

# Depicting a Protagonist's False-belief in the Frog Story: An Investigation of Linguistic and Evaluative Strategies Used in Written and Oral Narratives

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# Depicting a Protagonist's False-belief in the Frog Story: An Investigation of Linguistic and Evaluative Strategies Used in Written and Oral Narratives

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**Abstract :** This series of three studies investigates the narrators' mental state references by linguistically depicting the protagonist's false-belief in the frog story. Study 1 compared the proportion of participants who made explicit false-belief references in their narratives, which were produced in written or oral formats. No difference was found in the proportion of people who made explicit false-belief references between the two formats. Study 2 examined the participants' awareness of the protagonist's false-belief using a questionnaire. An analysis of the answers to the questionnaire found that the participants were aware of the protagonist's false-belief, and this included those that did not make an explicit false-belief reference in their narratives. Study 3 compared linguistic strategies used to narrate the frog story between those who made explicit false-belief references and those who did not, and found that people who made explicit false-belief references used significantly more evaluative strategies, such as mental state references throughout their story.

**Keywords :** Theory of mind, narrative, Frog Story, Japanese language, mental state language

## 1. Introduction

Narratives are constructed from a sequence of events presented in a temporally- and causally-related manner. More specifically, Labov and Waletzky (1967) define narratives in terms of referential and evaluative functions. Referential functions depict events and actions of protagonists in the story plot, and evaluative functions serve to infer the mental states of protagonists and possible causal relationships between events. Evaluative functions in narratives have been examined by Aksu-Koç and Tekdemir (2004) in relation to how a protagonist's false-belief was depicted when narrating a picture storybook, titled *Frog, where are you* (Mayer, 1969). This storybook is about a boy and his dog, who go into the woods to look for their missing frog. Various aspects of narratives based on this picture book have been studied extensively (Strömqvist & Verhoeven, 2004). The present study focused on one of the sub-plots, where the boy protagonist mistakes a deer's antlers for a tree

branch. According to Strömqvist and Verhoeven (2004), this episode involves a specific sub-plot that places a demand on the narrator's epistemological operation at an advanced level of theory-of-mind.

In their study, Aksu-Koç and Tekdemir (2004) maintain that mature narrators make good use of these functions by adopting the different perspectives of the author and protagonists, and that this perspective shifting rests on the understanding of other people's mental states and connecting causal links between their beliefs and reality. They examined how the narrators identify the protagonist's misrepresentation based on the same scenes, for developmental changes and cross-linguistic differences. They found significant developmental changes between 3 and 9 year-old children and adults for the strategies used in the misrepresentation scenes. However, there was no explicit linguistic statement of the misrepresentation until the children were 9 years old.

They also examined cross-linguistic differences

between English and Turkish speakers. Their analyses of oral narratives found that 73% of Turkish-speaking and 60% of English-speaking narrators made explicit references to the protagonist's misrepresentation of reality- which was the false belief. They hypothesised that as Turkish has a specific verb for encoding misrepresentation, Turkish narrators would be more likely to depict the misrepresentation linguistically. Although the proportion of narrators who depicted the misrepresentation is higher for Turkish than for their British counterparts, this difference was not significant. The specific linguistic device for encoding false-belief in Turkish does not appear to facilitate a linguistic mentioning of the misrepresentation.

One of the developments of theory of mind entails the understanding of false-belief that is achieved by 5-year-olds universally. In this respect, we assume that 5-year-old children can understand the misrepresentation scenes in this picture book. However, children did not make references to false-beliefs in their narratives until they were 9 years old. This discrepancy in development indicates that when telling a story, one needs the linguistic means to represent what one has perceived.

However, the performance may not just be a matter of linguistic ability. For example, adults who have a full-blown theory of mind understanding also shows limits in their theory-of-mind performance (Keysar, Lin, & Barr, 2003). Although the proportion of adults who made explicit references to the protagonist's misrepresentation was higher than for the children, the figures suggest that not all adults, who are probably well aware of theory-of-mind (i.e. people can have false beliefs) made explicit false belief references.

This study examines why a certain proportion of narrators do not make an explicit reference to the protagonist's mental state. Recent research has shown that there are limits to adults' theory-of-mind performance (Keysar, Barr, Balin, & Brauner, 2000; Keysar et al., 2003), indicating that an adults' ability to interpret another's action may not manifest itself in their performances.

Keysar et al. claim that the theory of mind is not fully incorporated into the human comprehension systems in social communication, even for adults, suggesting that transforming their reflective ability to impute their knowledge to another's spontaneously in real-world situations may not always be reliable.

To better understand this dissociation, a series of three studies were conducted to try to discover why some adults do not make explicit mental state references in narratives with regards to different forms of narrative production and individual differences in evaluative strategies used in narrating a story.

Study 1 examined oral and written narratives in Japanese that depicted the same story (the Frog story) used by Aksu-Koç and Tekdemir. As for the different representation medium, writing entails strategies that make explicit connections between foreground and background information in narratives using lexicalisation and syntactic structures, whereas speaking relies on context and maximal meanings and connective relationships between foreground and background that are implied rather than stated (Tannen, 1982). Thus it is possible to assume that narratives in writing and speaking entail different linguistic strategies.

We hypothesised that different methods of producing a narrative would place different demands on the narrators when implicit awareness of false-belief in cognitive systems are transformed into linguistic forms, such as writing and speaking. This cognitive load in representing a coherent story may lead to a difference in the extent to which the false-belief is depicted linguistically. Thus, we hypothesised that when the story was depicted in written narratives, adults maybe more likely to make linguistic references to the protagonist's mental state. In the present study, we examined narratives produced by female adults, because females such as mothers tend to be the most studied group for tasks such as narrating a picture book for children and were thus regarded as a relevant population for narrating the Frog Story.

## Study 1

To test the hypothesis that adults are more likely to make explicit mental state references when the story was depicted by written narratives, we set two different tasks. Oral and written narratives of the picture storybook *Frog, where are you* (Mayer, 1969), were compared and the proportion of mental state references to the protagonist's false-belief in these narratives were analysed.

## 2. Method

### 2.1. Participants

86 adult females participated in this study. 48 university students ( $M_{\text{age}}=20.4$ ,  $SD_{\text{age}}=.67$ ) undertook the written narrative session, and 20 university students ( $M_{\text{age}}=21.3$ ,  $SD_{\text{age}}=.44$ ) and 18 mothers ( $M_{\text{age}}=26.3$ ,  $SD_{\text{age}}=1.88$ ) undertook the oral narrative sessions. The students for both sessions were recruited from psychology courses and were given a course credit and the mothers were recruited from mother and toddler groups. They received a book token for their participation.

### 2.2. Procedure

The participants were asked to narrate a story following the pictures in the storybook *Frog, where are you?* They were instructed to construct a story for children. The written narrative sessions were administered in groups, whereas the oral sessions took place individually and the oral narratives were recorded. The instructions were the same for all sessions. Participants were asked to look through the pictures of the storybook until they grasped the storyline and to narrate the story when they were ready. No time constraint was made. Written narratives took about one hour, whereas oral narratives took between 10 and 20 minutes. Oral narratives were transcribed prior to coding.

### 2.3. Coding

To assess whether a narrative included the protagonists' false-belief (FB) references about the misrepresentation plot, where a boy mistakes a deer's antlers for a tree branch, which leads to an encounter with the deer, references to the following were considered (Aksu-Koç & Tekdemir, 2004):

1) tree branch and deer's antlers, 2) describing the protagonist's mental state when mistaking the deer's antlers for tree branches by using mental state terms, such as 'thought', 'surprised' and 'mistook', and other constructions, 'in fact' and 'it turned out that'; and 3) the unintentional nature of the boy's encounter with the deer. Taking account of these three criteria, a final coding was made as to whether each narrator made an explicit reference to the protagonist's misrepresentation. Agreements of two independent coders were 98% for written narratives and 97% for oral narratives. Any disagreements were resolved by discussion. Examples of explicit references to the protagonist's false-belief are as follows:

Example 1 (written narrative with misrepresentation)

*Otokonoko ga sakebuto, fuwarito karada ga ukiagari, doujini shika ga sugata o arawashi mashita. Douyara, eda dato omotte-ita no wa shika no tsuno datta yodesu.*

'When the boy called out the name of his frog, the boy was lifted by the deer which had appeared. What the boy believed to be a tree branch was actually the deer's antlers.'

Example 2 (oral narrative with misrepresentation)

*Suruto, ki dato omotte-ita mono wa shika no tsuno deshita.*

'What he thought to be a tree branch was the deer's antlers.'

Example 3 (written narrative without misrepresentation)

*Kaeru o sagashiteiruno? Totsuzen kikoeta koeni otokonoko wa bikkuri.*

'Are you looking for a frog? The boy was surprised to hear the deer's voice.'

Example 4 (oral narrative without misrepresentation)

*Totsuzen shika ga arawarare mashita.* 'Suddenly a deer appeared.'

## 3. Results and Discussion for Study 1

The number of narratives that included explicit references to the protagonist's false-belief (FB) was counted (Table 1). 58% of the written

Table 1. The number of narratives that included explicit FB and no explicit FB references in written and oral narrative sessions

Narrative session	Written	Oral		
	Students (N = 48)	Students (N = 20)	Mothers (N = 18)	Total (N = 38)
Explicit FB reference	28	10	6	16
No explicit FB reference	20	10	12	20

narratives, 50% of the students' oral narratives and 33% of the mothers' oral narratives, made explicit references to the false-belief. Although the proportion of written narratives that made explicit false-belief references was greater than those for oral narratives, this difference was not significant:  $\chi^2(1)=2.24, p>.1$ . This result was the same when written and oral narratives were compared for the students' data only:  $\chi^2(1)=0.398, p>.1$ , or compared for the three groups:  $\chi^2(2)=3.29, p>.1$ .

These results suggest that the ways of narrating the story did not make a significant difference to the proportion of narratives that made explicit references to the false-belief.

As written and oral narratives differ in the cognitive processing required to representing a story (Tannen, 1982), it is likely that oral narratives place a greater demand on the narrator to produce a coherent story. Thus we hypothesized that oral narratives, which do not allow as much thinking time as written narratives, are more likely to omit the protagonist's misrepresentation that requires an interpretation based on a series of scene illustrations given in the picture book. Despite finding no significant difference, the absolute figure for the proportion of explicit FB references in written narratives was higher than for oral narratives. This may suggest that the difference in task demand may have affected the performance in depicting the protagonist's misrepresentation, and also the mentalizing process.

Were the people who did not make an explicit FB reference actually aware of the FB? An absence of explicit references in the narratives does not necessarily indicate a failure to understand the protagonist's false-belief. As Keysar et al.

(2003) showed, adults often fail to utilize spontaneously their fully-fledged theory of mind understanding when interpreting actions in social situations. To clarify the narrators' mentalizing process, it is important to examine the narrators' interpretation from a different perspective. To examine the participants' mentalizing process, Study 2 investigates the narrators' implicit level of awareness of the protagonist's FB through a separate questionnaire that asks the participants about their interpretation of the story.

## Study 2

Study 2 examined the participants' interpretation of the misrepresentation plot, reflectively. This examination aimed to uncover whether the absence of explicit references about the protagonist's false-belief (FB) in the narratives was due to a lack of spontaneous interpretation of the protagonist's mental state or just a lack of linguistic references in the narratives. If the narratives that did not make explicit FB references were due to the narrator's lack of spontaneous interpretation, then their responses to interpretation questions would differ from those narrators who made explicit FB references.

As Study 1 found no significant differences between oral and written narratives in relation to explicit references to the protagonist's false-beliefs, the majority of narratives collected in Study 2 were in the written format, which was followed by a questionnaire, as this was a more efficient method for collecting a large narrative sample. A small sample of oral narratives was also obtained to verify that oral narratives replicated the results found for the written narratives.

#### 4. Method

The method for collecting narrative data was the same as for Study 1, except for the administration of a questionnaire after the narratives were collected.

##### 4.1. Participants

112 adult female university students ( $M_{age}=20.2$ ,  $SD_{age}=.57$ ) from a psychology course ( $N=27$ ) and early years education course ( $N=85$ ) who did not participate in Study 1 were asked to participate in Study 2. An additional 16 oral narratives were obtained from psychology students ( $M_{age}=20.00$ ,  $SD_{age}=.36$ ) who did not participate in any of the previous sessions. All students were given a course credit for their participation.

##### 4.2. Procedure

Written narrative sessions were conducted using the same procedures as for Study 1. At the end of the sessions, the participants were asked about their interpretation of the scenes in the picture book. A questionnaire was handed out after the narratives had been collected so that their answers to these questions would be based on their interpretation rather than what they wrote. The main purpose of a questionnaire was to check whether or not the narrator was aware that the protagonist had mistook the deer's antlers for tree branches, without directly asking this question.

There were eight questions in the questionnaire. In the instructions, the participants were told that the purpose of the questionnaire was to clarify their interpretation of the story. There were no right or wrong answers and they should respond with yes/no according to their interpretation of the pictures. Of the eight questions, three were critical questions related to the misrepresentation scenes. The other five filler questions were included so that the intention of the questionnaire did not appear to focus specifically on the misrepresentation plot. The key questions for the misrepresentation plot were: CQ1) Was the deer at the scene when the boy climbed up the hill? CQ2) Did the boy know that the deer was nearby? ; and CQ3) Did the boy intend to climb on to the deer's head? (see Appendix for all questions). These

questions were used to check that the narrators' interpretations were in congruent with the knowledge required to make the FB interpretation. To enable the FB interpretation, the narrators should have responded to the critical questions as: 1) the deer was at the scene when the boy climbed the hill (YES); 2) the boy did not know that the deer was nearby (NO); and 3) the boy did not intend to climb on to the deer's head (NO).

The narratives were coded in the same way as for Study 1 to identify an explicit reference to the protagonist's false-belief. The agreement between two independent coders was 89% for the written narratives, and 88% for the oral narratives.

#### 5. Results and discussion for Study 2

Coding of the written narratives for an explicit reference to the protagonist's FB revealed that 55 (49%) narratives: 19 (70%) of the psychology students, and 36 (42%) of the early years students included an explicit FB reference, whereas 57 (51%) narratives: 8 (30%) for psychology students, and 49 (58%) of the early years students did not include an explicit reference. The participants' responses to the critical questions were analysed. The proportion of the participant whose answers indicated that they understood the false-belief interpretation was tabulated in Table 2. As the proportion that made explicit references to the protagonist's FB differed significantly across the students' study disciplines:  $\chi^2(1)=6.44$ ,  $p=.011$ , the analyses were conducted for each study discipline group. The number of students that answered all three critical questions (All CQs) correctly is also tabulated.

To examine if the participants who made explicit references to the protagonist's FB in their narratives were more likely to answer all three critical questions in such a way that corresponds with the FB interpretation, this proportion was compared between the groups. The chi-square tests revealed that there were no significant differences in the responses between those who did and did not make explicit FB references in their narratives: All participants:  $\chi^2(1)=0.88$ ,  $p>.1$ ; psychol-

Table 2. The proportion of participants who provided responses that matched the false-belief interpretation

Total participants (n=112)	CQ1	CQ2	CQ3	All CQs
No explicit FB reference (n=57)	0.74	0.95	0.95	0.68
Explicit FB reference (n=55)	0.76	1.00	0.98	0.76
Psychology (n=27)				
No explicit FB reference (n=8)	0.88	1.00	1.00	0.88
Explicit FB reference (n=19)	0.89	1.00	1.00	0.89
Early years education (n=85)				
No explicit FB reference (n=49)	0.71	0.94	0.94	0.65
Explicit FB reference (n=36)	0.69	1.00	0.97	0.69

ogy students:  $\chi^2(1)=0.68$ ,  $p>.1$ ; and early years education students:  $\chi^2(1)=0.16$ ,  $p>.1$

These results suggest that the participants were aware of the protagonists' false-belief, but did not always linguistically depict it in their narratives.

To verify whether this finding could be replicated for oral narratives, 16 additional oral narratives were analyzed. The analyses of the oral narratives confirmed that whether or not an explicit FB reference had been made in the narrative, that this was independent of the answers to the critical questions. 68% of these students made explicit FB references in their oral narratives and 32% did not. 64% and 60% respectively correctly answered all three critical questions:  $\chi^2(1)=0.87$ ,  $p>.1$ .

To summarize the present findings, the absence of linguistic references to the protagonist's FB did not indicate an absence of awareness, and this was independent of the method used to produce the narratives. These results suggest that even though adults are generally aware of the protagonist's mental states in a story, they do not always make this explicit using linguistic means. What would make the adults more likely to make a linguistic representation of the false-belief? One possibility is the use of strategies in producing narratives. Although developmental aspects of linguistic strategies in narrating the Frog story have been well reported (Bamberg & Damrad-Frye, 1991; Küntay & Nakamura, 2004) little is known about the individual differences in this area for adults. As for the individual differences it is possible to hypothesize that the narrators who tend to make linguistic references to the mental state of protagonists may be

more likely to depict the protagonist's FB linguistically. To test this hypothesis, Study 3 examined the linguistic strategies used to narrate the entire Frog Story based on the coding scheme used by Küntay and Nakamura (2004).

### Study 3

This study compared the narrators' linguistic strategies in relation to explicit references to the protagonist's FB in the key plots. It was anticipated that the narrators who made explicit references to the protagonist's FB would tend to use more linguistic strategies to elaborate on other events. Particularly, this tendency could lead to the use of such strategies as *frames of mind*, which include expressions of the mental states of the protagonists in relation to the events.

## 6. Method

### 6.1. Participants

Written narratives were obtained from 171 female university students ( $M_{age}=20.17$ ,  $SD_{age}=.80$ ) from a psychology course ( $N=82$ ) and an early years education course ( $N=89$ ). The students were given a course credit for their participation. The narratives of 48 psychology students from Study 1 were included to create a balanced sample across the two study disciplines.

### 6.2. Procedures

The written narratives were obtained in the same way as for Study 1. The narratives were coded for explicit references to the protagonist's FB and for linguistic strategies that comprised 7 categories based on the work of Küntay and

Table 3. The means and standard deviations for the frequency of use of the categories of linguistic strategies

	No Explicit FB (n =80)		Explicit FB (n=91)	
	Psychology	Early years education	Psychology	Early years education
	(n=34)	(n=46)	(n=48)	(n=43)
Frames of mind	8.29	6.85	10.92	8.07
	5.56	3.93	6.53	4.57
Hedges	2.00	3.33	2.58	3.26
	2.04	4.03	2.45	3.30
Negative qualifiers	5.97	4.63	6.73	5.67
	3.51	2.66	3.66	2.95
Character speech	16.41	18.41	14.81	16.86
	11.50	11.15	13.35	12.85
Causal connectors	5.59	3.00	6.77	4.98
	3.81	2.24	4.03	2.70
Enrichment expressions	10.65	8.76	13.02	11.74
	5.84	4.91	7.22	5.62
Onomatopoeia	7.53	11.98	7.23	10.26
	5.90	8.20	8.13	6.89

Nakamura (2004). These are *frames of mind*: expressions of the mental states of the characters; hedges: linguistic devices used to signify a narrators epistemological state on the true value of the proposition expressed; *negative qualifiers*: expressions for a negation of a state or an action that might arise from the discrepancy between reality and a narrators' expectation; *character speech*: direct statements made in a speech-like form on behalf of a character; *causal connector*: use of certain sentence structures to inform a causal framework between the events in a narrative; *enrichment expressions*: adverbial phrases and intensifiers to elaborate the depiction of state and action; and *onomatopoeia*: a sound symbolic device to indicate the vividness of sound or movement. Agreement for coding the explicit references to the protagonist's FB were 95%. For the linguistic strategies, two coders coded 25% of the narratives and Cohen's kappa reached .91. Any disagreements were resolved by discussion.

### 7. Results and Discussion for Study 3

The number of narratives that included explicit references to the protagonist's false-belief (FB) was counted for both psychology and early years education students, and no group difference was

observed:  $\chi^2(1)=1.79, p>.1$ ; 58% of psychology students and 48 % of early year education students made explicit references to the protagonist's FB.

Frequency measures were used to analyze the linguistic strategies used to narrate the story. The means and standard deviations for the frequency of use for the categories of linguistic strategies were computed (Table 3).

The distribution of data did not meet normality assumptions. Therefore it was transformed for further analyses. A MANOVA was used to examine the explicit FB references, with the students study discipline as an independent variable and the frequency of the 7 linguistic strategies as dependent variables. It showed a significant multivariate effect for the linguistic strategies as a whole in relation to the FB reference: Pillai's Trace (7, 161)=2.48,  $p=.019$ , partial  $\eta^2=.097$  (FB reference > no FB reference) and for the students study discipline: Pillai's Trace (7, 161)=5.46,  $p<.001$ , partial  $\eta^2=.19$  (psychology > early years education). There was no significant interaction between these effects.

With respect to individual strategy use, the FB reference effects were found for *frames of mind*:  $F(1, 167)=4.86, p=.029$ , partial  $\eta^2=.028$ , *negative qualifiers*:  $F(1, 167)=4.79, p=.040$ , partial  $\eta^2=.025$ ,



*causal connectors*:  $F(1, 167)=12.85$ ,  $p<.001$ , partial  $\eta^2=.071$ , and *enrichment expressions*:  $F(1, 167)=7.61$ ,  $p=.006$ , partial  $\eta^2=.044$ . The student's study discipline effects were found for *frames of mind*:  $F(1,167)=5.56$ ,  $p=.020$ , partial  $\eta^2=.032$ , *negative qualifiers*:  $F(1, 167)=4.79$ ,  $p=.030$ , partial  $\eta^2=.028$ , *causal connectors*:  $F(1, 167)=17.43$ ,  $p<.001$ , partial  $\eta^2=.094$ , and *onomatopoeia*:  $F(1, 167)=14.30$ ,  $p<.001$ , partial  $\eta^2=.079$ . A significant difference in the use of onomatopoeia was found in the opposite direction (psychology < early years education).

These results suggest that those who made explicit FB references generally used more *frames of mind*, *negative qualifiers*, *causal connectors* and *enrichment expressions* throughout their narratives. As expected, the linguistic strategies used to narrate the frog story differed in quantity between the two groups of students with respect to making explicit FB references.

## 8. General discussion

The three main findings from this series of studies are: Firstly, the ways of representing the frog story, either by writing or speaking, did not significantly change the proportion of narratives that made explicit references to the protagonist's false-belief. Secondly, regardless of their linguistic references to the protagonist's FB, most of the narrators were implicitly aware of the misrepresentation scenes when their interpretations were clarified using a reflective questionnaire. And lastly, those who made explicit FB references also used significantly more linguistic strategies when narrating the story, in comparison with those people who did not make explicit FB references.

The lack of differences between written and oral narratives in relation to the degree to which one would make explicit FB references may be explained by a several factors. The first is that the story narrated in this study may be far too simple to require differential cognitive demands. The various plots in the story involve similar events, such as searching for the missing frog, and these events occur repeatedly. This simple structure

might have caused the narrators in both written and oral formats to perceive each 'searching scene' as a routine event. Thus, such simple routine events in pictures lead to simple representations, which, resulted in no differential cognitive loads in narrating the story. Alternatively, given the finding that even the people who did not make explicit references to the protagonist's FB were aware of them when asked in a reflective way using a questionnaire, the participants who used the written format also made the assumption that such false-beliefs can be inferred, as frequently as the oral narrators (Tannen, 1982), because it is a simple story. The way of producing narratives may not always make a significant difference and this difference may be related to the material to be narrated.

Despite these explanations, why did some people fail to depict the FB while others succeeded to do so? A finding of adults' limit of spontaneous performance in a theory-of-mind task (the so called director's task) derived from very simple task that required an understanding of another person knowledge or false-beliefs. A 'director' who could not see all the objects or options asked the participant who could see everything to move an object. To make the correct move the participant needed to understand the director's perspective (Keysar et al., 2000; Keysar et al., 2003). Some of the participants' omission of explicit FB references in the simple frog story may be related to Keysar's findings. Keysar et al. (2000) argue that people initially use an egocentric heuristic which involves approaching a task from their own perspective, and then error correction takes place based on the mutual knowledge.

In our study, the participants might have failed to adopt the hypothetical hearer's (a child's) perspective in transforming their understanding of the misrepresentation scenes into linguistic representations. Because the goal of the present task was to narrate a story for a child, the extent to which one makes linguistic representations of what they understand, whether or not they take account of the hearer's perspective was left to the

participants. However, Keysar's task had a clear goal and expectation, yet some adults still failed to take the director's perspective. Thus it is not surprising that some people did not make explicit FB references in the narrative task.

Individual differences in the use of linguistic strategies in narrating a story could explain whether or not explicit FB references were made. The findings from Study 3 indicated clear differences in linguistic strategies between those who made clear FB references and those who did not. People who made clear FB references were more likely to use linguistic narrative strategies to elaborate a story. Individual differences in strategy use were also reflected in narrating the target plots in this study. Addressing whether or not such differences may be found in narrating other stories is beyond the present study; however for this frog story, individual differences in strategy use is one of the factors that explain the differences in depicting the protagonist's FB.

Another factor that might relate to individual differences is social groups. The findings from Study 3 indicate that there are differences in linguistic strategy use between the groups of students that study different disciplines. This finding might suggest possible group differences that could exist in relations to gender, occupation and possibly interpersonal orientation (e.g. empathy quotient-systematized quotient: Wakabayashi, A., Baron-Cohen, S., & Wheelwright (2006)). Albeit not necessarily mutually exclusive, personal experiences such as reading fictional literature may also related to individual differences. Reading literary fiction, which involves a narrator taking a protagonist's perspective, has been reported to enhance the theory of mind performance (Kidd & Castano, 2013), suggesting that individual differences in perspective-taking skills is malleable. Further examination of individual differences in narrators' evaluative strategies could provide a new window into understanding the relationship between linguistic representations of mind and mentalizing ability in adulthood.

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#### Appendix

Please provide your interpretation of the Frog story by answering (yes/no) to the following questions.

1. In the morning, was the boy surprised to find out that his frog had disappeared from the jar?
2. Did the boy know where the frog had gone?
3. Did the boy want to ask a mole where his frog was?
4. Was the deer at the scene when the boy climbed up the hill?
5. Did the boy know that the deer was nearby?
6. Did the boy intend to climb on to the deer's head?
7. Did the boy take his frog back home?
8. Did the boy take a different frog back home?

## Frog Story の語りにもみられる誤信念の描写 —語り手が用いた評価方略の分析—

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### 要 旨

3つの研究において、Frog Story の語り手が用いた語りの評価方略を心的状態語への言及に注目して分析した。研究1では、書き言葉と話し言葉の2つのフォーマットによって産出された語りを分析し、誤信念への言及の割合を比較したところ、書き言葉・話し言葉・話し言葉によって誤信念への言及は異なることが明らかとなった。研究2では、語りの直後に、語り手が主人公の誤信念に気づいていたかを確認する質問への回答をもとめたところ、語り手は、主人公の誤信念に気付いていたにもかかわらず、語りにおいて、明確な言語表現を用いなかったことが明らかとなった。研究3では、語りにおいて主人公の誤信念への言及を行なった語り手とそうしなかった語り手の語りに用いた評価方略の比較をしたところ、誤信念を言及した語り手グループは、語り全般において、心的状態語を頻繁に用いることが明らかとなった。

キーワード：心の理論、ナラティブ、Frog Story、日本語、心的状態語