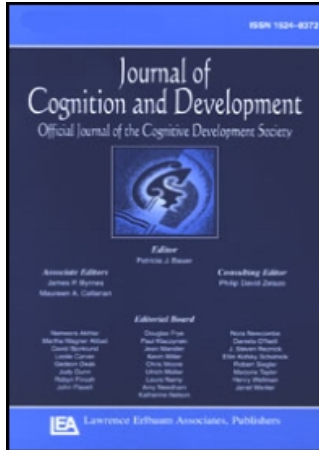


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Seeing Things Unseen: Fantasy Beliefs and False Reports

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Whereas past research has demonstrated that children's beliefs about the real world can influence their memory for events, the role of fantasy beliefs in children's recall remains largely unexplored. We examine this topic in 5- and 6-year-olds by focusing on how belief in a familiar fantasy figure, namely the Tooth Fairy, is related to children's memory for their most recent primary tooth loss. Although children who fully believed in the reality of the Tooth Fairy provided more voluminous and complex accounts than those with less strong beliefs, they also provided the most fictitious reports, frequently characterized by claims of hearing or seeing the Tooth Fairy. Belief in the Tooth Fairy did not affect the accuracy of children's reports of the mundane elements of their tooth loss, and many fantastic claims were linked to real events. Exposure to seemingly tangible evidence of the Tooth Fairy's existence was associated with the provision of fantastic claims.

A longstanding theme in the literature on memory is that recollections are the result of constructive processes, rather than exact copies of external events (Bartlett, 1932). According to the constructivist perspective, individuals use their existing knowledge and beliefs to monitor, interpret, and encode their experiences (Bransford & Franks, 1972; Bransford & Johnson, 1972). Consequently, what is remembered is assumed to contain more and different information than that available in the objective situation. Relevant knowledge generally leads to inferences

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and elaborations that facilitate the generation of a well-organized, elaborate representation in memory. However, when expectations are inconsistent with what was experienced, individuals unwittingly may condense, embellish, or distort information to reflect their current beliefs. Just as prior knowledge can affect encoding, it can also influence storage and retrieval processes, particularly over long delays, as details are lost and expectations are used as a guide for filling in gaps in memory (Ross, 1989; Trabasso & van den Broek, 1985).

Numerous studies demonstrate that even very young children exhibit constructive processing. For example, what preschool-aged children already know about routine physical examinations can enhance their recall of the medical procedures that occurred during a specific visit to the doctor (Ornstein, Baker-Ward, Gordon, Pelphrey, Tyler, & Gramzow, 2006). However, young children's knowledge can lead to errors in memory when their expectations differ from what actually happened. To illustrate, after undergoing a mock physical examination in which some highly expected procedures were omitted (e.g., listening to the heart with a stethoscope), most children subsequently reported experiencing at least one expected but omitted procedure (Ornstein, Merritt, Baker-Ward, Gordon, Furtado, & Principe, 1998). In another study, preschoolers who were led to believe that a stranger who visited their classroom was clumsy and often ruined things were more likely than others who were not given these expectations to later state that the stranger damaged toys and books during his visit, even though he did not touch anything (Leichtman & Ceci, 1995).

Generally, research examining the link between knowledge and memory has focused on how children's beliefs about the real world can affect recall. Little is known, however, about how one type of belief common to children, namely, fantasy beliefs, might influence memory for their personal experiences. A consideration of the role of fantasy beliefs is relevant to a basic understanding of early memory as fantasy plays a significant role in lives of young children. Research on a variety of aspects of children's everyday behavior indicates that most children lead quite active fantasy lives during the preschool and early elementary years. Between the ages of 3 and 8 years, most children display high amounts of pretend play (Singer & Singer, 1990) and often offer magical explanations for events that they do not understand (Phelps & Woolley, 1994; Rosengren & Hickling, 1994). Many young children also invent imaginary companions (Taylor & Carlson, 1997; Taylor, Carlson, Maring, Gerow, & Charley, 2004). Further, most children in this age range believe in the supernatural powers of common fantasy figures, such as witches, unicorns, and monsters (Rosengren & Hickling, 1994; Sharon & Woolley, 2004), and in the reality of event-related beings, such as Santa Claus, the Easter Bunny, and the Tooth Fairy (Clark, 1995; Harris, Brown, Marriot, Whittall, & Harmer, 1991).

Considering the constructive tendencies of memory, it seems likely that children's proclivity toward pretense and magical explanations might affect their at-

tempts to understand and remember certain types of events, particularly those events in which their meanings or causes could be interpreted in terms of fantastic entities or processes. Although there are no studies on how fantasy beliefs might impact memory in children, there are a few investigations in the adult literature that provide evidence that fantasy beliefs can influence perception and recall in otherwise typical individuals. To illustrate, Zusne and Jones (1989) found that when shown obvious failed demonstrations of extrasensory perception (ESP), adults who believed in the reality of ESP, but not those who disbelieved, later wrongly reported seeing successful attempts. In other work, belief in alien visitations was the primary variable that differentiated people who claimed memories of unidentified flying object (UFO) abduction experiences from those who did not claim such experiences (Spanos, Cross, Dickson, & DuBreuil, 1993). Similarly, a poll conducted by the Gallop Organization on 1,721 randomly selected adults found that 22 percent recalled having visited or lived in a haunted building and 8 percent reported communicating with a dead person using a Ouija board (Baylor Institute for Studies of Religion, 2006).

Given these demonstrations of the influence of fantasy beliefs on memory in adults, children's difficulty at separating memories based on imagination from those reflecting actual events may put children at an even greater risk of remembering fantastic experiences as real. Young children traditionally have been thought to have trouble distinguishing real from imagined events in memory. For example, Freud suggested that children's statements are untrustworthy because their imagination predominates (Freud, 1909/1955), and Piaget believed that before a child is 7 or 8 years of age, "it is extremely difficult for him to distinguish between fabrication and truth" (Piaget, 1928, p. 202). Although there is a growing body of contemporary work demonstrating that even quite young children can make an impressive variety of distinctions between reality and imagination (e.g., Estes, Wellman, & Woolley, 1989; Harris et al., 1991; Wellman & Estes, 1986; Woolley & Boerger, 2002; Woolley & Bruell, 1996), there is considerable evidence that their ability to discriminate the real from the imaginary is sometimes fragile, especially when they are asked to imagine events and later report on whether or not the imagined events actually occurred. In support of this viewpoint, research on reality monitoring has demonstrated that at least to 10 years of age, younger children are more likely than older children and adults to confuse imagined and real events in memory (Foley & Ratner, 1998; Parker, 1995; Sussman, 2001). In fact, when children make errors, they more often claim that imagined events actually happened than the reverse (Foley & Johnson, 1985; Gordon, Jens, Shaddock, & Watson, 1991; Parker, 1995; Roberts & Blades, 1995; Sussman, 2001; Welch-Ross, 1995), suggesting a bias toward interpreting images in memory as real. Further, investigations in the suggestibility literature have shown that repeatedly imagining events that never happened (e.g., getting a finger caught in a mousetrap and having to go to the hospital) can induce children to provide quite

elaborate accounts that can be very convincing to naïve adults (Ceci, Huffman, Smith, & Loftus, 1994a; Ceci, Loftus, Leichtman, & Bruck, 1994b). Supporting the notion that imagined events can become confused with real events in memory, despite being told during debriefing that the imagined events never happened but merely were suggested, some of the children in the Ceci et al. studies continued to assert that the imagined events really occurred (see Huffman, Crossman, & Ceci, 1997). The insistence that imagined events took place even though being told otherwise by a seemingly knowledgeable adult suggests that the children had come to believe that the imagined events really were experienced.

One set of experiences that might be affected by children's confusions between imagination and reality are those that adults encourage children to conceptualize in terms of fantasy. Because many young children believe in the reality of supernatural entities and magical forces, they may be prone to interpret and later recall certain situations in a fantastic manner when adults encourage them to do so. A common series of events that many children are persuaded to conceptualize in a supernatural manner are the rituals that follow the loss of a primary tooth. Many children put their lost tooth under their pillow at night and wake up the next morning to find that their tooth has been replaced with a small amount of money or a toy. Despite the fact that parents are behind the tooth/prize exchange, children are persuaded to interpret these events in terms of a fairy who collects children's teeth. Consequently, there is widespread belief among children in the Tooth Fairy and the behaviors associated with her (Clark, 1995; Harris et al., 1991; Prentice, Manosevitz, & Hubbs, 1978). Even though the magical powers of the Tooth Fairy (e.g., knowing who has lost a tooth and when the tooth has been left out for an exchange) might seem to discredit her reality, there are several reasons to suspect that even the most cognitively sophisticated children, at least at first, believe. For instance, unlike the fantasies that children generate themselves during pretense, and generally understand are not real by age 3 (see Leslie, 1987), children themselves do not formulate the Tooth Fairy. Rather, the myth is presented ready-made to children, often with strong demands to believe (e.g., no money for disbelievers) and much in the same way as *real* unseen entities that have apparent (at least to young children) supernatural qualities, such as oxygen, germs, and dinosaurs (Harris & Koenig, 2006). Further, many parents engineer seemingly tangible evidence of the reality of the Tooth Fairy, such as when they hide prizes under the pillow or sprinkle "fairy dust" on the windowsill.

Against the backdrop of these findings on children's memory, fantasy beliefs, and reality monitoring, the current study was designed to explore four general questions by asking children to report their memory for their most recent primary tooth loss. First, examined in this paper is the extent to which children's degree of belief in the reality of the Tooth Fairy might influence the narrative structure of their accounts. Generally, children's event reports become increasingly voluminous and complex with age (e.g., Fivush, Haden, & Adam, 1995; McCabe & Peter-

son, 1991). However, other work has found that false narratives induced by repeated misleading interviews (Bruck, Ceci, & Hembrooke, 2002) or an overheard rumor (Principe, Kanaya, Ceci, & Singh, 2006) tend to be greater in volume than true narratives. Thus, it seems conceivable that belief in the Tooth Fairy might boost the volume and complexity of children's narratives to the extent that they use their fantasy as fodder to embellish their accounts of their tooth loss.

Second, the work aimed to assess the degree to which belief in the Tooth Fairy might be associated with differences in the content of children's reports. Of particular interest was whether children who fully believed in the Tooth Fairy would be more likely than those with partial or no beliefs to relate fantastic occurrences consistent with the myth but that could not have taken place in reality. Also of interest was whether strong believers might be more prone than others to recall perceptual experiences involving the Tooth Fairy, namely, hearing or seeing her. Claims of hearing or seeing the Tooth Fairy are of interest because they would suggest that the child views his or her memory as originated by a direct experience, rather than as derived from an unknown source or a nonexperiential source, such as another's suggestions or inference. Indeed, inference (i.e., using expectations to generate what must have happened) commonly is cited as the central process linking knowledge and memory (Bartlett, 1932; Paris & Lindauer, 1976; Thompson & Myers, 1985; Trabasso, Suh, Payton, & Jain, 1995). However, acknowledgment of hearing or seeing the Tooth Fairy would suggest that the child's report is not simply based on an inference about what must have happened (e.g., "the Tooth Fairy must have come into my bedroom through the window because this is how my mother told me that she gets into the house"), but linked to a memory for phenomenal experience with this figure.

A third goal was to explore the association between belief in the Tooth Fairy and the accuracy of children's reports of their tooth loss. Although fantastic details are observed more frequently in false accounts than in true reports (Bruck et al., 2002), generally true narratives can contain fantastic elements (Everson, 1997). Consequently, the mere presence of fantastic information does not automatically signify that a child's entire account is erroneous. Unknown, however, is whether the presence of fantastic details decreases the accuracy of the non-fantastic portions of children's reports. One possibility is that children's fantasy beliefs could serve as a form of autosuggestibility (Brainerd & Reyna, 1995) and shift their entire reports in the direction of their fantasies. However, given that children's narratives can contain elements of both fact and fiction, the provision of fantastic details may have no effect on children's ability to describe contemporaneous details that are unrelated to the Tooth Fairy myth. As such, of interest was whether children who believed in the Tooth Fairy might show reduced levels of accuracy of the mundane, non-fantastic elements of losing their tooth. Further, given that children are persuaded to interpret some real events in a supernatural manner following a tooth loss, also of interest was the extent to which children's fantastic claims of the Tooth

Fairy might contain some elements of real events rather than being made up of purely supernatural claims that have no basis in reality.

The final purpose of this work was to explore the effects of children's exposure to concrete evidence (e.g., fairy dust or a letter from the Tooth Fairy) that has been engineered by parents to serve as confirmation of the Tooth Fairy's existence. As noted above, parents often go out of their way to produce evidence of mythical figures. Some work demonstrates that tangible evidence, such as a phone call and a toy, can inflate levels of belief in fantastical entities (Woolley, Boerger, & Markman, 2004). Unknown, however, is how concrete evidence in support of a fantasy might affect children's tendency to describe the past in line with their fantasies. It seems conceivable that exposure to concrete evidence would convey strong demands to interpret and remember the tooth/money exchange in a supernatural manner, particularly among those children who believe in the Tooth Fairy.

To address these issues, 5- and 6-year-olds, all of whom participated in traditional rituals involving the Tooth Fairy myth, were interviewed about what happened when they lost their last primary tooth. This age range was used because prior research has demonstrated that belief in the Tooth Fairy is fairly common during this period (Clark, 1995; Harris et al., 1991; Prentice & Gordon, 1986), and many children lose their first primary tooth between the ages of 5 and 6 (Ash & Nelson, 2003). To assess the relation between fantasy beliefs and memory, a sorting task was used to classify the children as fully believing, uncertain, or disbelieving in the Tooth Fairy.

METHOD

Participants

The sample consisted of 90 5- to 6-year-old children ($M = 69$ months, range = 60–83 months) recruited from suburban preschools, afterschool programs, elementary schools, and summer day camps in southeastern Pennsylvania. Approximately half of the children were female (57%). Reflecting the population of these programs, 91% of the children were European American, 7% were Asian American, and 2% were African American. All of the children had lost at least one primary tooth and had parents who engaged them in common Tooth Fairy rituals.

Design and Procedures

After informed consent was obtained, a questionnaire was sent home for the children's parents to fill out (see below). Once parents returned the completed questionnaires, the children were administered a sorting task and a memory interview. The order of these two tasks was counterbalanced, so that half of the children re-

ceived the sorting task first and the remaining half were given the memory interview first. These interactions were videotaped and carried out individually in a quiet room at the children's schools.

Based on their responses to the sorting task, the children were placed in equal numbers into three groups denoting their belief in the Tooth Fairy: Believers, Uncertains, and Disbelievers. Because uneven numbers of children in these three categories were encountered, the first 30 children given the sorting task who fit into each level-of-belief group were used in this study.

Parental Questionnaire

First, the parents were to note their child's gender, date of birth, birth order, number of siblings, number of primary teeth lost, and the date of the most recent tooth loss. Then, the parents were asked a series of 18 questions to gauge their level of encouragement for their child to believe in the Tooth Fairy myth. Two separate components of parental encouragement were measured. First, parents indicated whether or not they had paraphrased any of nine statements consistent with the myth to their child (e.g., "The Tooth Fairy replaces lost teeth for money or prizes." "The Tooth Fairy can fly." "The Tooth Fairy comes in through children's bedroom windows."). Second, parents indicated whether or not they had engaged in any of nine behaviors that described common rituals associated with the myth (e.g., replaced a tooth with money or a prize, sprinkled "fairy dust," left a "note" from the Tooth Fairy), and were asked to elaborate on the details of each behavior (e.g., "I replaced Nora's tooth with \$5." "I sprinkled gold glitter on Noah's windowsill."). The parents also were given several prompts to write a narrative that described in detail the circumstances surrounding the most recent tooth loss.

Sorting Task

The sorting task designed to assess the children's level of belief in the reality of the Tooth Fairy was modeled after that of Morison and Gardner (1978). This two-part sorting task was made up of 18 black-and-white line drawings. Twelve of the drawings depicted fantasy figures, with four of them showing event-related figures (Santa Claus, Easter Bunny, Tooth Fairy, Leprechaun), four showing figures from popular books and television (Winnie the Pooh, Mickey Mouse, Scooby Doo, Blue), and four showing generic supernatural figures (ghost, alien, dragon, genie). The remaining six cards depicted real entities (lizard, mouse, dentist, dog, king, man). Multiple fantasy figures were used so as not to make the purpose of this task obvious to the children, thereby reducing the likelihood that it would affect their performance on the subsequent memory interview.

First, the children were given a three-card sorting task. The experimenter named each picture and placed each set of three in front of the child in a randomly deter-

mined triangular pattern. Each set consisted of two pictures of fantasy figures (e.g., Mickey Mouse and Scooby Doo) and a picture depicting a real entity (e.g., mouse) that could be classified with one of the fantasy figures. Thus, for each set, the children could pair the cards on the basis of a real category (e.g., Mickey Mouse and mouse) or on the basis of being fantasy figures (e.g., Mickey Mouse and Scooby Doo). For each set, the children were given two opportunities to make pairings and to offer explanations for their pairings. The children were asked, "Which two pictures go together?" and "Why?" and then "Can you think of two different pictures that go together?" and "Why do you think these two go together?" The set of cards designed to elucidate the children's level of belief in the Tooth Fairy contained drawings of the Tooth Fairy, the Easter Bunny, and a dentist.

Following the three-card sorting task, the children were asked to name each picture and then place the pictures into piles of "real" and "pretend" things: "Put all of these pictures into two piles—one pile of things that are real and one pile of things that are pretend." Errors in naming were infrequent and not corrected. Once the children had sorted all of the cards into a real pile and a pretend pile, the experimenter shuffled the cards and then flipped over each card one at a time and said, "You put _____ in the real/pretend pile. Are you very sure or not very sure that _____ is/are real/pretend?" Half of the children were asked this question with the "very sure" alternative first, whereas the other half were asked the "not very sure" alternative first.

Memory Interview

The interview was carried out by a different examiner who used information collected from the parents to orient the children to their last tooth loss (e.g., "Remember the tooth that you lost when you bit into an ear of corn?" "Remember the tooth you lost while you were at your grandparents' house?"). The interview was hierarchically structured and began with an open-ended probe: "I'd like you to tell me everything that you remember about what happened when you lost your last tooth. Don't guess or make anything up. Start with the first thing that happened and tell me everything that you can, even things that you don't think are very important."

After additional open-ended probing (e.g., "Tell me more." "What else happened?" "What happened next?"), the children were asked to tell everything that they *saw* or *heard* when they lost their tooth: "Sometimes we remember a lot about what we saw. Tell me all of the things that you saw when you lost your tooth." "Sometimes we remember a lot about sounds or things that people said. Tell me all of the things that you heard when you lost your tooth." These two prompts hereafter are referred to as the Looked and Heard prompts. These questions were included because young children often provide incomplete accounts in response to only very general prompts (e.g., Burgwyn-Bailes, Baker-Ward, Gordon, &

Ornstein, 2001) and evidence higher levels of recall with more directed open-ended questions (see, e.g., Poole & Lindsay, 1995; 2001).

Once open-ended recall was exhausted, the children were asked a series of twelve specific (yes/no) questions. Six of these questions were consistent with the Tooth Fairy myth (e.g., "Did the Tooth Fairy leave a prize under your pillow?") and six were inconsistent with the myth, three of which were consistent with the Santa Claus myth (e.g., "Did the Tooth Fairy fill your stockings with toys?") and three of which were consistent with a routine dental examination (e.g., "Did the Tooth Fairy check your teeth for cavities?"). After responding to each question, the children were encouraged to elaborate by using only general prompts (e.g., "Tell me more.") or repeating what the child said (e.g., "Wow, she left you a dollar under you pillow; tell me more about that."). Two comparable interview protocols were developed that differed only in the order of the specific questions and the Looked and Heard prompts, and one half of the participants received each version of the interview.

Coding of the Parental Questionnaire

The Parental Questionnaire was used to calculate two parental encouragement scores. One was calculated as the number of "yes" responses to the nine statements and the other as the number of "yes" responses to the nine behaviors. A total parental encouragement score also was calculated as the sum of the statement and behavior scores. Further, parents' reports were used to calculate an index of the extent to which they provided concrete evidence that could be interpreted by their children as confirmation of the Tooth Fairy's existence. To calculate the concrete evidence score, the number of "yes" responses to the following five behaviors was calculated: replaced tooth with money or prize, sprinkled fairy dust, gave child a letter or certificate from the Tooth Fairy, arranged a phone call with the Tooth Fairy, and left other physical evidence (e.g., open window, a "magic" wand).

Coding of the Sorting Task

As noted above, the sorting task was used to divide the children into three post-hoc groups in terms of their belief in the reality of the Tooth Fairy: Disbelievers, Uncertains, and Believers. Group assignment was made on the basis of the children's sorts and on their explanations for their sorts. The children were scored as Believers if they sorted the Tooth Fairy card with the "real" figure (i.e., the dentist) and provided an explanation that supported the reality of the Tooth Fairy (e.g., "The dentist and the Tooth Fairy work together." "Both give me prizes."), placed the Tooth Fairy in the "real" category, and said that they were "very sure" that the Tooth Fairy was real. The children who sorted the Tooth Fairy card with the "fantasy" figure (i.e., the Easter Bunny) and gave a rationale that explicitly stated that

the Tooth Fairy is fantasy (e.g., "The Easter Bunny and the Tooth Fairy are not real." "Both are my parents."), placed the Tooth Fairy in the "pretend" category, and said that they were "very sure" that the Tooth Fairy was pretend were rated as Disbelievers. Uncertain was scored for those children whose explanations for their sorts suggested that they wavered between belief and disbelief or who said that they were "not very sure" that the Tooth Fairy was either real or pretend.

The sorting task also was used to obtain a measure of the children's general level of belief in fantasy figures. The number of fantasy figures ($N=12$) that were sorted into the "real" pile and for which the child reported being "very sure" of their reality were counted. The sorting task was coded by one rater. A second rater independently scored 20% of the sorting tasks; the level of agreement for both the Tooth Fairy belief group and the general measure of belief in fantasy figures was .98.

Coding of the Memory Interview

The videotaped interviews were transcribed and the children's narrative responses to both open-ended and specific questions were broken down into propositions for coding. Following the definition put forth by Fivush et al. (1995), a proposition was defined as a clause containing a subject and a verb, either explicit or implied, that had not been mentioned previously by either the interviewer or the child. Examples of propositions included, "I yanked out my tooth," "I heard her in my room," and "I got a buck" (in response to the specific question, "Did the Tooth Fairy leave a prize under your pillow?"). If two subjects were nominated, the clause was parsed into two propositions (e.g., "Me/and my brother pretended to be asleep."). If two action verbs were provided for one subject, the statement was also counted as two propositions (e.g., "She opened the window/then flew in."). Propositions that did not concern circumstances relevant to losing a tooth or the Tooth Fairy myth were not coded. Also, propositions reported in response to specific questions that did not contain original information were not scored (e.g., "She left me a prize" in response to the specific question, "Did the Tooth Fairy leave a prize under your pillow?").

Structure coding. First, as an index of the volume of the children's narratives, the total number of propositions reported in response to open-ended and specific questions was counted. Then, in an attempt to gauge the complexity of each unit of thought that the children expressed, the ratio of words per proposition was calculated for each child.

Content coding. Next, to explore the content of the children's narrative accounts, each proposition was classified into one of three categories: Realistic, Ritual, or Fantastic. Realistic propositions described mundane occurrences that were consistent with losing a primary tooth and not related to the Tooth Fairy myth. Ex-

amples include getting a tooth stuck in piece of food or wiggling a loose tooth until it came out. Ritual propositions referred to common rituals involving the Tooth Fairy myth that were described without making reference to any supernatural occurrences. Statements describing putting a tooth under the pillow, receiving a prize under the pillow, or leaving the window open were scored as Ritual. Statements coded as Fantastic were supernatural descriptions of occurrences in line with the myth. Fantastic propositions included statements describing entirely supernatural events (e.g., "She flapped her wings." "The Tooth Fairy looked like a tiny little princess.") as well as statements reflecting supernatural interpretations of possibly real events, such as mistakenly interpreting found money as left by the Tooth Fairy (e.g., "The Tooth Fairy gave me five dollars.") or mistakenly interpreting glitter scattered by parents as fairy dust ("She sprinkled her magic dust in my room.").

Next, within the subset of Fantastic propositions, coders noted which, if any, statements included explicit accounts of hearing or seeing the Tooth Fairy. For example, "I *heard* her creeping in my room." and "She *told* me I take good care of my teeth." was coded as reports of hearing the Tooth Fairy. "When she went out the window, I *saw* her little sparkle and she *flied* like this (demonstrates) with her wand." and "She *looked* like Tinkerbell." were coded as reports of seeing the Tooth Fairy.

Accuracy coding. Two measures of accuracy were calculated by comparing the propositions provided by the children with their parents' written narratives and indications of carrying out the 18 verbalizations and behaviors listed on the Parental Questionnaire. The first measure of accuracy was performed only on Realistic and Ritual propositions in an attempt to determine the accuracy of the children's reports of mundane, non-fantastic occurrences surrounding their tooth loss. Propositions were scored as accurate for complete agreement between parent and child as well as for close approximations. To illustrate, "I got cash." was scored as accurate because the mother indicated that she left a Sacagawea dollar under the pillow. Likewise, "I got three dollars." was coded as accurate because the mother checked off the behavior "replaced a tooth with money or a prize" that was listed on the questionnaire. Propositions were coded as errors when they explicitly contradicted the parent's report. For example, "I got twenty dollars." was scored an error because the father noted that he had exchanged the tooth for a book. Propositions that could not be confirmed or contradicted by the parents were not coded for accuracy.

The second measure of accuracy assessed the extent to which the Fantastic propositions provided by the children contained elements of reality. Fantastic propositions were scored as accurate when they were judged to reflect a fantastic interpretation of an actually occurring event noted by the parent on the Parental Questionnaire. For instance, "The Tooth Fairy left a sprinkle of stardust in my room." was coded as accurate because the mother reported that she scattered glitter in her child's bedroom and later explained that the glitter was stardust left behind

by the Tooth Fairy. However “She hung my tooth up in the sky and turned it into a star.” was coded as inaccurate because the father wrote that the Tooth Fairy “returns” baby teeth and that his daughter keeps all of her lost teeth in a jar in her bedroom. Likewise, “She wrote me a letter.” was coded as inaccurate because the child’s mother did not check off this behavior that was listed on the questionnaire. Propositions that could not be confirmed or contradicted by the parents were not coded.

Of the 90 interviews coded, 20% were selected at random and independently coded by a second rater. Interrater agreement was calculated as the ratio of the number of agreements over the total number of codes given. Reliability ranged from .89 to .98. Disagreements were resolved by discussion among the coders.

RESULTS

Preliminary Analyses

A series of initial analyses indicated no differences in the dependent variables discussed below as a function of child gender, age in months, birth order, number of siblings, number of teeth lost, the delay interval between the last tooth loss and the memory interview, the order of the sorting task, the order of questioning during the interview, the interviewers, or the source of recruitment. Accordingly, the data were collapsed over these variables for subsequent analyses.

Parental Encouragement

Findings from the Parental Questionnaire indicated that the children were quite involved in participating in rituals commonly associated with the Tooth Fairy myth. The level of parental encouragement for belief in the Tooth Fairy myth was quite high—86% of the parents assented to at least half of the statements and behaviors on the questionnaire. The mean statement score was 8, with a range from 5 to 9, and the mean behavior score was 5, with a range from 1 to 8. The mean total encouragement score was 14 and the range was 5 to 19. The parental encouragement scores did not differ as a function of the children’s level of belief in the Tooth Fairy.

General Belief in Fantasy Figures

As described above, a measure of the children’s general level of belief in fantasy figures was obtained using the 12 fantasy figures during the sorting task. The mean number of fantasy figures that the children sorted into the “real” pile and for which the child reported being “very sure” of their reality was 7, with a range from 0 to 12, indicating that there was a fairly high but quite variable degree of belief in the

reality of a variety of fantasy figures. There was no relationship between this score and the children's level of belief in the Tooth Fairy or their parental encouragement scores.

Memory Interview

As the focus of the study is on the relation between children's beliefs in the reality of the Tooth Fairy and their reports of losing a tooth, the comparisons of interest are between the three level-of-belief groups on performance during the memory interview. Preliminary analyses indicated no differences in memory performance as a function of parental encouragement or the children's general belief in fantasy figures.

Structure of the children's reports. To examine differences in how the children structured their narrative accounts as a function of their belief in the Tooth Fairy, a series of one-way analyses of variance (ANOVAs) with level-of-belief as a between-subjects factor were carried out, followed, as appropriate, by preplanned contrasts. The mean numbers of propositions as a function of question type—open-ended, specific, and total (open-ended plus specific)—are shown the first three columns on Table 1. The level-of-belief effect on the total number of propositions provided was significant, $F(2, 87) = 22.53, p < .0001$. Preplanned contrasts indicated that the children in the Believer group provided more propositions than those in the Uncertain group, who in turn reported more propositions than those in the Disbeliever group, $F_s(1, 87) \leq 9.54, p_s \geq .01$. There also was a level-of-belief effect on the number of propositions reported in response to open-ended probes, $F(2, 87) = 3.98, p < .05$, such that the Believers provided more open-ended propositions than either the Uncertains or the Disbelievers, $F_s(1, 87) \leq 5.36, p_s \geq .05$; the latter two did not differ significantly from one another. Explored next were group differences in the ratio of word count to propositions, which may be viewed as a measure of the degree of detail of each thought expressed. As can be inferred from the data presented in the fourth column on Table 1, there was an effect of level of belief, $F(2, 87) = 6.97, p < .01$. The Believers provided a larger ratio of words to

TABLE 1
Mean Numbers of Propositions and Words per Proposition (and Standard Deviations) as a Function of Level-of-Belief

	<i>Open-ended</i>	<i>Specific</i>	<i>Total</i>	<i>Words per proposition</i>
Believers	17.47 (15.22)	18.43 (11.25)	35.90 (18.02)	7.08 (1.11)
Uncertains	10.70 (7.40)	13.13 (10.25)	23.83 (11.60)	6.33 (0.98)
Disbelievers	11.33 (2.13)	2.13 (2.54)	13.53 (6.43)	6.21 (0.81)

proposition than did either the Uncertains or the Disbelievers, $F_s(1, 87) \leq 8.83, ps \geq .01$; the latter two did not differ from one other.

Content of the children's reports. The first set of content analyses explored level-of-belief differences in the children's reports of Realistic, Ritual, and Fantastic propositions. As expected, all of the children reported at least one Realistic proposition in their accounts of losing a tooth. All of the children also recalled participating in at least one ritual commonly encouraged by parents, such as leaving a tooth under the pillow or finding money under their pillow, demonstrating that even those who did not believe in the Tooth Fairy played along with the myth. However, reports of Fantastic propositions differed as a function of belief level. Nearly all of the Believers (97%, $n = 29$) reported at least one Fantastic proposition, whereas only 53% ($n = 16$) of the Uncertains and 17% ($n = 5$) of the Disbelievers provided at least one Fantastic proposition. To examine these differences statistically, a series of logistic regressions was carried out with level-of-belief group placed as a predictor, and the Disbeliever group coded as the baseline. This analysis confirmed that the Believers and the Uncertains were more likely than the Disbelievers to report at least one Fantastic proposition, $\chi^2_s(1, N = 90) = 8.12, ps < .01$. When the analysis was run with the Believers as baseline, the children in that group were more likely than the Uncertains to report at least one Fantastic proposition, $\chi^2(1, N = 90) = 8.95, p < .001$.

To further explore group differences in the children's recall of realistic and fantastic occurrences involving the Tooth Fairy, the proportions of the total number of propositions that were coded as Realistic, Ritual, and Fantastic were calculated and are shown in Table 2. A one-way ANOVA, with the level-of-belief group as a between-subjects factor, confirmed an effect of level-of-belief on the proportions of Realistic propositions, $F(2, 87) = 36.22, p < .0001$. Preplanned contrasts indicated that the Disbelievers provided a higher proportion of Realistic propositions in their accounts than did the Uncertains, who in turn provided a higher proportion of Realistic propositions than did the Believers, $F_s(1,87) = 14.72, ps < .001$. Analyses indicated no significant group differences in the proportion of propositions that were Ritual, perhaps demonstrating equal levels of involvement in traditional Tooth Fairy rituals for the children in all three groups and consistent with the lack

TABLE 2
Mean Proportions (and Standard Deviations) of Realistic, Ritual,
and Fantastic Propositions as a Function of Level-of-Belief

	<i>Realistic</i>	<i>Ritual</i>	<i>Fantastic</i>
Believers	.35 (.20)	.16 (.10)	.49 (.22)
Uncertains	.57 (.19)	.22 (.15)	.21 (.18)
Disbelievers	.76 (.17)	.23 (.16)	.02 (.06)

TABLE 3
 Proportions (and Counts) of Children Who Reported Hearing and Seeing
 the Tooth Fairy as a Function of Level-of-Belief

	<i>Hearing the Tooth Fairy</i>	<i>Seeing the Tooth Fairy</i>
Believers	.77 (23)	.67 (20)
Uncertains	.37 (11)	.13 (4)
Disbelievers	.13 (4)	.07 (2)

of a significant relationship between parental encouragement and belief level. However, as can be inferred from the data in the third column in Table 2, the level-of-belief effect on Fantastic propositions was significant, $F(2, 87) = 60.35$, $p < .0001$, with the Believers including in their reports a higher proportion of Fantastic propositions than the Uncertains, who in turn provided a higher proportion of Fantastic propositions than the Disbelievers, $F_s(1,87) = 18.93$, $ps < .0001$.

Examined next was the association between level of belief and claims of perceptual experiences involving the Tooth Fairy. Table 3 shows the numbers of children who reported at least one instance of actually hearing or seeing the Tooth Fairy. A logistic regression, with the Disbelievers coded as baseline, indicated that the Believers and the Uncertains were more likely than the Disbelievers to recall actually hearing the Tooth Fairy, $\chi^2_s(1, N = 90) = 4.07$, $ps < .05$. With the Believers coded as baseline, the children in this group were more likely than the Uncertains to recall an instance of hearing the Tooth Fairy, $\chi^2(1, N = 90) = 9.142$, $p < .01$. Likewise, with the Disbelievers coded as baseline, the Believers were more likely than the Disbelievers to report seeing the Tooth Fairy, $\chi^2(1, N = 90) = 16.19$, $p < .0001$. However, the difference between the Uncertains and the Disbelievers was insignificant.

Accuracy of the children's reports. Analyses of the children's accuracy centered on the extent to which their reports were confirmed by their parents' accounts. First, the accuracy of the children's Realistic and Ritual propositions were calculated. As can be seen in the first column on Table 4, there was a good deal of overlap between the children's and their parents' accounts. Nearly 80% of the Realistic and Ritual propositions were scorable, that is, could be confirmed or contradicted by the parents. Further, as indicated in the second column, the children's descriptions of losing their tooth and traditional Tooth Fairy rituals were quite accurate and contained few errors. There were no group differences in accuracy, with the children evidencing an average accuracy rate of 88%.

Second, the extent to which the children's Fantastic propositions contained accurate elements was determined. Disbelievers were excluded from this analysis because only 2% of their reports involved descriptions of fantastic occurrences, with most of these a simple statement that the Tooth Fairy exchanged their tooth

TABLE 4
 Proportions (and Standard Deviations) of Propositions That Were
 Scorable for Accuracy and Scored as Accurate

	<i>Real and Ritual</i>		<i>Fantastic</i>	
	<i>Scorable</i>	<i>Accurate</i>	<i>Scorable</i>	<i>Accurate</i>
Believers	.79 (.20)	.84 (.16)	.50 (.33)	.88 (.23)
Uncertains	.81 (.21)	.88 (.15)	.73 (.29)	.89 (.18)
Disbelievers	.79 (.20)	.92 (.11)	n/a*	n/a

* n/a = not applicable.

for a prize. As shown in the third column of Table 4, many of the Fantastic propositions provided by the Believers and the Uncertains were scorable for accuracy; that is, they contained references to real events that could be either confirmed or disconfirmed by their parents. Compared to the Uncertains, however, the Believers provided proportionally less *scorable* Fantastic propositions, $t(58) = -2.96$, $p < .005$, suggesting that full belief in the Tooth Fairy was associated with an increase in original or novel fantastic claims that did not overlap with parents' conceptions of their children's tooth loss. Despite this group difference in scorable Fantastic propositions, as indicated in the fourth column on Table 4, the Believers and the Uncertains provided equivalent proportions of Fantastic propositions that contained elements of real events as noted by their parents. Thus, these two groups were equally likely to produce partially accurate claims, or, more specifically, fantastic interpretations of real events in line with the Tooth Fairy myth.

Effects of concrete evidence The final set of analyses explored the extent to which the children's exposure to concrete evidence was associated with the provision of fantastic reports in line with the Tooth Fairy myth. Using data from the Parental Questionnaires, the mean concrete evidence score was 2, with a range from 1 to 5. This score was not associated with any of the demographic variables described above or the children's level of belief in the Tooth Fairy. However, this score was linked with reports of seeing the Tooth Fairy, such that those children who recalled actually seeing the Tooth Fairy had higher concrete evidence scores ($n = 26$, $M = 3.04$, $SD = 2.03$) than those who did not report seeing her ($n = 64$, $M = 2.03$, $SD = 1.38$), $t(88) = -3.13$, $p < .005$. There was no difference in the concrete evidence scores among those children who did and did not report hearing the Tooth Fairy.

Examined next was whether exposure to concrete evidence influenced the provision of Fantastic propositions. The Disbelievers were dropped from these analyses because of the low levels of Fantastic propositions in their reports. The concrete evidence score was not correlated with the proportion of Fantastic

propositions, $p = .77$. To further explore the effects of concrete evidence on the children's reports, the children were split into two groups on the basis of whether they were exposed to only one form of evidence or multiple forms of evidence. Note that all of the children were exposed to at least one form of concrete evidence, namely, finding money or a prize in exchange for their tooth. Based on this grouping, 18 of the 30 Believers received multiple forms of evidence, with these children showing a higher proportion of Fantastic propositions ($M = .56$, $SD = .14$) than those who were exposed to only one form of evidence ($M = .38$, $SD = .27$). Among the Uncertains, 15 children fell into each category, with those who received multiple forms of evidence showing only a slightly higher proportion of Fantastic propositions ($M = .23$, $SD = .19$) than those who were exposed to only one form of evidence ($M = .19$, $SD = .18$). A 2 (level-of-belief: Believers versus Uncertains) \times 2 (evidence: one form of evidence versus multiple forms of evidence) ANOVA confirmed a significant interaction, $F(1, 56) = 4.95$, $p < .05$, demonstrating that exposure to multiple forms of concrete evidence had an especially powerful effect on the provision of Fantastic propositions among the Believers.

DISCUSSION

The results of this study replicate and extend the current literature by providing evidence of the impact of not only beliefs, but fantasy beliefs, on the autobiographical memory reports of 5- and 6-year-olds. Children who fully believed in the Tooth Fairy talked quite differently about what happened when they lost their last tooth than those who were uncertain about the existence of the Tooth Fairy or those who do not believe in the Tooth Fairy's reality. Consistent with previous research (e.g., Elischberger, 2005; Ornstein et al., 1998), the children's beliefs exerted both beneficial and detrimental effects on their memory reports. The children with the strongest beliefs in the Tooth Fairy generated the most voluminous and complex narratives about losing their last tooth. However, those with firm beliefs also provided the most fantastic accounts, frequently peppered with claims of hearing or seeing the Tooth Fairy—a nonreal but expected entity. Interestingly, the children's degree of belief did not affect the accuracy of their descriptions of the mundane elements of their tooth loss, and many of the fantastic claims made by the children had some basis in reality. Further, exposure to seemingly tangible evidence of the Tooth Fairy's existence was linked with the provision of fantastic claims.

The more voluminous and complex reports of the Believers might be attributed to the fact that these children were less constrained to limit their reports to reality than either the Uncertains or the Disbelievers. The children with solid fantasy beliefs simply may have had more information than the others to recount—it likely takes more words to describe a magical fairy's visit than to relate how your parents replaced your tooth with a dollar. Likewise, the excitement of a visiting fairy, as

opposed to a mundane parental tooth/prize exchange, perhaps incited the Believers to repeatedly rehearse and consequently strengthen their memory for fantastic images as they ruminated about the fairy's visit or shared their story with others. Further, these findings are in line with studies in the suggestibility literature that show that beliefs engendered by false suggestions from others can boost the volume and complexity of children's accounts (Bruck et al., 2002; Poole & Lindsay, 2001; Principe & Ceci, 2002; Principe et al., 2006). However, such demonstrations have been limited to mundane beliefs, such as a classroom visitor who is clumsy or a missing rabbit that is loose in the school. The current findings extend extant work by revealing that fantasy beliefs (presumably also originating in false suggestions from others) also can augment the volume and complexity of children's accounts.

In addition to group differences in structure, the children's accounts also varied in terms of content. During the memory interview, all of the children reported participating in at least one traditional ritual associated with the Tooth Fairy. Despite this evidence among the Disbelievers of playing along with the fantasy, these children largely centered their reports on the mundane events surrounding their tooth loss rather than on the myth. Importantly, the Disbelievers' general exclusion of fantastic details was not due to a lack of participation in ritualized behaviors or a decreased exposure to tangible evidence in support of the myth. Consistent with the findings reported in prior work (Prentice et al., 1978; Prentice & Gordon, 1986; but see Woolley et al., 2004), parental support to believe was equivalent among belief groups. Further, the Disbelievers did not exhibit a general disbelief in fantasy figures (for similar results, see Prentice et al., 1978; Prentice, Schmechel, & Manosevitz, 1979); rather, their incredulity appeared specific to the Tooth Fairy. In contrast to the mundane reports of the Disbelievers, the Believers related a good deal of supernatural occurrences, as nearly half of their accounts were made up of fantastic details consistent with the myth. Exposure to multiple forms of concrete evidence was linked with an increase in reports of fantastic events among only the Believers, suggesting that exposure to tangible evidence in support of a believed-in fantasy may augment constructions in line with the fantasy. Interestingly, most (88%) of the codable fantastic statements made by the Believers were partially accurate, that is, triggered by real events known to their parents but interpreted in ways consistent with children's fantastic expectations. Thus, many of the fantastic constructions made by the Believers reflected misinterpretations of actual experiences rather than entirely original fabrications. However, about half of the Believers' fantastic statements were not scorable for accuracy (because they could not be confirmed or contradicted by their parents), suggesting that a good deal of their fantastic reports was due to unknown sources, likely both external (e.g., a sibling or a television program) and internal (e.g., a dream or a wish). The Uncertains reported proportionally fewer fantastic details than the Believers, but more than the Disbelievers, indicating that children wavering between belief and disbelief in a fantasy are still somewhat prone to make supernatural claims.

One of the most intriguing findings to emerge from this work is that many of the Believers and some of the Uncertains reported actually hearing or seeing the Tooth Fairy. Admittedly, the frequent reports of hearing and seeing this fantastic entity is in contrast to studies of reality monitoring in both children and adults (e.g., Johnson, Foley, Suengas, & Raye, 1988; Sluzenski, Newcombe, & Ottinger, 2004) that indicate that memories for imagined events rarely contain perceptual information. However, the high levels of partial accuracy in the children's fantastic statements suggest that some of the claims of hearing and seeing were not entirely imaginary but rather based on misinterpretations of real events as generated by the Tooth Fairy. The more extensive exposure to concrete evidence in favor of Tooth Fairy's existence among those who recalled seeing her relative to those who made no such claims also suggests that seemingly tangible support for a fantasy belief may be a key factor in producing memories of seeing things consistent with one's fantastic expectations. It seems possible that children exposed to more extensive concrete evidence in support of a fantasy may be more likely to attribute ambiguous sights (e.g., a shadow under the bedroom door or a light outside the bedroom window) and sounds (e.g., a creaking of the stairway or a voice in the hallway) to entities supposed by the fantasy.

Why was the effect of belief in the Tooth Fairy on the children's reports so strong when a large body of research provides convincing evidence that children as young as 3 have the basic ability to distinguish between fantasy and reality? As alluded to above, the answer may have to do with the fact that these children are immersed in a culture that endorses their belief in the reality of fantastic figures, such as the Tooth Fairy, the Easter Bunny, and Santa Claus. The results of this study also demonstrate the potent role of tangible evidence that could be interpreted in support of the existence of these figures, such as the fairy dust found on the windowsill where the Tooth Fairy purportedly made her exit or the crumbs found on the plate that once held cookies left out for Santa. Further, frequent mixing of true and fantastic elements in the children's reports highlights the notion that children's accuracy is not all or none. For instance, even though the Believers reported high levels of fictitious details, the portions of their reports reflecting mundane occurrences were described with much accuracy. Thus, these data demonstrate that even though fantasy beliefs may induce outlandish claims, the presence of fantastic details does not automatically signal that an entire report should be regarded as erroneous.

Despite the collective evidence of the role of fantasy beliefs on memory, a limitation of the current work stems from the fact that level of belief was not experimentally assigned. Indeed, the conclusions of this study would be strengthened by a design that manipulated belief by inducing a fantasy rather than relying on an already established belief. Additional work also is needed to determine whether belief differences in children's reports are specific to events involving the Tooth Fairy or extend beyond this fantasy figure to descriptions of other sorts of experiences. For instance, although the Believers did not exhibit an elevated rate of general be-

lief in fantasy figures, a more precise measure might reveal that they are more credulous only in certain types of fantastic entities or processes and consequently are more receptive to interpreting other specific sorts of occurrences in a supernatural manner. Further, questions remain as to how long children with firm beliefs in the Tooth Fairy will maintain their memories of fantastic experiences involving her. Clearly, once children understand that the Tooth Fairy is not real, they will realize that any memories involving her must be false. Greenhoot's (2000) study on changes in beliefs about realistic events suggests that a dissipation of fantasy beliefs would lead to reconstructive changes in memory in line with the new, realistic understanding of the tooth/money exchange.

Another important issue concerns the processes that mediated between belief in the Tooth Fairy and fantastic recall. Given that inferential reasoning is conceptualized as a major factor by which knowledge exerts its effects on memory, some portion of the children's fantastic reports likely reflected inferences about what must have happened following the tooth loss. As stated above, however, the relatively high levels of partial accuracy of fantastic statements suggest that many of the supernatural reports stemmed from misinterpretations of real events (e.g., a sleepy look in the darkness at a parent replacing a tooth with a prize) as involving the Tooth Fairy. Still other fantastic claims likely reflected source monitoring errors, such as misremembering a parental statement (e.g., the Tooth Fairy has wings) as a real occurrence or misattributing a hoped-for event (e.g., seeing the Tooth Fairy turn a lost tooth into a star) as an actual experience. Lastly, the children's claims of hearing and seeing the Tooth Fairy suggest that some of the children formulated memories of phenomenal experiences involving her. Despite these multiple routes to unwitting errors, some unknown portion of the children's fantastic claims may have been due to pretense. Considering the nature of the event being asked about, some of the children may have viewed the interview as an invitation to indulge in pretend play about the Tooth Fairy. Others may have misinterpreted specific questions such as, "Did the Tooth Fairy leave a prize under your pillow?" in terms of pretense: "Did you pretend that the Tooth Fairy left a prize under your pillow?" Although additional work is needed to tease apart these various processes, the current findings are consistent with the constructivist perspective that children's beliefs—both real and fantastic—are linked with what children can remember and report about their experiences.

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