Children's recency tendency: A cross-linguistic study of Persian, Kurdish and English

Mehdi B. Mehrani
University of Neyshabur, Iran

Carole Peterson
Memorial University of Newfoundland, Canada

Abstract

In the present cross-linguistic study two experiments were conducted to investigate the effects of age and linguistic background on response tendencies of preschoolers toward forced-choice questions. A total of 163 2- to 5-year-old children, including 63 Persian speakers, 57 Kurdish speakers and 43 English speakers, were asked a set of forced-choice, two option questions about familiar and unfamiliar objects. The results showed that, regardless of their linguistic background, children displayed a recency tendency in response to forced-choice questions. In addition, younger children exhibited a stronger tendency and this tendency was more pronounced when children were asked questions about unfamiliar objects. The findings suggest that recency tendency is a universal phenomenon. However, it grows weaker as children's age increases. The mechanism of a recency tendency along with implications of the use of forced-choice questions with children is discussed.

Keywords

Forced-choice questions, interviewing, response bias, recency tendency, young children

For many years, researchers have examined the suggestibility of children's responses to various questions. But developmental studies have recently witnessed increasing interest about the credibility of children's responses. In fact, during the last three decades, more

Corresponding author:
Mehdi B. Mehrani, English Department, University of Neyshabur, Adib Blvd, Neyshabur 9319774400, Iran.
Email: mehrani@neyshabur.ac.ir

research has been conducted on the reliability of children's responses than in all of the prior decades combined (Krähenbühl & Blades, 2006). This resurgent wave of interest in research has been motivated by various practical concerns in different fields of studies. For example, psycho-legal scholars have been investigating children's testimony and their responses to interview questions because the results of these studies often have important implications for how police interviews are conducted and how legal cases are decided (Lyon, 2000; Reyna, Holliday, & Marche, 2002). In medical science, these studies can provide insightful findings for measuring the intensity and other features of pain (Chambers & Johnston, 2002; Peterson & Biggs, 1997; von Baeyer, Forsyth, Stanford, Watson, & Chambers, 2009). The contributions of studies dealing with the reliability of children's responses are also applicable to education, applied linguistics, language testing and informal information gathering (Fritzley, Lindsay, & Lee, 2013; Mehrani & Peterson, 2015).

In response to these practical demands across different disciplines, various strands of inquiry on issues related to children's responses have emerged (Ceci & Bruck, 1993; Newcombe & Dour, 2001). Some researchers, for instance, have investigated the potential causal mechanisms of children's suggestibility such as memory, concept formation, reasoning and linguistic competence (Holliday, Reyna, & Hayes, 2002; McCormack, Brown, Smith, & Brock, 2004; Quas, Goodman, Bidrose, Pipe, & Craw, 1999; Reyna et al., 2002; Sheffield, 2004). Others have explored developmental and individual factors that enable children to provide more accurate and reliable responses (e.g. Ackil & Zaragoza, 1995; Akehurst, Milne, & Kohnken, 2003; Bruck & Ceci, 1999; Bruck, Ceci, & Melnyk, 1997; Cassel & Bjorklund, 1995; Connolly & Lindsay, 2001; Davison & Thomas, 2001; Doherty-Sneddon & McAuley, 2002; Emmett, Clifford, & Gwyer, 2003; Quas & Schaaf, 2002).

A further line of research has focused on the effect of question format and the syntactic properties of questions on the accuracy of children's responses (e.g. Mehrani, 2011; Okanda, Somogyi, & Itakura, 2012; Peterson, Dowden, & Tobin, 1999). There is now a growing body of research that has focused on children's responses to various types of questions such as yes-no and forced-choice questions. For example, Howie, Sheehan, Mojarrad, and Wrzesinska (2004) compared young children's responses to yes-no, open-ended and forced-choice questions. They found that 4- to 5-year-old children were vulnerable to forced-choice questions, whereas 7- to 8-year-olds were vulnerable to misleading yes-no questions rather than simply forced-choice questions. In a different study, Howie and colleagues (Howie, Kurukulasuriya, Nash, & Marsh, 2009) controlled for the content of questions and reported that only 4-year-old children showed evidence of sensitivity to question format. Brown et al. (2013) also compared the accuracy of 5- to 7-year-old children's responses to open-ended and directive prompts (including yes-no and forced-choice questions) and found that open-ended prompts elicited more detailed responses than more focused directive prompts without reducing accuracy.

Overall, these comparative studies suggest that preschoolers are more likely to provide impoverished and even false answers to questions that restrict the scope of their responses. Such questions are referred to as 'leading questions' in the literature. Goodman and Schaaf (1997) define a leading question as a question that provides information that is not already mentioned. Endres (1997) maintains that a question can be defined as

leading or suggestive to the extent that it includes information about the desired or expected answer. On this basis, forced-choice questions can be considered to be highly leading, since the respondent is asked to select between the options already embedded in such questions.

When interviewing children, a common problem is that young children do not often provide much information during free recall or after general open-ended prompts (see Pipe, Thierry, & Lamb, 2006; Powell, Fisher, & Wright, 2005, for reviews). To elicit further information, interviewers often resort to other types of questions that have restricted response options and have the potential to lead or mislead the child (Larsson & Lamb, 2009; Peterson & Biggs, 1997; Peterson & Grant, 2001). Researchers have reported that forced-choice questions are frequently used in various situations, including forensic contexts (Lamb et al., 2003), in spite of recommendations to avoid such questions (Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007). For example, Davies, Tarrant, and Flin (2000) found that in interviews conducted by police officers in the UK with suspected child victims of sexual abuse, almost half of the questions were either yes-no or forced-choice questions. Similarly, Lamb et al. (2003) found that only 2% of the questions by specially trained Israeli youth investigators, when interviewing 5- to 11-year-old alleged victims of sexual abuse, were open-ended. Likewise, court records document overwhelming use of closed-ended questions by attorneys in the courtroom (Ceci & Bruck, 1993). Therefore, because of the ubiquitous use and considerable importance of forced-choice questions, the implications of asking such questions need to be understood.

Inspection of the literature, however, shows that systematic studies on children's responses to forced-choice questions are rare. As Peterson et al. (1999) assert, 'Unfortunately, much and perhaps even most research on suggestibility uses almost nothing but yes-no format questions' (p. 541). In addition, of the limited number of studies which have specifically focused on forced-choice questions the majority have been conducted on English-speaking children and have found inconsistent results. For example, Peterson and Grant (2001) examined 32 English-speaking preschoolers' (3- and 4-year-olds) responses to forced-choice two-option questions about their participation in a choreographed scenario. They found that children did not exhibit any response biases for forced-choice questions, choosing the two given options equivalently often. Rocha, Marche, and Briere (2013) compared 4- to 12-year-old Canadian children's responses to different types of forced-choice questions about a dental visit. The forced-choice questions could have as the correct answer option 1, option 2, or neither stated option. The results showed that children at all ages were most inaccurate as well as most suggestible when they were given a two-option question where neither option was correct. In addition, although the authors did not specifically mention a recency bias in children's responses, their data are consistent with the existence of such a bias toward choosing option 2 in two-option questions in their youngest age group of 4- to 6-year-olds, although not with older children. Similarly, Fritzley, Lindsay, and Lee (2009) investigated whether 2- to 5-year-old English-speaking children display any response bias when they are asked dual-option forced-choice questions concerning familiar and unfamiliar objects. They found that children of all ages showed a recency tendency when answering two-option, forced-choice questions. There were no significant age differences found with

respect to response choice, as children on the whole tended to display a strong recency bias. Children's recency tendency was stronger when objects were unfamiliar and when questions were not understandable.

The above studies were conducted on English-speaking children. To our knowledge, there is only one study that has looked at forced-choice questions in non-English-speaking children. Recently, in the Iranian context Mehrani and Peterson (2015) conducted two experiments to investigate whether forced-choice questions would lead to any particular tendency in 3- to 5-year-old Persian-speaking children's responses. In both experiments, children were shown a short animation and then were asked a set of forced-choice questions about the content of the animation. For some of the questions the correct answer was the first option and for others the correct answer was the second option. The results showed that children displayed a consistent 'recency tendency'. That is, they tended to choose the second option in forced-choice questions and that this tendency grew weaker as children aged. However, Mehrani and Peterson (2015) speculate that children's recency tendency might be a language-specific phenomenon. They particularly suggest that the intonation patterns of forced-choice questions in different languages may variously influence children's responses. For this reason, they recommend that comparative studies be conducted in different languages and cultures.

In sum, as the above review shows, the literature concerning children's response tendencies to forced-choice questions is mixed: some researchers have found a strong recency tendency for preschoolers (e.g. Fritzley et al., 2009; Mehrani & Peterson, 2015), while others have failed to find any particular tendency (e.g. Peterson & Grant, 2001). In addition, some researchers focusing on age as a determining factor have found a small recency bias for younger children and no bias for older children (e.g. Rocha et al., 2013). Thus, it is unclear what conditions are and are not differential in children's responses to forced-choice questions. The issue is further complicated because most research has been conducted in North America (Fritzley et al., 2009; Peterson & Grant, 2001; Rocha et al., 2013) and with native English-speaking children (the exception is Mehrani & Peterson, 2015, who studied Persian speakers). And yet the conclusions of this body of research are assumed to apply universally, regardless of the language spoken by the children. Therefore, cross-linguistic explorations are needed in order to verify the results of previous studies and to provide better insights into this area.

In the present study, two cross-linguistic experiments were conducted to explore possible response bias in children's responses to forced-choice questions. It does this by expanding on Mehrani and Peterson's study (2015) by including additional features and goals. While Mehrani and Peterson (2015) showed 3- to 5-year-old children a video clip and asked simple forced-choice questions about its content, the present study focuses on 2- to 5-year-old children's responses to questions about objects, and importantly, differentiates familiar and unfamiliar objects, since Fritzley et al. (2009) found that object familiarity is an important variable. In addition, the participants in Mehrani and Peterson's study (2015) were limited to monolingual Persian speakers, while the present study is extended to include three groups of children with various languages, namely English, Persian and Kurdish. Our choice of these languages was mainly motivated by their different grammatical structures and intonation patterns for expressing forced-choice questions. These differences are discussed below.

Table 1. Syntactic differences across Kurdish, Persian and English in forced-choice questions.

Kurdish	Persian	English
subject + complement 1 + verb + or + complement 2	subject + complement 1 + verb + or + complement 2 + verb	verb + subject + complement 1 + or + complement 2
Am + sour + a + ya + sowz?	In + ghermez + hast + ya + sabz + hast?	Is this red or green?
This red is or green?	This red is or green is?	Is this red or green?

Persian, locally known as Farsi, is spoken by approximately 110 million people in Iran, Afghanistan and Tajikistan. Persian belongs to the Indo-European language family and it shares genetic features of Old Persian. Some of such features include 'subject + object + verb' word order for declarative sentences, agglutinative verb morphology, phonemic tone and lack of grammatical gender. Kurdish refers to a continuum of dialect groups spoken by about 30 million Kurds in Iran, Iraq, Turkey and Syria. Kurdish was derived from the Iranian branch of the Indo-European family about 2000 years ago. It is traditionally written in a modified Arabic script, though Latin script is increasingly used. The majority of Kurdish dialects are known to have 'subject + object + verb' as the predominant constituent order. Apparently, due to longstanding and intense historical contacts, a considerable number of words in Kurdish are of Persian, Turkish and Arabic origins. However, Kurdish has its own unique grammar which makes it different from the neighboring languages. Especially relevant to the present study, while in Kurdish a 'subject + complement 1 + verb + or + complement 2' word order is normally used for forced-choice questions, in Persian such questions are formulated through a 'subject + complement 1 + verb + or + complement 2 + verb' word order. In English, on the other hand, a typical structure for forced-choice questions is 'verb + subject + complement 1 + or + complement 2'. Table 1 illustrates these syntactic differences.

In addition to these syntactic differences there are also some phonological differences across English, Persian and Kurdish. For instance, in English, normally a rising intonation is used in the first part of forced-choice questions, and a falling intonation is used for the second part. For example, 'Would you like ↗ tea or ↘ coffee?' In Persian and Kurdish however, a rising intonation is often associated with both parts of forced-choice questions, 'Would you like ↗ tea or ↗ coffee?' Therefore, while the specific intonation pattern of forced-choice questions in English may make the first option a more prominent choice, in Persian and Kurdish, both parts often receive the same level of emphasis (Mehrani & Peterson, 2015).

Experiment 1

In the first experiment, three research questions were examined: (1) Do young children show any tendency toward either of the stated options in forced-choice questions when asked forced-choice two-option questions concerning familiar objects? (2) Does children's linguistic background have any effect on their responses to forced-choice questions? (3) Does children's age have any effect on their responses to forced-choice

questions? Due to the inconsistencies in the literature, we could not easily predict the exact direction of children's response tendencies. Given that most of the previous studies were only conducted on English-speaking children, we were also hesitant to predict the effect of children's linguistic background on their responses to forced-choice questions. However, based on Rocha et al.'s study (2013) and the existing studies on other types of questions, it was hypothesized that such a tendency, if it exists, would grow weaker as children's age increases.

Method

Participants. Three groups of participants ($N = 82$) with different linguistic backgrounds participated in this experiment. There were 29 Iranian Persian speakers in two age groups including 15 younger children (8 females and 7 males, age range = 27–44 months, $M = 37.6$ months, $SD = 2.7$) and 14 older children (6 females and 8 males, age range = 48–70 months, $M = 59.2$ months, $SD = 3.2$). These children were monolingual speakers of Persian and they were recruited from two kindergartens in Neyshabur and Mashhad, Iran. Children's demographic information was gathered through reports provided by kindergarten administrators; consequently there were some missing data concerning parent education. However, the kindergartens were located in the downtown areas and included preschoolers from neighborhoods where mostly middle-class, working families lived. Thus, participants came from similar socio-economic backgrounds, minimizing possible social and cultural variations. There were also 31 Kurdish speakers who were divided into a younger group of 15 children (9 females and 6 males, age range = 25–44 months, $M = 35.3$ months, $SD = 2.3$) and an older group of 16 children (7 females and 9 males, age range = 50–71 months, $M = 61.5$ months, $SD = 1.9$). The participants were recruited from two child care centers in Sanandaj, Iran. Since there were a few bilingual children in these child care centers, the researchers sent a demographic survey to each parent and asked about children's linguistic background. All parents identified their children as monolingual speakers of Kurdish. There were four additional children who were identified as bilingual by parents, and were excluded. The third group of participants included 22 English speakers in two age groups: 12 younger children (7 females and 5 males, age range = 26–43 months, $M = 36.1$ months, $SD = 3.5$) and 10 older children (5 females and 5 males, age range = 48–66 months, $M = 56.7$ months, $SD = 2.4$). These children were recruited from a child care center in a southeastern university in Canada. Canadian children's demographic information was gathered through teacher reports, and in the portion of the sample ($N = 9$) for which parental education information was provided, nearly every parent achieved at least a college degree. Inspection of children's age showed that there is no significant difference among younger children in the three language groups, $F (2, 39) = .70$, $p = .501$. Similarly, the older children in the language groups were not significantly different, $F (2, 37) = 1.85$, $p = .170$.

Procedure and materials. To investigate children's response tendency, first a pilot study was conducted to select a few household objects which were familiar to children in all contexts and age groups. Attempts were made to select objects that were easily pronounced in both Persian and Kurdish as well as in English. We were also mindful of

Table 2. Questions asked in Experiment 1.

Objects	Questions
Pen	Is it for writing or for reading?
	Is it made of wood or plastic?
Ball	Is it round or square?
	Is it green or white?
Toothbrush	Is it for brushing teeth or for brushing hair?
	Is it used with shampoo or with toothpaste?
Spoon	Is it for eating or for drinking?
	Is it used in the bathroom or in the kitchen?

choosing objects that were frequently used in all contexts. The final four familiar objects included a pen, a toothbrush, a ball and a spoon. To ensure that each object was truly familiar for children, prior to the main study, 11 children (3 English speakers, 3 Kurdish speakers and 5 Persian speakers) aged from 2 to 5 years were presented with the objects and asked questions concerning the name, properties and functions of each object. Children in all contexts knew the properties and functions of the objects, as expected.

It should be mentioned that the choice of objects as the focus of this study was mainly motivated by the literature that suggests children are more likely to provide more accurate responses to questions concerning tangible objects (e.g. Fritzley & Lee, 2003; Mehrani, 2011; Okanda & Itakura, 2010). The literature on language development also suggests that preschoolers often show interest in talking about names and properties of concrete objects (e.g. Nelson, 1973). In addition, designing interview questions based on a few household objects allowed us to reduce the potential socio-cultural load of our questions and collect cross-linguistically comparable data.

We then followed the procedures used by Mehrani (2011) and Mehrani and Peterson (2015) to design a forced-choice question task about the functions and properties of the objects. The test included two questions about each of the items. Only simple and easily understandable words were used in designing the task. The correct answer to half of the items was the first option stated in the question stem, and for the other half, the correct answer was the second option. The questions in English are found in Table 2.

To collect data in the other linguistic contexts, the test was translated into Persian and Kurdish by two bilingual experts in applied linguistics, and several other linguists were then asked to review and revise the tests. In order to detect any ambiguity in the items, the resulting versions were used in a small-scale pilot study on seven Persian and Kurdish preschoolers. Having ensured the precision and clarity of the items, the final versions of the translated tests were used to collect data from Persian and Kurdish children.

To counterbalance the order of the presentation of first and second option questions, two versions of the tasks were developed. Children in each context were randomly assigned to one of two groups for questioning. The first group received the task which started with a first option question being correct followed by a correct second option question, followed by a correct first option question, and so on. The second group

received the same task in the opposite direction: for the first question the second option was correct, followed by a correct first option question, and so on.

Written consent forms from the child care centers' administrators and children's parents were obtained before beginning data collection. In each context, a research assistant who was a native of that context and did not know the purpose of the research was first asked to spend a few days in the children's care centers for a rapport-building introduction. Then, the assistants individually invited children into a separate room in the child care centers and explained the task process. In particular, children were instructed that 'I don't know' responses were acceptable. Children were then tested and their responses were written on a score sheet immediately after each question.

Results

To examine whether children had a particular response tendency, a response tendency score was calculated for each child. To do so, a primacy score and a recency score were first obtained. The primacy score was obtained by assigning a +1 to any correct answer to first option questions and the recency score was obtained by assigning a +1 to any correct answer to second option questions. 'I don't know responses' and 'unanswered questions' received scores of zero. The primacy score was then subtracted from the recency score, resulting in a maximum response tendency score of +4 and a minimum score of –4. Within this formulation, the response tendency score for a child with no response bias should be zero. A positive response tendency score suggests a recency tendency, whereas a negative response tendency score suggests a primacy tendency.

First, the frequencies of 'I don't know' responses and 'unanswered questions' were investigated. As shown in Table 3, children in all contexts and 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 13 times in all linguistic contexts that 'I don't know' responses were observed (across a total of 656 questions), and only 14 times 'no answer' responses were observed in all conditions. As Table 4 shows, the mean of children's response tendency scores in both age groups and across all language contexts was positive, indicating that children did display a tendency toward choosing the second option stated in the questions. The data also showed that the mean scores across all language conditions increasingly approached zero (i.e. no response bias) as children developed.

To investigate the effects of age and language on children's responses to forced-choice questions, a 2 (age: younger and older children) × 3 (language: Persian, Kurdish, English) analysis of variance (ANOVA) was performed on children's response scores. Results showed a significant main effect for age, $F(1, 76) = 12.25$, $p < .001$, partial $\eta^2 = .139$. As age increased, children's response tendency scores decreased. However, the main effect of language, $F(2, 76) = .88$, $p = .42$, partial $\eta^2 = .023$, and the language × age interaction, $F(2, 76) = 1.06$, $p = .35$, partial $\eta^2 = .027$, were not significant. To further examine the effect of age as well as to ascertain whether a recency tendency was present, one-sample t-tests were conducted to compare the mean response tendency score of each age group to a score of zero (i.e. no response bias). Younger children's mean response tendency scores were significantly above zero, $t(40) = 6.67$, $p < .001$. Thus, they displayed a significant recency tendency. Although older children's mean scores were lower than those

Table 3. Summary of 'I don't know' and 'no answer' responses for each age group in each condition.

Condition			Persian		Kurdish		English	
			Younger	Older	Younger	Older	Younger	Older
Experiment 1	Familiar	I don't know	2	3	1	3	4	0
		No answer	3	1	2	4	2	2
Experiment 2	Familiar	I don't know	0	2	2	0	2	3
		No answer	4	2	3	5	1	3
	Unfamiliar	I don't know	2	4	1	3	12	17
		No answer	3	3	13	19	0	3

Table 4. Children's response tendency scores as a function of language and age in Experiment 1.

Language	Age	N	M	SD
Persian	Younger	15	1.47	.91
	Older	14	.36	.63
Kurdish	Younger	15	.87	1.24
	Older	16	.38	.61
English	Younger	12	.92	.99
	Older	10	.40	.84

of younger children, they were also significantly above zero, t (39) = 3.55, p = .002, indicating a recency tendency.

In this experiment, the analysis of the results confirmed that children show a 'recency tendency' in response to forced-choice questions. That is, children tend to choose the last option stated in forced-choice questions. The findings suggest that a recency tendency is not restricted to a particular language community, but it occurs regardless of language. In addition, the findings revealed that age had a significant effect on children's responses to two-option forced-choice questions: recency tendencies were more pronounced in younger children' responses than in older children's responses.

Experiment 2

Experiment 2 was conducted with two main purposes. First, we investigated whether the observed recency tendency in the children's responses could be replicated. Thus, employing a split ballot technique, we modified the procedure used in Experiment 1 and asked children the same questions in the opposite direction. For instance, the question *Is it round or square?* was asked as *Is it square or round?* While in response to the former question children needed to select the first option (round) in order to correctly answer this question, in the latter case they were required to choose the second option. This modification was applied to all eight questions concerning the familiar objects. The purpose of this procedural modification was to ensure that children's response accuracy was

attributed to question format. Based on the findings of Experiment 1, we predicted that there would be a significant effect of word order and younger children, regardless of their linguistic background, would display a stronger recency tendency than older children.

Second, we further modified the procedure used in Experiment 1 and added eight more questions to the task items so that a proportion of the task items included questions concerning objects that were unfamiliar to children. The purpose of this modification was to simulate an interviewing situation in which interviewers ask questions that are beyond child knowledge. Based on the existing literature, albeit inconsistent, we hypothesized that there would be a significant familiarity effect: children would display a stronger recency tendency when the questions concerned unfamiliar objects than when the questions were about familiar objects. If the children were displaying a recency tendency toward questions about unfamiliar objects, it seems reasonable to suggest that their recency tendency would be even more pronounced when they could not understand the question. Alternatively, because of the lack of knowledge about the unfamiliar objects, it may be possible that the children would resort to 'I don't know' and 'no answer' responses.

The four unfamiliar items for which the eight questions were designed were selected based on the existing studies conducted on young children in various contexts including North America (e.g. Fritzley & Lee, 2003), Japan (e.g. Okanda & Itakura, 2010) and Iran (e.g. Mehrani, 2011) and included a pipe holder, a central processing unit (CPU), an antenna connector and an electricity convertor. However, to ensure that children do not know the objects, a pilot study was conducted with children in all contexts. Therefore, 15 children (4 English speakers, 6 Kurdish speakers and 5 Persian speakers) aged from 29 to 63 months were presented with the objects and asked questions concerning the name, properties and functions of each object. But, as expected, they could not name or describe the functions of unfamiliar objects.

Method

Participants. In this experiment there were also three groups of Persian-, Kurdish- and English-speaking children ($N = 81$). The Persian speakers included 34 children in two age groups, including 18 younger children (10 females and 8 males, age range = 25–46 months, $M = 36.2$ months, $SD = 2.3$) and 16 older children (7 females and 9 males, age range = 49–71 months, $M = 57.8$ months, $SD = 2.6$). These children were native speakers of Persian and they were recruited from a kindergarten in Neyshabur, Iran. There were also 26 monolingual speakers of Kurdish including 12 younger children (6 females and 6 males, age range = 26–47 months, $M = 36.9$ months, $SD = 1.7$) and 14 older children (7 females and 7 males, age range = 51–69 months, $M = 58.5$ months, $SD = 2.6$). The participants were recruited from a child care center in Sanandaj, Iran. A total of 21 English speakers in two age groups: 12 younger children (5 females and 7 males, age range = 27–45 months, $M = 38.6$ months, $SD = 2.9$) and 9 older children (4 females and 5 males, age range = 49–68 months, $M = 53.9$ months, $SD = 1.8$) also participated in this experiment. English participants were recruited from a child care center in Canada. Like the participants of Experiment 1, all children in this experiment were from families with middle socio-economic backgrounds. Preliminary analysis showed that in different language groups both younger children, $F (2, 39) = .753, p = .478$, and older children, $F (2, 36) = 1.38, p = .263$, were similar in terms of age.

Table 5. Questions asked in Experiment 2.

Objects	Questions
Pen	Is it for reading or for writing?
	Is it made of plastic or wood?
Pipe holder	Is it used in buildings or in vehicles?
	Is it used for opening windows or for holding pipes?
Ball	Is it square or round?
	Is it white or green?
CPU	Is it used in computers or in televisions?
	Is it for playing or for printing?
Toothbrush	Is it for brushing hair or for brushing teeth?
	Is it used with toothpaste or with shampoo?
Antenna connector	Is it used for connecting wires or for connecting pipes?
	Is it used for televisions or for telephones?
Spoon	Is it for drinking or for eating?
	Is it used in the kitchen or in the bathroom?
Electricity convertor	Is it full of wire or empty?
	Is it used for motor bikes or for coffeemakers?

Materials and procedure. The procedure used in this experiment was similar to that used in Experiment 1, except for the modifications made on the response tendency task. That is, the arrangement of the options in questions concerning familiar questions was reversed, so that if the correct answer was the first option in Experiment 1, it was the second option in this experiment. In addition, eight questions about four unfamiliar items were added to the task used in Experiment 2, so that it included eight questions about four familiar objects and eight questions about four unfamiliar objects (see Table 5).

Results

Following the procedure employed in Experiment 1, two response tendency scores were calculated for each child. The first response tendency score was obtained for children's responses to questions concerning familiar questions, and the second score was obtained for children's responses to questions about unfamiliar objects. In calculating the scores, 'I don't know responses' and 'unanswered questions' received no scores. Within this framework, positive response tendency scores suggest a recency tendency, and negative scores suggest a primacy tendency. The response tendency scores for children with no response tendency should be zero. Table 6 presents the response tendency scores for the second experiment.

Preliminary analyses included tallying the frequency of 'I don't know' responses and 'unanswered questions'. Based on the findings of the first experiment, we did not expect a high frequency of 'I don't know' responses to questions concerning the familiar objects, although such responses were expected to be higher with the unfamiliar objects. As shown in Table 3, children in the familiar condition seldom responded 'I don't know' ($N = 9$). The frequency of 'unanswered questions' was also very low ($N = 18$). However,

Table 6. Children's response tendency scores as a function of language, age and familiarity in Experiment 2.

Language	Age	N	Condition	M	SD
Persian	Younger	18	Familiar	1.28	1.07
			Unfamiliar	2.17	1.79
	Older	16	Familiar	.31	.60
			Unfamiliar	1.19	1.27
Kurdish	Younger	12	Familiar	1.00	1.20
			Unfamiliar	2.83	1.26
	Older	14	Familiar	.43	.64
			Unfamiliar	1.64	1.15
English	Younger	12	Familiar	.92	.99
			Unfamiliar	2.17	1.74
	Older	9	Familiar	.33	.86
			Unfamiliar	1.67	1.00

in the unfamiliar condition a total of 39 'I don't know' responses were observed, of which 29 were given by English-speaking children. In addition, we observed 41 'no answer' responses, of which 32 belonged to Kurdish children.

A 2 (age: younger children, older children) × 3 (language: Persian, Kurdish, English) × 2 (familiarity: familiar objects, unfamiliar objects) ANOVA was conducted on children's scores, with familiarity as the repeated measure. Results showed a significant main effect for age, $F(1, 75) = 13.54$, $p < .001$, partial $\eta^2 = .153$. As children got older, their recency tendency decreased. We also found a significant main effect for familiarity, $F(1, 75) = 52.94$, $p < .001$, partial $\eta^2 = .414$. Children's recency tendency was more pronounced in response to questions concerning unfamiliar objects. However, the main effect of language, $F(2, 75) = .51$, $p = .60$, partial $\eta^2 = .013$, the language × familiarity interaction, $F(2, 75) = 1.43$, $p = .25$, partial $\eta^2 = .037$, the language × age interaction, $F(2, 75) = .34$, $p = .71$, partial $\eta^2 = .009$, and the familiarity × age interaction, $F(1, 75) = .29$, $p = .59$, partial $\eta^2 = .004$, were not significant. To further examine the effect of age and familiarity as well as to ascertain whether a recency tendency was present, one-sample t-tests were conducted to compare the mean response tendency score of each age group to a score of zero within each condition. Younger children displayed a significant recency tendency in both familiar, $t(41) = 6.59$, $p < .001$, and unfamiliar conditions, $t(41) = 9.34$, $p < .001$. Similarly, older children displayed a significant recency tendency for familiar and unfamiliar items, $t(38) = 3.35$, $p < .001$ and $t(38) = 7.83$, $p = .002$, respectively.

Overall, the findings of this experiment showed that regardless of their linguistic backgrounds, young children tended to demonstrate a recency tendency when they were asked forced-choice questions. As in Experiment 1, the results in this experiment revealed that younger children exhibited a stronger tendency toward the second options embedded in questions and showed further that this tendency is more pronounced when children are asked questions about unfamiliar objects. In addition, the findings confirmed that children's recency tendency grew weaker as children aged.

General discussion

The present study investigated whether younger and older preschoolers exhibit a recency tendency to forced-choice questions about familiar and unfamiliar objects, and whether children's responses are influenced by their linguistic background. It is important to note that this research was the first cross-linguistic study, to our knowledge, that investigated children's response tendencies to forced-choice questions. In Experiment 1, children were only prompted with questions concerning familiar objects to which younger children exhibited a strong recency tendency and older children displayed a more moderate recency tendency. The findings also indicated that children's linguistic background does not seem to have any significant effect on the way they respond to forced-choice questions. In Experiment 2, the majority of the findings replicated those from the first, and for the most part the three specific hypotheses were confirmed. In Experiment 2 we also investigated the effect of children's knowledge on their responses, which was found to influence their response tendency.

Let us first address the age-related differences found in this study. Younger preschoolers exhibited a strong recency tendency to familiar questions, whereas older children were, for the most part, able to answer these questions correctly and they showed only a moderate recency tendency. These findings are consistent with those of Mehrani and Peterson (2015), who, when looking at 3- to 5-year-olds' responses to forced-choice questions, found the strongest recency tendency in 3-year-olds' responses and the weakest in 5-year-olds'. Fritzley et al. (2009) also found the strongest recency tendency among 2-year-olds, followed by the 3-year-olds. The smaller response bias found by Rocha et al. (2013) may be because their youngest age group included children between 4 and 6 years of age (mean age = 5.8 years). Peterson and Grant (2001), whose study participants only included 3- to 4-year-olds, were the only ones who did not report an age effect. Overall, these findings lend support to the previously reported hypothesis that 2- to 3-year-old children are at a developmental transition stage when it comes to response tendencies (Fritzley & Lee, 2003; Steffensen, 1978). Although this conclusion is originally based on studies dealing with children's accuracy of response to yes-no questions, the results of this study, along with the findings reported in the literature (e.g. Fritzley & Lee, 2003; Fritzley et al., 2013), suggest that 2- to 3-year-old children undergo a developmental transition in response to forced-choice questions as well.

The age differences may be attributed to younger children's lack of full communicative competence. From a psycholinguistic perspective, to comprehend and reply to a question one needs first to attend to various components of language – sound system, syntax, semantics and pragmatics – to be able to decode a question from its linguistic form; subsequently, situational factors need to be taken into account to decide what is meant by the message. Next, addressees have to draw on their broader knowledge base to find the suitable response to the question. Finally, a response is delivered, encoding the message in the form of language (Mehrani, 2011). Younger children's recency tendency might be a direct result of lack of linguistic development at each of these levels. However, it may also be possible that children's responses to forced-choice questions are affected by their limited memory resources. Considerable research has demonstrated that there is developmental change in how many items a child can keep in mind over

short delays (e.g. Schneider, Knopf, & Sodian, 2009). For example, in memory span assessments the average memory span of 2-year-olds is two items whereas that of 5-year-olds is four items (Bjorklund, 2012). Although the degree to which children's memory is altered by acceptance of false information that is suggested in leading questions is still a debated issue (Goodman & Schaaf, 1997), as Mehrani and Peterson (2015) state it seems that forced-choice questions may be leading as a consequence of the memory load needed to keep multiple options in mind. Therefore, younger children's limited processing resources may make it difficult for them to hold the truth (Goodman & Schaaf, 1997), and thus they are more likely to choose the last option stated in forced-choice questions.

The findings of this study are congruent with the results of two other studies conducted in the North American context (Fritzley et al., 2009; Rocha et al., 2013) as well as with findings of Mehrani and Peterson in the Iranian context (Mehrani & Peterson, 2015) who reported children's response biases favoring the second of the options given in forced-choice questions. However, Peterson and Grant (2001) failed to find any particular tendency. These discrepancies may be related to methodological differences. Participants in this study and those in Fritzley et al.'s study (2009) were shown familiar and unfamiliar objects and were asked questions. Children in Mehrani and Peterson (2015) watched a video clip and then answered questions about it, and those in Rocha et al. (2013) were questioned about their dental experiences. These studies reported moderate to strong recency biases. None of these studies involved children's active participation in salient events. But Peterson and Grant's study (2001) differed significantly in that children in their study were individually involved in an enacted choreographed scenario and were questioned a week later. Existing studies suggest that personal involvement as well as a delay between the event and the questioning have significant impacts on children's response accuracy (Howe, 2000; Jones, Swift, & Johnson, 1988).

Mehrani and Peterson (2015) speculate that children's option choice might be influenced by the various linguistic features of children's language such as intonation patterns. However, an important finding of this study was that children with different languages similarly displayed a recency tendency. This suggests that recency tendency is not restricted to a particular linguistic community, but it seems to occur regardless of language differences. In other words, recency tendency might be a universal phenomenon. Given the importance of understanding the factors that can influence children's responses, however, we suggest that future research be conducted in a wider range of societies to examine possible social and linguistic influences.

Our second experiment provided some insight regarding whether familiarity has any effect on children's response tendencies toward forced-choice questions. Regardless of their linguistic background, both younger and older children's recency tendency was more pronounced in the unfamiliar condition. It seems plausible to assume that this finding might be because children, like adults, do not like to admit when they do not understand or know the answer to a question (Goody, 1978; Siegal, 1997); therefore, they provide an answer. But they often choose the second option because retrieving the earlier heard option requires greater effort. In other words, thanks to the development of their pragmatic competence children realize that they must verbalize in response to forced-choice questions (Steffensen, 1978), but because they do not understand the semantics of the question, they may not pay attention to the true meaning of the response that they provide.

The results that both younger and older children rarely left questions unanswered and almost never said 'I don't know' in the familiar condition is also worth noting. Children in both experiments appeared to respond to questions about the familiar objects with a veneer of certainty by providing either correct or incorrect answers. These findings are, for the most part, consistent with the current literature that suggests children often show interest in talking about objects they are familiar with. On the other hand, the frequency of 'I don't know' and 'no answer' responses to questions about the unfamiliar objects showed some cultural differences among Kurdish, Persian and Canadian children. The frequency of 'no answer' increased in 2- to 3-year-old Kurdish and Persian children's responses to unfamiliar questions. But Canadian 2- to 3-year-olds did not leave any questions unanswered. On the other hand, Canadian 4- to 5-year-old children tended to say 'I don't know', Kurdish 4- to 5-year-olds refused to answer the questions by the 'no answer' response, and Persian 4- to 5-year-old children answered almost all questions in the unfamiliar condition. Other studies have also reported similar findings. For instance, Okanda and Itakura (2010) found that in response to yes-no questions, 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 (2010) pointed out that Japanese children could have a specific response attitude to yes-no questions influenced by Japanese culture. Considering the methodological differences between the studies, it seems that familiarity with the questioning issue can influence children's response tendency, but it might play different roles in different cultures. Future research can clarify the conditions that influence children's willingness to communicate in response to binary questions.

In sum, the present set of experiments provides insight into how children respond to forced-choice questions. The study found evidence of a recency tendency in younger children's responses with various linguistic backgrounds. Such a tendency has been reported in a few other studies with English-speaking (e.g. Fritzley et al., 2009; Rocha et al., 2013) and Persian-speaking (Mehrani & Peterson, 2015) children. Consistent with some of the existing studies, although not with all, the experiments also showed that children's recency tendency weakens as age increases. In addition, the experiments showed that lack of familiarity with questioning issues has an impact on children's response biases – when asked questions about unfamiliar objects, the children tended to display a higher level of recency tendency. These findings have important methodological and practical implications. Forced-choice questions are extensively used with young children in various contexts, including forensic situations, developmental studies and educational and medical settings. As such, uncovering any biases that young children may hold toward such questions becomes of critical importance. Researchers and interviewers often have mixed feelings about asking forced-choice questions (Ceci & Bruck, 1993; Howie et al., 2009; Mehrani, 2011). On the one hand, this type of question can be used to elicit information where other types of questions may not be effective. On the other hand, there is concern that children's responses to forced-choice questions may not be accurate. The present study does not support a switch to the use of forced-choice questions when interviewing children, particularly younger children. Rather, our findings underscore the importance of avoiding such questions.

This study also has important implications about the use of forced-choice questions as a data collection method (either as questionnaire items or as interview prompts) in

developmental research. Investigations show that questioning is one of the most frequently employed methods for collecting data in developmental studies. Fritzley and Lee (2003) reported that in 74% of the developmental studies published between 1995 and 1998 in *Child Development* and *Developmental Psychology*, questioning was used as a data collection method. However, only a few studies have examined how questioning is used for investigating developmental phenomena (Fritzley & Lee, 2003). It is important that future researchers investigate various social, psychological and linguistic factors that might influence the reliability and trustworthiness of data collected through questioning.

References

Ackil, J. K., & Zaragoza, S. M. (1995). Developmental differences in eyewitness suggestibility and memory source. *Journal of Experimental Child Psychology*, *60*, 57–83.

Akehurst, L., Milne, R., & Kohnken, G. (2003). The effects of children's age and delay on recall in a cognitive or structured interview. *Psychology, Crime & Law*, *9*, 97–107.

Bjorklund, D. F. (2012). *Children's thinking: Cognitive development and individual differences* (5th ed.). Belmont, CA: Wadsworth Publishing.

Brown, D. A., Lamb, M. E., Lewis, C., Pipe, M., Orbach, Y., & Wolfman, M. (2013). The NICHD investigative interview protocol: An analogue study. *Journal of Experimental Psychology: Applied*, *19*, 367–382.

Bruck, M., & Ceci, J. S. (1999). The suggestibility of children's memory. *Annual Review of Psychology*, *50*, 419–439.

Bruck, M., Ceci, S. J., & Melnyk, L. (1997). External and internal sources of variation in the creation of false reports in children. *Learning and Individual Differences*, *9*, 289–316.

Cassel, S. W., & Bjorklund, F. D. (1995). Developmental patterns of eyewitness memory and suggestibility: An ecologically based short-term longitudinal study. *Law and Human Behavior*, *19*, 507–532.

Ceci, S. J., & Bruck, M. (1993). Suggestibility of the child witness: A historical review and synthesis. *Psychological Bulletin*, *113*, 403–439.

Chambers, C. T., & Johnston, C. (2002). Developmental differences in children's use of rating scales. *Journal of Pediatric Psychology*, *27*, 27–36.

Connolly, D., & Lindsay, D. (2001). The influence of suggestions on children's reports of a unique experience versus an instance of a repeated experience. *Applied Cognitive Psychology*, *15*, 205–223.

Davies, G., Tarrant, A., & Flin, R. (2000). The impact of questioning style on the content of investigative interviews with suspected child sexual abuse victim. *Psychology Crime and Law*, *6*, 81–97.

Davison, L. E., & Thomas, G. V. (2001). Effects of drawing on children's item recall. *Journal of Experimental Child Psychology*, *78*, 155–177.

Doherty-Sneddon, G., & McAuley, S. (2002). Influence of video-mediation on adult-child interviews: Implications for the use of the live link with child witnesses. *Applied Cognitive Psychology*, *14*, 379–392.

Emmett, D., Clifford, B. R., & Gwyer, P. (2003). An investigation of the interaction between cognitive style and context reinstatement on the memory performance of eyewitnesses. *Personality and Individual Differences*, *34*, 1495–1508.

Endres, J. (1997). The suggestibility of the child witness: The role of individual differences and their assessment. *The Journal of Credibility Assessment and Witness Psychology*, *1*(2), 44–67.

Fritzley, V. H., & Lee, K. (2003). Do young children always say yes to yes-no questions? A metadevelopmental study of the affirmation bias. *Child Development*, *74*, 1297–1313.

Fritzley, V. H., Lindsay, R. C. L., & Lee, K. (2009, April). *Is it A) primacy bias or B) recency bias? Young children's response tendencies toward dual-option multiple-choice questions. Presented at the biennial meetings of the Society for Research in Child Development*, Denver, CO.

Fritzley, V. H., Lindsay, R. C. L., & Lee, K. (2013). Young children's response tendencies toward yes-no questions concerning actions. *Child Development*, *84*, 711–725.

Goodman, G. S., & Schaaf, J. M. (1997). Over a decade of research on children's eyewitness testimony: What have we learned? Where do we go from here? *Applied Cognitive Psychology, 11*, S5–S20.

Goody, E. N. (1978). *Questions and politeness: Strategies in social interaction*. Cambridge, UK: Cambridge University Press.

Holliday, R. E., Reyna, V. F., & Hayes, B. K. (2002). Memory processes underlying misinformation effects in child witnesses. *Developmental Review*, *22*, 33–77.

Howe, M. L. (2000). *The fate of early memories: Developmental science and the retention of childhood experiences*. Washington, DC: American Psychological Association.

Howie, P., Kurukulasuriya, N., Nash, L., & Marsh, A. (2009). Inconsistencies in children's recall of witnessed events: The role of age, question format and perceived reason for question repetition. *Legal and Criminological Psychology*, *14*, 311–329.

Howie, P., Sheehan, M., Mojarrad, T., & Wrzesinska, M. (2004). 'Undesirable' and 'desirable' shifts in children's responses to repeated questions: Age differences in the effect of providing a rationale for repetition. *Applied Cognitive Psychology*, *18*, 1161–1180.

Jones, D. C., Swift, D. I., & Johnson, M. A. (1988). Nondeliberate memory for a novelty event among preschoolers. *Developmental Psychology*, *24*, 641–645.

Krähenbühl, S., & Blades, M. (2006). The effect of interviewing techniques on young children's responses to questions. *Child: Care, Health and Development*, *32*, 231–331.

Lamb, M. E., Orbach, Y., Hershkowitz, I., Esplin, P., & Horowitz, D. (2007). A structured forensic interview protocol improves the quality and informativeness of investigative interviews with children: A review of research using the NICHD Investigative Interview Protocol. *Child Abuse & Neglect*, *31*, 1201–1231. doi:10.1016/chiabu.2007.03.021

Lamb, M. E., Sternberg, K. J., Orbach, Y., Esplin, P. W., Stewart, H., & Mitchell, S. (2003). Age differences in young children's responses to open-ended invitations in the course of forensic interviews. *Journal of Consulting and Clinical Psychology*, *71*, 926–934.

Larsson, A. S., & Lamb, M. E. (2009). Making the most of information-gathering interviews with children. *Infant and Child Development*, *18*, 1–16.

Lyon, T. D. (2000). Child witnesses and the oath: Empirical evidence. *Southern California Law Review*, *73*, 1017–1074.

McCormack, T., Brown, G. D. A., Smith, M. C., & Brock, J. (2004). A timing-specific memory distortion effect in young children. *Journal of Experimental Child Psychology*, *87*, 33–56.

Mehrani, M. B. (2011). What is biased? Children's strategies or the structure of yes/no questions? *First Language*, *31*, 214–221.

Mehrani, M. B., & Peterson, C. (2015). Recency tendency: Responses to forced-choice questions. *Applied Cognitive Psychology*, *29*, 418–424.

Nelson, K. (1973). Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development, 38*(1–2), 1–135.

Newcombe, P. A., & Dour, T. M. (2001). Conversational influences on young children's responses to misleading questions. *Applied Developmental Psychology*, *22*, 363–378.

Okanda, M., & Itakura, S. (2010). When do children exhibit a 'yes' bias? *Child Development*, *81*, 568–580. doi:10.1111/j.1467-8624.2009

Okanda, M., Somogyi, E., & Itakura, S. (2012). Differences in response bias among younger and older preschoolers: Investigating Japanese and Hungarian preschoolers. *Journal of Cross-Cultural Psychology*, *43*, 1325–1338.

Peterson, C., & Biggs, M. (1997). Interviewing children about trauma: Problems with 'specific' questions. *Journal of Traumatic Stress*, *10*, 279–290.

Peterson, C., Dowden, C., & Tobin, J. (1999). Interviewing preschoolers: Comparisons of yes/no and wh- questions. *Law and Human Behavior*, *23*, 539–555.

Peterson, C., & Grant, M. (2001). Forced-choice: Are forensic interviewers asking the right questions? *Canadian Journal of Behavioural Science*, *33*, 118–127.

Pipe, M. E., Thierry, K. S., & Lamb, M. E. (2006). The development of event memory: Implications for child witness testimony. In M. P. Toglia, J. D. Read, D. F. Ross, & R. C. L. Lindsay (Eds.), *Handbook of eyewitness psychology, vol. 1: Memory for events* (pp. 447–472). Mahwah, NJ: Lawrence Erlbaum.

Powell, M. B., Fisher, R. P., & Wright, R. (2005). Investigative interviewing. In N. Brewer & K. D. Williams (Eds.), *Psychology and law: An empirical perspective* (pp. 11–42). New York, NY: Guilford Press.

Quas, J. A., Goodman, G. S., Bidrose, S., Pipe, M. E., & Craw, S. (1999). Emotion and memory: Children's long-term remembering, forgetting and suggestibility. *Journal of Experimental Child Psychology*, *72*, 235–270.

Quas, J. A., & Schaaf, J. M. (2002). Children's memories of experienced and nonexperienced events following repeated interviews. *Journal of Experimental Child Psychology*, *83*, 304–338.

Reyna, V. F., Holliday, R., & Marche, T. (2002). Explaining the development of false memories. *Developmental Review*, *22*, 436–489.

Rocha, E. M., Marche, T. A., & Briere, J. L. (2013). The effect of forced-choice questions on children's suggestibility: A comparison of multiple-choice and yes/no questions. *Canadian Journal of Behavioural Science*, *45*, 1–11.

Schneider, W., Knopf, M., & Sodian, B. (2009). Verbal memory development from early childhood to early adulthood. In W. Schneider & M. Bullock (Eds.), *Human development from early childhood to early adulthood: Findings from a 20-year longitudinal study* (pp. 63–90). New York, NY: Psychology Press.

Sheffield, E. G. (2004). But I thought it was Mickey Mouse: The effects of new postevent information on 18-month-olds' memory. *Journal of Experimental Child Psychology*, *87*, 21–238.

Siegal, M. (1997). *Knowing children: Experiments in conversation and cognition* (2nd ed.). London, England: Psychology Press.

Steffensen, M. S. (1978). Satisfying inquisitive adults: Some simple methods of answering yes/no questions. *Child Language*, *5*, 221–236.

von Baeyer, C. L., Forsyth, S. J., Stanford, E. A., Watson, M., & Chambers, C. T. (2009). Response biases in preschool children's ratings of pain in hypothetical situations. *European Journal of Pain*, *13*, 209–213.