



## Article

# Can Children Learn How to Resist Repeated Leading Questions and Social Pressures?

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**Abstract:** In forensic contexts, children who are victims or witnesses of crimes are repeatedly questioned using stressful leading questions and social pressure. The main aims of the present study are to verify the effects of repeated suggestive interviews on children's level of suggestibility and resistant responses and to study how age and intelligence quotient may reduce the vulnerability of children. The study involved 110 children aged 10–15 years who were administered the Gudjonsson Suggestibility Scale 2, and 6 months later, the parallel form GSS1. Older children showed a significant reduction in levels of yielding leading questions in the second administration, while the levels of a shift in answers related to negative criticism remained unchanged. In older children, the age and intelligence quotients may reduce the effect of leading questions and improve resistant responses. The results showed that younger children maintain a stable suggestive vulnerability and constant use of the same strategies to cope with cognitive and social risk factors of interrogative suggestibility, while older children could reduce their levels of yield and use more resistant responses that defer to greater source monitoring and less adherence to external expectations. Children, when exposed to repeated suggestive interviews, may learn to cope with more cognitive aspects of misleading questions while being less able to handle social-emotional pressures. In forensic practice, these results may indicate how children, depending on their age, manage the factors of suggestibility during a testimony hearing and which resistance capacities they can actually use.

**Keywords:** suggestibility; misleading information; criticism; resistant behavioural responses



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## 1. Introduction

Particularly in forensic contexts, children who are victims or witnesses of crimes are heard as witnesses. Judicial practice highlights how they are often heard multiple times by police, professional figures, and judges. If children are already exposed to several suggestive interviews before giving their official testimony in court, it becomes important to clarify what effect repeated exposure to suggestive questions has, not only in terms of altering recollection but especially in terms of vulnerability.

The main aims of the present study are to verify whether repeated suggestive interviews lead to an increase or decrease in children's level of suggestibility and resistant responses (Gudjonsson et al. 2021) and how age and intelligence quotient can reduce their vulnerability.

Several studies have shown how exposure to misinformation and leading questions can lead to memory impairment (Loftus 1979; Loftus et al. 1990; Lamb et al. 2008). Furthermore, the literature highlights that suggestibility is one of the principal risk factors for eyewitnesses and that immediate and delayed suggestibility are different and independent: the first concerns the way in which the individual answers the leading questions, while the second represents the tendency to incorporate misleading information into the original memory (Vagni et al. 2015; Gabbert and Hope 2018; Gudjonsson 2018).

Lamb and colleagues (Lamb et al. 2008) have shown that 80% of the questions that are addressed to children during forensic hearings are closed and require dichotomous yes/no

or more alternative answers. The children's ability to distinguish different responses and, above all, their effectiveness in rejecting both immediately—in the case of exposure to factors of repetition of suggestive questions and factors of emotional pressure, and, after time, the suggestions to which they may be exposed—represents a critical aspect of their accuracy and testimonial reliability.

According to several authors, children have less ability to source monitoring and trust in their own memory, leading to the risk of them confusing information suggestively provided and actually experienced, altering their original memory (Nelson and Fivush 2004; Bauer and Larkina 2016; Jack et al. 2016). Moreover, children in the forensic context are more affected by expectations of success, interpersonal trust, and authority of figures such as policemen or judges and are more vulnerable to emotional and social pressures (Vagni et al. 2018). It seems important to understand if and how these aspects can reduce the reliability of children's memories when they are victims and witnesses of some crimes.

Few studies, however, seem to have considered what effect this produces in children in terms of their ability to respond to subsequent suggestive questions (Melnyk and Bruck 2004).

To better understand what the effects of repeated exposure to suggestive questions may be, it is first necessary to explain what is meant by interrogative suggestibility and resistant responses.

### 1.1. Interrogative Suggestibility

The paradigm of interrogative suggestibility (IS), also called immediate suggestibility, developed by Gudjonsson and Clark (1986), is a psychosocial model that refers to the social pressure that an interviewee receives during the process of answering suggestive questions.

The model of Gudjonsson and Clark (1986), which is used primarily in the forensic context, includes two distinctive and independent aspects of interrogative suggestibility: the impact of "leading questions" and "negative feedback" (Gudjonsson 2003). The "leading questions" are questions that contain suggestions to influence the response of the interviewee or witness through post-event information or misleading information. The negative feedback is a criticism directed at respondents to increase their degree of uncertainty and insecurity.

The main assumptions of IS are uncertainty, interpersonal trust, and expectations of success. Leading questions include misleading information, and this leads people to be uncertain about the correct answer. This occurs all the more when the suggestive information appears pertinent, plausible, and compatible with one's knowledge and expectations. Interpersonal trust means that the witness believes that the interviewer's intentions are true. Expectations of success indicate the belief of the witness that they are able to answer the questions correctly.

According to the IS model, there are two factors of suggestibility: yielding, which is the tendency to accept leading questions (Yield), and Shift, which is the tendency to change one's answers following negative feedback (Gudjonsson 1984, 1987).

Previous studies indicated a strong negative relationship between intellectual ability and interrogative suggestibility (Gudjonsson 1983, 1990, 2018), and Frumkin et al. (2012) found intellectual ability to be more closely related to the tendency to yield to misleading questions than the tendency to shift answers following negative feedback.

In addition, regarding cognitive factors, age influences the level of suggestibility, given its relationship with developmental processes (Caso et al. 2013; Goodman et al. 2014). Several studies have shown that younger children are generally significantly more vulnerable to misleading questions (Ceci et al. 2007; Goodman et al. 2014), and this may be due to their poorer memory traces (Ceci 1994; Goodman 1984), lower language skills and less developed cognitive abilities than older children (Eysenck 2015).

Furthermore, according to Ceci and Bruck (2006), younger children are probably more influenced by social pressure and lack of social support. In relation to immediate suggestibility, age seems to have an impact on up to 12 years of age; subsequently, the performance of children over the age of 12 is similar to that of adults (Gudjonsson 2003).

Age appears to be a significant predictor of immediate suggestibility but not of delayed suggestibility (Lee 2004).

With regard to socioemotional factors, exposure to adverse life events, including being involved in court cases as witness, appears to correlate with higher levels of suggestibility (Drake 2010, 2011, 2014; Drake et al. 2008; Gudjonsson et al. 2020; Vagni et al. 2021), and reduces the ability to cope with interrogative pressure (shift) and repeated questioning (yield 2) (Drake 2014; Vagni et al. 2018, 2021).

Recent studies (Gudjonsson et al. 2021, 2022) highlighted the importance of also considering how children respond to suggestive questions and what resistant responses they can express.

### 1.2. Resistant Behavioural Responses

People have several ways to answer leading questions: accepting, rejecting, or admitting they do not know the answer. The different responses of refusal of a suggestion represent the Resistant Behavioural Responses.

The Resistant Behavioural Responses (RBR) is a model validated by (Gudjonsson et al. 2021, 2022) and is based on a source monitoring framework (SMF; Johnson 1997; Johnson et al. 1993; Johnson and Raye 1981) that “refers to a set of processes involved in making attributions about the origin of memory, knowledge, and beliefs” (Johnson et al. 1993, p. 3). People can answer leading questions by accepting, refusing with a simple “No” (NO answers), or expressing one’s uncertainty (“Don’t know”, DK answers). People who have high source monitoring of information respond by providing direct E\explanations (DE answers) and not just saying no. Many studies are concerned with “Don’t Know”-type answers (DK), such as RBR in children (e.g., Brubacher et al. 2015; Earhart et al. 2014; McWilliams et al. 2014; Waterman and Blades 2011), highlighting how younger children have difficult answering “don’t know” and declaring their uncertainty, probably due to their poorer understanding of unanswerable questions and greater expectation that they must provide either ‘yes’ or ‘no’ answers (Ceci and Bruck 1993).

A recent study on 360 children aged between 7 and 17 years (Gudjonsson et al. 2022) found that NO, DE, and DK answers are different and independent response styles that have different effects on resistance to misleading questions. In particular, “Direct Explanation” answers are the most stable and robust and increase incrementally with age in children (Gudjonsson et al. 2021). The results showed that DE answers are driven by different cognitive and social processes than DK and NO answers. The main difference between DE, DK, and NO answers is that for DE answers, people recognize the discrepancy between what was observed, showing effective strategic source monitoring and control processes.

For the purposes of the study, it is important to detect what the effects of repeated suggestive questions could be in terms of the degree of vulnerability and the ability to resist suggestibility.

### 1.3. Repeated Suggestive Interviewing

The effect of repeated suggestive questions over time has been investigated by other previous research, sometimes leading to conflicting results. Some studies found that repeated interviews can help support accurate memory (Goodman and Quas 2008; Hershkowitz et al. 2021) and may be helpful for building rapport with children (Faller 2014). However, excessive interviewing of children using suggestive techniques can be detrimental to accuracy (e.g., Ceci et al. 2007), especially if memory is weak for what occurred (Goodman and Quas 2008). Children are more likely to change their answers (e.g., to “I don’t know”) to repeated yes/no, forced-choice, or suggestive questions, or to challenges to their original answers (Candel et al. 2000).

Warren and Lane (1995) showed that the repetition of more suggestive interviews did not necessarily lead children to be more suggestible. Cassel et al. (1996) found that the tendency to yield to repeated-ended suggestive questions decreased with age leading 12-year-olds to perform similarly to adults and display stable levels of suggestibility

(La Rooy et al. 2009). In answering repeated leading questions, various factors intervene, such as age (Gudjonsson 2003; Gudjonsson et al. 2016); higher source monitoring skills (Lee and Shin 2022); coping strategies (Maiorano and Vagni 2020; Rossi-Arnaud et al. 2023); language skills; stressful nature of the context, such as the forensic one (Vagni et al. 2018); and resilience skills (Gudjonsson et al. 2020; Gudjonsson et al. 2021). However, inter-subject variability in levels of vulnerability depends on individual differences (Klemfuss and Olaguez 2020).

With increasing age, children develop greater cognitive skills that allow them to better cope with the repetition of suggestive questions and the possible confusion effect deriving from misleading information and perceived social pressure during the interview.

According to Memon and Vartoukian (1996), children who were able to answer “Don’t know” and understood that this answer was plausible and accepted by the interviewer in subsequent interviews were more resistant.

Learning that a resistant answer is effective may lead children to use it more in subsequent interviews. People who have certain skills, such as memory confidence, metacognitive skills, ability to monitor sources, and critical analysis skills, are less suggestible and less influenced by context (Johnson and Raye 1981; Parker and Fischhoff 2005; Singh and Gudjonsson 1992). Often, these skills are not present in younger children because they require greater cognitive maturity.

Previous studies have verified the effect of repetitions of misleading questions using the same questions at a distance of time or creating similar interviews. Few studies have used the repetition of two parallel scales with the same psychometric properties that guarantee measurable and comparable results (Baxter and Bain 2002). The existing literature lacks a study that has measured what children’s effective resistance capacities may be when, over time, they are subjected to multiple suggestive interviews presenting misleading information. Indeed, no study has associated the effect of repetition of suggestive interviews in children with the Resistant Behavioral Responses model to test whether capacities of resistance vary or remain stable.

The present study primarily aims to analyze the effects of repeated suggestive interviews on children. It also intends to examine the influence of resistant social pressure skills in these scenarios. The second objective is to verify how age and intelligence quotient (IQ) protect children from suggestibility factors and lead to greater resistant responses. The last objective is to verify if children increase their ability to provide Resistant Behavioural Responses as they grow up.

The present study verified the following hypotheses:

**Hypothesis 1:** *The levels of interrogative suggestibility of the children exposed to repeated leading questions in a short period of time show a reduction of yield levels but maintain the same vulnerability to negative feedback (Shift).*

**Hypothesis 2:** *Age and IQ may reduce the effect of leading questions and social pressure related to cognitive factors when children are exposed to repeated suggestive interviews.*

**Hypothesis 3:** *Age and IQ are protective factors against exposure to subsequent suggestive interviews and increase RBR.*

## 2. Materials and Methods

### 2.1. Participants

The study involved 128 minors from 10 to 15 years ( $M = 12.09$ ;  $SD = 1.03$ ), 70 females (54.7%), and 58 males.

The ecological sample was selected randomly from several Italian schools. The inclusion criteria in the recruitment of participants were as follows: age range between 10 and 15 years; understanding of the Italian language; absence of serious pathologies of cognitive functioning, such as autism, medium and severe intellectual disability; deficit in perceptual

functions (such as deafness, blindness). Children of different ethnicities were included in the sample, but since there are few of them, they cannot be used as a comparison variable. However, they had good competence in the Italian language.

In agreement with the specialist literature (Hritz et al. 2015; Ridley and Gudjonsson 2013), in this study, the following significant variables linked to suggestibility were considered: intelligence quotient (IQ), age, and gender.

IQ was measured by a non-verbal test (Raven Matrices; Raven 1954), whose average was 100.47 (SD = 8.82; min = 70; max = 110). Participants who failed to complete all tests due to comprehension difficulties were excluded from the sample.

The study involved an assessment of suggestibility in the test–retest mode using two parallel forms of the suggestibility scale validated by the author (Gudjonsson 1984, 1987, 1997). In the retest phase, some children did not participate, and the final sample is made up of 110 participants (from 10 to 15 years;  $M = 12.03$ ;  $SD = 1.00$ ; min = 10; max = 15); with average IQ ( $M = 100.95$ ;  $SD = 8.61$ ; min = 80; max = 110): 64 females (58.2%) and 46 males. According to Gudjonsson (2003), children after the age of 12 show the ability to reject suggestive questions similar to adults. The age group variable was constructed by attributing a value of 1 to “younger children” 10–12 years ( $N = 64$ ; 58.2%) and a value of 2 to “older children” ( $N = 46$ ; 41.8%). The descriptive statistics for age group on GSS2 and GSS1 scores are reported in Appendix A (Table A1).

## 2.2. Procedure

The instruments were administered following the same procedure with all the participants and were administered at the first meeting with each child. The children were met in the same place six months later to complete the Gudjonsson Suggestibility Scale 1 (GSS1). GSS1 presents a more complex verbal stimulus than GSS2, and for this reason, it was administered later to limit the learning effect between the two instruments.

Three researchers and psychologists carried out the assessment, and they followed the same procedure after specific training. Data were collected from all participants in the same location.

Ethical principles were respected in accordance with ethical research involving children.

All tools were administered individually. The materials were used with the authorization of the parents or guardians of the minors involved, in accordance with the Declaration of Helsinki, and the study conformed to all ethical guidelines for research with human participants. The informed consent was signed before the inclusion of the children in the research and contained information on the objective of the study, methods of conduct, and information on the conservation of sensitive data. The study was approved by the institutional ethics committee.

## 2.3. Instruments

### 2.3.1. Gudjonsson Suggestibility Scales

Gudjonsson Suggestibility Scale 1 and 2 (GSS2; Gudjonsson 1984, 1987, 1997). The GSS1 and 2 measure the tendency to immediate suggestibility in answering leading questions, memory tasks, and confabulation memory errors (that include distortion and fabrication).

The Italian version of the GSS2 scale (Vagni et al. 2015; Gudjonsson et al. 2016) used in this study has good reliability as measured by Cronbach’s alpha coefficient that measures internal consistency of a scale Yield 1,  $\alpha = 0.81$ ; Yield 2,  $\alpha = 0.83$ ; Shift,  $\alpha = 0.71$ ; and Total Suggestibility,  $\alpha = 0.77$  (Gudjonsson et al. 2016) and has been administered in several studies (Vagni et al. 2017; Vagni et al. 2018; Vagni et al. 2021; Vagni et al. 2022). The story consists of 40 items that are requested immediately after reading (Immediate Recall).

Confabulation is scored in immediate recall of the GSS stories as distortions and fabrications (Gudjonsson 1997; Clare et al. 1994).

Distortions are the total number of major changed details of an existing element of the story target.



Fabrications are the total number of new ideas added to the recall and not mentioned in the story target.

During the interview phase, 15 leading questions are asked, alternating with 5 neutral questions. Some examples of leading questions are “Was the husband a bank director?” with yes/no answer; or “Was the boy taken home by Anne or John?” which provides for double misleading information. Responses that accept the suggestion make up the Yield 1 score. Negative feedback is provided: “you have made some mistakes. I will ask you all the questions again, try to be more accurate”, which increases the levels of uncertainty and represents social-emotional pressure.

The acceptance responses to the second leading questions are the Yield 2 score and the number of changed responses (to both neutral and leading questions) are the Shift score. The sum of Yield 1 and Shift constitutes the Total Suggestibility.

GSS1, normally used for adults or children over 12, has similar characteristics to GSS2, but the semantic content is different (Curci and Bianco 2014).

In the present study, those participants who gave more than 2 wrong answers to the neutral questions were excluded because this could suggest a poor or deficient understanding of the story.

According to Resistant Behavioural Responses Model (RBR; Gudjonsson et al. 2021, 2022), responses to leading questions on both GSS2 and 1 were counted according to their degree of resistance: all “No” and “neither” answers were counted as “No” (NO); all “There wasn’t” or “Not mentioned” responses were counted as “Direct Explanation” (DE); finally all “I don’t know” or “I don’t remember” answers were counted as “Don’t Know” (DK).

The RBR model has good reliability from 0.88 to 0.91 and allows you to detect the response strategies that children activate to respond to suggestive questions and to deal with negative pressure. The model refers to the theoretical construct of source monitoring (Johnson and Raye 1981). The answers “Don’t Know”, “No” and “Direct Explanation” respectively present a progressive increase in the level of source monitoring.

Preliminary Shapiro–Wilk normality tests were performed on scores of both GSS2 ( $W_{\text{Yield1}} = 0.98$ ; Gl 110;  $p$  n.s.;  $W_{\text{Yield2}} = 0.97$ ; Gl 110;  $p$  n.s.;  $W_{\text{shift}} = 0.95$ ; Gl 110;  $p$  n.s.;  $W_{\text{total}} = 0.98$ ; Gl 110;  $p$  n.s.) and GSS1 ( $W_{\text{Yield1}} = 0.98$ ; Gl 110;  $p$  n.s.;  $W_{\text{Yield2}} = 0.97$ ; Gl 110;  $p$  n.s.;  $W_{\text{Shift}} = 0.96$ ; Gl 110;  $p < 0.05$ ;  $W_{\text{Total}} = 0.98$ ; Gl 110;  $p$  n.s.).

### 2.3.2. Raven Progressive Matrices

This is a tool that evaluates non-verbal intellectual abilities using a series of abstract and incomplete geometric figures that are presented to the person gradually and with ascending difficulty. The tool allows us to obtain a measure of the participants’ IQ. As recommended in the manual, Coloured Progressive Matrices (CPM; Raven 1984; Belacchi et al. 2008) ( $\alpha = 0.94$ ) were used for children up to the age of 12 years, and the Standard Progressive Matrices (SPM; Raven 1954; Giunti O.S. Organizzazioni Speciali 2008) (KR-20 = 0.91) for children age 12 years and over.

### 2.4. Analytic Strategies

A preliminary Pearson correlation analysis was performed to estimate the relationship between memory, memory errors, suggestibility levels, IQ, and age scores on the two parallel suggestibility scales.  $T$ -test was carried out to verify differences related to the gender variable.

A paired  $t$ -test was analyzed to detect any differences in the corresponding scores between the two scales administered six months apart. Non-parametric analyses using Wilcoxon signed rank were conducted to verify different ranks for yield levels and for age group on suggestibility scores.

To verify the incidence of age and IQ between the scores of Yields 1 and 2 of each scale, GLM for Repeated Measures was generated assuming suggestibility scores as Dependent Variables and Age and IQ as covariates.

To verify if the answering style had also become more effective in rejecting the suggestions (Hypothesis 3), a preliminary Pearson's correlation was made between Resistant Behavioural Responses (RBR) and suggestibility scores. A paired *t*-test was performed on RBR between the two suggestibility scales. MANOVA was generated to test age and IQ effects on resistant responses as dependent variables.

### 3. Results

#### 3.1. Preliminary Analysis

Pearson's correlation analysis confirmed the association between age, IQ, and GSS2 and GSS1 scores (see Table 1). Age and IQ showed a negative significant correlation with yielding levels on both suggestibility scales. In particular, age emerged with a negative significant correlation to Yield 1 and Yield 2 scores of GSS2 and with Yield 1, Yield 2, and Total Suggestibility of GSS1, and for IQ emerged negative significant correlation with all suggestibility scores of GSS2 and Yield 1, Yield 2, Total Suggestibility of GSS1. Immediate Recall and GSS2 suggestibility scores are associated with high GSS1 scores.

**Table 1.** Pearson's correlation between age, IQ, GSS2, and GSS1 (*n* = 110).

	Age	IQ	IR GSS2	Yield 1 GSS2	IR GSS1	Yield 1 GSS1
GSS2						
IR	0.092	0.278 **	1	−0.392 ***	0.342 ***	−0.209 *
Distortion	−0.011	−0.117	−0.172 *	0.135	0.015	0.007
Fabrication	−0.173 *	−0.252 **	−0.197 *	0.017	−0.084	0.089
Confabulation	−0.099	−0.228 **	−0.245 **	0.121	−0.031	0.052
Yield 1	−0.131	−0.252 **	−0.392 ***	1	−0.408 ***	0.579 ***
Yield 2	−0.224 **	−0.177 *	−0.283 **	0.762 ***	−0.349 ***	0.571 ***
Shift	−0.122	−0.202 *	−0.239 **	0.416 ***	−0.226 **	0.347 ***
Total Sugg.	−0.151	−0.270 **	−0.375 ***	0.843 ***	−0.377 ***	0.551 ***
GSS1						
IR	0.002	0.286 **	0.342 ***	−0.408 ***	1	−0.562 ***
Distortion	0.171 *	0.177 *	−0.054	−0.112	−0.035	−0.116
Fabrication	0.109	0.015	−0.037	0.107	−0.156	0.179 *
Confabulation	0.216 *	0.168 *	−0.07	−0.04	−0.121	−0.003
Yield 1	−0.259 **	−0.232 **	−0.0209 *	0.579 ***	−0.562 ***	1
Yield 2	−0.320 ***	−0.196 *	−0.204 *	0.529 ***	−0.0439 ***	0.805 ***
Shift	−0.142	−0.062	−0.075	0.291 **	−0.208 *	0.480 ***
Total Sugg.	−0.235 **	−0.174 *	−0.167 *	0.510 ***	−0.452 ***	0.868 ***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; GSS1 and GSS2 = Gudjonsson Suggestibility Scale 1 and 2; IR = Immediate Recall; Total Sugg. = Total Suggestibility.

A preliminary *t*-test for gender variable was made and no significant differences were found. The gender variable was, therefore, not taken into consideration in the subsequent analyses. Given the results of these preliminary analyses, which highlighted correlations between the suggestibility scales, age, and intelligence, it was possible to proceed with verifying the hypotheses of the study.

#### 3.2. Hypothesis 1

To verify Hypothesis 1, paired mean comparisons were made between the scores of GSS2, which was administered first, and GSS1, administered 6 months later (Table 2). The performance of participants to the administration of the second scale (GSS1) showed an increase in memory errors in immediate recall but a decrease in acceptance levels of leading questions. No difference in terms of Immediate Recall, Shift, and Total Suggestibility. The GSS1 story has greater semantic complexity and appears to have led to more memory errors. Acceptance levels of suggestive questions in the retest phase were significantly lower.

**Table 2.** Paired *t*-test between the GSS2 and GSS1 scales (N = 110).

Variable	GSS2 Mean (SD)	GSS1 Mean (SD)	<i>t</i>
Immediate Recall	16.40 (5.07)	17.57 (6.489)	−1.83
Distortion	0.67 (0.83)	1.47 (1.27)	−5.38 **
Fabrication	0.26 (0.52)	0.51 (0.80)	−2.74 *
Confabulation	0.94 (1.00)	1.98 (1.419)	−6.15 **
Yield 1	6.75(3.30)	5.88 (2.68)	3.27 *
Yield 2	8.03 (3.97)	6.91 83.27)	3.57 *
Shift	5.18 (3.27)	5.14 (2.55)	0.14
Total Suggestibility	11.94 (5.52)	11.02 (4.50)	1.99

\*  $p < 0.01$ , \*\*  $p < 0.001$ ; GSS1 and GSS2 = Gudjonsson Suggestibility Scale 1 and 2.

The Wilcoxon signed-rank test was performed to verify if the differences in means obtained could be considered statistically significant or, on the contrary, the performance of the participants in GSS2 and GSS1 remained in the same rank.

The results showed significance for Yield 1 but not for 2 Yield 2 ( $Z_{\text{yield1}} = -3.572$ ;  $p = 0.01$ ;  $Z_{\text{yield2}} = -1.923$ ;  $p = \text{n.s.}$ ). By carrying out the same non-parametric analysis with respect to the age group variable, significance was obtained in older children for both Yield 1 ( $Z_{\text{yield1}} = -2.331$ ;  $p = 0.05$ ) and Yield 2 ( $Z_{\text{yield2}} = -2.651$ ;  $p = 0.01$ ), but not for Shift (younger children:  $Z_{\text{shift}} = -0.224$ ;  $p = \text{n.s.}$ ; older children:  $Z_{\text{shift}} = -0.713$ ;  $p = \text{n.s.}$ ).

The results showed that the youngest children maintained the same suggestibility levels while the oldest may have decreased their own acceptance of the leading questions but not vulnerability to social pressure. Since a reduction in Yield 1 and Yield 2 scores emerged, the possible effect of age and IQ on this reduction was verified.

### 3.3. Hypothesis 2

To verify the possible effect of Age and IQ (Hypothesis 2) on repeated suggestibility levels, a GLM for Repeated Measures model was generated assuming the dimensions of First-Yield (Yield1<sub>GSS2</sub>–Yield1<sub>GSS1</sub>) and Second-Yield (Yield2<sub>GSS2</sub>–Yield2<sub>GSS1</sub>) as dependent variables, and Age and IQ as covariates. The model showed the main effect for First-Yield\*Age (Pill's trace Val. = 0.51;  $F = 5.80$ ;  $g1(1, 107) p < 0.05$ ). Between subjects effects were for Age ( $F = 8.740$ ;  $p < 0.01$ ;  $\eta^2 0.76$ ) and IQ ( $F = 7.218$ ;  $p < 0.01$ ;  $\eta^2 0.063$ ). IQ reduced the tendency to accept leading questions in early interviews (Yield1<sub>GSS2</sub>:  $t = -2.69$ ;  $p < 0.01$ ; Yield1<sub>GSS1</sub>:  $t = -2.50$ ;  $p < 0.05$ ) while increasing age limited the effect of repetition of questions to the second interviews (Yield2<sub>GSS2</sub>:  $t = -2.39$ ;  $p < 0.05$ ; Yield2<sub>GSS1</sub>:  $t = -3.52$ ;  $p < 0.01$ ). Age also showed a significant effect on Yield 1 of the GSS1 ( $t = -2.81$ ;  $p < 0.01$ ), indicating that as children grow older, they may develop better monitoring strategies to cope with leading questions.

### 3.4. Hypothesis 3

The results of the previous hypothesis showed that children had become more resistant to suggestive questions as they grew older. With hypothesis 3, it was verified whether their ability to answer had also changed.

Pearson's correlations were performed to verify the association between suggestibility levels and Resistant Behavioural Responses. Responses of greatest resistance showed significant negative correlations with yielding levels. The NO and DE responses showed above all significant negative correlations with the suggestibility scales, while DK only in some cases had small correlations (Table 3).



**Table 3.** Pearson’s correlations between Resistant Behavioural Responses and suggestibility scores in both GSS scales (N = 110).

	GSS2			GSS1		
	Yield 1	Shift	Yield 2	Yield 1	Shift	Yield 2
GSS2						
NO1	−0.370 ***	−0.170	−0.220 *	−0.124	−0.58	−0.106
DE1	−0.684 ***	−0.233 **	−0.529 ***	−0.484 ***	−0.199	−0.447 ***
DK1	−0.197	−0.100	−0.215 *	−0.159	−0.229 *	−0.160
NO2	−0.195 *	−0.251 **	−0.345 ***	−0.194	−0.109	−0.177
DE2	−0.630 ***	−0.344 ***	−0.676 ***	−0.520 ***	−0.281 ***	−0.571 ***
DK2	−0.156	−0.123	−0.301 **	−0.167	−0.154	−0.187
GSS1						
NO1	0.038	−0.95	−0.018	−0.315 ***	−0.159	−0.151
DE1	−0.553 ***	−0.194	−0.486 ***	−0.656 ***	−0.338 ***	−0.637 ***
DK1	−0.095	−0.148	−0.135	−0.148	−0.009	−0.078
NO2	−0.051	−0.213 *	−0.052	−0.247 *	−0.377	−0.404 ***
DE2	−0.535 ***	−0.228 *	−0.575 ***	−0.646 ***	−0.359 ***	−0.725 ***
DK2	−0.042	−0.060	−0.161	−0.154	−0.040	−0.178

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; GSS1 and GSS2 = Gudjonsson Suggestibility Scale 1 and 2; DE1 and 2 (Direct Explanation); DK 1 and 2 (Don’t Know).

Paired *t*-test was made on NO, Direct Explanation (DE), and Don’t know (DK) responses at the first and second interviews of both suggestibility scales (see Table A2). The results revealed significant differences for both “NO” Responses at first ( $\text{NO}_{\text{GSS2}} - \text{NO}_{\text{GSS1}}$ :  $t = -2.393$ ;  $p < 0.05$ ) and at the second interview ( $\text{NO2}_{\text{GSS2}} - \text{NO2}_{\text{GSS1}}$ :  $t = -3.554$ ;  $p < 0.01$ ).

MANOVA was performed to verify age and IQ effects on Resistant Behavioural Responses (VD) in both GSS 2 and 1 scales.

Age showed the main effect (Pillai’s trace: Val 0.195;  $F = 1.944$ ;  $gl(12, 96)$ ;  $p < 0.05$ ;  $\eta^2 = 0.195$ ). Between subject effects for age were on DE-1<sub>GSS2</sub> ( $F = 5.715$ ;  $p < 0.05$ ;  $\eta^2 0.51$ ;  $t = 2.39$ ;  $p < 0.5$ ), DE-1<sub>GSS1</sub> ( $F = 5.875$ ;  $p < 0.05$ ;  $\eta^2 0.52$ ;  $t = 2.42$ ;  $p < 0.5$ ), DE-2<sub>GSS2</sub> ( $F = 13.175$ ;  $p < 0.001$ ;  $\eta^2 0.11$ ;  $t = 3.63$ ;  $p < 0.001$ ), DE-2<sub>GSS1</sub> ( $F = 8.686$ ;  $p < 0.01$ ;  $\eta^2 0.075$ ;  $t = 2.95$ ;  $p < 0.01$ ).

IQ’s effects were for DE-2<sub>GSS2</sub> ( $F = 6.582$ ;  $p < 0.05$ ;  $\eta^2 0.58$ ;  $t = 2.57$ ;  $p < 0.5$ ), and DE-2<sub>GSS1</sub> ( $F = 5.628$ ;  $p < 0.05$ ;  $\eta^2 0.50$ ;  $t = 2.37$ ;  $p < 0.5$ ).

#### 4. Discussion

The main objective of the present study was to test whether children’s exposure to repeated suggestive interviews over time led to changes in their levels of suggestibility.

The study involved children aged 10 to 15 years who were exposed to the administration of two parallel forms of suggestibility scales six months apart. The first scale to be administered was the GSS2 and then the GSS1. The latter contains the same psychometric features as the former, but the verbal stimulus presents greater semantic complexity.

The scores on the two scales showed significant correlations confirming their parallel structure (Table 1). Furthermore, these results confirmed that the GSS scales are effective for testing children’s resistance to suggestibility factors even when they are exposed to repeated suggestive interviews. The results also demonstrated that any changes in the ability to resist suggestive interviews are age and intellectual maturity dependent.

By making paired comparisons between the scores obtained on the two scales, it was found that immediate recollection abilities remained constant. Even so, more memory errors were found in the immediate recall of GSS1, which could be related precisely to the higher semantical difficulty of the task (Table 2). No change was observed at the level of Shift and Total Suggestibility. The Shift refers to the negative criticism that children receive following the first suggestive interview, and that tends to increase the levels of uncertainty and personal insecurity in answering leading questions due to socio-emotional pressure. Giving negative feedback represents social pressure that can affect Shift and Yield 2 scores. With respect to psychosocial suggestibility factors, children showed similar vulnerability

over time. This implies that children who show vulnerability to external pressure will also tend to be vulnerable in subsequent interviews. Instead, the yielding levels showed from the first to the second scale a reduction in scores. The yielding refers more to cognitive aspects and to the way the questions are phrased. The variation appeared significant only in older children, confirming the findings of other studies ([Memon and Vartoukian 1996](#); [Baxter and Bain 2002](#)).

This seems to indicate that younger children who have a high level of suggestive vulnerability will also tend to show it in subsequent interviews. However, the fact that there was a reduction in levels of yield in older children suggested that growing children may learn more effective strategies. The repeated-measures model (Hypothesis 2) showed that on levels of yield to the first interview, having good intellectual skills allows one to cope with the risk of acceptance of leading questions. Good cognitive skills thus seem to enable good source monitoring skills, better decision-making processes, and confidence in one's memory skills ([Stanovich and West 1998](#); [Bruine de Bruin et al. 2007](#)). IQ generally is associated with good immediate recall, which limits memory errors and the level of yield ([Vagni et al. 2022](#)). Thus at the second GSS1 interview, which occurred after 6 months, age had a protective factor leading older children to reject misleading questions and tolerate exposure to repeated questions. Furthermore, age also appears to have had a negative effect on first GSS1 interview failure levels. This age effect was not recorded at the first GSS2 interview, showing that older children may become better able to learn ways of resisting suggestive questions. The lack of difference between the two immediate memories scored in the two parallel forms of GSS indicated that there was no increase in memory capacity. Thus, in older children, the greater ability to reject the leading questions was not due to an increase in memory but to other cognitive abilities.

Regarding the Resistant Behavioural Responses provided by the children (see Table A2 in Appendix A), it is observed that the only differences between the pairs of responses between the two scales are the "NO" responses at both the first and second interviews. According to other studies, the ability to cope more effectively with leading questions increases with age ([Caso et al. 2013](#); [Goodman et al. 2014](#); [Gudjonsson et al. 2016](#)). In the present study, it was found that only older children are able to provide more resistant responses to leading questions (Hypothesis 3). This was evidenced by paired *t*-test analysis by age group (under 12 vs. over 12 years) which showed significant scores for older children. The results offer further reflection: the increased responses to the second interview of GSS1 are the "NO" responses. The same result is not observed for the Don't Know and Direct Explanation responses. The latter implies a high degree of source monitoring and personal safety, as well as a clear memory of what was learned. These results highlighted the important function of source monitoring, which allows for a correct comparison between the information requested and that possessed and reduces the tendency to accept leading questions. Both interrogative suggestibility and RBR model refer to the theoretical construct of source monitoring ([Gudjonsson 2003](#); [Gudjonsson et al. 2021, 2022](#); [Johnson and Raye 1981](#)). The source monitoring skill increases with age, and our results showed that the older children at the second interview of GSS1, who have learned and developed a more effective response strategy, rejected the leading questions and proved to be less vulnerable.

Furthermore, MANOVA analysis showed that with increasing age, children tend to acquire a greater capacity for source monitoring that enables them to discriminate more accurately whether the information from the leading question corresponds to the information contained in their memories. IQ showed a significant negative effect on the yield scales, which represent the most cognitive component of the process of interrogative suggestibility ([Klemfuss and Olaguez 2020](#); [Gudjonsson 2018](#)). In fact, the first interviews of GSS2 and GSS1, which measure the first level of yield, require an examination of comprehension and discrimination between the information requested and the information learned and is, thus, a cognitive task. The IQ effects are modest, however, and this may be due to the fact that the tool used in the study measures nonverbal intelligence. Multiple

cognitive abilities are involved in the process of responding to leading questions, which, however, are not measured accurately by Raven's Matrices. In fact, MANOVA analysis on the resistant responses showed a greater effect of age that would tend to increase the presence of "Direct Explanation" responses rather than IQ. On "Don't Know" responses, on the other hand, no effect is registered by IQ and age, which seems to suggest that they depend on other factors that would merit further investigation.

The results confirm the study hypotheses by showing that younger children maintain a stable suggestive vulnerability and constant use of the same coping strategies to yielding and social pressure factors. Older children may reduce their yield levels using more of those response strategies that defer to greater source monitoring and less adherence to external expectations. The results also highlighted how children can learn to cope with the cognitive factors related to misleading and repeating questions but are even less able to manage the effect of social pressures.

#### *4.1. Limitations*

The present study showed several limitations. First, the extension of the sub-samples related to age groups is limited, and an extension of the sample would be required for a generalization of the results. Secondly, the measure of intelligence quotient utilized in this study only involved a non-verbal test, which does not allow information on more specific cognitive abilities. The results obtained suggest that in similar studies, it would also be necessary to provide a measure of the levels of understanding and linguistic production to be related to the RBR model. Moreover, since the risks associated with the repetition of questions and social pressures mainly affect the forensic context, it would be necessary to extend the study by recruiting a group of child witnesses to compare with a normal sample. Indeed, previous studies have shown that samples of children recruited in the forensic context have higher suggestibility levels and use different response styles than children recruited in control samples; therefore, it would be interesting to compare these different samples to give more suggestions to professionals who evaluate children in a forensic setting.

#### *4.2. Recommendations for Future Research*

Furthermore, starting from the results of this study and the limitations highlighted, various focuses for future research objectives could be explored; for example, in a new study, the relationship between suggestibility, coping strategies, the resistant responses (No, Don't Know and Direct Explanation), and other variables such as executive functions could be analyzed to investigate whether the ability to choose and modify response types can be linked to cognitive flexibility; furthermore could be analyzed the relationship with counterfactuals influence causal (Catellani et al. 2021).

Respect to the role of coping in this paradigm could be considered to verify if avoidance coping influences the choice of the "Don't Know" answer and, at the same time, if problem-focused coping strategy can increase the frequency of the "not mentioned" answer being given to leading questions.

### **5. Conclusions**

The main aims of the present study are to verify whether in children repeated suggestive interviews lead to an increase or decrease in their level of suggestibility and resistant responses (Gudjonsson et al. 2021) and how age and intelligence quotient can reduce their vulnerability.

The findings of this study confirm that the main recommendation for interview practices is that suspected victims of sex crimes should be interviewed accurately and non-suggestively, providing them with 'ground rules'. It is also necessary to propose further studies on the analysis of suggestibility with the GSS using the RBR model and its relationships with other psychological variables, especially in the forensic context.

In the forensic context, the risk of exposure to repeated suggestive interviews and to psycho-social pressure factors leads experts to wonder what the effect is in terms of increasing or reducing children's suggestive vulnerability. The main objectives of this study were to analyze the effect of repeated suggestive interviews and the resistant responses to leading questions and social pressure on individual suggestibility levels. We discussed the results in terms of applicability in the socio-forensic context for understanding the factors and variables involved, like IQ and age, that may reduce the vulnerability of children.

In terms of application, the study highlighted how children exposed to repeated suggestive interviews always maintain the risk of being suggestible. However, older children show that they are able to learn more effective coping strategies when they are asked to be more accurate and when they manage to perceive that their refusal responses can be accepted by the interviewer. The findings of this study confirm that the main recommendation for interview practices is that child witnesses and suspected victims of sex crimes should be interviewed accurately and non-suggestively, providing them with "ground rules" (like to warn that some questions may be repeated, to give the instructions to say "I don't understand" and "I don't know, and to tell when the interviewer has been made a mistake). It is also necessary to propose further studies on the analysis of suggestibility with the GSS using the RBR model and its relationships with other psychological variables, especially in the forensic context.

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**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Table A1.** Descriptive statistics for GSS2 and GSS1 scores between age groups (N = 110).

Variable	10–12 Years (N = 64) (m = 25; f = 39)		13–15 Years (N = 46) (m = 21; f = 25)	
	GSS2 Mean (SD)	GSS1 Mean (SD)	GSS2 Mean (SD)	GSS1 Mean (SD)
Immediate Recall	16.23 (5.00)	17.80 (5.91)	16.68 (5.24)	17.20 (7.40)
Distortion	0.64 (0.81)	1.17 (1.03)	0.73 (0.87)	1.98 (1.48)
Fabrication	0.29 (0.57)	0.49 (0.76)	0.22 (0.42)	0.54 (0.87)
Confabulation	0.93 (1.03)	1.67 (1.23)	0.95 (0.82)	2.51 (1.55)
Yield 1	7.13 (3.31)	6.30 (2.55)	6.12 (3.85)	5.17 (2.76)
Yield 2	8.65 (3.62)	7.55 (3.08)	6.98 (4.35)	5.83 (3.33)
Shift	5.51 (3.03)	5.32 (2.67)	4.63 (3.60)	4.83 (2.33)
Total Suggestibility	12.64 (5.15)	11.62 (4.62)	10.76 (5.99)	10.00 (4.12)

GSS1 and GSS2 = Gudjonsson Suggestibility Scale 1 and 2; m = males; f = females.

**Table A2.** Differences in scores on the RBR between the GSS2 and GSS1 scales (N = 110).

Variable	GSS2 Mean (SD)	GSS1 Mean (SD)	t
NO-1	5.93 (2.47)	6.55 (2.27)	−2.39 *
NO-2	4.54 (2.66)	5.49 (2.31)	−3.55 **
DE-1	1.73 (3.01)	1.99 (2.59)	−1.21
DE-2	1.81 (3.29)	2.12 (2.82)	−1.43
DK-1	0.54 (1.28)	0.58 (1.23)	−0.37
DK-2	0.54 (1.52)	0.39 (1.05)	1.13

\*  $p < 0.05$ , \*\*  $p < 0.01$ , GSS1 and GSS2 = Gudjonsson Suggestibility Scale 1 and 2; DE1 and 2 (Direct Explanation); DK 1 and 2 (Don't Know).

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