



## Script knowledge enhances the development of children's false memories

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### ABSTRACT

We examined whether script knowledge contributes to the development of children's false memories. Sixty 7-year-old and 60 11-year-old children listened to false narratives describing either a high-knowledge event (i.e., fingers being caught in a mousetrap) or a low-knowledge event (i.e., receiving a rectal enema) that were similar in terms of plausibility and pleasantness. Moreover, half of the children in each condition received additional suggestive details about the false events. Across two interviews, children had to report everything they remembered about the events. Script knowledge affected children's false memories in that both younger and older children developed more false memories for the high-knowledge event than for the low-knowledge event. Moreover, at the first interview, additional suggestive details inhibited the development of children's images into false memories.

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### 1. Introduction

Children are able to give detailed descriptions of events they experience in daily life (see Fivush, 1997, 1998). Although these descriptions will be often accurate, studies have shown that children can “remember” entire events that did not happen to them (e.g., Ceci & Bruck, 1993; Otgaar, Candel, & Merckelbach, 2008). A common procedure in these studies is to present children with false narratives or doctored photographs suggesting that an event happened to them while in fact it did not (i.e., implantation paradigm: e.g., Otgaar, Candel, Merckelbach, & Wade, 2009; Pezdek & Hodge, 1999; Strange, Sutherland, & Garry, 2006). Subsequently, they are encouraged to report everything they remember about the fictitious event. With this procedure, many children can be brought to falsely remember a plethora of events ranging from plausible (i.e., lost in a shopping mall; Pezdek & Hodge, 1999) to implausible events (i.e., abducted by a UFO; Otgaar et al., 2009). The aim of the present study was to examine whether schematic or script knowledge (i.e., knowledge structures specifying sequences of actions; Fivush, 1997) is a critical precursor of children's implanted false memories.

So far, the few studies that explored the role of script knowledge focused on how it affects adults' beliefs (Hart & Schooler, 2006; Scoboria, Mazzoni, Kirsch, & Jimenez, 2006). Overall, these

studies found that in adults, script knowledge is *not* a necessary prerequisite for false beliefs and memories to develop. Whether script knowledge contributes to the development of *children's* false memories, however, is largely unknown.

One of the few studies that addressed this issue in children is that of Pezdek and Hodge (1999). These authors reported that children more readily developed false memories for having been lost in a shopping mall than for having received a rectal enema. However, event plausibility and script knowledge were confounded in this study. That is to say, relative to the rectal enema event, children might possess more background knowledge about being lost in a shopping mall *and* find it a more plausible event. Although one might expect that the concepts of plausibility and script knowledge are highly correlated, the one study that examined this in adult participants found no relationship between them (Scoboria, Mazzoni, Kirsch, & Relyea, 2004).

Examining whether script knowledge boosts children's false memories for entire events has theoretical significance. Although beliefs and memories are interrelated constructs, they are certainly not equivalent (Scoboria et al., 2004; Smeets, Merckelbach, Horselenberg, & Jelicic, 2005). When people have a memory of an event, they have a clear recollection of the event whereas people can believe in the occurrence of an event with or without recollection (Scoboria et al., 2004; Smeets et al., 2005). Although former studies focusing on the role of script knowledge concentrated mainly on (false) belief ratings of adults (e.g., Hart & Schooler, 2006; Scoboria et al., 2006), no study thus far has focused on the effect of script

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knowledge upon children's false memory formation. Thus, it is relevant to examine whether in children existing script knowledge has an impact that goes beyond false beliefs and promotes genuine false memories. As well, it is unknown whether adding suggested details (i.e., background information) would further promote such memories. The Mazzoni and Kirsch (2002) metacognitive model of false belief and memory formation predicts that lack of knowledge about an event may be used to reject an unremembered event as not having occurred (see Ghetti (2008) for a similar argument). However, research on children's metamemory abilities indicates that younger children may be less able to use their knowledge effectively to determine whether or not events did occur (see Ghetti & Alexander, 2004; Koriat, Goldsmith, Schneider, & Nakash-Dura, 2001). Thus, it may well be the case that children form false memories even when they have no knowledge about a fictitious event.

While it is true that recent research suggests that event plausibility is not a critical antecedent of young children's false memories (Otgaar et al., 2009; Strange et al., 2006), plausibility of events has not been well controlled in the preceding work on script knowledge. Indeed, previous studies did not specifically establish to what extent their target false events were regarded as plausible by children (e.g., Pezdek & Hodge, 1999). Recent work by Ghetti and Alexander (2004) demonstrated that before the age of 7, children tend not to use plausibility when evaluating unremembered events. In contrast from the age 9 onwards, children employ plausibility in a way that is similar to adults to reject false events. Hence, what is needed are studies that examine the impact of script knowledge upon children's false memory formation while controlling for the plausibility of events.

Another parameter that has not been systematically varied in past research is the degree to which fictitious events are judged as unpleasant. Studies which have contrasted events such as receiving a non-invasive medical procedure (e.g., an X-ray) or moderate unpleasant events (e.g., lost in a shopping mall; Pezdek & Hodge, 1999) with receiving an enema have the additional confound that the enema event is typically viewed as invasive and uncomfortable, and therefore may be less likely to be endorsed.

To date, no study has examined whether script knowledge enhances children's implanted false memories while holding plausibility and pleasantness constant. Hence, the aim of the present study was to investigate whether script knowledge promotes the development of children's false memories. Using a false memory implantation procedure (see below), 7-year-old and 11-year-old children listened to fabricated narratives about a moderately plausible, low-knowledge event or a moderately plausible, high-knowledge event (see Appendix A). Half of the children received additional suggestive details about their target event. Across two interviews, children had to indicate everything they remembered about the event.

Following Pezdek, Blandon-Gitlin, Lam, Hart, and Schooler (2006) who argued that script-relevant information must be retrieved from memory to facilitate the construction of an image of a false event, we hypothesized that the high-knowledge event would evoke more false memories than the low-knowledge event. Germane to this is also recent research showing that having semantic knowledge increases the development of false memories (Brainerd, Reyna, & Ceci, 2008). As to the effect of additional suggestive details, two outcomes are possible. On the one hand, additional suggestive details might deepen script-relevant information about the target events, thereby boosting false memory rates for the events. On the other hand, additional suggestive details may suppress false memory creation. The idea here is that additional suggestive details could restrict imagination and/or inhibit recall fluency, because extra information includes specific details, people, and locations thereby lowering the chances for the construction of

false memories (Garry and Wade (2005); see also Tesser and Leone (1977)).

With respect to age, we hypothesized that younger children would be more likely to develop implanted false memories than older children. This hypothesis was derived from developmental false memory research (see Bruck & Ceci, 1999; Otgaar et al., 2009; Strange et al., 2006) showing that younger children assent more readily to suggestive manipulations than older children and adults. Furthermore, recent research shows that younger children are less effective in using metacognitive strategies (e.g., event memorability) to judge whether or not a false event has occurred. This implies that younger children are less likely able to reject false events and thus develop more false memories than older children (Ghetti & Alexander, 2004). Also, based upon Ghetti's (2008) work, we anticipated that if younger children are less effective at using a lack of script knowledge to reject the occurrence of fictitious events, then they should show more false memories for the low-knowledge event than older children. To test this, we included two age groups: 7-year-olds and 11-year-olds (e.g., see also Bruck & Ceci, 1999; Ceci, Ross, & Togliola, 1987). So, young children's deficits in using metacognitive strategies could be particularly pronounced when they are presented with false events of which their knowledge is extremely limited (e.g., low-knowledge event; Ghetti, 2008).

## 2. Method

### 2.1. Participants

The participants were 120 primary school children (51 girls) from two different age groups ( $n = 60$ , 7-year-old,  $M = 7.37$ ,  $SD = 0.52$ , range 7–8;  $n = 60$ , 11-year-old,  $M = 11.33$ ,  $SD = 0.47$ , range 11–12). Children received a small present for their participation upon completion. Informed consent was provided by the school and the children's parents. The study was approved by the standing ethical committee of the Faculty of Psychology, Maastricht University.

### 2.2. Materials

#### 2.2.1. True narratives

To obtain for each child two true events that happened to him/her at the age of 4, questionnaires were sent to the parents. Specifically, they were instructed to describe two moderately significant experienced events (e.g., birthday party and family trip), including what the event was, where it took place, when it took place, and who was present. These details formed the basis for the true narratives, which were approximately five sentences in length. An example of a true narrative (translated from Dutch) was

"Your mother told me that when you were 4 years old, you went to Euro Disney in France. This was for your birthday. Your parents and grandparents also joined you. You came there by bus. Your mother told me you really loved the fairy forest."

#### 2.2.2. False narratives

False events were selected from a pilot study in which 103 children ( $M = 8.48$  years,  $SD = 1.67$ , range 6–13) rated the plausibility and pleasantness of 48 events on 7-point Smiley scales (anchors: ☹ = implausible/negative, ☺ = plausible/positive), with bigger Smiley faces indicating more plausible/more positive events. Specifically, children indicated how likely it was that the events happened to them (e.g., "How likely is it that you personally could have received a rectal enema?"; i.e., personal plausibility; Scoboria et al., 2004) and how pleasant the events were for them (e.g., "How pleasant

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