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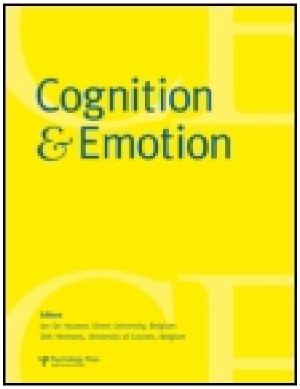

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Jill Thijssen [a] , Henry Otgaar [a] , Mark L. Howe [b] & Corine de Ruiter [a]
[a] Department of Clinical Psychological Science , Maastricht University , Maastricht , The Netherlands
[b] Department of Psychology , Lancaster University , Lancaster , UK
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BRIEF REPORT

Emotional true and false memories in children with callous-unemotional traits

Jill Thijssen[1], Henry Otgaar[1], Mark L. Howe[2], and Corine de Ruiter[1]

[1]Department of Clinical Psychological Science, Maastricht University, Maastricht, The Netherlands
[2]Department of Psychology, Lancaster University, Lancaster, UK

Several studies have found that children with callous-unemotional (CU) traits have a deficit in processing emotionally negative material. The present study examined whether this deficit also affects emotional memory. Twenty-two children with low CU traits and 24 children with high CU traits between 8 and 12 years of age were selected from a community sample and presented with neutral and negative emotional words, using the Deese–Roediger–McDermott paradigm. On true recall, there was no difference between the groups. Both groups had higher true recall rates for the neutral word lists than for the negative lists. However, on false recall, although there were no group differences for neutral word lists, the high CU group recalled significantly fewer critical lures on the negative word lists than the low CU group. Furthermore, the high CU group had significantly less false recall on the negative word lists compared to the neutral word lists, while the low CU group showed no difference in false recall between the word lists. These results indicate that children with high CU traits have no deficiencies in true memory performance, yet are less susceptible to developing false memories concerning emotionally negative material.

Keywords: Callous-unemotional traits; Emotional memory; DRM paradigm.

Some children with conduct disorder are characterised by so-called callous-unemotional (CU) traits, which closely resemble the emotional detachment component of psychopathy in adult forensic samples (Frick, 2006). Children with CU traits display low fear in combination with high impulsivity, are not truly concerned with others' feelings, and typically do not feel bad or guilty when showing rule-breaking behaviour. Like adults with psychopathic traits, children with

Correspondence should be addressed to: Jill Thijssen, Forensic Psychology Section, Department of Clinical Psychological Science, Faculty of Psychology and Neuroscience, Maastricht University, PO Box 616, 6200 MD Maastricht, The Netherlands. E-mail: Jill.Thijssen@maastrichtuniversity.nl

As of 1 January 2013, Professor Mark L. Howe will be at City University, London.

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CU traits have deficits in emotional processing. Children with CU traits seem to have more difficulty in identifying fearful and sad facial expressions compared to expressions of surprise, happy, disgust, and anger (Blair, Colledge, Murray, & Mitchell, 2001) and may be less physiologically responsive to distressing and threatening stimuli (Blair, 1999). This indicates that the deficit in emotional processing in children with CU traits is specific to negative stimuli (Frick, 2006).

There is evidence implying that this deficit can lead to an impaired memory for negative emotional material, while emotional events generally are remembered better than neutral ones (LaBar & Cabeza, 2006). For example, adults and adolescents with psychopathic traits appeared to be worse at recalling negative emotional slides than healthy controls (Dolan & Fullam, 2005, 2010). If these impairments in emotional memory could also be found in children with CU traits, it could explain why these children do not learn from negative emotional experiences. For example, research has shown that children with CU traits are less responsive to parental limit setting, because they respond with insufficient anxiety when confronted with their misbehaviour (Oxford, Cavell, & Hughes, 2003; Wootton, Frick, Shelton, & Silverthorn, 1997). Therefore, they are less likely to remember the experience of being punished after their misbehaviour, which makes them less likely to inhibit their behaviour in future situations in order to avoid punishment (see Dadds & Salmon, 2003). To our knowledge, no studies have examined emotional memory in children with CU traits.

Interestingly, it is likely that the deficiency in emotional processing found in individuals with psychopathic traits will not only affect accurate remembering, but also incorrect remembering (i.e., false memories). A robust paradigm to examine both true and false memory is the Deese–Roediger–McDermott (DRM) paradigm (Deese, 1959; Roediger & McDermott, 1995). In this paradigm, participants are presented with a list of words, which are all semantically related to a non-presented theme word that is called the critical lure. A false memory occurs when the critical lure is incorrectly recalled or recognised as being presented in the word list (see Brainerd, Reyna, & Ceci, 2008, for an overview).

The development of false memories elicited by the DRM paradigm could be explained by the associative activation theory (AAT; Howe, Wimmer, Gagnon, & Plumpton, 2009), which is partly founded on activation monitoring theory (Roediger, Watson, McDermott, & Gallo, 2001). According to the AAT, the processing of one word leads to the spreading activation of corresponding nodes or concepts in our mental lexicon (i.e., knowledge base). This process can also lead to the activation of the critical lure. AAT assumes that the development of false memories is predominantly the result of increases in the amount and strength of associative relations as well as the speed and automaticity with which these associations are accessed and activated (Wimmer & Howe, 2009). Because associated relatedness is higher among emotionally negative material than among neutral material (Howe, Candel, Otgaar, Malone, & Wimmer, 2010; Howe et al., 2009; Talmi & Moscovitch, 2004), AAT assumes that spreading activation is more automatic (faster) when negative material is encountered than when neutral material is experienced. This would lead to an increased risk of false memories for negative material. Indeed, a number of studies have found higher false recognition for negative information than for neutral information (e.g., Brainerd, Stein, Silveira, Rohenkohl, & Reyna, 2008) although some studies showed that false recall is also higher for neutral than negative emotional word lists (e.g., Howe et al., 2010).

The aim of the present study was to examine whether emotional memory in children with high CU traits differs from children with low CU traits. The DRM paradigm was used to test true and false recall for neutral versus negative word lists. Since emotional events are generally remembered better than neutral ones and AAT hypothesises more spreading activation for negative material, it was predicted that children with low CU traits would have better true recall for negative rather than for neutral word lists. We

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did not expect a difference between low and high CU children for neutral word lists. Children with high CU traits are less likely to benefit from enhanced memory for negative material than children with low CU traits, because of their deficit in emotional processing (Frick, 2006). Therefore, we hypothesised that the high CU group would recall fewer negative words than the low CU group. This is also in accordance with the expectations of the AAT, which implies that it is likely that children with high CU traits would process negative information less automatically because they are trying to inhibit access to that material more than children with low CU traits (Howe, Toth, & Cicchetti, 2011).

Based on AAT, one would expect that children with low CU traits would show increased false memories for the negative word lists, because of the heightened spreading activation. Again, no difference between the high and low CU groups was expected for the neutral word lists. For the negative word lists, children with high CU traits would be expected to have fewer false memories, because the automatic activation spreads slower than in children with low CU traits.

METHOD

Participants

The current sample of children between 8 and 12 years of age was recruited through elementary schools as part of a larger research project (see also Thijssen, Otgaar, Meijer, Smeets, & de Ruiter, 2012). Children were allowed to participate only when they assented to the procedure *and* parental consent had been obtained. Information and consent forms, which explained the nature of the study, together with the Antisocial Process Screening Device (APSD) to assess psychopathic traits in children, were distributed at the elementary schools. Parents were asked to sign the consent form, fill out the APSD and to return them to the child's school where they were then collected. In total, data from 111 children were obtained. This study was approved by the standing Ethical Committee of the Faculty of Psychology and Neuroscience, Maastricht University.

To obtain extreme groups, we selected only the children with scores of six or higher on the CU subscale of the APSD as the high CU group (n = 24, 13 male) and the children with CU subscale scores of two or lower as the low CU group (n = 22, 13 male). These scores were selected based on the means found for clinical and community samples in previous studies. For clinical samples, means of around six on the CU-subscale are found (e.g., Fite, Greening, Stoppelbein, & Fabiano, 2009). For community samples, means of around two on the CU-subscale are found (e.g., Dadds, Fraser, Frost, & Hawes, 2005). The two groups did not differ with respect to mean age (high CU group: 10.3; low CU group: 9.7); $t(44) = -1.55$, $p = .13$, and gender distribution, $\chi^2(2) = 0.97$, $p = .62$.

Materials

Antisocial Process Screening Device. The APSD (Frick & Hare, 2001) is a 20-item questionnaire to assess traits of psychopathy in children (and adolescents). The APSD has to be completed by the children's parents or teachers. It consists of three dimensions: callous-unemotional (6 items); impulsivity (5 items); and narcissism (7 items), with all items answered with 0 (*Not at all true*), 1 (*Sometimes true*), or 2 (*Definitely true*). Examined in both community and clinic samples, the internal consistency of the three subscales ranged from .65 to .85 (Frick, Bodin, & Barry, 2000). The APSD has been found to have good convergent and construct validity (Vitacco, Rogers, & Neumann, 2003). The Dutch translation that was used in the present study has also been validated (Bijttebier & Decoene, 2009).

Deese–Roediger–McDermott paradigm. Five neutral and five emotionally negative word lists were used. The critical lures of the neutral lists were *bread*, *window*, *sweet*, *smoke*, and *foot*. The critical lures of the negative word lists were *murder*, *pain*, *punishment*, *death*, and *cry*. Each list was 10 items long. These word lists have been used in previous

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research (see Howe et al., 2010; Otgaar, Peters, & Howe, 2012). The 10 word lists were orally presented through a computer at a 3-second rate. Half of the children received the neutral word list first followed by the negative lists, while the other half first received the negative word list. After a word list had been presented, the child had to do a distractor task (circling the letter X in a string of letters). Then the child had to recall as many words as he/she could remember from the word list. This procedure was repeated until all 10 word lists had been presented.

Design and procedure

The present experiment was a 2 (Valence: neutral vs. negative) × 2 (Group: low CU vs. high CU) split-plot design, with the latter factor as the between-subjects factor. The selected children were tested individually in a quiet room at their school. They were told they would hear a number of words through the laptop, which they should try to remember. The DRM took about 15 minutes and was always administered in the morning to control for time of day effects on attention and concentration. Afterwards, children were given a small present in return for their participation.

RESULTS

Separate repeated-measures analyses of variance (ANOVAs) were conducted for proportion true recall, recall of critical lures, recall of unrelated lures, and net accuracy with Valence (neutral vs. negative) as within-subjects factor and Group (high CU group vs. low CU group) as between-subjects factor. For both groups, Table 1 shows the mean proportion of true recall, false recall, recall of unrelated lures, and net accuracy on the neutral and negative word lists.

For true recall, no significant interaction between Valence and Group was found, $F(1, 44) = 1.56$, $p = .22$. However, there was a significant main effect of Valence, $F(1, 44) = 13.84$, $p < .05$, $\eta_p^2 = .24$. True recall was higher for the neutral word lists than for the negative word lists (see Table 1).

For false recall, there was a significant interaction between Valence and Group, $F(1, 44) = 5.79$, $p < .05$, $\eta_p^2 = .12$. Simple effects analyses revealed that there was no significant difference in critical lures for the low CU group between the neutral and negative word lists, $F(1, 21) = 2.01$, $p = .17$. However, for the high CU group, there was a significant difference between the neutral and negative word lists with fewer critical lures for the negative word lists than the neutral word lists, $F(1, 23) = 4.31$, $p < .05$, $\eta_p^2 = .16$. Furthermore, independent samples t-tests showed no significant difference in critical lures between the groups on the neutral word lists, $t(44) = -0.57$, $p = .57$. However, the difference between the groups on the negative word lists was significant with the high CU group recalling significantly fewer critical lures than the low CU group, $t(44) = 2.37$, $p < .05$. Figure 1 shows the proportion of critical lures recalled for the neutral and negative word lists per group.

For the unrelated lures, which is the proportion of all recalled words that were unrelated words (i.e., not in the word list and not the critical lure),

Table 1. *Mean proportions and standard deviations per group for true recall, false recall, recall of unrelated lures, and net accuracy*

	Low CU group		*High CU group*	
	Neutral	*Negative*	*Neutral*	*Negative*
True recall	0.51 (0.11)	0.47 (0.11)	0.56 (0.11)	0.49 (0.10)
False recall	0.26 (0.22)	0.35 (0.25)	0.30 (0.21)	0.20 (0.19)
Unrelated lures	0.07 (0.07)	0.10 (0.09)	0.08 (0.07)	0.08 (0.05)
Net accuracy	0.70 (0.20)	0.64 (0.22)	0.68 (0.18)	0.75 (0.21)

Note: CU = callous-unemotional.

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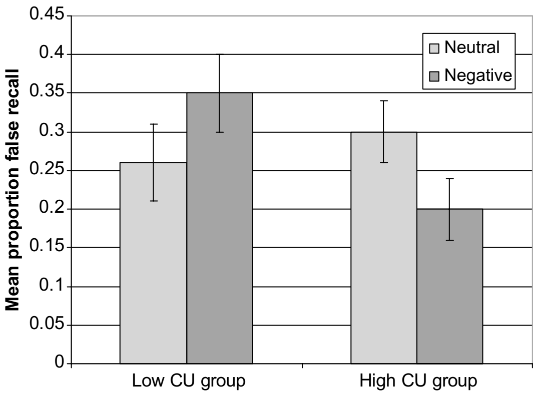

Figure 1. *Mean proportion false recall on neutral and negative word lists in children with high and low CU traits.*

no significant interaction, $F(1, 44) = 2.95$, $p = .09$, or main effect was found, $F(1, 44) = 1.51$, $p = .23$. Furthermore, we examined any group differences in net accuracy (true recall/true recall + false recall; see Otgaar et al., 2012). Again, no main effect, $F(1, 44) = 0.02$, $p = .88$, or significant interaction was found, $F(1, 44) = 2.87$, $p = .10$.

Since previous studies have found a difference in performance on the DRM paradigm between younger and older children (e.g., Brainerd, Holliday, Reyna, Yang, & Toglia, 2010; Brainerd, Reyna, & Zember, 2011), an exploratory repeated-measures ANOVA was performed with Valence (neutral vs. negative) as within-subjects factor and Group (high CU group vs. low CU group) and Age (8/9 years vs. 11/12 years) as between-subjects factors. For this analysis, there were eight 8/9-year-old children with low CU traits, six 8/9-year-old children with high CU traits, six 11/12-year-old children with low CU traits, and 12 11/12-year-old children with high CU traits. No significant interactions were found for true recall and the recall of unrelated lures. However, there was a significant three-way interaction for false recall, $F(1, 28) = 6.87$, $p < .05$, $\eta_p^2 = .20$. Simple effects analyses showed only one significant difference between neutral and negative word lists, namely for the 11/12-year-old children with low CU traits. These children recalled significantly more negative than neutral critical lures, $F(1, 5) = 45$, $p < .05$, $\eta_p^2 = .90$.

DISCUSSION

Using the DRM paradigm, the present study examined whether there is a difference in true and false memories for neutral and negative word lists between children with high and low CU traits. Our findings can be summarised as follows. First, the two groups did not perform differently on true recall. For both groups, true recall was higher for the neutral word lists than for the negative word lists. This finding is not as predicted, but consistent with previous studies (Howe et al., 2010; Otgaar et al., 2012). Interestingly, we did not find that children with high CU traits differed in their true recall on the negative word lists compared with children with low CU traits. Therefore, the present results do not suggest that children with high CU traits have an impaired emotional memory. This is in contrast to previous studies on adolescents and adults with psychopathic traits (Dolan & Fullam, 2005, 2010), but consistent with findings from a recent study from our lab. In this study, children high and low on CU traits performed similarly on a task where they had to recognise central and peripheral components in neutral and emotionally negative pictures (Thijssen et al., 2012).

For false recall, there was no difference between the high and low CU groups on the neutral word lists. However, there was a difference between the groups on the negative word lists: the high CU group recalled fewer critical lures than the low CU group. Moreover, the low CU group showed no difference in false recall between the neutral and negative word lists. This finding is not consistent with previous research in which a difference between the word lists was found (e.g., Brainerd, Stein et al., 2008; Howe et al., 2010). This could be due to the small sample size, which may have led to insufficient power to detect a significant difference. However, it should be mentioned that mixed findings concerning the effect of valence on false memories have been

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reported in previous studies (see Brainerd & Reyna, 2012).

The high CU group showed a significant difference in false recall between the word lists. These children had fewer false memories on the negative word lists compared to the neutral word lists. This result on false recall is in accordance with the predictions of AAT. Children with high CU traits have difficulties in automatically processing negative emotional material. Furthermore, as children with high CU traits are found to process negative material differently than children with low CU traits (e.g., Blair, 1999; Blair et al., 2001), it is equally likely that the associative networks of children with high CU traits related to negative material are not as well integrated and dense relative to children low on CU traits. As a consequence, the flow of information in such a network in high CU traits children will be less automatic and slower. Indeed, our study demonstrated lower negative false memory rates in children with high CU traits compared to children with low CU traits.

Since previous research has found an age effect in DRM-performance (e.g., Brainerd et al., 2010, 2011), the low and high CU children in the present study were divided by age. Results showed that 11/12-year-old children with low CU traits recalled significantly more critical lures for the negative word lists compared to the neutral word lists. However, these results should be interpreted with caution, because the number of children per group was very small.

The following limitations deserve some comment. First, we used a community sample for our study. Children of both the low and high CU groups were selected from the general population. In the present study, no differences on true recall were found between the low and high CU group. It is possible that there would be a difference in true recall if the high CU group were selected from the clinical population. However, our findings concerning false recall could be even stronger for the high CU group when selected from the clinical population. Second, only one source of information (i.e., the parent) was used to measure CU traits in the children. It would have been better if additional measures of CU traits were used. Third, only five word lists per valence were used. Especially in our relatively small sample, this could create little variability in performance and limit the generalisability. To enhance the generalisability of the findings, it would be advisable to repeat this study with a larger set of (clinical) children including more word lists or other types of false-memory measures (e.g., misinformation paradigm; Loftus, 2005). Fourth, the present study did not control for arousal. There is some evidence suggesting that false memories are related to arousal level (e.g., Corson & Verrier, 2007). However, in studies with children, valence tends to play a more important role than arousal (i.e., most memory effects are driven by changes in valence not arousal) when these factors are varied orthogonally using the DRM paradigm (e.g., see Brainerd et al., 2010). Finally, one may wonder whether our findings can be translated to forensic contexts. That is, can results obtained from semantically related word lists provide us with critical information about events that people experience in daily life? Although it has been debated whether the DRM paradigm might be useful in the legal domain (e.g., Brainerd et al., 2011), research shows that the DRM paradigm is a robust tool to examine the mechanism behind memory illusions. Even more important, studies show that the DRM illusion is related to autobiographical memory (e.g., Gallo, 2010).

In sum, the present study found that children with high CU traits do not differ from children with low CU traits concerning true recall, which implies that the deficit in processing emotionally negative material does not affect correct emotional memory in children with CU traits. However, for false recall, children with high CU traits recalled fewer not presented words at the negative word lists than children with low CU traits. This indicates that children with high CU traits are better at differentiating between true and false memories concerning negative material than children with low CU traits. Children with CU traits are more likely to encounter negative emotional

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situations because of their aggressive/antisocial problem behaviour. Our study shows that they are less likely to spontaneously, falsely report elements related to these negative situations. Conclusively, it seems that having high CU traits lowers the risk for inaccurate memories, while leaving true emotional memory untouched.

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REFERENCES

Bijttebier, P., & Decoene, S. (2009). Assessment of psychopathic traits in children and adolescents: Further validation of the Antisocial Process Screening Device and the Childhood Psychopathy Scale. *European Journal of Psychological Assessment*, *25*, 157–163.

Blair, R. J. R. (1999). Responsiveness to distress cues in the child with psychopathic tendencies. *Personality and Individual Differences*, *27*, 135–145.

Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, *29*, 491–498.

Brainerd, C. J., Holliday, R. E., Reyna, V. F., Yang, Y., & Toglia, M. P. (2010). Developmental reversals in false memory: Effects of emotional valence and arousal. *Journal of Experimental Child Psychology*, *107*, 137–154.

Brainerd, C. J., & Reyna, V. F. (2012). Reliability of children's testimony in the era of developmental reversals. *Developmental Review*, *32*, 224–267.

Brainerd, C. J., Reyna, V. F., & Ceci, S. J. (2008). Developmental reversals in false memory: A review of data and theory. *Psychological Bulletin*, *134*, 343–382.

Brainerd, C. J., Reyna, V. F., & Zember, E. (2011). Theoretical and forensic implications of developmental studies of the DRM illusion. *Memory & Cognition*, *39*, 365–380.

Brainerd, C. J., Stein, L. M., Silveira, R. A., Rohenkohl, G., & Reyna, V. F. (2008). How does negative emotion cause false memories? *Psychological Science*, *19*, 919–925.

Corson, Y., & Verrier, N. (2007). Emotions and false memories: Valence or arousal? *Psychological Science*, *18*, 208–211.

Dadds, M. R., Fraser, J., Frost, A., & Hawes, D. J. (2005). Disentangling the underlying dimensions of psychopathy and conduct problems in childhood: A community study. *Journal of Consulting and Clinical Psychology*, *73*, 400–410.

Dadds, M. R., & Salmon, K. (2003). Punishment insensitivity and parenting: Temperament and learning as interacting risks for antisocial behavior. *Clinical Child and Family Psychology Review*, *6*, 69–86.

Deese, J. (1959). On the prediction of occurrence of particular verbal intrusions in immediate recall. *Journal of Experimental Psychology*, *58*, 17–22.

Dolan, M. C., & Fullam, R. (2005). Memory for emotional events in violent offenders with antisocial personality disorder. *Personality and Individual Differences*, *38*, 1657–1667.

Dolan, M. C., & Fullam, R. (2010). Emotional memory and psychopathic traits in conduct disordered adolescents. *Personality and Individual Differences*, *48*, 327–331.

Fite, P. J., Greening, L., Stoppelbein, L., & Fabiano, G. A. (2009). Confirmatory factor analysis of the Antisocial Process Screening Device with a clinical inpatient population. *Assessment*, *16*, 103–114.

Frick, P. J. (2006). Developmental pathways to conduct disorder. *Child and Adolescent Psychiatric Clinics of North America*, *15*, 311–331.

Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the Psychopathy Screening Device. *Psychological Assessment*, *12*, 382–393.

Frick, P. J., & Hare, R. D. (2001). *Antisocial Process Screening Device*. Toronto, Canada: Multi-Health Systems.

Gallo, D. A. (2010). False memories and fantastic beliefs: 15 years of the DRM illusion. *Memory & Cognition*, *38*, 833–848.

Howe, M. L., Candel, I., Otgaar, H., Malone, C., & Wimmer, M. C. (2010). Valence and the development of immediate and long-term false memory illusions. *Memory*, *18*, 58–75.

Howe, M. L., Toth, S. L., & Cicchetti, D. (2011). Can maltreated children inhibit true and false memories for emotional information? *Child Development*, *82*, 967–981.

Howe, M. L., Wimmer, M. C., Gagnon, N., & Plumpton, S. (2009). An associative-activation theory of children's and adults' memory illusions. *Journal of Memory and Language*, *60*, 229–251.

LaBar, K. S., & Cabeza, R. (2006). Cognitive neuroscience of emotional memory. *Nature Reviews Neuroscience*, *7*, 54–64.

Loftus, E. F. (2005). Planting misinformation in the human mind: A 30-year investigation of the malleability of memory. *Learning & Memory*, *12*, 361–366.

Otgaar, H., Peters, M., & Howe, M. L. (2012). Dividing attention lowers children's but increases adults' false memories. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *38*, 204–210.

Oxford, M., Cavell, T. A., & Hughes, J. N. (2003). Callous/unemotional traits moderate the relation between ineffective parenting and child externalizing problems: A partial replication and extension. *Journal of Clinical Child and Adolescent Psychology*, *32*, 577–585.

Roediger, H. L., & McDermott, K. B. (1995). Creating false memories: Remembering words not presented in lists. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *21*, 803–814.

Roediger, H. L., Watson, J. M., McDermott, K. B., & Gallo, D. A. (2001). Factors that determine false recall: A multiple regression analysis. *Psychonomic Bulletin & Review*, *8*, 385–407.

Talmi, D., & Moscovitch, M. (2004). Can semantic relatedness explain the enhancement of memory for emotional words? *Memory & Cognition*, *32*, 742–751.

Thijssen, J., Otgaar, H., Meijer, E. H., Smeets, T., & de Ruiter, C. (2012). Emotional memory for central and peripheral details in children with callous-unemotional traits. *Behavioral Sciences & the Law*, *30*, 506–515.

Vitacco, M. J., Rogers, R., & Neumann, C. S. (2003). The Antisocial Process Screening Device: An examination of its construct and criterion-related validity. *Assessment*, *10*, 143–150.

Wimmer, M. C., & Howe, M. L. (2009). The development of automatic associative processes and children's false memories. *Journal of Experimental Child Psychology*, *104*, 447–465.

Wootton, J. M., Frick, P. J., Shelton, K. K., & Silverthorn, P. (1997). Ineffective parenting and childhood conduct problems: The moderating role of callous-unemotional traits. *Journal of Consulting and Clinical Psychology*, *65*, 301–308.

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