Distinguishing Between Realistic and Fantastical Figures in Iran

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Children in the United States come to distinguish historical from fictional story figures between the ages of 3 and 5 years, guided by the plausibility of the story events surrounding the figure (Corriveau, Kim, Schwalen, & Harris, 2009; Woolley & Cox, 2007). However, U.S. children vary in their reactions to stories that include fantastical events. Secular children with no religious education think of such stories and their protagonists as fictional, whereas children who have had a religious education are more prone to think of them as historically true. In the current studies, we asked if a sample of children in Iran who are regularly exposed to religious narratives in their daily lives resemble religious children in the United States. As expected, Iranian 5- and 6-year-olds systematically categorized figures in realistic stories as real, but they were also prone to think of figures in fantastical stories as real. We suggest that children's willingness to conceive of figures in fantastical stories as real is explained by their exposure to religious narratives alleging that miracles have actually happened.

Keywords: reality, fantasy, religion, theory of mind

Children typically learn about the important historical (e.g., Abraham Lincoln) and fantastical (e.g., Snow White) figures in their culture from the testimony of other people, often in the context of stories. Previous research with U.S. children suggests that the ability to understand the real status of historical figures and the pretend status of fantastical figures develops between the ages of 3 and 5 years (Corriveau, Kim, Schwalen, & Harris, 2009; Woolley & Cox, 2007). Specifically, children use their conception of physical, mental, and biological causality when making judgments about the real-world plausibility of story events (Corriveau et al., 2009; Woolley & Van Reet, 2006). They tend to categorize a protagonist in a novel story with magical or impossible events as fictional, whereas they categorize a protagonist in a novel story with ordinary, plausible events as real.

However, recent research that included samples of nonreligious and religious children in the United States indicates that exposure to religion, through church attendance, schooling, or both, has a marked impact on children's categorization of novel figures (Corriveau, Chen, & Harris, 2015). Specifically, upon hearing a novel story that included fantastical events, children with a religious education were unsystematic in categorizing the protagonist as

real. By contrast secular children with no religious education were very systematic in categorizing the protagonist as pretend. By implication, a religious education, including the belief in a divine power that can bring about miracles unexplained by biological and physical laws—for example, parting the seas or raising the dead—can extend children's conception of what is possible in reality. As a result, religious children are more likely than nonreligious children to think of a protagonist who is involved in such miracles as a real person.

Presumably, if religious children in North America are more likely than their secular counterparts to judge figures embedded in fantastical stories as real, then children around the same age in a society where almost all children are widely and frequently exposed to religion should also be unsystematic in judging such figures as pretend, even when they are embedded in a story that includes causally impossible elements. The current study tests this hypothesis by presenting novel characters embedded in either real or fantastical stories to children in Iran, a society in which religion affects almost all aspects of people's lives, including formal education and parenting.

Before providing a brief account of the significance of religion in the upbringing and education of Iranian children, we describe our working hypothesis in more detail. We anticipated that Iranian 5–6-year-old children, like American preschoolers with a religious background, would be open to the possibility that a fictional story character, whose actions or attributes defy ordinary causal constraints, could in fact be real. We assumed that Iranian children have been exposed to events that contradict their knowledge of ordinary causal constraints through their reading of religious texts, which have been presented as accounts of historical reality. Such exposure should influence Iranian children's categorization of novel characters embedded in stories that include fantastical or impossible events. Note that we did not expect differences in the performance of Iranian children, religious American children, or secular American children when judging the status of familiar

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characters as real or fictional. Thus, we anticipated that all children should be able to recognize that various well-known story characters are only make-believe or fictional, whereas other well-known historical figures lived in the past and are real.

Since the Islamic revolution of Iran in 1979, Iran has been a theocracy; the constitution and the civil and criminal laws were replaced by the holy law of Shi'ite Islam (Yarshater, 2004). One of the main goals of the Islamic revolution was to build a society based on Islamic principles and to create a "New Islamic Person," whose most important values include a belief in God, piety, honesty, and passion for equality and justice (Mehran, 1989). In this context, the socialization of children in schools has played an important role in creating a new generation of committed Muslims (Mehran, 1989). In fact, the principles of educational reform set forth in the educational plan of the Ministry of Education clearly state that the educational system "should be based on Islamic teachings, as well as on rejection of any form of atheism and polytheism, and it should be geared to the restoration of Islamic culture and civilization."

The new curriculum after the revolution includes Quran lessons, where verses from the Quran are recited and memorized, as well as Religious Study lessons, where Quranic history and the principles of Shi'ite Islam, as well as the life, teachings, and miracles of other prophets, especially Moses and Jesus, are discussed (Mehran, 2007). All state schools have been mandated to employ these principles in their curricula. Private schools exist in large numbers throughout major cities in Iran, but they too are mandated by the state to follow the same curriculum as public schools (Mehran, 1997). The curriculum for kindergartens has also been subject to religious supervision and religious instruction after the revolution, although religious supervision has been moderated over the years (Mirhadi, 1997).

Preschool education is not officially part of Iran's educational system, and it is confined to daycare centers under the supervision of the Ministry of Health and Medical Education. Nevertheless, an emphasis on religious teaching, as well as the religious and spiritual growth of children also plays a key role in the daycare educational program (Sorkhabi, 1992). Specifically, all principals and proprietors of daycare centers are required to be Muslim,[1] and to oversee the religious development of children (Sorkhabi, 1992). The curriculum and educational program at daycare centers are not tailored to specific age groups, and all children between 2 and 6 years old are eligible to attend a daycare center (Sorkhabi, 1992). Thus, from age 2, most children are exposed to religious teachings across a variety of educational setting.

In addition to their exposure to religious teachings in educational settings, most Iranian children are also exposed to religion through interaction with their families. Because Shi'ite Islam has been the religion of a large majority in Iran, as well as the political program ever since the Islamic Revolution, the religious values communicated by the regime through school textbooks and other media are generally reinforced in informal settings by other socialization units such as the family (Shorish, 1988). In a 2005 survey, 71% of parents mentioned religious faith to be an especially important quality that children should be encouraged to develop at home; 78% indicated that religion is a very important aspect of their lives; 80% stated that they consider themselves a religious person; and 87% said that God is very important in their lives (World Values Survey, 2005). It should be noted, however,

that these numbers might not reflect the actual composition of Iranian society, due to the political and social risks involved in open and public rejection of religious faith.

Although cultural input, including a religious education and exposure to accounts of miracles, are likely to influence children's categorization of a novel story protagonist, children's understanding of the concept of representation is also likely to play an important role in such categorizations. In support of this proposal, Corriveau and Harris (2015) found that preschoolers with a better understanding of false beliefs and of false signs were more likely to take into account the realistic or fantastical nature of story events when judging the status of novel story figures as real or fictional. A plausible interpretation of this link is that during the preschool years, children come to appreciate that certain types of representation—beliefs, signs, and historical stories—all aim to provide an accurate guide to reality. Accordingly, as a further test of this proposal, children in the present study were assessed for their understanding of representation using a theory-of-mind scale originally devised by Wellman and Liu (2004) and adapted for use with Iranian children by Shahaeian, Peterson, Slaughter, and Wellman (2011). Past findings indicate that Iranian children progress toward an understanding of false belief at approximately the same rate as U.S. children. Hence, we predicted that Iranian children, like U.S. children, would categorize story characters more accurately if they obtained higher theory-of-mind (ToM) scores.

Studies with Iranian children have also shown that, in contrast to the developmental sequence observed among North American and Australian children, they perform successfully on tests of differential access to knowledge before they pass tests of diversity of belief, as measured by standard ToM tasks (Shahaeian et al., 2011; Shahaeian, Nielsen, Peterson, & Slaughter, 2014). Accordingly, we expected a link between overall ToM performance and the conceptual understanding of stories as representations, but we also scrutinized the sequence of development to compare it with the pattern widely observed among Western children.

In discussing the observed link between the categorization of novel story figures and the understanding of representation, Corriveau and Harris (2015) noted that they had not included a measure of executive function (EF). Yet EF might impact children's categorization of novel story figures in two different ways. First, conflict inhibition is significantly linked to the development of ToM abilities, such as understanding the appearance–reality distinction and understanding false beliefs in preschoolers (Carlson & Moses, 2001). Hence, it is plausible that variation in executive functioning—rather than variation in the understanding of representations—accounts for the variability in children's categorization of novel story figures. Second, in order for children to categorize a novel story character as real or pretend, they must attend to specific elements of the story context (notably the absence or presence of implausible elements) and then judge the status of the character based on those elements. There is evidence that EF abilities play an important role in such context-sensitive responses (Zelazo, Müller, Frye, & Marcovitch, 2003). Given these two considerations, we included a conflict-inhibition mea-

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[1] Non-Muslims can ask for permission to open daycare centers if: (a) they are either Jewish, Christian, or Zoroastrian and (b) the daycare center serves only children of the relevant faith.

sure to investigate the potential contribution of EF skills to children's categorization of novel story characters. We anticipated that any contribution made by EF skills might mediate ToM abilities. Alternatively, EF skills might make a contribution over and above ToM skills, particularly, if they promote children's sensitivity to story context.

To examine the impact of religious exposure on Iranian children's conception of historical and fictional figures, we conducted two studies. In Study 1, we asked Iranian, Persian-speaking children between the ages of 3 and 6 years to categorize familiar historical and fictional figures. This allowed us to assess the categorization task procedures adapted from Corriveau et al. (2009) in a different culture. Moreover, it provided us with an opportunity to evaluate children's ability to categorize familiar historical and fictional characters as real versus pretend outside of any narrative context. Prior research has shown that preschoolers from the United States typically have little difficulty with this task (Corriveau et al., 2009), and we expected the Iranian sample to also correctly identify the status of such familiar figures as real versus pretend.

In Study 2, we asked 3- to 6-year-old Iranian, Persian-speaking children to categorize novel figures, embedded in stories with either realistic or fantastical contextual clues. In light of the above discussion concerning the cognitive abilities that are likely to support such categorizations, we also measured two potential sources of individual differences. First, we assessed children's ToM performance. Second, to assess children's ability to adjust their responses to contextual cues, we administered the day-night measure of EF (Lagattuta, Sayfan, & Monsour, 2011). In Study 2, we predicted that Iranian children who are regularly exposed to religion would systematically categorize novel figures in realistic stories as real but would also be prone to categorizing novel figures involved in implausible events as real.

Study 1

Method

Participants. Twenty-six children between the ages of 3 and 6 years from a preschool/kindergarten in a middle-class neighborhood of Tehran participated. The sample size was determined based on effect sizes reported in previous research using the current paradigm (Corriveau et al., 2009, 2015; Corriveau & Harris, 2015). The experimenter was experienced in conducting research at the school, although not with the participating children. Prior to conducting research, the experimenter described the study rationale to the school principal. All parents of children in two classrooms were asked to allow their child to participate (approximately 20 children per classroom), and were provided written information about the study procedures, rationale, and background. Most parents gave permission for their children to participate. Children were divided into a younger group (3–4-year-olds, $N = 13$, $M = 45.78$ months, $SD = 3.73$ months, range = 41.5–51.2 months) and an older group (5–6-year-olds, $N = 13$, $M = 69.21$, $SD = 3.29$, range = 64.5–74.7 months).

Materials. We presented children with two folders: one for the "pretend" figures, with a picture of a lion playing a flute, and another for the "real" figures, with a picture of a child sitting in a classroom. Sixteen pictures of familiar characters (8 historical, 8

fictional) were used. The familiar, historical characters included the former king of Iran, the former queen of Iran, the leader of the Islamic revolution of Iran, two well-known poets (Sohrab Sepehri and Ahmad Shamloo), a well-known actor (Khosro Shakibaei), a popular political figure (Mossadegh), and Einstein. The familiar, fictional characters included Harry Potter, Snow White, Superman, Sponge Bob, Pinocchio, a cartoon character from a children's movie (Voroojak), and two puppets from a popular children's TV show (Babaei and Aghaye Hamsaye).

To develop the list of characters, the first author informally surveyed parents and teachers about popular characters most likely to be familiar to children. Whereas parents and teachers agreed on a set of familiar, fictional characters, the only familiar, historical characters that met with consensus were Khomeini, the leader of the Islamic revolution, and the Shah, the former king of Iran. This limitation will be reconsidered in the Discussion section.

Procedure. To introduce the task, the experimenter presented children with the two folders, and called their attention to the pictures on the folders (i.e., the fantastical aspect of a lion playing the flute and the real aspect of a child sitting in a classroom). The experimenter briefly explained the game by going over a translated script of the following excerpt from Corriveau et al. (2009):

> Sometimes, we hear stories about people that really happened. For example, you might have heard a story that really happened about your Mommy when she was a little girl. But sometimes we hear stories about people that are pretend. For example, you might hear a story about a superhero who [fought and defeated][2] a dragon. So, in this game, I have pictures of people, but they're all mixed up and I want you to help me. Some of the people are real. So, I want you to put those in the real [folder].[3] And some of the people are pretend and only exist in stories. So, I want you to put those in the pretend [folder]. Let's begin.

Children first completed two practice trials in which they categorized one familiar, fictional character (Kolah Ghermezi, a puppet character widely known to children and adults in Iran) and one familiar, real character (a popular, TV show moderator/host). Children were corrected if they categorized either character incorrectly.

Immediately following the two practice trials, the experimenter presented the 16 test pictures individually in a random order. The experimenter presented the picture and asked, "Have you ever heard of X?" If the child answered "yes", he or she was handed the picture and asked, "Do you think X is real or pretend? Which folder does he go to?" If the child answered "no," the experimenter placed that picture to the side, and the child was not asked to categorize it.

Each figure was coded for whether or not children had heard of it; if children did claim to have heard of the figure and went on to categorize it, they received a score of 1 for allotting it to the "Real" folder and 0 for the "Pretend" folder for both types of characters.

Results

We confirm both for Study 1 and Study 2 that we have reported all measures, conditions, data exclusions, and how sample size was determined.

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[2] The original English script said "killed."
[3] The original English script said "box."

Familiarity question. Overall, children claimed to have heard of more fictional characters (max = 8, $M_{younger}$ = 7.62, SD = 0.51, M_{older} = 7.15, SD = 1.07) than historical characters (max = 8, $M_{younger}$ = 4.85, SD = 3.10, M_{older} = 3.54, SD = 2.76). A two-way mixed ANOVA with Age Group as the between-subjects variable and Type of Figure as the within-subjects variable indicated a significant main effect of Type of Figure ($F(1, 24)$ = 38.0, $p < .001$, η_p^2 = 0.61). There was no main effect of Age Group ($F(1, 24)$ = 1.74, $p = .2$, η_p^2 = 0.07) and no interaction between Age Group and Type of Figure ($F(1, 24)$ = 0.67 $p = .42$, η_p^2 = 0.27).

Categorization task. Of those characters that children said they had heard of, a greater proportion of historical characters were appropriately categorized as "real" ($M_{younger}$ = 0.63, SD = 0.11, M_{older} = 0.85, SD = 0.09) than fictional characters ($M_{younger}$ = 0.30, SD = 0.05, M_{older} = 0.16, SD = 0.04). A two-way mixed ANOVA with Age Group as the between-subjects variable and Type of Character as the within-subjects variable confirmed the main effect of Type of Character ($F(1, 24)$ = 50.68, $p < .001$, η_p^2 = 0.68) as well as the interaction of Age Group $\times$ Type of Character ($F(1, 24)$ = 6.15, $p = .02$, η_p^2 = 0.20). There was no main effect of Age Group.

To examine the interaction in more detail, the simple effect of Type of Character was assessed for each age group. Both younger, $F(1, 24)$ = 10.76, $p = .003$ and older, $F(1, 24)$ = 46.08, $p < .001$ children correctly categorized a greater proportion of historical than fictional characters as real, with older children more sharply differentiating between the character types than younger children.

Analysis of the simple effect of age indicated that older children were less likely than younger children to mistakenly categorize fictional characters as real, $F(1, 24)$ = 4.37, $p = .047$, but that older and younger children appropriately categorized historical characters as real at similar rates, $F(1, 24)$ = 2.35, $p = .138$.

Comparisons to chance indicated that both the younger and older groups were systematic in rarely categorizing the fictional characters as real ($M_{Younger}$ = 0.30, $t(12)$ = −4.06, $p < .005$, 95% CI [0.19, 0.41]; M_{Older} = 0.16, $t(12)$ = −8.29, $p < .001$, 95% CI [0.08, 0.25]). Categorization of the historical characters as real was systematic in the older group (M = 0.85, $t(12)$ = 4.12, $p < .005$, 95% CI [0.66, 1.03]), but did not differ significantly from chance in the younger group (M = 0.63, $t(12)$ = 1.11, $p = .29$, 95% CI [0.38, 0.88]).

Discussion

Children in Study 1 were presented with pictures of characters potentially familiar to them, asked if they had heard of the character and if so, asked to categorize the character as "real" or "pretend". Older children performed well in the categorization task. Although they claimed to have heard of more fictional characters than historical characters, they proceeded to categorize each type of figure systematically. They allocated more historical characters than fictional characters to the real folder. Indeed, they allocated most of the historical characters to the real folder and most of the fictional characters to the pretend folder.

The performance of younger children was also quite systematic. Like older children, they claimed to have heard of more fictional characters than historical characters. Also like older children, they allocated more of the historical than fictional characters

to the real folder. However, although they appropriately allocated most of the fictional characters to the pretend folder, they were unsystematic in their allocation of the historical characters.

A plausible explanation of this last finding is that younger children often claimed to have heard of historical figures that were, in fact, unknown to them, so that they had no basis for categorizing them correctly. Two pieces of evidence support this interpretation. First, as noted in the Materials section, other than the former Shah of Iran and Khomeini, there were no historical figures that parents and teachers agreed would likely be familiar to most children in the target age range. Second, 54% of children in the younger group said that they had heard of all of the historical characters, whereas no child in the older group did so. Despite their generally unsystematic allocation of historical characters, younger children did fairly well on the two characters that adults expected them to have heard of. Thus, the majority of allocations of the Shah and Khomeini were to the real folder (67% and 73%). However, in neither case were children's categorizations better than chance.

Overall, the findings from Study 1 largely mirror those found when children from the United States were asked to categorize familiar fictional and historical characters (Corriveau & Harris, 2015; Corriveau et al., 2009). Although there is some improvement with age, children of 3 to 6 years are able to differentiate between fictional and historical characters. They typically categorize fictional characters as pretend and historical characters as real.

In Study 2, we explored children's ability to use their causal understanding to make inferences about the status of novel characters embedded in either a fantastical or realistic story context.

Study 2

Method

Participants. Eighty-one children between the ages of 3 and 6 years from different daycare centers in the city of Tehran and Karaj (a growing municipality, neighboring Tehran) participated in the study.[4] Sample size was determined based on effect sizes from previous experiments using the same paradigm (Corriveau et al., 2009, 2015; Corriveau & Harris, 2015). Prior to conducting the study, the experimenter, an Iranian and native Persian speaker, described the study rationale to the school principals. If the principal agreed, consent forms were distributed to teachers to be sent home to parents. All of the approached centers, with one exception, agreed to participate and most parents consented. Children were divided into a younger group (3–4-year-olds, N = 42, M = 50.28 months, SD = 5.29 months, range = 38.2–59.5 months) and an older group (5–6-year-olds, N = 39, M = 69.96 months, SD = 5.98 months, range = 60.1–84.0 months). Two additional 3 year olds were excluded from the analysis due to lack of concentration and failure to respond to most questions. Although information about socioeconomic status was not collected, the centers served mostly middle-class families and were located in middle-class neighborhoods.

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[4] The kindergartens in Tehran were all located in or near the city center, in urban middle-class areas of the city. The kindergarten in Karaj was located in the neighborhood of Mehr-shahr, a, growing, suburban community of middle-class families.

Materials and procedure. All children first completed a day-night EF task, then a warm-up task identical to the familiar characters categorization task in Study 1, where they were asked to categorize all 16 familiar characters from Study 1. This was followed by a novel characters categorization task, and a complete battery of six TOM tasks in a fixed order. Children completed the tasks in a separate, quiet classroom or a quiet corner within the building. Each of these tasks is described in more detail below.

Day-Night task. The Day-Night task was administered using eight laminated, identical pictures of a sun and eight identical pictures of a moon in a random order. We selected this task for two reasons. Conflict inhibition, but not delay inhibition, has been shown to strongly relate to ToM abilities and to contribute significantly to false-belief performance (Carlson & Moses, 2001; Carlson, Moses, & Breton, 2002). In the day-night task, there is conflict between the presented picture and the response asked for (Gerstadt, Hong, & Diamond, 1994). More generally, the day-night task has been widely used as a valid measure of executive functioning in early childhood, especially before the age of 8 (Diamond, Kirkham, & Amso, 2002; Lagattuta et al., 2011).

For this task, the experimenter first presented a picture of the sun/moon and said, "Here's a picture of the sun/moon; is the sun/moon out in the day or night?" "Right, the day/night!" If children answered these two questions incorrectly, corrective feedback was provided, and the questions were reasked. If children answered correctly, the experimenter said, "Okay, we're going to play an opposites game. In this game, when I show you a picture of the sun, I want you to say, NIGHT! And when I show you a picture of the moon, I want you to say, DAY! So, let's go over the rules again. When I show you the sun, you say . . . and when I show you a moon, you say. . . . OK, let's practice." The participant then completed four practice trials, each including one double string (e.g., day-night-night-day). If any errors were made, the child was corrected, reminded of the rules, and administered another four practice trials. Test trials began upon 100% correct completion of a set of four practice trials.

During testing, the experimenter held all 16 cards and presented them individually to the child. Children were not instructed to finish the task as quickly as possible. Responses were live coded for the number of errors and for the time taken to complete all 16 cards (following procedures from Lagattuta et al., 2011).

Familiar characters categorization task. To introduce children to the task, the experimenter first introduced the two folders by going over the script described in Study 1, and presented the same 16 familiar character cards from Study 1. Given that the results in Study 1 indicated that older and younger children were able to categorize familiar characters correctly, responses were coded only for the number of correct categorizations. All children, with the exception of two 3-year-olds, categorized at least three familiar characters correctly.

Novel characters categorization task. Immediately following presentation of the familiar characters, the experimenter removed all familiar character cards from the two folders and said, "Now, I'm going to tell you some stories about people you've never heard of. Some of them belong in the "real" folder and some of them belong in the "pretend" folder. I want you to listen carefully because I'm going to ask you why you chose to put them in the folder you did." The experimenter then presented children with six pictures of three novel character types (2 pictures of different children, 2 pictures of different farmers, and 2 pictures of different bakers). One of each character type was embedded in a realistic story and the other in a fictional story. An example of a realistic story associated with a picture of a farmer was: "This man is a farmer and his name is Mash Ghasem. He used to plant fruits and vegetables in a field near the city of Rasht, where he lived in a house with a small backyard in a nice village." An example of a fictional story was: "This man is a farmer and his name is Mash Mammad. He used to plant tomatoes and cucumbers. Every morning, he ate a very big apple that kept him alive forever." (See Appendix for the stories used in this task).

After hearing each story, children were invited to place the picture into one of the two folders, and to justify their decision. The order of presentation of the characters, as well as the story type assigned to each character varied across children.

Theory-of-mind battery. Immediately following the novel characters categorization task, children were presented with all six ToM tasks in Persian from Shahaeian et al. (2014), which is a slightly modified version of the test devised by Wellman and Liu (2004). The translated scripts from Shahaeian et al. (2014) were used. (See Table 1 for a brief description of ToM tasks).

Results

EF task. Children's responses to the EF Day-Night task were coded for the number of errors made and the cumulative time to complete the naming of all 16 cards. As expected, the 3–4-year-olds made, on average, more errors than the 5–6-year-olds ($M = 3.48$, $SD = 2.73$ and $M = 1.97$, $SD = 1.63$, respectively, $t(67.57) = 3.0$, $p = .004$, 95% CI [0.51, 2.49], equal variances between samples not assumed). Compared to older children, younger children also took longer, on average, to complete the task ($M = 32.14$ seconds, $SD = 6.68$ seconds for younger, and $M =$

Table 1
Percentage of Children Passing Each ToM Task by Age Group

ToM tasks passed	Description	3–4-year-olds	5–6-year-olds
No task completed		2.4	2.6
Diverse desires	Woman presented in picture has different desire from participant.	81.0	92.3
Knowledge access	Doll does not have access to knowledge while participant does.	76.2	89.7
Diverse belief	Boy presented in picture has different belief from participant.	47.6	56.4
False belief	Object is displaced in the absence of doll.	35.7	71.8
Hidden emotion	Boy presented in picture tries to hide his emotion and participant is asked how boy feels.	11.9	20.5
Sarcasm	Doll makes a sarcastic comment and participant is asked about why doll made the comment.	0	5.1

26.64 seconds, $SD = 4.53$ seconds for older children, $t(79) = 4.31$, $p < .001$, 95% CI [2.96, 8.04]).

Novel characters categorization task.   Figure 1 shows the mean proportion of times (out of 3) that younger and older children judged the novel story characters embedded in realistic and fictional stories to be real. Inspection of Figure 1 shows that younger children mostly judged both character types as real. By contrast, older children differentiated between characters in the two story types.

To check this conclusion, a two-way ANOVA of Age × Type of Character was conducted. This revealed a main effect of type of character ($F(1, 79) = 36.76$, $p < .001$, $\eta_p^2 = 0.32$) and an interaction between Age and Type of Character ($F(1, 79) = 15.65$, $p < .001$, $\eta_p^2 = 0.16$). Further analysis confirmed that the simple effect of Type of Character was not significant for younger children, $F(1, 79) = 2.30$, $p = .133$, whereas older children correctly categorized a greater proportion of the characters in realistic as opposed to fictional stories as real, $F(1, 79) = 48.41$, $p < .001$. In addition, although the simple effect of age was not significant for the categorization of characters in realistic stories, $F(1, 79) = 1.29$, $p = .26$ older children were less likely than younger children to incorrectly categorize the characters in fictional stories as real, $F(1, 79) = 11.32$, $p = .001$. In fact, 40% of the younger children categorized all of the six figures (3 realistic, 3 fictional) as real, whereas only 26% of the older children did so. Only one child (2%) in the younger group correctly categorized all three fictional characters correctly as pretend and all three realistic characters as real whereas 26% of children in the older group did so.

Comparisons to chance confirmed that children categorized characters in realistic stories as real significantly above chance both in the younger ($M = 0.79$, $t(41) = 5.51$, $p < .001$, 95% CI [0.18, 0.39]) and older group ($M = 0.86$, $t(38) = 8.32$, $p < .001$, 95% CI [0.27, 0.45]). Comparisons to chance also showed that children incorrectly categorized characters in fictional stories as real significantly above chance in the younger group ($M = 0.69$, $t(41) = 3.71$, $p < .005$, 95% CI [0.09, 0.29]) but were at chance in the older group ($M = 0.41$, $t(38) = -1.35$, $p = .18$, 95% CI [−0.22, 0.04]).

Justifications.   Children's justifications for their categorization were coded for references to five different aspects of the story.
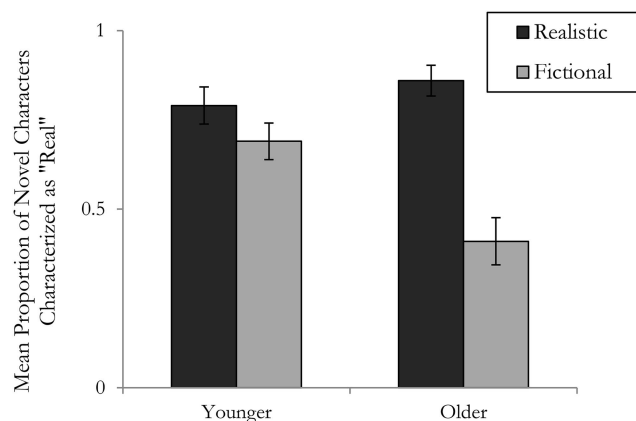
With the exception of one category, all other categories were chosen to be consistent with Corriveau et al. (2009). Based on the coding scheme in Corriveau et al. (2009), justifications that referred to realistic aspects of the stories, including references to biological characteristics of the figures, were included in the Reality category (e.g., "he is real because he plants fruits and vegetables"; "when a man is a farmer, he is real", "because he has a stomach"; "because he has life in him"). References to alleged impossibilities were assigned to the Impossibility category (e.g., "he is pretend because pieces of wood cannot make a table when a stick is turned in the air"; "because a person cannot be a doctor and like his job"). References to the visual aspects of the pictured characters or the background were assigned to the Visual category (e.g., "because he looks old, look!" "because it's day in the picture"). Justifications that were uninformative, including "I don't know" responses, were assigned to the Uninformative category (e.g., "because the real ones go in here"; "because I wanted to"; "because he is a man"). In addition to these four categories, we also included a category for references to God (e.g., "he is real because God has made him"; "I know—because God told me so") in order for the coding system to represent all substantive explanations.
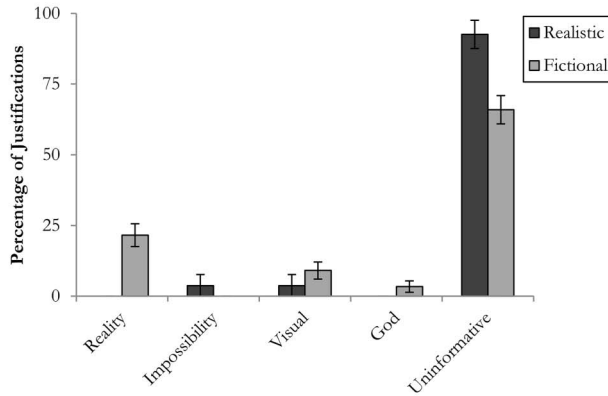
To analyze the relative frequency of each type of justification, we first divided justifications into those given after an incorrect categorization (i.e., categorizing a character in a fictional story as real or a character in a realistic story as pretend) and those given after a correct categorization by each age group. Younger children produced a total of 115 incorrect categorizations (27 for characters in realistic stories and 88 for characters in fictional stories) and 119 correct categorizations (100 for characters in realistic stories and 19 for characters in fictional stories). Older children produced a total of 47 incorrect categorizations (16 for characters in realistic stories and 31 for characters in fictional stories) and 170 correct categorizations (101 for characters in realistic stories and 69 for characters in fictional stories).

Figure 2 shows the percentage of each of the five categories of justification given after incorrect [Figure 2(a)] and correct [Figure 2(b)] categorizations by 3–4-year-olds. Similarly, Figure 3 shows the percentage of each of the five categories of justification given after incorrect [Figure 3(a)] and correct [Figure 3(b)] categorizations by 5–6-year-olds.

Inspection of Figure 2(a) shows that younger children's justifications after incorrect categorizations did not systematically differentiate between characters in fictional and realistic stories. Indeed, 93% of their justifications following incorrect categorization of characters in realistic stories and 66% of their justifications following incorrect categorization of characters in fictional stories were uninformative.

Inspection of Figure 2(b) shows that younger children's justifications after correct categorizations were more systematic. Nearly half (47%) of the justifications given after correct categorization of characters in fictional stories but none of the justifications after correct categorization of the characters in realistic stories referred to impossible aspects of the story context. Conversely, 27% of the justifications given after correct categorization of characters in realistic stories but only 11% of those given after correct categorization of the characters in fictional stories referred to real aspect of the story. Nevertheless, uninformative justifications were still

Figure 1.   Mean proportions of categorizations of characters in realistic and fictional stories as real by younger and older children.

(a). Incorrect Categorization
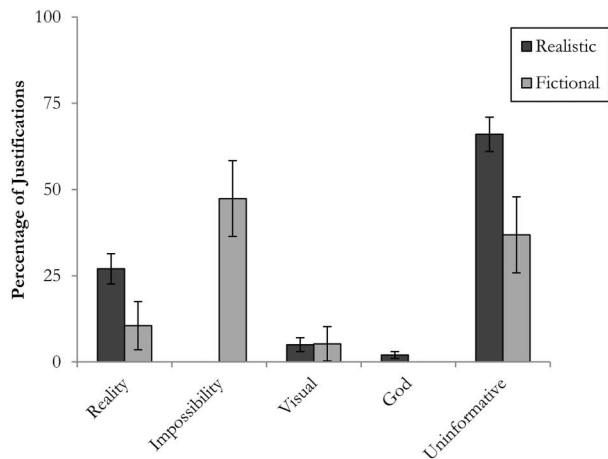

(b). Correct Categorization

Figure 2. Percentage of justifications offered by the younger group after incorrect (a) and correct (b) categorization of characters in realistic and fictional stories by justification type.

its impossible aspects. By contrast, incorrect categorizations were often followed by uninformative or unsystematic justifications in both age groups.

Theory-of-mind battery. Table 1 shows children's performance on each of the individual ToM tasks. Overall performance replicated the findings of Shahaeian et al. (2011, 2014), showing that Iranian children, unlike American and Australian children, often pass the knowledge-access task before they pass the diverse-belief task. Performance on knowledge access was superior to performance on diverse beliefs, both collapsing across age ($M_{Knowledge\ Access} = 0.83$, $SD = 0.38$ and $M_{Diverse\ Belief} = 0.52$, $SD = 0.51$, $t(80) = 4.44$, $p < .001$, 95% CI [0.17, 0.45], $d = 0.49$) and also when considering each age group separately: younger children ($M_{Knowledge\ Access} = 0.76$, $M_{Diverse\ Belief} = 0.48$, $t(41) = 2.75$, $p = .009$, 95% CI [0.8, 0.49], $d = 0.42$), older children ($M_{Knowledge\ Access} = 0.90$, $M_{Diverse\ Belief} = 0.56$, $t(38) = 3.61$, $p = .001$, 95% CI [0.15, 0.52], $d = 0.58$). Across the entire sample, 40% failed the diverse-beliefs task, but passed the knowledge-access task, whereas only 9% failed the knowledge-access task, having passed the diverse-beliefs task.

Aside from children's relatively inaccurate performance on the diverse-belief task, the findings replicated the order of difficulty that has been found in other cultures (i.e., Diverse Desires >

(a). Incorrect
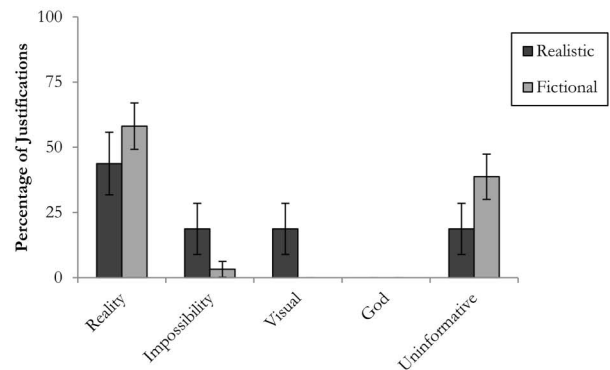
(b). Correct
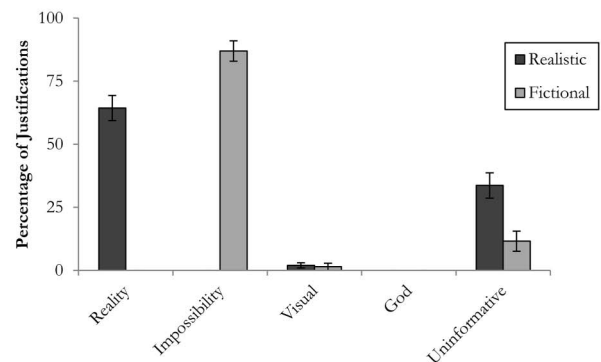
Figure 3. Percentage of justifications offered by the older group after incorrect (a) and correct (b) categorization of characters in realistic and fictional stories by justification type.

quite frequent for characters in both types of stories (66% for realistic stories and 37% for fictional stories).

Inspection of Figure 3(a) shows that after incorrect categorizations, older children—like younger children—did not systematically differentiate between characters in fictional and realistic stories in their justification pattern. Thus, references to real aspects of the story were the most frequent justification in each case.

Finally, Inspection of Figure 3(b) shows that older children's justifications after correct categorizations were quite systematic. Having correctly categorized the characters in realistic stories, children mostly (63%) referred to real aspects of the story, but having correctly categorized the characters in fictional stories, children mostly (87%) referred to impossible aspects of the story.

In summary, as compared to incorrect categorizations, correct categorizations were associated with a more systematic pattern of justification for both age groups. Especially in the older group, children justified the correct allocation of a character in a realistic story by referring to its realistic aspects and they justified the correct allocation of a character in a fictional story by referring to

Knowledge Access > False Belief > Hidden Emotion > Sarcasm) together with a marked improvement across the two age groups in performance on False Belief.

Based on the results of Corriveau and Harris (2015), we anticipated a link between children's correct categorization of novel story characters (out of 6) and overall performance on the ToM tasks (out of 6). More precisely, we anticipated that such a relationship would indicate children's progress toward understanding the way that beliefs are a guide to reality. We also tested for a possible relationship between EF skills and correct categorization.

To examine these possible relationships, we ran a hierarchical multiple regression model with the Total Correct Categorizations as the outcome variable and Total ToM score, Age Group, EF scores, and the interaction of EF and ToM as predictors in four steps. Table 2 shows the results of these analyses. Inspection of Steps 1 and 2 in Table 2 indicates that both Age Group and Total ToM scores each account for significant unique variance in children's correct categorization ($\beta = 0.33$, $t(78) = 3.03$ $p = .003$ and $\beta = 0.22$, $t(78) = 2.09$, $p = 0.04$, respectively). The overall Step 2 model was significant ($F(2, 78) = 10.35$, $p < 0.001$), accounting for 21% of the variance in children's categorization of novel figures.

To examine the potential contribution of EF skills in Step 3, we included EF accuracy scores (number of errors on the Day-Night task). Controlling for EF scores, Total ToM scores no longer accounted for unique variance in the outcome, suggesting that EF scores might moderate the relationship between ToM and correct categorization. Finally, in Step 4, when we accounted for the ToM × EF interaction, the model was significantly improved ($\Delta R^2 = 0.05$, $F(1) = 4.95$, $p = .03$, $R^2 = 0.28$); the product term was a significant predictor ($\beta = -023$, $t(76) = -2.22$, $p = .03$), supporting the speculation that EF accuracy scores moderate the effect of ToM on correct categorizations of the characters. Figure 4 illustrates the nature of this moderation effect. As shown by the pattern in Figure 4, children who made a high number of errors on the Day-Night task, were just as likely to categorize the characters incorrectly whether they had a high or a low ToM score. By
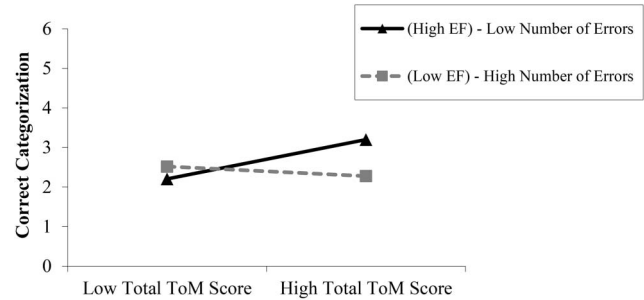

Figure 4. Executive function (EF) scores, measured as number of errors on the Day-Night Task, moderate the relationship between theory-of-mind (ToM) scores and correct categorization, controlling for age.

contrast, children who made a low number of errors on the Day-Night task performed better on the categorization task if they had a high rather than a low ToM score. We repeated the same processes, replacing EF accuracy score with completion time, and did not observe a significant contribution of completion time to the model. Both age group and total ToM scores significantly predicted correct categorization, controlling for completion time.

Discussion

Study 2 tested the extent to which 3–6-year-old Iranian children are able to use their causal understanding when categorizing novel story characters as pretend or real. Younger children did not distinguish between characters embedded in plausible versus implausible stories. Specifically, 3–4-year-old children categorized a significant portion of the novel characters as real, regardless of the story context. By contrast, older children were able to distinguish between novel characters embedded in a realistic story as compared to a fictional story. They categorized most characters presented in a realistic story as real, but they were at chance in categorizing characters presented in a fictional story as pretend. Overall, our findings present interesting similarities and differences compared to results of past work with American children. We consider each age group in turn.

Previous research with 3–4-year-olds in the United States has shown that they, like Iranian children, do not differentiate between novel characters embedded in stories containing plausible versus impossible events (Corriveau et al., 2009; Corriveau & Harris, 2015). However, the error pattern differs across the two cultural settings. Whereas Iranian children typically categorized most novel characters as real, children in the United States were prone to categorize them as either real or pretend, albeit without any systematic reference to the story context. A plausible explanation for this divergence is that the 3–4-year olds in Iran had been exposed to many religious narratives. Hence, they were accustomed to hearing stories, including stories with fantastical or impossible elements, in which the protagonist was presented as a real person. By contrast, 3–4-year-olds tested by Corriveau et al. (2009) and by Corriveau and Harris (2015) in the United States were recruited from a science museum. Arguably, they had been exposed to a more mixed diet of stories in which the protagonist was presented as either a real person or a make-believe character. Note that because Corriveau et al. (2015) only included 5–6-year-

Table 2
Summary of Hierarchical Regression Model for Analysis of the Relationship Between Total Categorization Scores, Theory of Mind (ToM) Scores, Inhibitory Control Accuracy Scores (EF), and Age Group

Variable	B	SE (B)	β	R^2	F	ΔR^2
Step 1				.16	15.65***	
Age group	1.07	.27	.41***			
Step 2				.21	10.35***	.04*
Age group	.86	.28	.33**			
Total ToM score	.25	.12	.22*			
Step 3				.24	7.94***	.03
Age group	.75	.29	.29*			
Total ToM score	.20	.12	.18			
EF (Number of errors)	−.10	.06	−.18			
Step 4				.28	7.50***	.05*
Age group	.69	.28	.26*			
Total ToM score	.19	.12	.17			
EF (Number of errors)	−.15	.06	−.27*			
EF * Total ToM score	−.31	.14	−.23*			

* $p < .05$.   ** $p < .01$.   *** $p < .001$.

olds in their sample, it remains an open question whether a group of 3–4-year old American children from religious families and/or attending parochial schools would perform similarly to Iranian children in their categorization of fictional figures.

Turning to the older children, the findings for 5–6-year-olds in Iran are strikingly similar to those obtained with religious 5–6-year-olds in the United States. Like the Iranian children, the religious children in the United States distinguished between characters embedded in a realistic versus a fictional context. In addition, they systematically categorized most characters presented in a realistic context as real. Nevertheless, like the Iranian children, they were at chance in categorizing characters presented in a fictional context as pretend (Corriveau et al., 2015).

The pattern of justifications observed in Study 2 strengthens the claim that older children are sensitive to the events in the story even if they do not systematically categorize the characters in fantastical stories as pretend.

The pattern illustrated in Figure 3(a) also lends support to the claim that older children were sensitive to the content of the stories, even when they categorized the embedded characters incorrectly. When they incorrectly categorized the fictional characters as real, 58% of their subsequent justifications appropriately referred to aspects of reality in the story. Further analysis showed that a large majority (86%) of these justifications were instances of children not referring to the causally implausible aspects of the story and focusing instead on aspects of these fictional stories that were plausible (e.g., "because he bakes bread"; "because he lives in a house"; "because he has intestines").

One possible interpretation of the persisting difficulty displayed by Iranian children—as well as religious children in the United States—in judging the status of characters presented in a fantastical context is that they lack a concept of pretend characters. However, this interpretation is inconsistent with other findings. Recall that the Iranian 5–6-year-olds tested on familiar characters in Study 1 differentiated systematically between familiar historical and familiar fictional characters and appropriately categorized most fictional characters as pretend. A similar result was obtained with religious 5–6-year-olds in the United States—they too differentiated between familiar, historical and familiar, fictional characters and correctly categorized fictional characters as pretend (Corriveau et al., 2015).

A more plausible interpretation of the findings, both in Iran and the United States, is that children who receive a religious education often hear accounts of miracles. Such accounts are usually recounted as historical narratives rather than as fanciful, fairy stories. We assume that regular exposure to such narratives encourages children to think that the fantastical or miraculous can actually occur. Hence, when they meet such an implausible event in a narrative context, they do not immediately regard it as an indication that the narrative—and the protagonist in the narrative—is merely fictional.

Strong support for this line of interpretation was provided by the nonreligious 5–6-year-olds tested by Corriveau et al. (2015). These children, who were attending secular state schools and did not go to church with their families, were very systematic in categorizing the characters in fantastical stories as pretend. By implication, although they were likely to have heard plenty of stories that included fantastical or impossible events, such stories were not presented to them as narratives describing events that had

actually happened but as fairy stories recounting events in a make-believe world.

Given the similar findings for religious children in the United States and in Iran, two further investigations would benefit the field's growing knowledge of the impact of religious narratives on children's causal understanding. First, it would be helpful to observe the performance of 3–4-year-old North American children attending preschools that emphasize religious narratives. This would allow for a comparison between the reality-prone categorization pattern of younger Iranian children and their Western counterparts. Second, it would be informative to investigate whether religious adults, both in Iran and the United States, differ from secular adults in their analysis of historical claims. Such research could advance our understanding of the extent to which adults think of the inclusion of seemingly miraculous events in a narrative as a threat to its historical plausibility. In a recent study by Gottlieb and Wineburg (2012), Jewish and Christian historians were shown to shift between different modes of interpreting the historical past when analyzing a text recounting the Exodus from Egypt. They switched between prioritizing historical veracity on the one hand and religious significance on the other. More generally, there is evidence that adults readily combine naturalist and supernatural modes of explanation when interpreting the same phenomenon (Legare, Evans, Rosengren, & Harris, 2012).

Corriveau and Harris (2015) found that children with higher scores on ToM tasks performed better at categorizing story protagonists. A similar pattern was observed in Study 2. A plausible interpretation of these parallel findings is that children's developing understanding of representation—as indexed by their ToM score—facilitates their insight into the fact that the same representational format, that is, a narrative, can serve different functions; it can represent real events or fictional events. However, Study 2 also suggests, given the observed interaction between ToM and EF skills, that EF skills may set limits on how much children can benefit from such a conceptual insight. More specifically, inhibition skills may be needed if children are to make their judgments about the categorization of the story protagonist appropriately sensitive to the story context, especially the presence of fantastical versus realistic elements. For example, before deciding that a protagonist is fantastical, children have to listen to the story, focus their attention to the relevant parts of the story (i.e., its fantastical elements), and then respond appropriately when asked to categorize the figure. Moreover, over the course of the six trials, children need to switch between attending to real versus fantastical elements in the story. Together, these task demands require that children make their decisions sensitive to the context of the story, as well as switch their attention from salient aspects of the stimulus (i.e., visual features of the picture) to more subtle narrative elements, which may or may not be fantastical. Work on children's representational flexibility and the role of stimulus characteristics supports the hypothesis that EF skills play an important role in preschoolers' ability to make such context-sensitive decisions in an experimental setting (Zelazo et al., 2003). Furthermore, our data suggest that children benefited from high ToM abilities when they also showed high response inhibition skills but not when inhibition skills were low. Importantly, the relationship between ToM performance and our categorization task was not mediated, but moderated by EF scores, suggesting that performance on the categorization task is related to both ToM understanding and inhibition

skills. This is consistent with findings showing that conflict inhibition is significantly associated with ToM skills, over and above general intellectual ability or working memory skills (Carlson et al., 2002).

It is important to note that we did not include a direct measure of religiosity. In Iranian society, most children are exposed to a uniform school curriculum that includes religious teaching, but exposure to religion in the private family setting varies considerably. It is plausible that such variability might be related to individual differences among children in their ability to distinguish real from fictional characters. However, we judged that explicit questions to children or their families about their private religious practices and beliefs would be inappropriate in the context of Iranian politics.

In conclusion, consistent with the findings of Corriveau et al. (2015) for U.S. children, the pattern observed among the Iranian 5–6-year-olds can be plausibly attributed to children's exposure to religious narratives that include miracles brought about by divine intervention. Many American children also accept that God has supernatural powers. For example, God answers prayers (Bamford & Lagattuta, 2010), has knowledge that ordinary mortals lack (Barrett, Richert, & Driesenga, 2001; Lane, Wellman, & Evans, 2010, 2012), and presides over Heaven (Harris & Giménez, 2005). There are no systematic studies of Iranian children's conception of God and the extent of his supernatural powers. However, the prevalence of religious and ideological teachings (Mehran, 2007), and the importance of God in adults' daily lives (as reported by 87% of Iranian adults in the World Values Survey, 2005) are likely to impact children's education and to influence their ideas about what is possible. Due to this exposure, Iranian children are likely to form a conception of an almighty God who is part of everyday life. This conception, manifest in the historical analyses of religious adults (see Gottlieb & Wineburg, 2012), includes a belief in extraordinary powers that can change the course of events in unimagined and unknown ways, influencing, therefore, children's conception of what is possible. Children use their causal understanding in different domains to differentiate what can happen in real life from what is fantastical (Subbotsky, 1994; Corriveau et al., 2009), but if their causal understanding also includes a representation of intervening powers and miracles, then a wide range of "impossible" events can be regarded as feasible.

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Appendix

Novel Stories Associated With Novel Historical and Fictional Characters

Farmer

Historical. This man is a farmer and his name is Mash Ghasem. He used to plant fruits and vegetables in a field near the city of Rasht, where he lived in a house with a small backyard in a nice village.

Fictional. This man is a farmer and his name is Mash Mammad. He used to plant tomatoes and cucumbers. Every morning, he ate a very big apple that kept him alive forever.

Child

Historical. This is a child and his name is Alireza. When Alireza grew up, he became a doctor and he liked his job a lot. He was born on a hot summer day in a hospital in Tehran.

Fictional. This is a child and his name is Pedram. When Pedram grew up, he became a carpenter. He had a white stick and when he turned his stick three times in the air, pieces of wood would stick together and a table was made.

Baker

Historical. This man is a baker and his name is Sadegh. He used to make Lavash and Sesame bread. He had a small house next to his bakery, where he lived with his wife and children. He used to work long hours.

Fictional. This man is a baker and his name is Adel. He used to make tasty bread. When he took the bread out of the hot oven, his hands would not burn because he would quietly say something and the bread would immediately freeze.