



Age differences in the interrogative suggestibility of children's memory: Do shift scores peak around 5–6 years of age?

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ABSTRACT

This research was aimed at testing Scullin and Ceci's (2001) hypothesis that the tendency to shift answers to misleading questions after negative feedback follows an inverted U-shape developmental pattern peaking some time after the age of 5 years. Distinguishing between different directions of shift, we found a peak at 5.5–6.0 years for shifts from correct answers before feedback to incorrect answers after feedback, but no effect of age for the opposite shift direction. However, the ascending part of this peak disappeared when shift scores were related to the scores of correct answers before feedback. Results suggest that the temporary increase of shift scores does not manifest a temporary increase of the suggestibility to negative feedback.

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1. Introduction

Until not many years ago, researchers generally agreed that the interrogative suggestibility of children's memory steadily decreases with age (Bruck & Ceci, 1999; Ceci & Bruck, 1993, 1995). Recently, however, this view has been repeatedly questioned (see Bruck & Ceci, 2004), as several studies report that in certain conditions (Ceci, Crossman, Gilstrap, & Scullin, 1998) and for certain types of interrogative suggestibility (Finnilä, Mahlberg, Santtila, Sandnabba, & Niemi, 2003; Scullin & Ceci, 2001; Zaragoza, Payment, Kirchler, Stines, & Drivdahl, 2001), the suggestibility of memory may be significantly higher in older than in younger children. In particular, while the tendency to *yield* to misleading questions seems to decrease continuously with age, this does not seem to be the case for the tendency to *shift* answers to misleading questions after negative feedback. For example, in a study aimed at validating the "Video Suggestibility Scale for Children" (VSSC), Scullin and Ceci (2001) found that 4- and 5-year-olds shifted their answers to mostly misleading questions after negative feedback significantly more often than 3-year-olds. As Danielsdottir, Sigurgeirsdottir, Einarsdottir, and Haraldsson (1993) found that shift scores decreased between 6- and 12-year-olds, Scullin and Ceci (2001, p. 853) hypothesized that "Shift scores follow an inverted U-shape developmental trajectory peaking some time after the age of 5 years of age". This hypothesis seems to be confirmed by a study

by Finnilä et al. (2003), aimed at validating the Swedish version of the "Bonn Test of Statement Suggestibility" (BTSS). The Authors found that 7–8-year-olds shifted their answers to misleading questions in response to doubt significantly more often than 4–5-year-olds, with 4-year-olds shifting significantly less often than 5-year-olds and 7-year-olds shifting significantly more often than 8-year-olds. Thus, in accordance with Scullin and Ceci's (2001) hypothesis, Finnilä et al.'s (2003) results suggest a peak of shift scores between 5 and 7 years of age.

In order to explain their findings, Scullin and Ceci (2001) and Finnilä et al. (2003) suggest different hypotheses. According to Scullin and Ceci (2001), the increase of shift scores between 3 and 5 years of age might be due to the acquisition of "Theory-of-Mind" (ToM) abilities known to be acquired in that period, in particular the ability to represent other people's mental representations: "In order to shift one's response in the face of conflicting assertions (you've made some mistakes), it probably helps if children have an ability to hold the two conflicting mental representations in their minds simultaneously in order to distinguish between what they said and what they think the interviewer wants them to say" (Scullin & Ceci, 2001, p. 853). By contrast, according to Finnilä et al. (2003, pp. 38–39), "[t]he likely explanation is that the older children had a better understanding of the conversational rules that dictate that a repeated question means that the previous answer was wrong." Neither Scullin and Ceci (2001) nor Finnilä et al. (2003) provide an explanation for the subsequent decrease of shift scores, found already by Danielsdottir et al. (1993). Both groups of researchers seem to suggest that the

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subsequent decrease in shift scores is basically due to a more sophisticated use of the abilities whose acquisition originally caused the increase of shift scores.

However that may be, before trying to give a psychological explanation for the increase of shift scores, it might be illuminating to consider the possibility that the increase of shift scores is really a virtual phenomenon, which does not manifest an increase of the suggestibility to negative feedback. As a matter of fact, the standard suggestibility tests used by Scullin and Ceci (2001) and Finnilä et al. (2003) favour shifts from correct answers before feedback to incorrect answers after feedback ($\text{Shift}_{[C \rightarrow I]}$) over shifts from incorrect answers before feedback to correct answers after feedback ($\text{Shift}_{[I \rightarrow C]}$), for the feedback is given irrespective of the children's answers and the interview questions are exclusively (Finnilä et al., 2003) or at least predominantly (Scullin & Ceci, 2001) misleading and are not asked immediately, but after a distracting intermediate task (Finnilä et al., 2003) or after a delay of 1–3 or 7–10 days (Scullin & Ceci, 2001). Consequently, the increase in shift scores with age might simply mirror the well-established fact that the number of correct answers to misleading questions increases with age. Given this fact, the total number of shifts from correct answers before feedback to incorrect answers after feedback ($\text{Shift}_{[C \rightarrow I]}$) may be expected to increase even if the probability to change a correct answer before feedback into an incorrect answer after feedback remained constant or slightly decreased with age. Accordingly, the more the number of shifts in this direction ($\text{Shift}_{[C \rightarrow I]}$) exceeds the number of shifts in the opposite direction ($\text{Shift}_{[I \rightarrow C]}$), the more the total number of shifts ($\text{Shift}_{[C \rightarrow I]} + \text{Shift}_{[I \rightarrow C]}$) is likely to increase with age, too. Unfortunately, on the basis of the results published by Scullin and Ceci (2001) and Finnilä et al. (2003) it is not possible to exclude this alternative hypothesis, for neither Scullin and Ceci (2001) nor Finnilä et al. (2003) distinguish between different directions of shift: in both studies, shift scores are total shift scores that comprise both directions of shift.

Given this empirical and theoretical background, the present research was aimed at testing Scullin and Ceci's (2001) hypothesis that "shift scores follow an inverted U-shape developmental pattern peaking some time after the age of 5 years", and at examining whether the peak of shift scores, if it exists, manifests a peak of the suggestibility to negative feedback.

2. Method

2.1. Participants

Eighty-nine (40 boys, 49 girls) 4–7-year-old children (mean age: 65.48 months; standard deviation: 10.92 months) recruited from a single school in the outskirts of Cagliari (Sardinia) participated in the study. The children were assigned to six age groups: 16 (10 boys, 6 girls) 4.0–4.5-year-olds (mean age: 50.13 months; SD: 1.25 months); 15 (7 boys, 8 girls) 4.5–5.0-year-olds (mean age: 55.87 months; SD: 1.92 months); 14 (5 boys, 9 girls) 5.0–5.5-year-olds (mean age: 63.29 months; SD: 1.94 months); 15 (6 boys, 9 girls) 5.5–6.0-year-olds (mean age: 69.67 months; SD: 1.29 months); 14 (5 boys, 9 girls) 6.0–6.5-year-olds (mean age: 74.29 months; SD: 1.82 months); and 15 (7 boys, 8 girls) 6.5–7.0-year-olds (mean age: 81.13 months; SD: 1.92 months).

2.2. Procedure

Individually or in groups of 2 or 3, the children were shown a 4-min cartoon. Immediately afterwards, the children were individually interviewed by one of four interviewers. The children were first asked to give a free recall of what happened in the cartoon and then to answer a series of mostly misleading specific questions

listed in a Questionnaire (see Section 2.3.2). Irrespective of their answers, children were given mild negative feedback ("You missed a few of the questions. Let's go through them again and see if you can do better this time") after the first and again after the second half of the specific questions in order to keep the feedback salient, with half of the questions repeated each time. Thus, except for the absence of any delay between the video session and the interview session, the procedure was identical to that employed by Scullin and Ceci (2001).

2.3. Materials

2.3.1. The cartoon

The cartoon, entitled "Hocus' birthday", is part of a series of cartoons originally produced for teaching foreign languages to 3–8-year-old children in the context of the European project "The adventures of Hocus & Lotus". Each of the cartoons, available in English, French, German, Italian and Spanish, tells a story as it would be told to a native speaker of that age. The characters of the cartoons are humanized animals: while Hocus and Lotus, the main characters, are "dinocross", i.e. fantastic hybrids between dinosaurs and crocodiles, the other characters (Duck, Rat, Frog, etc.) represent real animals.

The plot of the cartoon may be summarized as follows: After Hocus has gone out for a walk in the park, his friend Lotus calls their common friends in order to invite them to a surprise birthday party for Hocus. Each of the friends engages in preparing a gift for Hocus: Frog bakes a cake, Duck fetches juice, and Rat searches for balloons. On their way to Hocus' and Lotus' house, the three friends meet Hocus in the park. They hide the gifts and deny knowing that it is Hocus' birthday. Hocus goes back home very sad. When he opens the door, he finds his house decorated and all his friends singing "Happy birthday".

2.3.2. The Questionnaire

The Questionnaire contained 18 specific questions that allowed three possible answers: "yes", "no" or "don't know". Fifteen of the 18 questions were misleading, i.e. questions that suggested facts or events that did not happen in the cartoon (e.g. "Did Rat burst a balloon?" when Rat did not burst a balloon). The remaining 3 questions were not-misleading, i.e. questions that suggested facts or events that actually did happen in the cartoon (e.g. "Was there a white rabbit in the park?" when there was in fact a white rabbit in the park). Thus, the proportion of misleading and not-misleading questions was similar to that employed by Scullin and Ceci (2001) and other standard suggestibility tests. The facts to which the questions referred were equally distributed along the whole sequence of the cartoon (see Table 1).

2.4. Scoring

For each child, we calculated the absolute number of items correctly described in **free recall**, the mean percentage of **Correct (C)**, **Incorrect (I)** and **"Don't know" (X)** answers to the specific questions, both before and after feedback, as well as the following shift scores:

- **Absolute Shift** $_{[C \rightarrow I]}$, i.e. $(C \rightarrow I)/Q$: mean percentage of questions answered correctly before negative feedback, but incorrectly after negative feedback.
- **Absolute Shift** $_{[I \rightarrow C]}$, i.e. $(I \rightarrow C)/Q$: mean percentage of questions answered incorrectly before negative feedback, but correctly after negative feedback.
- **Relative Shift** $_{[C \rightarrow I]}$, i.e. $(C \rightarrow I)/C$: mean percentage of the questions answered correctly before negative feedback, which were answered incorrectly after negative feedback.

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