

How many mental state words can be elicited from the “Frog story”? An analysis of narratives written in Japanese

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Abstract: The present study examined written narratives in Japanese elicited from the ‘Frog Story’ with a particular focus on mental state references. Unlike most research that analysed evaluative comments on clauses, the present study is new in the following aspects: 1) analyses were made after narratives were broken into morphemes, which are the smallest meaningful unit of a word and 2) the variety and frequency of word use were identified and evaluated to describe the characteristics of Japanese narratives. The results indicated that Japanese students used a wider variety of mental state words than non-mental state words. However, the frequency of mental word use was significantly less than that of non-mental state words. The results suggest that both indices may be useful for describing and evaluating narratives when studying narrative from developmental and cross-linguistic perspectives.

Key words: Narratives, Japanese, frames of minds, mental state references, Frog Story

Narrative is defined as a kind of discourse in which two or more events/happenings are described in sequence and extends to talk about personal experience, scripts and fictional stories (Hudson & Shapiro, 1991). According to Lavob and Waletzky (1967) the basic elements of a narrative are composed from i) referential components in which actual events are described and listed in sequential order; and ii) evaluative components, which refer to an outcome of behaviours and actions or to a particular mental state. To view these two elements more distinctively, Bamberg (1991) for example, reframed these from narrative orientations: linear orderly descriptions of events as the horizontal (temporal) axis and the evaluation of such events as the vertical

axis in a hierarchical order. Evaluative comments serve to provide each event and action with meaning and allow one to understand such events as an organised whole.

In narrative research, evaluative comments have been studied extensively from developmental and cross-linguistic perspectives. Many of the narrative studies (e.g. Bamberg & Damrad-Frye, 1991; Kuntay and Nakamura, 2004) focused on the evaluative comments because they reflect the narrator’s interpretations of the events and actions, such as inferring a protagonist’s intention and feelings, from their own emotional and subjective point of view (Nakamura, 2008). Numerous studies (Guo *et al.*, 2008) have reported that an ability to make evaluative comments will develop

with age and that from very early development, children use culturally appropriate strategies as a part of evaluative devices. Bamberg and Damrad-Frye (1991) examined narratives produced by 5-year-old and 9-year-old children and adults who were speaking American English, using five different types of evaluative devices: 'frames of mind', such as making reference to characters' emotional states, 'character speech', 'hedges', 'negative qualifiers' and 'causal connector'. They found that adults used more evaluative devices than children; three times as often as five-year-olds and two times as often as nine-year-old children. The major difference in types of evaluative devices across these three age groups was the frequency of 'frames of mind'.

Küntay and Nakamura (2004) also compared developmental changes in evaluative comments between Turkish and Japanese speakers. They found that Japanese four-year-old and five-year-old children used 'character speech' more than any other categories. However, seven-year-old children started to use more 'frames of mind' than 'character speech' and nine-year-olds used an 'enrichment device', such as the use of adverbial phrases, more than 'frames of mind'. In addition, in both cultures, culture specific trends were found in the development of narrative. For example, Japanese children used onomatopoeia or mimesis extensively as early as four-years-old, whereas Turkish children and adults tended to use evaluative remarks, which were the reflections about the events in the story from a narrator's subjective point of view.

As seen in these studies, how the frog story is narrated appeared to differ both developmen-

tally and cross-culturally. The cross-culture studies indicate how people construct evaluative comments in a culturally meaningful way. In other words, as Nakamura (2008) puts it, children are socialised to express affects using language within culturally-specific adult-child interactions at early ages and thus they come to use culturally appropriate ways of expressing and interpreting their emotions. In the same line of the study, Minami and McCabe (1995) and Minami (2002) found that parental narrative elicitation styles in Japanese appeared to be culturally specific in that mothers used discourse devices such as "ne" (you know), "un" (uh huh) or "huun" (well) extensively, which indicates that the listener is giving their attention or empathetic attitudes towards the speaker. Also Japanese mothers provided less evaluative comments explicitly. Such maternal interaction styles makes one to suppose that Japanese children's reference to the frames of minds of the protagonist may be less than their western counterparts. Bamberg and Damard-Frye (1991) speculated that such mental state inferences are not possible as these do not fall into the speaker's territory of information. Nevertheless, Nakamura's (2008) data suggests that this is not the case because a coder as a listener assumes and interprets these implicit expressions as being the mental state references.

The way in which narratives are interpreted seems to affect how much mental-state references are made. Of course, these judgements are meaningful and common practices in narrative research. However, it is also important to evaluate how many explicit mental-state words can be elicited from the frog story.

For this reason, the present study, by focusing at the level of morphemes, examines the extent to which explicit mental-state references in Japanese narratives are derived from the frog story. This analysis also intends to provide a basis for future narrative studies, especially those that are concerned with explicit mental-states terms in a context of cross-linguistic comparisons. Moreover, individual differences in narrative styles can be considered, particularly with reference to mental-state words, as existing studies on parental mental-state conversations have reported to have an impact on children's development of social understanding (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Symons, Fossum, & Collins, 2006; Taouapeau & Ruffman, 2006, 2008).

Method

Participants

Thirty-five female university students participated in the study. They were in their second year of a training course for nursery school teachers.

Material and Procedures

In order to elicit narratives, the wordless picture book *"Frog, where are you?"* authored by Mercer Mayer (Mayer, 1969) was used. This is called the "frog story" and is used extensively in narrative research. This story consists of 24 scenes in which a boy and a dog find that their frog had disappeared one morning and they went out in search of the frog. They encountered several animals in the wood before they finally found him.

The students were given a copy of frog story pictures, which were laid out in sequence, and were asked to look through them for 10 minutes. They were then given a paper to write down a story for this book as if they were going to read it to children. In order to ensure a minimum length for the narrative, they were asked to write a story which related to each page in the sequence. In this way, each student made at least one sentence-long narration for each scene, giving the frog story a minimum length of 24 sentences. The narrative writing took approximately 40 minutes.

Data analyses

The written narratives were typed in to a csv file using Excel software. This data file was then analysed for morpheme frequencies using the TTM (Tiny Text Mining) program (Matsumura & Miura, 2009).

In the full list of morphemes derived from the TTM analyses, those that were related to "frames of mind" and other perceptual behaviours were selected based on the coding scheme developed for the purpose of identifying mental state words. This coding scheme was modified from the original coding categories used by Tomouapeau and Ruffman (2006, 2008). The category of mental state words consists of words that are related to desire, emotion and cognition. The category of non-mental words includes physical state words, physical state emotion and visual and auditory perception words. Some examples for these categories are given in Table 1.

Table 1. Examples for the categories of mental/non-mental state words

Mental state words	
Desire	want, like, love, hope, wish, dream, prefer, keen on, hate
Emotion	(not) happy, (does not) look happy, (not) pleased, sad, scared, afraid, fear, disgust, surprise, angry, growly, grumpy, cross
Cognition	think, know, understand, recognise, satisfy
Non-mental state words	
Perceptual words	see, look, notice, hear, listen, seen
Physical state	hurt, ill, pain, sleepy, tired, hungry, thirsty
Physical state emotion	cry, smile, laugh, giggle

Results

All written text was first separated into morphemes and their types and frequencies were obtained using the TTM program. The frog story elicited 5,963 morphemes, which fell into the word classes of verb, noun, adjective and adverb, which composed the total data set. The most frequently used word is “kaeru (frog)” and those that are related to the names of the protagonists, a boy, a deer, a bee, a mole etc made up approximately 26% of the total number of morphemes. The total number of morphemes identified in individual students’ narratives varied between 80 and 295, the mean frequency of total morphemes was 170 with a standard deviation of 45.6.

The mental state words and the three other non-mental state words were then identified from the list of morphemes. There were 32 different mental state words, 16 different perceptual words, 8 different physical state words and one physical state emotion word; each category generated a total of 168, 313, 19 and 2 words, respectively. Means and standard deviations for each type of word derived from the students are summarised in Table 2 and Table

3.

The students’ narrative involved different mental-state words as twice as many as different non-mental words, such as perceptual words and physical state words. However, when their mean frequencies were compared, the students used significantly more non-mental state words than mental state words: $t(34)=7.03$, $p<.0001$. These data suggest that, in relative terms, the story elicits a larger variety of mental state words than non-mental state words within the range of psychologically related words.

Individual differences in the use of mental state and non-mental state words are considered next. As seen in Table 2 and Table 3, the mean frequencies for each category vary between 1 and 15 for non-mental state words and between 3 and 14 for perceptual words. Taking a total frequency of morphemes into account, proportion of mental state words, perceptual words and physical state words were calculated for each student. These indices were then used to examine individual students’ profiles and to group the students into similar clusters. A cluster analysis with a Ward method yielded three clusters.

Table 2. Means and standard deviations for mental state words used by the students (N=35)

Mental state word		Min.	Max.	M	SD
okoru	be angry	0	4	1.09	1.197
bikkuri	be surprised	0	4	0.91	1.173
omou	guess	0	2	0.57	0.655
odoroku	be surprised	0	1	0.29	0.458
shiru	know	0	2	0.26	0.561
ureshii	be happy	0	3	0.20	0.584
tanoshii	be happy	0	2	0.14	0.430
awateru	panic	0	2	0.14	0.430
shinpai	be worried	0	1	0.11	0.323
kangaeru	think	0	1	0.09	0.284
akirameru	give up	0	1	0.09	0.284
anshin	comfort	0	1	0.09	0.284
iyagaru	hate	0	2	0.06	0.338
kakunin	confirm	0	1	0.06	0.236
daisuki	love	0	2	0.06	0.338
hansei	reflect	0	1	0.06	0.236
obieru	be scared	0	1	0.06	0.236
tamageru	be astounded	0	1	0.06	0.236
keikai	be wary	0	1	0.06	0.236
kyoumi	be interested	0	1	0.06	0.236
komaru	be troubled	0	1	0.06	0.236
kowai	be scared	0	1	0.03	0.169
wasureru	forget	0	1	0.03	0.169
shinpaiso	look worried	0	1	0.03	0.169
shiru	know	0	1	0.03	0.169
yurusu	forgive	0	1	0.03	0.169
kanashimu	feel sad	0	1	0.03	0.169
ikari	anger	0	1	0.03	0.169
kikioboe	remember	0	1	0.03	0.169
hirameku	flash	0	1	0.03	0.169
yorokobi	be delighted	0	1	0.03	0.169
kanashii	sad	0	1	0.03	0.169
iyaso	look disgusted	0	1	0.03	0.169
Total		1	15	4.80	2.784

Table 3. Means and standard deviations for non-mental state words used by the students (N=35)

Perceptual words		Min.	Max.	M	SD
sagasu	look for	0	7	3.63	1.750
miru	look, see	0	4	1.29	1.017
kikoeru	hear	0	2	0.91	0.612
nozoku	look through	0	3	0.89	0.867
mitsukeru	find	0	4	0.66	0.968
kiku	listen	0	4	0.40	0.812
kiduku	notice	0	2	0.40	0.651
mitsukaru	be identified	0	3	0.29	0.622
nozokikomu	look into	0	2	0.11	0.404
urusai	be noisy	0	3	0.11	0.53
kigatsuku	notice	0	1	0.06	0.236
nagameru	view	0	1	0.06	0.236
tyuui	be careful	0	1	0.06	0.236
miataru	find	0	1	0.03	0.169
mieru	can see	0	1	0.03	0.169
mitsumeru	gaze	0	1	0.03	0.169
Total		3	14	8.94	2.807

Physical state words		Min.	Max.	M	SD
samasu	wake up	0	1	0.14	0.355
itai	pain	0	3	0.11	0.530
mezameru	awake	0	1	0.09	0.284
nemui	sleepy	0	1	0.06	0.236
tsukareru	tired	0	1	0.06	0.236
genkiso	look fine	0	1	0.03	0.169
sameru	awake	0	1	0.03	0.169
genki	fine	0	1	0.03	0.169
Total		0	3	0.54	0.741

In order to interpret the characteristics for each cluster, separate one-way ANOVAs for the proportions of mental-state words, perceptual words and physical state words were carried out. The results indicate that the three clusters differed significantly in their use of words relative to the other two clusters. Table 4 summarises the characteristic for each

cluster.

Cluster 1 included those students who used significantly more mental state words than the other two cluster groups, whereas the other two measures were not used as frequently as was found for cluster 2 or 3. Cluster 2 included the students who used significantly more physical state words whereas the

Table 4. Means and standard deviations (in parenthesis) for the proportion of each category for three cluster groups

	Cluster 1 (N=17)	Cluster 2 (N=12)	Cluster 3 (N=6)	<i>F</i>	<i>p</i> -value
Proportion of Mental-state words	4.11 (1.28)	1.78 (0.56)	1.60 (0.51)	25.88	<0.0001
Proportion of Perceptual words	5.21 (1.19)	4.46 (1.23)	7.88 (1.21)	16.59	<0.0001
Proportion of Physical state words	0.11 (0.22)	0.61 (0.42)	0.09 (0.21)	11.15	<0.0001

other two measures were not used as frequently as was found for cluster 1 or 3. Cluster 3 included the students who used significantly more perceptual words than the other two groups, whereas the other two measures were not used as frequently as was found for cluster 1 or 2.

Discussion

The present study examined 35 Japanese students' written narratives derived from the frog story and identified different types of morphemes used for narrating the story. Of particular interest was the use of mental state words relative to non-mental state words.

The variety of mental state and non-mental state words were examined first. The non-mental state words included perceptual words, physical state words and physical state emotion words. As we were interested in how many different morphemes can be elicited from the frog story, synonyms as well as

passive and active voices were counted as different words. From the students' narratives, 32 different mental state words were identified; this was larger than the variety of perceptual words, physical state words and physical state emotion words. These data suggest that Japanese written narratives of the frog story included a larger variety of mental state words. On the other hand, in terms of frequency, non-mental state words were used more frequently than mental state words. In the narrative research, commonly examined measures are the total frequency of particular categories. However, the present data suggest that frequency of word use is not the only index for describing narrative styles. Examining both variety and frequency of word use can be considered and may provide richer descriptions for analysing narratives from a cross-linguistic perspective. Contrary to a general belief that Japanese people do not refer to the mental state of the self and others as often as English-speaking people, a wider variety of mental

state words were identified in the present samples; this indicates that the breadth of expression is larger than that of non-mental state words. It is possible to say that individuals used different expressions when they refer to the protagonists' mental-states, whereas words referring to a non-mental state may be fixed to some extent across individuals. From a developmental perspective, some speculations can be made. For example, Nakamura (2008) and Kuntay and Nakamura (2004) indicated that changes in the proportion of a narrators' reference to the mental states of the protagonists (i.e. 'frames of mind') did not change between 4- to 9-year-olds. The lack of developmental changes during younger ages may be due the measurement that coded mental state words at a gross level rather than using measurements of variety and frequency of such word use. Thus, it is possible to speculate that if variety was taken into account, then 9-year-olds could show a wider variety of mental-state words than 4-, 5-, and 7-year-old children.

The present study also considered individual differences in using mental state words and non-mental state words. There appeared to be different cluster groups that differed in mental word users and non-mental word users. More specifically, a group of individuals who used mental state words significantly more frequently than the other cluster groups would be of interest for future studies to find what kind of other features they have in common in relation to their sensitivity to protagonist's mental states.

Adults making references to other people's mental state appeared to be important in

interacting with young children (de Rosnay & Hughes, 2006; Dunn et al., 1991; Symons et al., 2006). Given the current narrative samples derived from prospective nursery teachers who are interested in interacting with young children, the variability found in such a sample would suggest that there would be individual differences in maternal narratives of the frog story. Moreover, although the current study did not include cross-linguistic data, it may be very useful if any cross-linguistic comparisons were made in order to understand better Japanese referential features in mental state terms.

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