these analyses, zero was not in the 95% CI, the indirect effects were significantly different from zero. This further supports the hypothesis that gratitude might be a factor explaining why more securely attached children are more resilient against the development of depressive symptoms. Detailed results can be obtained from the authors.