

Interviewing Preschoolers: Response Biases to Yes–No Questions

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Summary: In the present study we examined the influence of question format and age on Iranian children's responses to various types of yes–no questions, to assess potential response biases. The participants were 177 2- to 6-year old native speakers of Persian who were asked both positively and negatively formulated yes–no questions about eight household objects. The results showed that children of different ages are influenced differently by the way questions are formulated. The findings also suggest that children display a compliance tendency when asked yes–no questions. That is, they tend to respond to yes–no questions in the direction implied by the question: 'yes' to positively worded questions and 'no' to negatively worded questions. This tendency, however, seems to grow weaker as children get older. Copyright © 2016 John Wiley & Sons, Ltd.

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In daily interactions, questioning is the most fundamental speech act which is used both by adults and children as a method of eliciting information. Questioning is also widely used in forensic and medical contexts by investigators and physicians as a valuable source of information for subsequent decision-making. Additionally, in social sciences, particularly in developmental studies, children's responses to adults' questions are considered to be a major data collection tool. However, developmental psychologists express reservations about the reliability of children's responses. A steadily mounting body of research has suggested that preschoolers' responses to certain types of questions are sometimes not reliable and should be approached with caution (Davies, Tarrant, & Flin, 2000; Fritzley & Lee, 2003; Fritzley, Lindsay, & Lee, 2013; Okanda & Itakura, 2007; Peterson & Grant, 2001). On the other hand, some researchers believe that preschoolers' communication abilities have been underestimated and children as young as three years old can provide accurate and reliable information in response to various types of questions (Peterson, 2012).

Yes–no questions are among the earliest types of questions perceived and produced by young children (Choi, 1991), and are commonly asked in different contexts when interviewing children. Fritzley and Lee (2003) reported that yes–no questions are the most frequent types of questions asked in developmental studies. In medical settings and dental check-ups, yes–no questions are employed as the primary method of eliciting information (von Baeyer, Forsyth, Stanford, Watson, & Chambers, 2009). Davies et al. (2000) found that in forensic interviews in the UK with suspected child victims of sexual abuse, 50% of questions were either yes–no or forced-choice. More recently, Stolzenberg and Lyon (2014) reported that in sexual abuse cases in California, about 50% of the questions that attorneys asked were yes–no questions, and children tended to provide unelaborated responses to such questions. Bouzhmehrani

(2011) also found that in the Iranian context yes–no questions are frequently used in police interviews with children, although he did not provide the frequency of such questions.

Despite the extensive use of yes–no questions in various contexts involving children, there is not an agreed-upon consensus about the accuracy of children's responses to these questions. Some scholars have argued that preschool-aged children, in response to yes–no questions, have a tendency toward saying 'no'. Such a bias was found by Peterson and Biggs (1997) when asking questions about a traumatic injury, particularly if there was uncertainty involved; as well, Fritzley and Lee (2003) found a 'no' bias when preschoolers were asked incomprehensible questions. In addition, Okanda, Somogyi, and Itakura (2012) reported that Hungarian 4-year-olds often display a nay-saying bias to questions about unfamiliar objects.

On the other hand, some researchers have reported that children are more inclined to say 'yes' rather than 'no' when asked yes–no questions. For example, Steffensen (1978) charted the development of two children's responses to yes–no questions in a longitudinal study, and observed a strong affirmative bias for one child. However, 'yes' responses were much more likely to match the answer expected by the adult speech community. She speculated that, prior to understanding the semantics of the question, children develop their own pragmatic competence, meaning that they realize they must verbalize in response to yes–no questions and that 'yes' is the most likely response. In addition, a number of other developmental studies have reported that North American children, before school age, tend to say 'yes' in response to yes–no questions (Fritzley & Lee, 2003; Fritzley et al., 2013; Peterson & Grant, 2001; Rocha, 2003). For example, Fritzley and Lee (2003) found that North American 2-year-olds display a consistent 'yes' bias, whereas 4- and 5-year-olds exhibit no particular response bias toward comprehensible questions although they display a 'no' saying bias toward incomprehensible questions. Similar findings were also reported in a more recent study by Fritzley et al. (2013), who found a tendency in Canadian children's responses toward saying 'yes'. These authors also reported that children's response bias was more pronounced for expected events than for unexpected ones. A 'yes' bias is also shown by children up through age 4 in Japan and

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Vietnam (Okanda & Itakura, 2007, 2010a, 2010b). Okanda and Itakura concluded that a 'yes' bias is 'a common phenomenon all over the world regardless of languages and cultures' (Okanda & Itakura, 2010b, p. 135), and that 'human's communicative responses begin with an affirmation bias' (Okanda & Itakura, 2007, p. 427). More recently, however, the universality of a 'yes' bias in all countries of the world has been challenged (Fritzley, Okanda, Itakura, & Lee, 2012).

Further inconsistencies in the literature come from recent research that found children display a more complicated form of bias. For instance, in a recent study, Mehrani and Behzadnia (2016) investigated 3- to 5-year old preschoolers' response tendencies, prompting them with yes-no tag questions, such as 'It is a hat, isn't it?'. The results revealed that children displayed a compliance tendency. That is, children showed a tendency to reply in the direction implied in questions addressed to them, 'yes' to positively loaded questions and 'no' to negatively loaded questions. Finally, there are studies that did not find any response bias at all. For example, Brady, Poole, Warren, and Jones (1999) found no bias in children between three and seven years of age and although Peterson, Dowden, and Tobin (1999) found that children displayed a 'yes' bias when question content involved people or actions, there was no bias when content involved physical context.

Although in our communicative interactions the process of asking and answering yes-no questions seems to be very simple, research has shown that many cognitive, socio-cultural, and contextual factors can influence this seemingly simple but, in actuality, complex process (Bruck & Ceci, 1999; Bruck & Melnyk, 2004; Ceci & Bruck, 1993; Krähenbühl & Blades, 2006; Reyna, Holliday, & Marche, 2002; Rudy & Goodman, 1991). Empirical investigations have supported that in interviewing situations the type and content of questioning (Andrews, Lamb, & Lyon, 2015), familiarity with objects (Fritzley & Lee, 2003), age and cognitive development (Hershkowitz, Lamb, Orbach, Katz, & Horowitz, 2012; Andrews & Lamb, 2014; Mehrani & Peterson, 2015), and cultural differences (Fritzley et al., 2012; Mehrani, 2011), among other factors, can result in discrepancies in children's responses to yes-no questions. Yet, there seems to be a paucity of investigation into the linguistic properties of questions asked in interviewing children. As Peterson and Biggs (1997) point out, this aspect of questioning has not been seriously investigated.

Mehrani (2011) argues that, although some of the previous studies on children's responses to yes-no questions have found an affirmation bias on the part of children (e.g. Fritzley & Lee, 2003; Fritzley et al., 2013; Moriguchi, Okanda, & Itakura, 2008; Okanda & Itakura, 2007, 2010a, 2010b; Okanda et al., 2012), the reported 'yes' bias might be because of the forms of the questions asked in these studies. In fact, a closer look at the syntactic properties of the questions asked in these studies reveals that subjects were asked only positive yes-no questions. However, understanding children's responses to negative questions is equally important and should be empirically examined. This is because in interviewing situations, especially in forensic settings, children are sometimes asked negative yes-no questions (Stolzenberg & Lyon, 2014). This could be because of a

variety of reasons, such as lack of appropriate interviewer training or even attempts by lawyers to mislead respondents. It should be noted that negation is a universal feature of human language and there is a compelling body of evidence showing that the comprehension and expression of negation is acquired very early in infancy (e.g. Bloom, 1970, 1991; Choi, 1988; Cuccio, 2011; Dimroth, 2010; Hummer, Wimmer, & Antes, 1993; Pea, 1980; Spitz, 1957; Vaidyanathan, 1991; and Volterra & Antinucci, 1979). Even before children learn to talk, that is, during the cooing and babbling stages of language development, they can respond negatively by using gestures or by shaking their head (Yule, 2010).

From a linguistic perspective, yes-no questions present an exclusive disjunction, a pair of alternatives of which only one is acceptable. Yes-no questions are formulated variously in different languages. In English, typically a 'verb + subject + complement' word order is used to form positive yes-no questions (e.g. Is it an apple?). Negative yes-no questions follow a similar word order except for the negation element, which can be added to the complement, 'verb + subject + (negation) complement' (e.g. Is it not an apple?) or to the verb, 'verb (negation) + subject + complement' (e.g. Isn't it an apple?). In other words, negative questions in English are more linguistically complex because they have an additional element. In some languages, however, the syntactic structure of negative questions does not differ from that of positive ones. For example, in colloquial Persian, a 'subject + complement + verb' word order is used for both positive and negative questions. For example

Positive question = In sib hast? (it apple is?) Is it an apple?

Negative question = In sib nist? (it apple isn't) Is it not an apple?

In the current study, we attempted to investigate 2- to 6-year-old Persian speakers' response tendencies to both positive and negative yes-no questions. The choice of Persian as the focus of this study was mainly motivated by the syntactic properties of Persian, which allow both positive and negative yes-no questions to be formulated in the same way. This eliminates the potential risk of making one type of question grammatically simpler than the other. Use of a language in which positive and negative yes-no questions are structurally identical may help us understand extant discrepancies in the literature.

A further reason for focusing on Persian has to do with the way negative yes-no questions are answered in this language. In some languages, including English, a simple 'yes' answer to a negatively loaded yes-no question can equally be interpreted as both 'yes' and 'no'. For example, when answering the 'Is it not a good book?' a 'yes' answer can be interpreted as either 'Yes, it is not' or 'Yes, it is,' depending upon whether the respondent is replying with the truth-value of the situation, or is replying to the polarity used in the question. In other words, there is potential ambiguity. In Persian, however, negative yes-no questions are answered in two ways: either by a '*na* response' which connotes 'No, it is not a good book' or by a '*chera* response' which means 'Yes, it is a good book'. Therefore, the ambiguity of a 'yes' response in English does not exist in Persian, and

children's responses to both positive and negative questions can be examined unambiguously.

In the present study, the following research questions were examined: (i) Does question format have any effect on children's responses to yes–no questions? (ii) Does children's age have any effects on their responses to yes–no questions? And (iii) Do children show any particular response biases when asked different types of yes–no questions? Because in existing studies children were prompted only with positively formulated yes–no questions, we were hesitant to predict whether question format has any effect on children's responses. However, based on Fritzley and Lee (2003) and Fritzley et al.'s (2013) studies we hypothesized that if children do show any particular response bias, their bias would grow weaker as their age increases. Finally, based on the inconsistencies in the literature, we were not able to predict whether children would show any particular tendency in response to positive and negative yes–no questions.

METHODOLOGY

Participants

Participants were 177 Iranian children in 5 age groups: 30 2-year-olds (16 female and 14 male, age range=24–35 months, $M=27.2$ months, $SD=3.1$); 32 3-year-olds (17 female and 15 male, age range=36 – 46 months, $M=41.6$ months, $SD=3.8$); 38 4-year-olds (22 female and 16 male, age range=48 – 61 months, $M=53.7$ months, $SD=1.9$); 42 5-year-olds (22 female and 21 male, age range=64 – 71 months, $M=68.3$ months, $SD=2.6$); and 35 6-year-olds (17 female and 18 male, age range=72–79 months, $M=75.8$ months, $SD=1.7$). Three other children participated in the study but were later excluded from further analysis because they either cried or did not participate in the entire process of data collection. The children were all monolingual speakers of Persian and were recruited from six child care centers in Mashhad, a city which is located in the north-east region of Iran, close to the borders of Turkmenistan and Afghanistan.

Materials and procedure

First, a pilot study was conducted to select eight everyday objects which were familiar for children in all age groups. The objects were an apple, a glass, a comb, a key, a pen, a spoon, a ball, and a toothbrush. To confirm whether each object was truly familiar to children, 17 children between 2 and 5 years old were asked the name and the function of each object. All children knew the properties and functions of the objects, as expected. (Children who participated in any pilot study were excluded from the main experiment.)

The choice of these everyday objects in this study was informed by the literature suggesting that children are more likely to provide accurate responses to questions concerning familiar objects (e.g. Fritzley & Lee, 2003; Okanda & Itakura, 2007, 2010a, 2010b). In addition, the literature on language development suggests that preschoolers often show interest in talking about names and properties of familiar objects (e.g. Nelson, 1973). The words used for designing

yes–no questions were similar to those used in previous studies (e.g. Fritzley & Lee, 2003; Okanda & Itakura, 2010a, 2010b) to ensure that they were understood by children. In addition, a second pilot study was conducted to ensure that children could easily understand the syntactic structures and words used in the designed questions. Twenty children (spanning all age groups) were individually shown the objects and asked all the yes–no questions for a comprehension check. In addition, to ensure that the participants could understand negative questions, we showed children some familiar objects of the same type (e.g. a yellow and a red apple) and asked them positive and negative forced-choice questions such as 'Which one is not red?' and 'Which one is yellow?' Moreover, children were shown objects of different types (e.g. a doll and a ball) and were asked to choose one, through questions like: 'Which one is not a ball?', 'Which one is a doll?' As was expected, they could comprehend the questions and had no problem understanding what was meant by them.

Four yes–no questions were then designed about the functions and properties of each object. Half of the questions for each item included a negation element (negative questions) and the other half included a positive element (positive questions). Also, for two of the questions about each object, the correct answer was 'yes' ('yes' questions) and for the remaining two, the correct answer was 'no' ('no' questions). Therefore, out a total of 32 questions 16 were 'yes' questions (eight negative and eight positive) and 16 were 'no' questions (eight negative and eight positive). Positive and negative questions were then counterbalanced following an alternation fashion. That is, the first question was positive, the second was negative, the third was positive, and so forth. (See Appendix for a complete list of questions).

A research assistant who did not know the purpose of the research interviewed the participants. Although she had worked in day care centers in Mashhad for about 4 years, she did not have any a priori familiarity with the children who took part in this study. After a short rapport-building introduction, each child was interviewed individually in a separate room in their child care centers. Children's responses were written on a score sheet immediately after each question; all interviews were also recorded to confirm accurate questioning and scoring. Finally, the children were thanked and each rewarded with a photo book.

Scoring

To examine children's response tendencies to different questions, four scores were obtained for each child. The first score (positive 'yes' score) was obtained by assigning a 1 to each correct answer to positively formulated questions that required a 'yes' response. The second score (negative 'yes' score) was obtained by assigning a 1 to each correct answer to negatively formulated questions that required a 'yes' response. The third score (positive 'no' score) was obtained by assigning a 1 to each correct answer to positively formulated questions that required a 'no' response. And the last score (negative 'no' score) was obtained by assigning a 1 to each correct answer to negatively formulated questions that required a 'no' response. In calculating the scores, 'I

don't know' responses and unanswered questions received no scores. Thus, the maximum of each score was 8 and the minimum was zero. Preliminary analyses were conducted to examine the effects of participants' gender on children's scores, and because no significant differences were found, data were collapsed over this variable in all the analyses presented below.

RESULTS

First, the frequency of 'I don't know' responses and unanswered questions was investigated. The researchers did not expect a high frequency of 'I don't know' responses as children were all familiar with the objects. Children at all ages seldom responded 'I don't know'. They also responded to almost all questions and rarely left questions unanswered. That is, there were only 15 times across all children that 'I don't know' responses were observed, and only 6 times 'no answer' responses were observed in all age groups.

As Table 1 shows, children's correct scores for positive 'yes' questions did not change across ages. In addition, their correct scores for negative 'no' questions changed very modestly across ages, but their correct scores for negative 'yes' questions and positive 'no' questions increased as children developed.

A 5 (age) × 4 (question type) analysis of variance (ANOVA) was conducted on children's correct scores, with the question types as the repeated measure. Results indicated significant main effects of age, $F(2.39, 384.96) = 280.20$, $p < .001$, $\eta^2 = .620$, and types of questions, $F(1, 172) = 40.54$, $p < .001$, $\eta^2 = .485$. However, the main effects were qualified by a significant interaction between age and question format, $F(8.95, 384.96) = 23.33$, $p < .001$, $\eta^2 = .352$. To analyze the interaction, trend analyses on age were performed separately for each type of question. For positive 'yes' questions, there was no significant linear effect, $t(172) = 1.49$, $p = .224$, showing that performance did not significantly change across age. Nor was there a significant quadratic effect, $t(172) = 2.15$, $p = .145$. For negative 'yes' questions, there was a significant linear effect, $t(172) = 172.49$, $p < .001$, reflecting improvement with age, as well as a significant quadratic effect, $t(172) = 12.07$, $p = .001$, indicating a leveling off of scores for older children. Post hoc Tukey tests confirmed that 2-year olds' means were significantly different from all other groups'. Likewise, 3-year-old children were significantly different from other groups. The 4-year-olds' means were significantly different from each of the other groups', except the 5-year-olds'. And finally, the mean scores of 5- and 6-year-old children did not differ

from each other. For positive 'no' questions there was also a significant linear effect, $t(172) = 100.21$, $p < .001$, reflecting improvement with age, as well as a significant quadratic effect, $t(172) = 13.16$, $p < .001$, indicating a leveling off of scores for older children. Post hoc comparisons revealed that the 2-year-olds' means were significantly different from all other age groups'. Three-year-olds' correct scores were significantly different from each of the other groups' except the 4-year-olds'. And, the mean correct scores of 4-, 5-, and 6-year-old children did not differ from each other. For negative 'no' questions there was a significant linear effect, $t(172) = 5.55$, $p = .020$. However, there was no significant quadratic effect, $t(172) = .108$, $p = .743$. Post hoc Tukey tests indicated that children's mean correct scores across age groups were not significantly different. Thus, improvement across age was very modest as well as gradual.

To see if children display any particular 'yes' or 'no' bias when answering different types of yes-no questions, paired samples *T*-tests were separately performed for each age group to compare the mean correct score of their responses to 'yes' questions with that of their responses to 'no'-questions. As Table 2 shows, results indicated significant differences between children's correct 'yes' scores and correct 'no' scores across all age groups. All age groups were more accurate when the correct response was 'no', and thus their pattern of responses suggests an overall bias toward saying 'no'.

To see if children's responses comply with the structures of the questions they were asked, a compliance score was calculated for each child, by adding their scores to the positive 'yes' questions with those of their negative 'no' questions; for both types of questions, the responses suggested by the form of the question and the correct response are consistent. A non-compliance score was similarly calculated by adding children's 'no' scores to positive questions with their 'yes' scores to negative questions; in both these cases, the

Table 2. *T*-test scores and means for correct 'yes' and 'no' scores across each age group

Age		Mean	<i>T</i> -value
2-year-olds	Yes score	8.20	$t(29) = -7.34^*$
	No score	12.01	
3-year-olds	Yes score	9.93	$t(31) = -5.59^*$
	No score	13.53	
4-year-olds	Yes score	11.10	$t(37) = -6.39^*$
	No score	14.76	
5-year-olds	Yes score	11.59	$t(41) = -14.33^*$
	No score	15.66	
6-year-olds	Yes score	12.48	$t(34) = -9.56^*$
	No score	15.65	

* $p < .001$.

Table 1. Children's mean of correct scores to various types of questions across age

	2-year-olds	3-year-olds	4-year-olds	5-year-olds	6-year-olds
Positive yes mean scores	7.00	6.53	6.42	6.64	6.54
Negative yes mean scores	1.20	3.41	4.68	4.95	5.94
Positive no mean scores	4.41	6.09	7.05	7.86	7.83
Negative no mean scores	7.60	7.44	7.71	7.81	7.83

Note: the maximum score is 8.

Table 3. Children's compliance and non-compliance mean of correct scores across age

	2-year-olds	3-year-olds	4-year-olds	5-year-olds	6-year-olds
Compliance scores (positive yes + negative no)	14.60	13.97	14.13	14.45	14.37
Non-compliance scores (positive no + negative yes)	5.61	9.50	11.73	12.81	13.77

*Note: the maximum score is 16.

correct answer is not consistent with the response suggested by the question form. Table 3 shows the relevant descriptive statistics.

A 5 (age) × 2 (questions type: compliance and non-compliance) ANOVA was conducted with the question type as the repeated measure. Results showed significant main effects for both question type, $F(1, 172) = 317.10$, $p < .001$, $\eta^2 = .648$ and age, $F(4, 172) = 45.74$, $p < .001$, $\eta^2 = .515$, as well as for the interaction between age and question format, $F(4, 172) = 49.18$, $p < .001$, $\eta^2 = .534$. To examine this significant interaction further as well as to explore whether a compliance bias was present, trend analyses on age were performed separately for each type of question. For the 'compliance condition', there was no significant linear effect, $t(172) = .02$, $p = .866$, showing that performance did not significantly change across age when the response implied by the question's structure and the correct response were consistent. Nor was there a significant quadratic effect, $t(172) = 2.05$, $p = .154$. For the 'non-compliance condition', there was a significant linear effect, $t(172) = 219.82$, $p < .001$, reflecting improvement of scores with age, as well as a significant quadratic effect, $t(172) = 20.80$, $p < .001$, indicating a leveling off of scores for older children. Post hoc Tukey tests confirmed that 2-year olds' means were significantly different from all other groups'. Likewise, 3-year-old children were significantly different from other groups. The 4-year-olds' means were significantly different from all other groups' except the 5-year-olds. And finally, the mean scores of 5- and 6-year-old children did not differ.

DISCUSSION AND CONCLUSIONS

The focus of the present study was threefold: (i) to investigate whether question format has any effect on children's responses to yes–no questions; (ii) to examine whether children's age has any effect on their responses to yes–no questions; and (iii) to explore whether children display any response tendencies when answering various types of yes–no questions. First, our findings revealed that in comparison with their correct 'yes' scores, children's correct 'no' scores at all age levels were higher, suggesting that children displayed a bias toward saying 'no'. Some forensic studies have reported that children tend to say 'no' indiscriminately to yes–no questions they do not understand (Fritzley et al., 2013; Peterson & Biggs, 1997). Fritzley and Lee (2003) speculate that children frequently say 'no' to incomprehensible questions because, like adults, they may be unwilling to indicate that they do not understand a question. Others (e.g. Peterson & Biggs, 1997) argue that children may say 'no' to questions like 'Did you drink water?' not because in fact they did not drink but because they cannot remember. Because pretesting found that the words used in the present

study as well as the question formats were comprehensible, and children were questioned immediately after they were presented with objects, these explanations are unlikely to play an important role here.

In addition, Lyon (2005) argues that positive yes–no questions can be made more suggestive by turning them into negative yes–no questions or tag questions. Some studies have found that young children are more likely to acquiesce to negative and tag questions than to positive questions (Greenstock & Pipe, 1996). On this basis, children's higher 'no' bias scores are because negative yes–no questions are more suggestive than positive yes–no questions. However, we do not believe this explanation can account for the results obtained in this study, because positive and negative questions are linguistically similar in Persian.

Studies have shown that children's tendency to say 'no' might be because they have learned that it is an effective strategy to terminate questioning (Peterson et al., 1999). This suggestion can be assessed in the present study because children attempting to terminate questioning should show a stronger bias in the second half of the interview. When looking across the data, however, we did not find higher 'no' scores in the second half of the interview. Thus, this explanation cannot effectively account for their higher 'no' scores.

We speculate that children's tendency toward saying 'no' might be due to a psychosocial phenomenon. Based on Erickson's theory of psychosocial development, it is possible that young children's 'no' responses are an attempt to oppose external forces and assert independence and identity (Erickson, 1964). However, the current study does not allow us to assess this.

Nevertheless, when considering the types of questions that children were asked, a simple 'no' bias cannot account for all of the differences found in children's responses. Although children's pattern of responses to various yes–no questions suggests an overall bias toward saying 'no', it is apparent that when children are asked negatively framed questions their responses are more likely to be negative, and if they are asked positively framed questions, affirmative responses are more likely. This suggests that children do not respond to yes–no questions based solely on a consistent and static 'no' bias. In other words, children are not simply biased toward one type of response; rather, their responses are vulnerable to the syntactic properties of questions. Our findings regarding children's compliance tendency scores showed that children's responses are in the direction implied by the structure of yes–no questions and they tend to comply with the implication of questions be it negative or positive, by replying in the same way. This suggests that children do not come to question–answer situations with an a priori, simple bias (either 'yes' bias or 'no' bias) but they appear to be easily influenced by aspects of the questions addressed to them.

The complexity of a compliance tendency suggests a reason for the discrepancies reported in the literature. As was mentioned, there are varying accounts of children's responses to yes–no questions, with some arguing for the existence a 'yes' bias (e.g. Fritzley & Lee, 2003; Fritzley et al., 2013; Moriguchi et al., 2008; Okanda & Itakura, 2007, 2010a, 2010b), some reporting a 'no' bias in children's response (e.g. Okanda et al., 2012; Peterson & Biggs, 1997) and others finding neither a 'yes' bias nor a 'no' bias (Brady et al., 1999; Peterson et al., 1999). However, it seems that our findings regarding children's compliance tendency pose a challenge for investigators' attempts to explain children's response tendencies in terms of a static, simple 'yes' or 'no' bias.

The findings of this study suggest that compliance tendency is a communication norm among Iranian children. However, communication norms are to a large extent unconsciously built up on the language habits of members of a given speech community. Communication norms are socially acquired, and we tend to perceive them within the context of our own culture, although they are not necessarily standards that are empirically defined. Sociolinguistic studies show that children in collectivist societies learn to inhibit the expression of their own wants and needs and to attend to the needs of others, especially adults. Deference to adults is valued by more collectivist cultures (Hofstede, 1983), and children are expected to be deferential and polite to adults, and to comply with their instructions (Rudy & Grusec, 2006). These qualities in collectivist societies, which require obedience from children without expression of their own point of view, may promote the development of children's compliance tendency. Therefore, one might conclude that compliance tendency is either unique to collectivist societies such as Iran, or more pronounced in the Iranian context than in some other societies, particularly in individualist societies.

A closer examination of the results, however, suggests that compliance tendency seems not to be merely a cultural phenomenon. It is evident from the results that as children developed socially, their compliance tendency grew weaker. In other words, as children acquire cultural and social norms in the Iranian context they appear to be less susceptible to the suggestibility loads of yes–no questions, and therefore less compliant. This leads us to hypothesize that perhaps compliance tendency is a developmental phenomenon, and novice language users are more likely to respond to yes–no questions in accordance with the expectations of yes–no questions. However, we suggest that future studies investigate the communication norms of children with different linguistic and cultural backgrounds.

Our findings confirm that 2- and 3-year-old children are less accurate than older children when answering negative 'yes' questions and positive 'no' questions. In addition, younger children appeared to display stronger levels of response bias. These patterns of findings with respect to age-related changes are consistent with the findings of several studies (e.g. Fritzley & Lee, 2003; Fritzley et al., 2013; Okanda & Itakura, 2007, 2010a, 2010b), and can be attributed to different factors. For example, it is possible that children's responses are affected by their limited memory resources; a younger child's positive response may be altered

by acceptance of false information that is suggested in negatively formulated questions. Therefore, younger children's limited processing resources may make it difficult for them to hold the truth (Goodman & Schaaf, 1997), and thus they may be more likely to answer questions incorrectly. In addition, as Fritzley and her colleagues argue (Fritzley & Lee, 2003; Fritzley et al., 2013), age-related differences in children's responses to yes–no questions might be because of younger children's lesser-developed cognitive and language skills.

However, when answering positive 'yes' questions and negative 'no' questions both younger and older children performed similarly. It is possible that older children's high scores are the results of their accurate responses to the questions. Compared to younger children, they are more cognizant of the demands of interviews, and they know that the interviewer expects them to provide accurate information from them. Consequently, they are more likely to try their best to accurately answer the questions (Fritzley et al., 2013). However, younger children's high scores may instead be rooted in their higher level of compliance tendency. As discussed earlier, younger children tend to comply more with the expectations implied in questions. In the case of positive questions, a 'yes' answer seems more compliant and in the case of negative questions a 'no' response is more agreeable. Therefore, younger children's higher scores on these question formats cannot necessarily be attributed to their attempt to provide accurate responses, but instead might be the result of their higher level of compliance.

Another important point in the results is that children almost never said 'I don't know' to either positive or negative yes–no questions. Also, children rarely left questions without any response. Instead, they appeared to respond with a veneer of certainty by providing either correct or incorrect answers. Although children in this study were supposed to understand the questions and know the answer to all questions, studies have shown that children from some cultures are likely to avoid binary decisions. For instance, Okanda and Itakura (2010b) found that 4- and 5-year-old Japanese children tend to provide 'I don't know' responses and 2-year-old Japanese children tend to avoid answering adults' yes–no questions. Okanda and Itakura (2010b) pointed out that Japanese children could have a specific response attitude to yes–no questions that is influenced by Japanese culture. In contrast, North American children often provide definitive responses in such situations because they may be unwilling to indicate that they are ignorant (Fritzley & Lee, 2003). Iranian children in this study did not appear to be unwilling communicators; rather they suggested a sense of cooperation by answering almost all questions. Future researchers should conduct comparative and cross-cultural studies to examine probable social and cultural influences on children's responses. Also, studies can be designed to compare children's response willingness to yes–no and other types of questions like wh- and forced-choice questions.

This study has important implications for conducting developmental studies and forensic interviews. Developmental researchers and forensic investigators are strongly encouraged to avoid yes–no questions because of concern that children's responses to these questions may not be accurate.

However, empirical studies show that in spite of such recommended avoidance, interviewers do often ask yes–no questions (Stolzenberg & Lyon, 2014), not only because they are more understandable than other question types for young children (Brown & Lamb, 2015; Choi, 1991; Perry & Wrightsman, 1991) but also because preschoolers often provide little pertinent information in response to wh- or other types of questions (Cederborg, La Rooy, & Lamb, 2008; Hershkowitz et al., 2012). However, this study suggests that although children may appear cooperative when asked yes–no questions, resorting to this type of question for eliciting information may result in ineffective and distorted data, particularly when used with younger children. Therefore, this study supports recommendations of avoiding yes–no questions in forensic investigations.

Children's compliance tendency, additionally, confirms that children as young as 2 years old can perceive subtle syntactic changes in the structure of yes–no questions. Younger children's sensitivity to syntactic changes in the structure of questions should be investigated in further research.

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APPENDIX

Objects used and questions asked in the study

Objects	Questions	Objects	Questions
Red apple	Is it eatable? Is it not yellow? Is it a toy? Is it not a fruit?	Pen	Is it for writing? Is it not made of wood? Is it used in kitchen? Is not it light?
Glass	Is it for drinking water? Is it not for eating food? Is it for painting? Is it not for drinking milk?	Spoon	Is it for eating? Is it not for playing? Is it for using computer? Is it not for cooking?
Green comb	Is it for brushing hair? Is it not for cleaning shoes? Is it green? Is it not for writing?	Ball	Is it round? Is it not white? Is it for cars? Is it not for reading?
Key	Is it for opening doors? Is it not for calling? Is it for eating food? Is it not for locking doors?	Toothbrush	Is it for brushing teeth? Is it not for watching TV? Is it for wearing shoes? Is it not made of plastic?