

A Further Validation of the Cognitive Bias Modification Effect on Trust in Middle Childhood

Guy Bosmans*¹

Martine W.F.T. Verhees¹

Simon De Winter

KU, Leuven, Belgium

Recent middle childhood research suggests that children's trust in maternal support can be manipulated using Cognitive Bias Modification (CBM) aimed at changing children's interpretation of ambiguous maternal support-related behavior. The current study with 60 children (40 girls, $M_{age} = 10.62$, $SD_{age} = 1.20$) aimed to replicate previous research and to test whether the CBM effect is specific to trust or generalizes to other child evaluations of maternal behavior. More specifically, CBM effects on children's evaluation of parenting behavior were tested. Trust and maternal parenting behaviors were assessed using children's self-report. Results largely replicated previous findings, including the positive effect of CBM on children's trust in maternal support. Suggesting that this effect was specific for trust, the CBM manipulation did not affect children's appraisal of maternal parenting behavior. This finding supports the validity of CBM effects.

Keywords: attachment; middle childhood; cognitive bias modification

ATTACHMENT, OF WHICH TRUST in caregiver support is the hallmark, plays a critical role in many domains of child development (Cassidy & Shaver, 2016).

¹ Joint first authors. This study was supported by grant C14/16/040 from Research Fund KU Leuven and by grants G075718 and G077415 from Fonds Wetenschappelijk Onderzoek granted to Guy Bosmans.

* Address correspondence to Guy Bosmans, KU Leuven, Leopold Vanderkelenstraat 32 - box 3765, 3000 Leuven, Belgium; e-mail: guy.bosmans@kuleuven.be.

Therefore, it is surprising that little is known about the mechanisms explaining attachment development (Rutter, 2014). Only recently, two middle childhood attachment studies found evidence suggesting that children's level of self-reported trust in maternal support is causally affected by biases in the processing of attachment-related information (De Winter, Bosmans, & Salemink, 2017; De Winter, Salemink, & Bosmans, 2018). When children process information regarding the mother as an indication that she is providing support, this increases their inclination to report higher levels of trust in her availability for support. For these studies, a Cognitive Bias Modification (CBM) paradigm was developed that allowed training children's tendency to interpret ambiguous maternal behavior in a supportive way. This training had a causal effect on self-reported trust. However, because this CBM effect was found at the level of self-reported trust, these studies could not rule out the possibility that CBM affected children's positive appraisal of their mother in general and not specifically their trust in their mother's support. To further validate the specificity of the CBM-trust effect, the current study aimed to evaluate the extent to which CBM also affected children's appraisal of other maternal (i.e., parenting) behavior.

Children's level of trust in maternal support reflects the extent to which they recurrently experience that their mother is sensitive and responsive to their needs during stress (Bowlby, 1969). Accumulating evidence shows that children who have more versus less trust in maternal support are more likely to interpret the same maternal behavior as a sign of more versus less maternal

support, further referred to as a positive versus negative attachment-related interpretation bias (De Winter, Vandevivere, Waters, Braet, & Bosmans, 2016; Zimmermann & Iwanski, 2015). Although many attachment researchers have claimed that these biases determine the content of attachment-related expectations in novel interactions with attachment figures (Bowlby, 1969; Dykas & Cassidy, 2011), this claim was only recently tested using CBM methodology.

CBM allows to manipulate children's attachment-related interpretation bias and to test whether this manipulation has a causal effect on children's trust in maternal support. More specifically, attachment-related CBM consists of two conditions to which children are randomly assigned in a Randomized Controlled Trial (RCT) design. In the training condition, children are presented with distressing situations that are ambiguous with regard to whether or not the mother provides support. Children are trained to interpret this maternal behavior in a positive way. In the placebo condition, children are presented with the same situations, but the resolution of the scenarios is not related to maternal behavior. Consequently, this is a neutral comparison condition. During the CBM procedure, reaction times to probe scenarios are measured in the training and the placebo condition to investigate whether children in the training condition become faster to interpret maternal behavior in a positive way as compared to a negative way. Before and after the training, children's attachment-related interpretation bias is measured and compared between both conditions to see whether training effects generalize beyond the training. Finally, before and after the training, children's self-reported trust in maternal support is measured and compared between conditions to see whether the training has a significant effect on children's trust.

Results of the two existing studies (De Winter et al., 2017, 2018) showed that the training increased children's speed to interpret ambiguous maternal behavior in a positive way as compared to the time they needed to interpret the scenarios in a negative way. Moreover, this effect generalized to the interpretation bias measured before and after the training. Finally, and most important, the training increased children's trust in maternal support during distress.

The fact that CBM altered children's trust added substantial credibility to the theory that attachment-related information processing biases play a causal role in the development and maintenance of children's trust over time (Bosmans, 2016). However, one of the concerns expressed in prior

attachment-related CBM research was that it could not be ruled out that the training did not have a trust-specific effect, but rather induced a general positive stance towards mother. To control for these alternative explanations, we repeated De Winter et al.'s (2017, 2018) studies, but in addition we measured children's self-reported appraisal of their mother's parenting behavior. More specifically, before and after the training, we measured children's evaluation of their mothers' positive parenting behavior, their rule-setting behavior, their punishment behavior, their harsh punishment behavior, and their rewarding behavior. If the CBM training has no specific effect on children's trust, but reflects a general positivity effect, one would predict that the training would similarly affect children's trust and children's appraisal of their parents' parenting behaviors. However, if the CBM procedure specifically manipulates trust, one would predict that the CBM training only affects trust and not the parenting variables. Finally, because priming individuals with secure attachment information elicits a positive or happy mood (Carnelley, Otway, & Rowe, 2016), and because a happy mood could lead to increases in self-reported trust due to reporter bias (Cohen, Towbes, & Flocco, 1988), we included happiness as a control variable to further assure that the CBM training effects not merely reflect a sense of happiness primed by the training condition. Therefore, we measured children's happiness before and after the training and controlled for change in happiness in the analyses.

Method

PARTICIPANTS

Data was collected in 60 children (40 girls) with ages ranging from 9 to 13 years ($M = 10.62$, $SD = 1.20$). Most children lived together with both biological parents (90%), and had mother as primary caregiver in the first year of their lives (100%). All children were Caucasian. Of the mothers, 28.3% had an elementary school or middle school diploma. The remaining mothers had a bachelor's or master's degree.

MATERIALS

Trust was measured using the Trust subscale of the People In My Life Questionnaire (Ridenour, Greenberg, & Cook, 2006). This subscale assesses experiences of trust in the availability and support of mother with 10 items (e.g., "I can count on my mother to help me when I have a problem"). Items were rated on a Likert-scale ranging from 1 (*almost never true*) to 4 (*almost always true*). Higher scores

indicate more trust in maternal support. Cronbach's α s were .75 and .89 for the pretraining and posttraining measurements, respectively.

Parenting behavior of mother as perceived by the child was measured with the brief Parental Behavior Scale (PBS; Van Leeuwen & Vermulst, 2010). This questionnaire consists of 25 items measuring maternal parenting behavior on 5 different scales: Positive parenting (8 items, e.g., "When I have a problem, my mom discusses with me what exactly is going on," $\alpha_{pre} = .62, \alpha_{post} = .77$); Rule setting (5 items, e.g., "My mom makes agreements with me about how to behave," $\alpha_{pre} = .78, \alpha_{post} = .81$); Punishment (4 items, e.g., "When I do something that I am not allowed to do, my mom punishes me," $\alpha_{pre} = .80, \alpha_{post} = .85$); Harsh punishment (5 items, e.g., "My mom slaps me when I have done something wrong," $\alpha_{pre} = .80, \alpha_{post} = .85$); Rewarding (3 items, e.g., "My mom lets me buy something when I have done something well," $\alpha_{pre} = .70, \alpha_{post} = .80$). Children rated how often the behavior occurred on a Likert scale ranging from 1 (*almost never*) to 5 (*almost always*).

Happiness was measured with one item using a Visual Analogous Scale. Children were asked to rate their happiness by drawing a cross on a 10 cm long line ranging from unhappy to happy. This item was administered before and after the CBM procedure. To control for changes in happiness, a

change score was calculated (happiness T2 – happiness T1) and used as a covariate in the analyses.

Cognitive Bias Modification training consisted of scenarios that described distressing situations in which maternal support might be needed. These scenarios were presented on a computer screen. All scenarios consisted of three lines of text, with one word missing in the last line. After children pressed the space bar, the missing word appeared on the screen as a word fragment with one letter missing. Children were instructed to press the space bar as soon as they knew the letter and recognized the missing word. Each scenario was followed by a yes/no comprehension question. In total, children were presented with 42 scenarios divided over six blocks of seven scenarios each. Children were allowed to take a break between blocks. Each block contained five training scenarios and two probe scenarios used to measure interpretation speed (see below).

The content of the training scenarios differed between the training condition and the placebo condition (see Figure 1). In the training condition, the missing word in the last line of the scenario caused the outcome to be ambiguous as to whether mother provided support. Resolving the word fragment in these scenarios always led to a secure interpretation, thereby training children to interpret ambiguous maternal behavior as supportive. In the

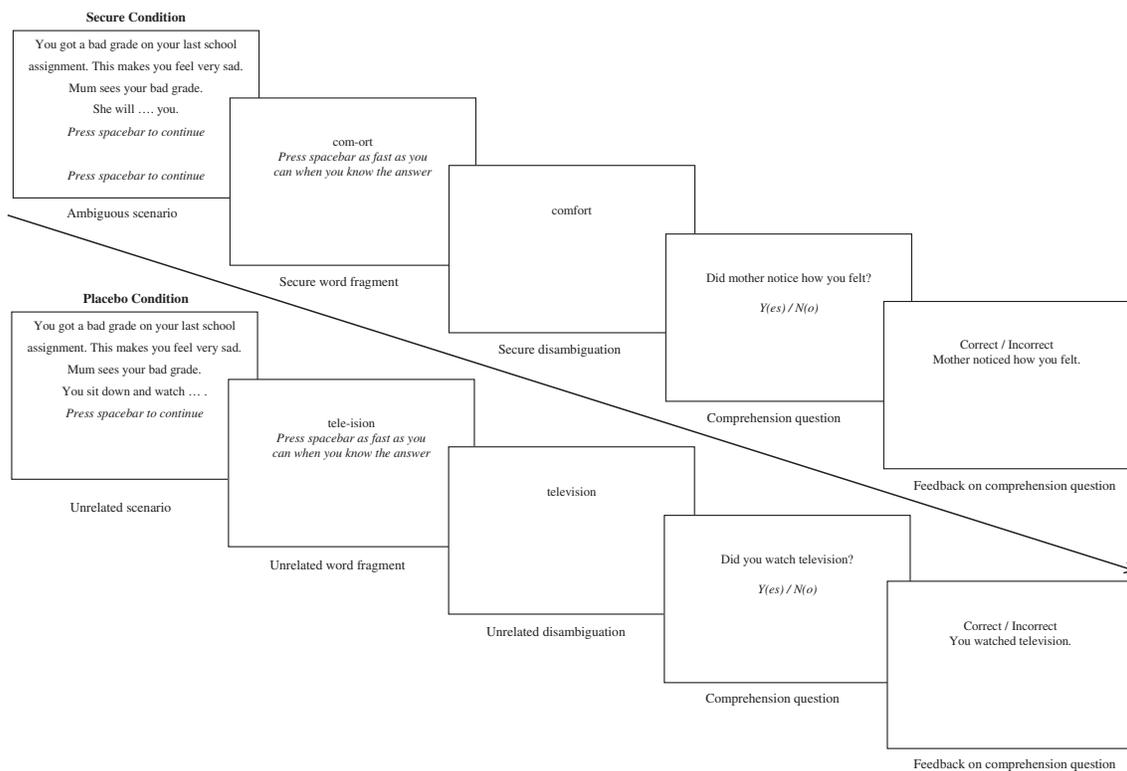


FIGURE 1 Example CBM/Placebo Trial

placebo condition, the scenarios described an identical situation, however, the last line of the scenario was unrelated to maternal behavior. Resolving the word fragment therefore did not relate to children’s interpretation of maternal behavior. For further details on the CBM procedure and its development, see De Winter et al. (2017).

Interpretation speed of positive and negative probe scenarios was used to assess children’s automatic interpretation strategies. The probe scenarios had the same format as the training scenarios and were presented throughout the training. The order of presentation of probe and training scenarios was randomized within each block, with the final order kept identical for all participants. Children in the training and the placebo condition received the same 12 probe scenarios, two per training block: one with a positive or secure resolution and one with a negative or insecure resolution of maternal behavior. Reaction times to the resolving word fragments of these probe scenarios were measured to assess whether children in the training condition were

faster in interpreting maternal behavior in a positive versus a negative way as compared to children in the placebo condition.

Recognition tasks (Mathews & Mackintosh, 2000) were used to assess children’s attachment-related positive and negative interpretation biases before and after the training. Children read seven attachment-related scenarios that had a title, a picture, and otherwise the same format as the scenarios presented during the training (i.e., three lines of text with a missing word in the last line, which was then presented as a word fragment that children needed to resolve, followed by a yes/no comprehension question). Contrary to the training scenarios, mother’s behavior remained ambiguous after resolving the word fragment (see Figure 2).

After children read all seven scenarios, they were presented with two events for each of the scenarios: one event that reflected a positive interpretation of the ambiguous maternal behavior and one that reflected a negative interpretation. The positive and negative event were presented separately, but both were accompanied by the title and picture of the

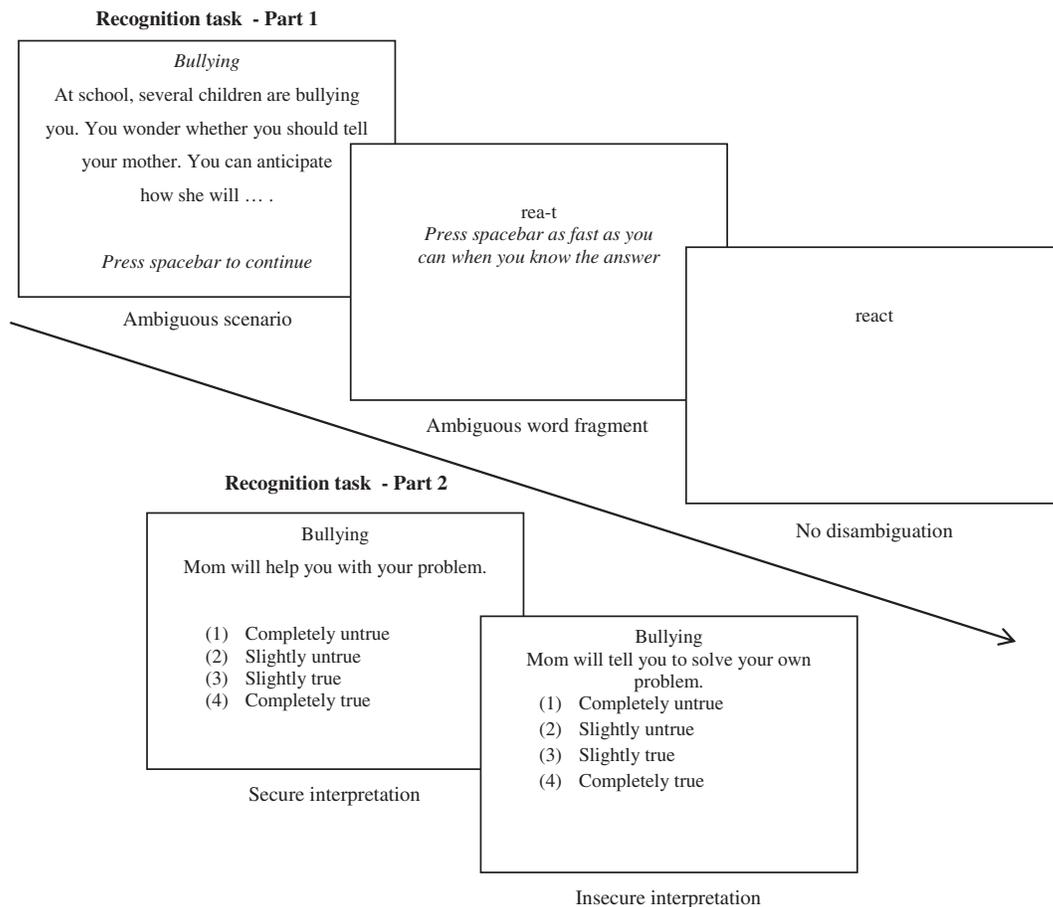


FIGURE 2 Example Recognition Task Item

scenario. Children rated for each event to what extent they thought it happened in the scenario on a scale ranging from 1 (*completely untrue*) to 4 (*completely true*). These scores reflected children's spontaneous interpretation of the scenarios, as none of the described events had actually occurred in the scenarios. Average scores for the positive and negative events separately were averaged per person to obtain a positive and a negative interpretation bias score, with higher scores indicating a tendency to interpret maternal behavior more positively versus more negatively.

PROCEDURE

To recruit participants, parents were informed about the study by distributing flyers at schools. If children were interested to participate, parents could give their active consent to participate in the study by filling out a leaflet and returning it to school. All parents who expressed interest to participate in the study were called up, further informed about the study, and invited to the lab. At the lab, mothers and children were again informed about the study and the study activities. Children only participated in the study when parents gave their active consent and children gave their active assent. As part of a larger project, children and their mothers participated in a mother-child discussion about conflict topics. Then, children filled out paper questionnaires about their trust, their mother's parenting behavior, and their emotional state. Then, children were randomly assigned to either the training or the placebo condition and were seated in front of the computer. After the recognition task was administered, the training (or placebo) started. At the end of the CBM procedure, the recognition task was repeated. Finally, children filled out the same set of paper questionnaires. All children received a movie theater ticket at the end of the procedure to thank them for their participation. This procedure was approved by the local university's ethical committee.

Results

GENERAL INFORMATION

In total, 1.2% of data was missing completely at random (Little's MCAR test: $\chi^2[162] = 148.98, p = .761$). Missing data was pair-wise deleted. Trust, parenting, and interpretation bias were meaningfully correlated at the start of the study (Table 1). Age was not correlated to the study variables. A multivariate ANOVA showed no gender effects on the study variables. A repeated measures ANOVA with time (pre versus post CBM) as within subject variable and condition (training versus placebo) as between subject variable to test training effects on happiness revealed no significant Time \times Condition interaction effect, $F(1, 58) = 0.84, p = .364, \eta_p^2 = .01$.

INTERPRETATION SPEED

A repeated measures ANOVA with valence (positive versus negative probes) as within subject variable and condition (training versus placebo) as between subject variable on reaction times to solve missing word fragments, while controlling for change in happiness before versus after the procedure, revealed a significant Valence \times Condition effect, $F(1, 54) = 4.18, p = .046, \eta_p^2 = .07$. Further disentangling of the interaction effect with paired samples *t*-tests for both conditions separately showed a significant training effect for the children in the training group, $t(29) = 3.70, p = .001, d = .65$. They more quickly solved positive probes ($M = 2978.18, SD = 1369.82$) than negative probes ($M = 4209.45, SD = 2311$). In the placebo group, no reaction time differences were found between positive and negative probes, $t(29) = 1.13, p = .270, d = .14$. This effect replicates earlier research (De Winter et al., 2017, 2018) and suggests that the training affected children's interpretation strategies on an automatic level.

RECOGNITION TASK

Data inspection of the recognition task data showed there was one outlier whose score on the positive

Table 1
Correlations Between the Variables at Baseline

	1.	2.	3.	4.	5.	6.	7.	8.
1. Trust Pre	1							
2. Positive IB pre	.34**	1						
3. Negative IB pre	-.51***	-.19	1					
4. Positive parenting pre	.47***	.26*	-.33*	1				
5. Rule setting pre	.41**	.13	-.26*	.46***	1			
6. Punishment pre	-.30*	-.19	.34**	.02	.25	1		
7. Harsh punishment pre	-.28*	-.01	.47***	-.21	-.09	.45***	1	
8. Reward pre	.10	.28*	-.04	.26*	.23	.08	.20	1

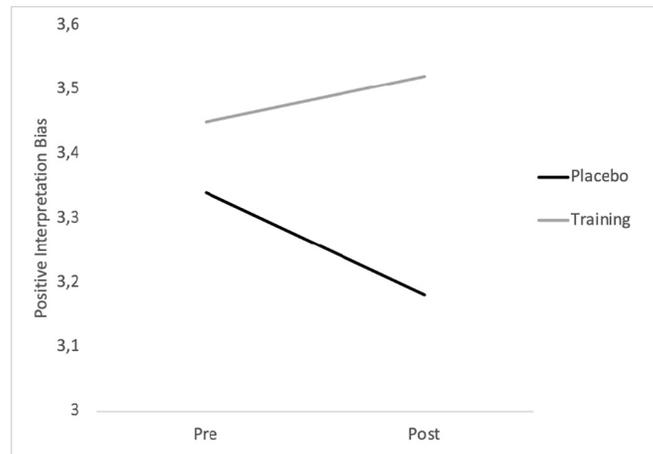


FIGURE 3 Positive Interpretation Bias Effect

bias measure before the CBM procedure diverged more than three *SDs* from the mean. Consequently, this person was removed from the data before the analyses. Two repeated measures ANOVAs were carried out with time (pre versus post CBM) as within subject variable and condition (training versus placebo) as between subject variable, while controlling for change in happiness before versus after the procedure, for positive and negative interpretation bias separately. For negative interpretation bias, there was no significant Time \times Condition interaction effect, $F(1, 54) = 0.12, p = .730, \eta_p^2 = .002$. For positive interpretation bias, the Time \times Condition interaction was significant, $F(1, 53) = 4.06, p = .049, \eta_p^2 = .07$. Figure 3 shows that, at the end of the procedure, training condition children had a more positive interpretation bias than placebo condition children, $F(1, 57) = 8.02, p = .006, d = .75$. There were no other between or within group effects that drove the significant interaction effect. Although these results only partly replicate earlier research, this finding is in line with prior research (De Winter et

al., 2017, 2018) and suggests that the CBM procedure affected how children interpreted attachment-related information.

TRUST EFFECTS

A repeated measures ANOVA with time (pre versus post CBM) as within subject variable and condition (training versus placebo) as between subject variable on trust while controlling for change in happiness before versus after the procedure, revealed a significant Time \times Condition effect, $F(1, 52) = 5.96, p = .018, \eta_p^2 = .10$. Figure 4 shows that Trust significantly increased in the training condition, $t(28) = 2.76, p = .010, d = .46$, but not in the placebo condition, $t(28) = 0.81, p = .427, d = .04$. Moreover, after the procedure, training condition children reported significantly higher trust compared to the placebo condition children. This result replicates earlier research suggesting that manipulating children's interpretation bias has a causal effect on their self-reported trust in maternal support (De Winter et al., 2017, 2018).

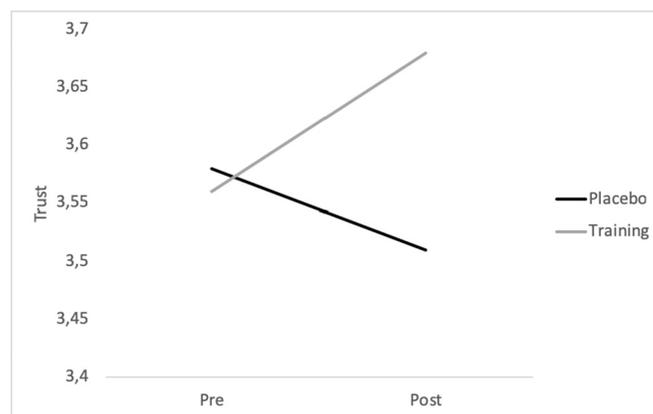


FIGURE 4 Trust Effect

PARENTING EFFECTS

For each of the five parenting subscales administered in this study, we conducted a repeated measures ANOVA with time (pre versus post CBM) as within subject variable and condition (training versus placebo) as between subject variable, while controlling for change in happiness before versus after the procedure. These analyses found no significant Time \times Condition interaction effects for any of the parenting subscales: positive parenting, $F(1, 54) = 0.04, p = .851, \eta_p^2 = .001$; rule setting, $F(1, 54) = 0.00, p = .956, \eta_p^2 = .000$; punishment, $F(1, 54) = 0.05, p = .818, \eta_p^2 = .001$; harsh punishment, $F(1, 54) = 0.07, p = .793, \eta_p^2 = .001$; rewarding, $F(1, 54) = 0.09, p = .763, \eta_p^2 = .002$. These results suggest that the CBM procedure did not affect children's perception of their mother's parenting behavior.

Discussion

The current study aimed to evaluate whether attachment-focused CBM has a specific effect on trust in maternal support, or whether the effects reflect a general positivity induction effect. To that aim, we used the design developed by De Winter et al. (2017) to see whether we could replicate the CBM effect on children's self-reported trust. In addition, we measured children's appraisal of their mother's parenting behavior before and after the CBM procedure. Results suggested that the previously found CBM effects could be largely replicated and that training children to interpret maternal behavior in a positive way significantly increased trust in her support. Suggesting that the training has a unique effect on trust, no training effects were found on all five perceived parenting behaviors (positive parenting, rule setting, punishment, harsh punishment, rewarding).

First, like in prior attachment-related CBM research, children in the training condition more quickly solved trials in which they had to interpret the scenarios in a positive way, while they were slower to resolve scenarios in a negative way. Contrarily, children in the placebo condition showed no reaction time differences between the two types of trials. This suggests that the training had the expected effect on children's ability to interpret ambiguous scenarios in positive versus negative way. Second, comparing children's interpretation bias before and after the training, results were not as robust as those in De Winter et al. (2017, 2018). No training effect was found for negative interpretation bias. For positive interpretation bias, the results were more in line with the prior studies. It might be that the variation in effect sizes across studies reflected statistical coincidence.

Indeed, also in the current study, controlling for pretraining positive interpretation bias, children in the training condition had higher positive interpretation bias scores than children in the placebo condition after the procedure. Most important, like in the previous attachment-related CBM studies, the training significantly increased children's trust in maternal support in the training condition, but not in the control condition.

In addition to replicating prior research, the current study added to our understanding of the meaning of the CBM effect by showing that the training effects are unique for children's trust in maternal support and do not generalize to maternal parenting behaviors. No training effects were found on children's appraisal of their mother's positive parenting behavior, rule setting, punishment, harsh punishment, and rewarding behavior. As such, this study adds to other studies challenging the basic assumptions about the nature of the CBM effect (e.g., Hoppitt, Mathews, Yiend, & Mackintosh, 2010). These prior studies and the current study are crucial to evaluate the value of CBM as a research paradigm and as a tool to investigate the hypothesis that (attachment-related) information processing biases have a causal effect on expectations like children's trust in their mother's availability to provide support during distress.

Although these findings add important support to the validity of the effects obtained with CBM trainings, more research is needed to evaluate the specificity of the CBM effect. First, CBM effects on other child appraisals of the mother should be included in future research. It is possible to argue that appraisals of maternal parenting behavior might be more difficult to manipulate and that CBM effects could be stronger on other appraisals of the mother. An alternative could be to ask children to evaluate their mother's parenting styles. However, the fact that we measured children's appraisals of concrete parental behavior is also a strength, because these appraisals are less likely to change in response to changes in trust. The main aim of the study was to evaluate the specificity of the CBM effect. Parenting behaviors are proximal enough for the study to provide a conservative test of the research question, but distal enough to avoid strong contamination that could have complicated the conclusions that could be drawn in case the findings would have suggested there is no specific CBM effect. Moreover, the fact that this pattern of results was obtained after controlling for changes in happiness throughout the procedure further supports the conclusion that CBM might have had a specific effect on children's trust in their mother's support during distress. Also, it would be

interesting to repeat the study to investigate the specificity of the CBM effect at a more automatic level. In the current study, parenting behaviors were measured with a questionnaire that is subject to participants' strategic control in how they respond to the items. De Winter et al. (2018) also found CBM training effects at a more automatic and less controllable level. More specifically, they found that CBM training increased access to more positive memories about interactions with mothers. Testing whether CBM also has a specific manipulation effect at such more automatic levels of cognitive processing would further validate the value of the attachment-related training effects. Finally, the study's narrow focus on trust could be seen as a limitation because attachment is a multifaceted construct, comprising emotions, cognitions, and behavior. However, individual differences on all these different factors share one underlying dimension: the extent to which children trust in the availability of a caregiver as a resource for support (Bosmans & Kerns, 2015). Therefore, in spite of the narrow focus, the study contributes significantly to the literature by showing that the core of the attachment construct can be manipulated through changing attachment-related interpretation biases.

In spite of its limitations, the current study added support to the validity of the CBM paradigm. This is important because this paradigm can prove useful to further understand the basics of trust development, and, relatedly, to understand the processes explaining stability and instability in attachment over time (Bosmans, 2016). The current study, together with the studies by De Winter et al. (2017, 2018), shows that attachment-related information processes are not merely an intriguing by-product of attachment development, as already widely accepted (Dykas & Cassidy, 2011; Zimmermann & Iwanski, 2015), but that these processes play a crucial role in children's attachment development.

A better understanding of this phenomenon could also prove to be clinically relevant. To date, parent management training is one of the typical intervention strategies relied upon in middle childhood behavior therapy for a wide variety of emotional and behavioral problems (e.g., Long, Edwards, & Bellando, 2009). However, intervention research suggests that parent management training is only limitedly effective (Lundahl, Risser, & Lovejoy, 2006). Because attachment mediates the association between parenting and the development of emotional and behavioral problems (e.g., Doyle & Markiewicz, 2005), it has been argued that attachment-related information processing biases might be one factor that limits the impact of parent management trainings (Bosmans, 2016).

If the parents' pedagogical approach is improved through parent management training, but insecure attachment-related information processing biases limit the children's capacity to encode improved parental behavior, the probability decreases that parent management training improves emotional and behavioral child functioning. It has been argued that these biases need to be targeted prior to therapeutic attempts to expose individuals to corrective learning experiences (Baert, Koster, & De Raedt, 2011; Verhees, Ceulemans, & Bosmans, 2019).

However, theory also suggests that merely changing attachment-related biases without targeting parent behavior could have negative outcomes as well. After all, these biases serve a protective function. When a child experiences the parent as seldom sensitive and supportive, insecure attachment-related information processing biases delay children's inclination to seek support (Bosmans et al., 2015). This avoids repetitive painful experiences of novel rejection or frustration due to a neglected desire for comfort (Dykas & Cassidy, 2011). So, solely changing insecurely attached children's biases without altering the pedagogical context could be hurtful to the child. Hence, an attachment-related CBM can only be seen as a promising adjunct to parent management training-like interventions (Verhees et al., 2019). Theory suggests that this combination would be significantly more effective than each intervention separately. Therefore, the current type of research, that finds proof of principle support for the hypothesis that attachment-related information processing biases affect the development of children's trust, is an important first step in the development of a more encompassing treatment strategy.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

References

- Baert, S., Koster, E. H. W., & De Raedt, R. (2011). Modification of information-processing biases in emotional disorders: Clinically relevant developments in experimental psychopathology. *International Journal of Cognitive Therapy, 4*, 208–222. <https://doi.org/10.1521/ijct.2011.4.2.208>
- Bosmans, G. (2016). Cognitive behaviour therapy for children and adolescents: Can attachment theory contribute to its efficacy? *Clinical Child and Family Psychology Review, 19*, 310–328. <https://doi.org/10.1007/s10567-016-0212-3>
- 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*. (pp. 1–14).

- Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment*. New York, NY: Basic Books.
- Carnelley, K. B., Otway, L. J., & Rowe, A. C. (2016). The effects of attachment priming on depressed and anxious mood. *Clinical Psychological Science*, 4, 433–450. <https://doi.org/10.1177/2167702615594998>
- Cassidy, J., & Shaver, P. R. (2016). *Handbook of attachment: Theory, research, and clinical applications* (3rd ed.). New York, NY: Guilford Press.
- Cohen, L. H., Towbes, L. C., & Flocco, R. (1988). Effects of induced mood on self-reported life events and perceived and received social support. *Journal of Personality and Social Psychology*, 55, 669–674. <https://doi.org/10.1037/0022-3514.55.4.669>
- De Winter, S., Bosmans, G., & Salemink, E. (2017). Exploring the causal effect of interpretation bias on attachment expectations. *Child Development*, 88, 131–140. <https://doi.org/10.1111/cdev.12587>
- De Winter, S., Salemink, E., & Bosmans, G. (2018). Interpretation bias in middle childhood attachment: Causal effects on attachment memories and scripts. *Behaviour Research and Therapy*, 102, 16–24. <https://doi.org/10.1016/j.brat.2017.12.004>
- De Winter, S., Vandevivere, E., Waters, T. E. A., Braet, C., & Bosmans, G. (2016). Lack of trust in maternal support is associated with negative interpretations of ambiguous maternal behavior. *Journal of Child and Family Studies*, 25, 146–151. <https://doi.org/10.1007/s10826-015-0197-4>
- Doyle, A. B., & Markiewicz, D. (2005). Parenting, marital conflict and adjustment from early- to mid-adolescence: Mediated by adolescent attachment style? *Journal of Youth and Adolescence*, 34, 97–110. <https://doi.org/10.1007/s10964-005-3209-7>
- Dykas, M. J., & Cassidy, J. (2011). Attachment and the processing of social information across the life span: Theory and evidence. *Psychological Bulletin*, 137, 19–46. <https://doi.org/10.1037/a0021367>
- Hoppitt, L., Mathews, A., Yiend, J., & Mackintosh, B. (2010). Cognitive mechanisms underlying the emotional effects of bias modification. *Applied Cognitive Psychology*, 24, 312–325. <https://doi.org/10.1002/acp.1678>
- Long, N., Edwards, M. C., & Bellando, J. (2009). Parent-training interventions. In J. L. Matson, F. Andrasik, & M. L. Matson (Eds.), *Treating childhood psychopathology and developmental disabilities* (pp. 79–106). New York: Springer.
- Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2006). A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review*, 26, 86–104.
- Mathews, A., & Mackintosh, B. (2000). Induced emotional interpretation bias and anxiety. *Journal of Abnormal Psychology*, 109, 602–615. <https://doi.org/10.1037/0021-843X.109.4.602>
- 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. <https://doi.org/10.1007/s10964-006-9070-5>
- Rutter, M. (2014). Commentary: Attachment is a biological concept—A reflection on Fearon et al. (2014). *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 55, 1042–1043. <https://doi.org/10.1111/jcpp.12301>
- Van Leeuwen, K., & Vermulst, A. (2010). *Handleiding bij de Verkorte Schaal voor Ouderlijk Gedrag [manual of the short version of the Parental Behavior Scale]*. Leuven: KU Leuven.
- Verhees, M. W. F. T., Ceulemans, E., & Bosmans, G. (2019). Strengthening attachment-based therapies: A case for cognitive bias modification? *Journal of the American Academy of Child and Adolescent Psychiatry*
- Zimmermann, P., & Iwanski, A. (2015). Attachment in middle childhood: Associations with information processing. In G. Bosmans, & K. A. Kerns (Eds.), *New Directions for Child and Adolescent Development*, vol. 148. (pp. 47–61). <https://doi.org/10.1002/cad.20099>

RECEIVED: November 19, 2018

ACCEPTED: April 16, 2019

AVAILABLE ONLINE: April 26, 2019