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Children's developing realization that some stories are true: Links to the understanding of beliefs and signs

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ABSTRACT

Given that children are told stories about real as well as pretend protagonists, how do they differentiate between them? Previous research indicates that children's understanding of historical versus fictional stories develops between ages 3 and 5 (Corriveau et al., 2009. *Cognition*, 112, 225; Woolley and Cox, 2007. *Developmental Science*, 10, 681). Across two experiments ($N = 134$), we asked if children's developing understanding of representation is related to their ability to differentiate between historical and fictional stories. Controlling for age and verbal ability, children's ability to correctly differentiate such stories is related to their developing understanding of false beliefs and false signs but not false photographs.

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1. Introduction

Three- and 4-year-olds distinguish between entities that they have conjured up in their imagination and those that truly exist (Harris, Brown, Marriott, Whittall, & Harmer, 1991; Wellman & Estes, 1986). They also distinguish make-believe from real companions (Harris, 2000; Taylor, Cartwright, & Carlson, 1993). In these cases, the source of the imaginary entity is the child. However, children can also identify the status of entities that they do not create but encounter in a representational medium such as a

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story. Indeed, children realize that there are distinct fictional worlds, that the make-believe characters within these worlds (e.g., Batman and Robin) can interact with each other but not with the characters from another fictional world (e.g., Beauty and the Beast; Skolnick & Bloom, 2006), and that characters may have their own special properties or powers (Van de Vondervoort & Friedman, in press).

Previous research has shown that 5–6-year-olds spontaneously use narrative context to infer whether the story protagonist is a real person or a fictional character. Even if they are not fully accurate or consistent in distinguishing between events that are possible versus impossible in the real world (Johnson & Harris, 1994; Rosengren, Kalish, Hickling, & Gelman, 1994; Shtulman & Carey, 2007; Weisberg & Sobel, 2012), children use that distinction to assess the status of a story protagonist. When the narrative includes only prosaic events that could happen in the real world, children typically categorize the protagonist as real, but when the narrative includes impossible events, children are likely to categorize the protagonist as pretend (Corriveau, Kim, Schwalen, & Harris, 2009). Moreover, children offer cogent justifications by appropriately citing either realistic or impossible story events (Corriveau, Chen, & Harris, 2014; Corriveau et al., 2009).

The findings for 3–4-year-olds are more variable. When asked, before categorizing the protagonist, whether story events could actually happen, some 3- and 4-year-olds still categorize protagonists randomly and offer mainly uninformative justifications. However, others begin to categorize protagonists systematically and continue to do so even when such prompts are withdrawn. Moreover, like older children, these 3–4-year-olds refer appropriately to either the realistic or impossible nature of the story events in justifying their categorizations. By implication, some young preschoolers can understand that some stories describe what happened to real people whereas others only describe what happened to make-believe people (Corriveau et al., 2009).

It is possible that this developing insight into the representational function of stories is linked to children's developing insight into representation more broadly. For example, between ages 3 and 5 children also come to realize that certain mental states (notably, beliefs) aim to represent reality, whereas other mental states (for example, imaginings) do not (Perner, 1991; Wellman, 1990; Woolley, 1995). Moreover, children come to realize that someone holding a belief will treat it as a representation of reality even when the belief is mistaken (Wellman, Cross, & Watson, 2001). We tested this hypothetical link between the understanding of stories and children's broader understanding of representation across two experiments. In Experiment 1, children completed three separate tasks: familiar characters, novel characters, and a mental state understanding (MSU) battery. We predicted that both younger and older children would systematically distinguish between real and pretend familiar characters. We further predicted that children's ability to differentiate between novel characters embedded in historical or fictional narratives would be related to their theory of mind. In Experiment 2, we asked whether children's differentiation between real and pretend characters is also linked to their understanding of non-mental representations such as signs and photographs.

2. Experiment 1

2.1. Method

2.1.1. Participants

Two groups of children ranging from age 3 to 7 participated. Our primary interest was in exploring the variability in younger children's story categorization. Thus, the majority fell into a younger group of 3- and 4-year-olds ($n = 63$; 27 female; mean age 4;0, range 3;0 to 5;0, SD 7 months). However, to confirm previous developmental findings suggesting that children's story categorization improves after age 5, we included a smaller group of 5–7-year-olds ($n = 25$; 14 females, mean age 6;2, range 5;1 to 7;4, SD 9 months).

Participants were recruited in a science museum serving predominantly middle-class families. Most participants were White (78%), although a variety of ethnicities was represented (15% Asian-American, 3% African-American, and 3% Hispanic). All children in the relevant age range were invited to participate, except those with disabilities that would prohibit participation (e.g., deafness) and those who did not speak English. Most families accepted the invitation to participate.

2.1.2. Materials and procedure

Children were tested individually in a quiet corner of the museum and completed three tasks in a fixed order: familiar characters, novel characters, and the mental state understanding (MSU) battery. Each task is described below.

Familiar characters. To introduce the familiar characters task, the experimenter brought out two boxes. One box was labeled "real" and displayed a picture of a teacher in a classroom; the other box was labeled "pretend" and displayed a picture of a flamingo painting on an easel. Following the script used by Corriveau et al. (2009), the experimenter explained that we sometimes hear stories about people that really happened and that we sometimes hear stories about people that are just pretend. Children were told that they should put pictures of real people in the real box and pictures of pretend people in the pretend box (order of presentation counterbalanced across participants).

The experimenter then presented children with two practice pictures: Goldilocks and Thomas Edison. Children were first asked if they knew who the character was. If the child said yes, she was invited to put the picture in one of the two boxes. If the child said no, the experimenter told her a short narrative about the character and then asked the child to decide where to put the character. Feedback was given on these first two trials.

Next, the experimenter presented up to 18 additional pictures in random order: nine pictures of historical characters (e.g., Abraham Lincoln, Martin Luther King), and nine pictures of fictional characters (e.g., Snow White, Peter Pan). The experimenter first asked if the child was familiar with the character. If the child said no, the picture was put aside. If the child said yes, the child was asked to put the picture in one of the two boxes. No feedback was given. Trials were discontinued after children had categorized three familiar historical and three familiar fictional characters. All but two children were familiar with at least three historical and three fictional characters.

Novel characters. Next, the experimenter removed all of the familiar character pictures 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' box and some of them belong in the 'pretend' box. I want you to listen carefully because I'm going to ask you *why* you chose to put them in the box you did."

The experimenter then presented children with six pictures of three novel character types: two soldiers, two Native Americans, and two children. Each character type was presented in one historical story and one fictional story. The historical story included only events that could actually happen, whereas the fictional story included events that do not ordinarily happen. For example, the historical story for the child character was, "This is Annie Paine. She became a doctor when she grew up. She was born in Washington, D.C., on the 4th of July." The matched fictional story was, "This is Sarah Adams. She became a firefighter when she grew up. She had a secret blanket that protected her from any harm and made her invisible."

After hearing a given story, children were asked to place the picture of the protagonist in either the "real" or "pretend" box (categorization question) and to justify their choice (justification question). Order of presentation of the six pictures and their associated stories varied randomly across participants. In addition, which picture of a given character type was associated with a historical versus a fictional story varied across participants.

Mental state understanding (MSU). Children were presented with all five tasks included in Wellman and colleagues' theory-of-mind battery (Peterson & Wellman, 2009; Peterson, Wellman, & Liu, 2005; Wellman & Liu, 2004) in increasing difficulty: diverse desires, diverse beliefs, knowledge access, false belief, and hidden emotion. To reflect the ordinal nature of the tasks, children received a score for the highest ranked task that they answered correctly (maximum = 5).

Coding. For both the familiar and novel characters tasks, children received a 1 when they categorized a character as real and a 0 whenever they categorized a character as pretend. Thus, correct responses resulted in high scores (out of 3) for historical characters and low scores (out of 3) for fictional characters.

Children's justifications were allocated to one of four categories: *impossibility* (references to the impossibility of the event or character, such as "because there's no such thing as magic seeds"); *realistic* (references to the historical or real nature of the event or character, such as "he ate lots of vegetables" or "he fought in a battle"); *visual* (references to a visual cue, such as "he looks real in the picture" or

Table 1
Mean number of "real" categorizations, standard deviation and comparison to chance of fictional and historical characters in the familiar characters and novel characters tasks of Experiment 1.

	3–4-Year-olds	$t(62)$	5–7-Year-olds	$t(24)$
Familiar characters				
Fictional	.92 (.92)	4.16***	.12 (.44)	15.69***
Historical	2.25 (.86)	6.95***	2.88 (.33)	20.80***
Novel characters				
Fictional	1.51 (.99)	.06	1.00 (1.08)	2.31*
Historical	1.70 (.87)	1.80	2.72 (.54)	11.26**

Note: Mean scores indicate the number of characters children categorized as "real" for Familiar and Novel Fictional and Historical characters (maximum score = 3). Standard deviations are indicated in parentheses.

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

"he's wearing a hat"); and *uninformative* (answers such as "don't know" or ones that were unrelated, like "just because"). The first author and a research assistant blind to the hypotheses of the experiment separately coded all responses. Agreement was 92% (Cohen's $\kappa = .87$) and disagreements were resolved through discussion.

2.2. Results

We first present results from the familiar and novel characters trials (Table 1). We then discuss the relationship between children's ability to categorize a novel character correctly and their justification of that categorization. Finally, we discuss the relationship between children's mental state understanding and their ability to correctly categorize novel characters and justify their categorizations.

Familiar characters. Table 1 shows that both age groups performed significantly and appropriately above chance when categorizing historical characters as real, and significantly and appropriately below chance when categorizing fictional characters as real.

A Kolmogorov–Smirnov test on the total number of "real" categorizations indicated that the distribution violated the assumption of normality, $Z = 2.11$, $p < .001$. We therefore converted the total scores into proportional scores and conducted an arcsine transformation on the square root of the proportion. A 2 (age group: younger, older) × 2 (character type: historical, fictional) repeated-measures analysis of variance (ANOVA) was calculated on the transformed "real" scores. This confirmed the main effect of character type, $F(1,86) = 171.31$, $p < .001$, $\eta_p^2 = .66$, as well as the interaction of age × character type, $F(1,86) = 24.74$, $p < .001$, $\eta_p^2 = .22$. The interaction reflected the fact that older children differentiated more sharply between historical and fictional characters than younger children. Nevertheless, follow-up tests confirmed that the simple effect of character type was highly significant for both younger, $F(1,62) = 44.37$, $p < .001$, and older children, $F(1,24) = 542.26$, $p < .001$.

Novel characters. Table 1 suggests that older children systematically categorized both types of characters, whereas younger children performed at chance. Because a Kolmogorov–Smirnov test on the total number of "real" categorizations indicated that the distribution violated the assumption of normality, $Z = 1.86$, $p < .001$, we conducted an arcsine transformation on the square root of the proportion of "real" categorizations. To further examine the pattern of categorization, a 2 (age: younger, older) × 2 (character type: historical, fictional) repeated-measures ANOVA was calculated on the transformed "real" scores. This revealed a main effect of character type, $F(1,86) = 44.66$, $p < .001$, $\eta_p^2 = .34$, and an interaction of age × character type, $F(1,86) = 33.01$, $p < .001$, $\eta_p^2 = .28$. Follow-up tests showed that the simple effect of character type was not significant for younger children, $F(1,62) = .38$, *n.s.*, but was significant for older children, $F(1,24) = 54.06$, $p < .001$.

Justifications. Younger children justified their responses similarly across the two story types, often providing either uninformative replies (about 56% of the time) or referring to the realistic nature of the story (about 30% of the time) for each story type. By contrast, older children offered a different pattern of justifications. They often cited the impossibility of story events for fictional stories (56%) but

Table 2
Proportion (SD) of children answering correctly on the five mental state understanding (MSU) tasks by age group (3–4-year-olds, 5–7-year-olds) in Experiment 1.

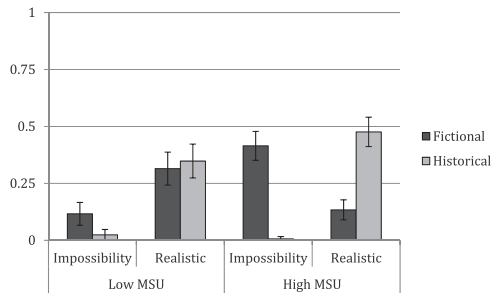| Mental state understanding tasks	3–4-year-olds	5–7-year-olds
Diverse desires	.95 (.21)	1.00 (.00)
Diverse beliefs	.83 (.38)	1.00 (.00)
Knowledge access	.67 (.48)	.92 (.28)
False belief: unexpected contents	.38 (.49)	.80 (.40)
Hidden emotion	.09 (.29)	.26 (.44)

Fig. 1. Proportion of children's responses to the justification question by justification type (impossibility, realistic) and type of character (fictional, historical) for children with low MSU scores and children with high MSU scores in Experiment 1.

rarely for historical stories (13%); and they often cited the realistic nature of story events for historical stories (58%) but rarely for fictional stories (5%).

Mental state understanding. Table 2 displays the proportion of children passing each of the five tasks by age group. On average, the highest task younger children passed was knowledge access ($M = 3.14$, SD = 1.10), whereas the highest task older children passed was false belief or hidden emotion ($M = 4.52$, SD = .77). The difference between the two age groups was significant, Mann-Whitney $U = 257.00$, $p < .001$. The correlation between age in months and mental state understanding score was also significant, $r_s(88) = .57$, $p < .001$.

We examined the potential effects of language ability by calculating a mean length of justification by child. The mean length of justification was correlated with age in months, $r(88) = .28$, $p < .01$, and also with the highest MSU task that was passed, $r_s(88) = .24$, $p < .05$. Accordingly, we re-ran the correlation between age in months and MSU controlling for justification length. The relationship between MSU and age in months remained significant, $r_s(85) = .55$, $p < .001$.

Relationship between mental state understanding, categorizations of novel characters, and justifications. First, to explore the relationship between MSU and categorizations, we conducted a multiple linear regression with MSU, age in months, and expressive language ability (justification length) as predictors on the arcsine of the square root of correct categorizations. Controlling for age and justification length, there was a significant effect of MSU, $\beta = .13$, $t(84) = 3.78$, $p < .001$, accounting for an additional 11% of unique variance.

To probe which particular aspect of mental state understanding was linked to categorizations, we ran simple correlations between scores on the five mental state tasks and categorization scores. These analyses indicated that only the final two tasks were correlated with categorization scores: for false belief, $r(88) = .61$, $p < .001$; for hidden emotion, $r(88) = .41$, $p < .001$. Accordingly, we divided children into a high MSU group (highest task passed was either false belief or hidden emotions; $n = 46$) and a low MSU group (highest task passed was diverse desires, diverse emotions, or knowledge access; $n = 42$) and re-ran the above regression including MSU as a dichotomous variable. Controlling for age and justification length, MSU was a significant predictor of categorization scores, $\beta = .32$, $t(84) = 4.58$, $p < .001$, accounting for an additional 15% of unique variance.

Finally, we examined the relationship between MSU and justifications. Fig. 1 displays the justifications of children with low and high MSU scores, respectively. Children with low MSU scores offered a

similar pattern of justification whether the character had been embedded in a fictional or a historical story. In contrast, children with high MSU scores offered distinct patterns of justification depending on story type. They often cited the impossibility of story events for fictional stories but rarely for historical stories, and they often cited the realistic nature of story events for historical stories but rarely for fictional stories.

2.3. Discussion

Experiment 1 examined the relationship between children's categorization of familiar and novel characters, their justifications of their categorizations, and their developing mental state understanding. Two main conclusions emerged. First, both younger (3–4-year-old) and older (5–7-year-old) children systematically categorized familiar real and pretend characters, showing that even young children have an understanding of the distinction between reality and fantasy, at least for familiar characters. In addition, although younger children did not take advantage of the story context when differentiating between the novel characters, older children systematically did so. A difference between younger and older children also emerged in their pattern of justifications: younger children were unsystematic in how they justified their categorization, but older children selectively appealed to the impossible nature of story events when categorizing characters in fictional stories, and to the realistic nature of story events when categorizing characters in historical stories. These data are fully consistent with previous work showing that 5–6-year-olds spontaneously use narrative events to infer the status of novel story characters (Corriveau et al., 2014; Corriveau et al., 2009; Woolley & van Reet, 2006).

Second, we found that children's categorization of novel characters was related to their developing understanding of mental states. Even when controlling for age and verbal ability (indexed by utterance length), children with greater MSU were better able to use the story context to categorize the story character as real or pretend. In particular, children who passed the false belief or hidden emotions task were more accurate in categorizing the story characters. In addition, they were also more likely to justify their categorizations by referring to the impossible nature of story events for fictional stories and the realistic nature of story events for historical stories (although we were unable to control for age in making this comparison).

The "job description" of beliefs involves correspondence with reality (Sabbagh, Moses, & Shiverick, 2006a). Thus, it would be anomalous if the need to bring a false belief into line with reality were ignored. Our hypothesis is that preschool children who recognize the reality-tracking function of certain mental representations – notably beliefs as opposed to imaginings – can apply that insight to narratives. More specifically, such children can appreciate that historical narratives, as opposed to fictional narratives, also have the "job description" of corresponding to reality. A narrative that does not aim to track reality – because it describes an event that cannot happen – can be regarded as fictional.

Experiment 2 was designed to probe two possible interpretations of the link between children's understanding of narrative and their understanding of mental states. Children's understanding of narrative might reflect their understanding of a broad range of representational media. Our interpretation, however, is that children's progress in understanding narrative reflects their emerging insight into the way that particular representational media aim to track reality.

Past research on children's understanding of representation shows that performance on tests of false belief is correlated with performance on tests of false sign understanding (Leekam, Perner, Healey, & Sewell, 2008; Sabbagh, Xu, Carlson, Moses, & Lee, 2006b; Perner & Leekam, 2008). Furthermore, the processing abilities that contribute to insight in these two representational media appear to overlap. Not only do individual differences in executive function (EF) ability, as indexed by performance on standard EF tasks such as the day/night task, predict children's performance on measures of false belief understanding, they also predict performance on measures of false sign understanding (Sabbagh et al., 2006b). However, children's performance on measures using a third representational medium, namely photographs, does not display the same pattern. Although children also come to realize in the preschool period that a photograph may or may not correspond to reality, this developmental change correlates only weakly with their performance on false belief tasks (Leekam & Perner, 1991; Perner,

1991; Slaughter, 1998; Zaitchik, 1990; Perner & Leekam, 2008). In addition, performance on executive function tasks does not predict performance on tests of the understanding of false photographs, even if, as noted, it predicts performance on tests of false belief and false sign understanding (Sabbagh et al., 2006b). Finally, despite their delayed performance on false belief and false sign tasks, children with autism perform quite well on false photograph tasks (Bowler, Briskman, Gurvidi, & Fornells-Ambrojo, 2005; Leslie & Thaiss, 1992; Leekam & Perner, 1991).

A plausible explanation of this dissociation between false photograph tasks and false belief and false sign tasks is that photographs, unlike beliefs and signs, are not generally used as a guide to reality. Of course, at the time a photograph is taken, we expect it to capture that particular fleeting reality, but looking at it later, we do not expect to use it as a guide to the way that things stand in a stable or generic fashion. For example, looking at a photograph of a child's birthday party, we do not assume that the child is still at the party or is still the same age. By contrast, we routinely expect beliefs and signs to reflect reality, and if they fail to do so they warrant correction.

Thus, Experiment 2 was designed to distinguish between two possibilities. According to a broad hypothesis, children's ability to differentiate realistic and fictional narratives will correlate with their progress in understanding beliefs, signs, and photographs because all these media can accurately represent or misrepresent reality. According to a narrow hypothesis, their ability to differentiate realistic and fictional narratives will correlate with their progress in understanding that some types of representation – beliefs and signs but not photographs – aim to track reality. In Experiment 2, we presented children with the same novel stories as in Experiment 1. Instead of using the full mental state battery, we included only the fourth task (false belief). Every child in Experiment 1 with low MSU failed this task, whereas all but two of the children with high MSU passed (the remaining two children passed hidden emotion). We also included two additional tasks to assess children's understanding of signs and photographs: the false sign task and the false photograph task (adapted from Sabbagh et al., 2006b).

3. Experiment 2

3.1. Method

3.1.1. Participants

Forty-six 3-year-olds participated (27 females; mean age 4;2, range 3;0 to 5;0, SD = 8 months). Participants were recruited from a children's exhibit in a science museum serving predominantly middle-class families. Most participants were White (80%), although a variety of ethnicities was represented (13% Asian, 4% African-American, and 2% Hispanic). All children in the relevant age range were invited to participate, and the majority of families accepted.

3.1.2. Materials and procedure

Children were tested individually in a quiet corner of the museum. They completed two separate tasks in a fixed order (familiar characters and novel characters), and three measures of representational understanding. The familiar characters and novel characters tasks were identical to those used in Experiment 1, with the following exception: Because we were primarily interested in how children's understanding of representations was related to their judgments of the reality status of novel characters, children's categorization of familiar characters was limited to only one familiar fictional and one familiar historical character.

The measures of representational understanding included the standard *false belief* task used in Experiment 1 and two additional tasks: a change-of-location false sign task and a false photograph task (from Sabbagh et al., 2006b; adapted from Parkin & Perner, 1996b). Both tasks probed children's understanding that a representation (i.e., a sign or photograph) can misrepresent the actual state of affairs. In the false sign task, the child was introduced to two houses: a red house and a blue house. Children were told, "Chester uses this arrow to let everyone know where he is playing," and were invited to state where the arrow is pointing. Next, the experimenter told a story about Chester and his friend deciding which house to play in. When the friend left, Chester stated that he would "leave the arrow pointing to where you could find [him]." But then Chester moved houses and forgot to change

the sign. Children were asked: (1) Where does the sign say Chester is? (2) Where is Chester really? Children received a score of 1 if they correctly answered both questions.

In the false photograph task, children were presented with a picture of Bert putting his cat inside a box. He then put a photograph of a cat on the box to remind him of what was inside it. Children were told, "When Bert was gone, the cat jumped out of the box and a frog jumped in!" Children were then presented with a picture of Bert with the box with a photograph of a cat on it and asked: (1) "What does the photograph say is in the box?" and (2) "What is really in the box?" Children received 1 point if they correctly answered both questions.

3.2. Results

We first present results from the familiar and novel characters tasks. Next, we discuss the relationship between children's ability to categorize a novel character correctly and their justification of that categorization. Finally, we discuss the relationship between children's false belief, false sign, and false photograph understanding and their ability to correctly categorize novel story characters and justify their categorizations.

We conducted Kolmogorov–Smirnov tests to check for violations of normality. Because these tests were not significant, all analyses were conducted on untransformed data.

Familiar characters. Children appropriately performed above chance when categorizing familiar historical characters as "real" ($M = 77\%$ SD = 42%, binomial test $p < .001$) and appropriately below chance when categorizing familiar fictional characters as "real" ($M = 26\%$, SD = 45%, binomial test $p < .001$).

Novel character categorizations. Three- to 4-year-olds performed at chance when categorizing both novel historical characters ($M = 1.73$, SD = .97), $t(45) = 1.66$, *n.s.*, and novel fictional characters ($M = 1.74$, SD = 1.02), $t(45) = 1.59$, *n.s.* as real. To further examine the pattern of categorization, we conducted a repeated measures analysis of covariance (ANCOVA) on the number of "real" categorizations for both novel historical and novel fictional characters with age in months as the covariate. No main effects or interactions were found. Thus, as in Experiment 1, when considered as a group, young children did not use the story context to categorize novel story characters.

False belief, false sign, and false photograph understanding. Children received a score of 1 for correctly answering each of the three tasks (maximum = 3). Overall, 44% of children passed the belief task, 59% passed the sign task, and 44% passed the photograph task.

Relationship between understanding representation, categorization, and justifications. To examine the relationship between children's categorizations and their understanding of representations that typically offer a guide to reality, we conducted three separate multiple linear regressions with age in months, expressive language (justification length), and performance on either false belief, false sign, or false photograph as predictors of total correct categorizations. The final models for the regressions included the effects of all three predictors, but not their interactions. Controlling for age in months and expressive language, there was a significant effect of false belief on categorization performance, $\beta = .42$, $t(44) = 3.03$, $p < .01$, accounting for an additional 14% of unique variance; similarly, there was a significant effect for false sign, $\beta = .33$, $t(44) = 2.22$, $p < .05$, accounting for an additional 7% of unique variance. By contrast, the final model for the regressions including false photograph displayed no significant effect of false photograph, $\beta = .30$, $t(44) = 1.59$, *n.s.*

In light of these regression results, we next examined the relationship between children's justifications and their representational understanding (as measured by their composite performance on the false belief and false sign tasks). Fig. 2 displays justifications by story type (historical, fictional) for children who did versus children who did not pass both the false belief and false sign tasks. Fig. 2 shows that children who failed either of these tasks were unsystematic in their justifications. By contrast, children who were correct on both tasks often cited the impossibility of story events when justifying their categorization of characters in fictional stories and often cited the realistic nature of story events when justifying their categorization of characters in historical stories. Finally, when children were categorized in terms of whether they passed the false photograph task, both subgroups offered a similar pattern of justification, irrespective of story type.
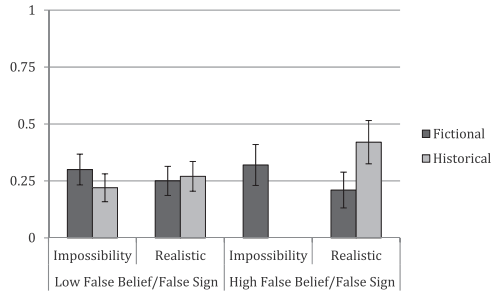
Fig. 2. Proportion of children's responses to the justification question by justification type (impossibility, realistic) and type of character (fictional, historical) for children who failed either false belief or false sign and children who passed both false sign and false belief in Experiment 2.

3.3. Discussion

Experiment 2 replicated previous findings (Corriveau et al., 2009) showing that 3–4-year-olds do not systematically identify the status of a novel character introduced to them in the context of a narrative. However, children who passed both the false belief and false sign tasks did categorize novel characters accurately and backed up their categorizations with appropriate references to realistic or impossible elements in the story. Children's performance on a false photograph task was not associated with their pattern of categorization or justification.

4. General discussion

Experiment 1 replicated previous research showing that 5–7-year-olds differentiate between familiar fictional characters like Snow White and familiar historical characters like George Washington. They also use the events in a story to appropriately categorize a novel protagonist as pretend or real. Moreover, they justify their categorizations of a protagonist in a fictional story as pretend by citing impossible story events, whereas they justify their categorization of a protagonist in a historical story as real by citing realistic story events.

Experiments 1 and 2 confirm that 3–4-year-olds can differentiate between a real and a pretend familiar character. Considered as a group, they do not use story events to systematically assess the status of novel characters or offer appropriate justifications. However, those 3–4-year-olds who display an understanding of false beliefs and/or hidden emotions (Experiment 1) or false beliefs and false signs (Experiment 2) categorize novel characters correctly and justify their categorizations appropriately, even when expressive language abilities are taken into account. By contrast, 3–4-year-olds' understanding of false photographs shows no systematic relationship to either their categorizations or their justifications.

There is a subset of representations – mental as well as non-mental – that aim to represent reality. For example, maps and clocks provide their audience with information about reality. By contrast, pretend gestures, as well as many types of artistic representation (e.g., plays and paintings) provide their audience with information about a make-believe reality. Stories are unusual in that they can serve both of these representational functions. We recount events from the actual past about real people, but we also tell fantastical stories about pretend characters. By age 5–6, children display some sensitivity to this difference in producing their own narratives. Principe and Smith (2008) invited 5–6-year-olds to provide either an "exactly true" story or a "really fun" story about the last time that they had lost a baby tooth. Children who no longer firmly believed in the Tooth Fairy adjusted their narratives accordingly. Following the "exactly true" instructions, they included few fantastical elements, but following the "really fun" instructions, they were likely to describe events that could not have actually taken place—for example, "She (the Tooth Fairy) flied in the window" or "My cat got her stinking fairy dust all over her fur." These narrative adjustments confirm that 5–6-year-olds can differentiate between a narrative that aims to describe what actually happened and a fantastical

narrative that includes make-believe elements. Similarly, children's judgments of protagonists as real or pretend are based on their differentiation between realistic or fantastical story elements.

Below, we discuss three aspects of our findings in more detail. First, we ask how our findings compare to those of Woolley and Cox (2007). Second, we say more about the theoretical interpretation and implications of the findings. Finally, we discuss the potentially important contribution of executive function skills.

Our results differ from those reported by Woolley and Cox (2007), who found that most 3–5-year-olds judged characters in a book to be pretend, regardless of story type. There are two possible reasons for the difference in findings. First, in our procedure, children heard the experimenter orally narrate a story about the protagonist. By contrast, Woolley and Cox (2007) presented children with a longer story read from a physical book. Because children are typically read fictional rather than historical narratives from books, it is possible that this mode of presentation led children to think of the characters as pretend. Second, the forced-choice questions differed across the two experiments. We invited children to put a picture of the protagonist in a box designated "real" or "pretend." By contrast, Woolley and Cox asked children questions about the story character in relation to a book—e.g., "Could (character) come and play with you today, or is s/he just in the book?" Given that the experimenter had just read from a physical book, this phrasing may have led children to choose the second option. In sum, we speculate that the pretend/real choices that we offered to children were less likely to bias them toward fictional responses and enabled them to assess the story character in relation to the story episodes.

Turning to our theoretical interpretation, we hypothesize that 3–4-year-olds struggle to differentiate between realistic narratives with real characters and fictional narratives with pretend characters. The findings for the false belief and false sign tasks suggest that this differentiation calls for a conceptual insight into the distinctive nature of reality-tracking representations, including narrative reports of the past. Children who appreciate that certain types of representations (notably beliefs and signs) ordinarily aim to represent reality are more likely to realize that narratives can also have that aim, and they deploy that insight when assessing the status of the protagonist. This interpretation is consistent with earlier findings. Thus, prompting 3–4-year-olds to say whether a particular story event could really happen (e.g., "Could someone eat a magic cookie that allowed her to stay the same age forever?") increased categorization accuracy (Corriveau et al., 2009). Presumably, such leading questions prompted children to reflect on whether the story aimed to represent reality and enabled them to categorize the protagonist accordingly.

It is interesting to note that other media that children engage with, especially drawings and paintings, have the same hybrid status as narratives. Thus, a drawing can aim to depict reality (a real person or building), but it can also aim to depict a fictional reality (a make-believe person or building). Children may take some time to grasp the dual function of drawings, and this insight may be linked to their emerging understanding of narratives.

Our hypothesis is different from what might initially appear to be a similar hypothesis. It is possible to represent or to misrepresent a fictional reality. For example, any given re-telling of a fairy tale might be faithful to the traditional plot or depart from it. Similarly, in pretend play, any given player might be faithful to the ongoing pretend scenario or depart from it. Interestingly, children understand such misrepresentations of pretend reality earlier than they understand misrepresentations of actual reality—namely, false beliefs (Hickling, Wellman, & Gottfried, 1997). We take such evidence to highlight the important theoretical point that when children struggle to understand false beliefs, a major component of their difficulty is in grasping that beliefs aim to track not just any reality but reality itself. This component is conceptually challenging, over and above any difficulties that children face in acknowledging that representations may conflict, as they sometimes do, even in the context of pretend play. We further assume that it is children's emerging insight into this specific, reality-tracking component that cuts across their developing appreciation of beliefs and signs as well as their developing appreciation of non-fictional stories. Stated differently, we would expect 3-year-olds to understand conflicting representations in fictional contexts without being able to differentiate fictional from non-fictional stories, because – we argue – it is the later emerging insight into the reality-tracking function of representations that helps children with the latter differentiation.

This clarification highlights a key question for future research. Even if there are important connections between children's insight into beliefs, signs, stories, and even drawings, it remains unclear how those connections are established. Children might first come to an understanding of how beliefs aim to track reality and extend that insight to other non-mental representations such as signs, historical stories, and reality-based drawings. But, the pattern of influence might operate in other ways. Indeed, training on either false beliefs or false signs improves performance on the other medium (Iao, Leekam, Perner, & McConachie, 2011).

Finally, we turn to the potential contribution of executive function abilities. First, variation in EF abilities might affect children's ability to flexibly allocate a given character to either the real box or the pretend box across successive trials. However, granted that younger and older children performed quite well in their sorting of familiar characters, it is unlikely that their judgments about novel characters were affected by limited sorting abilities. A more likely possibility is that EF abilities impact children's context-sensitive decisions about a given story character. More specifically, children needed to listen to the unfolding story, to classify episodes as either realistic or impossible, and to subsequently make a judgment about the story protagonist based on that classification. There is considerable evidence that EF abilities affect this type of context-sensitive decision-making (Zelazo, Müller, Frye, Marcovitch, 2003). Finally, EF abilities may impact the conceptual knowledge that children bring to the task. Recent findings show that individual differences in EF abilities predict the extent to which children can benefit from theory-of-mind training (Benson, Sabbagh, Carlson, & Zelazo, 2013). Similarly, individual differences in EF abilities might predict the extent to which children bring to any given narrative the conceptual insight that stories vary in terms of whether they include fantastical elements or stick closely to reality.

Future research should attempt to remedy three weaknesses of both experiments. First, research should include measures of EF, given the potential contribution made by those abilities. Second, granted the well-established correlation between language and false belief, it would be appropriate to use a more established language measure (Milligan, Astington, & Dack, 2007). Third, in Experiment 2, performance on false belief, false sign, and false photograph was assessed via a single task in each case. The inclusion of several tasks would permit a more stringent assessment of our claim that children's conception of narratives is linked to their understanding of false beliefs and signs but not to their understanding of false photographs.

In conclusion, children hear various narratives: fairy stories, family reminiscences about past episodes, and narratives about their community and its history. Our data suggest that 5–6-year-olds grasp a fundamental difference between two different narratives genres: those that aim to track reality and those that do not. That insight is also found among younger children who realize that other types of representations, notably beliefs and signs, also aim to track reality.

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