When Do Japanese-Speaking People Use Mental Verbs?

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Abstract：The present study examined situations in which Japanese-speakers use mental verbs to describe events. The experiment involved the participants viewing a series of video clips in which the main actress performed a series of actions, some of which lead her to holding false beliefs. The participants were assigned to one of two independent groups where they were either viewing the scenes with or without syntactic frameworks when describing the scenes. The participants' verb use in terms of types and frequency were compared between the types of scenes and the presence or absence of a syntactic framework. All the participants used proportionally greater mental verbs in the scenes that involved false-beliefs. However, when the two groups were compared, the participants with the aid of a syntactic framework used a greater proportion of mental verbs than those without syntactic frameworks. The implications for the findings are discussed in relation to the acquisition of mental verbs and the development of theory of mind.

Keywords：mental verbs, Japanese language, false beliefs, theory of mind

Introduction

A wealth of research has shown that mental verbs describing the inner states of others are harder to master than verbs describing actions. Although children begin to use action verbs in their second year of life (Bloom et al., 1975; Gentner, 1978), it is not until their third year that they engage in mental state talks using mental verbs such as know and think (Bartsch & Wellman, 1995; Bretherton & Beeghly, 1982). Why mental verbs are harder to acquire than action verbs is one of the challenging questions in language acquisition research. In child language literature, one camp hypothesized that the acquisition of mental verbs develops along with the development of mental state concepts known as theory of mind (Gopnik & Meltzoff, 1997). Thus, it is not until they approach the time of acquisition for theory of mind that they start to use mental verbs (Bartsch & Wellman, 1995). Alternatively, it is hypothesized that the mapping between in mental-state labels and their corresponding situations is harder than the mapping the labels of visible concepts such as physical movement (Gleitman, 1990). Thus it would require sufficient contextual and syntactic information to be available to serve as cues to the person in order to use mental verbs (Papafragou, Cassidy, & Gleitman, 2007).

In the recent analyses with adults and children, Papafragou et al. (2007) claim to have found strong support for the second hypothesis. They found that not only adults but also children are capable of using more mental verbs once they are equipped with syntactic frameworks that provide the participants with a structural guide to interpret the contexts that involve a protagonist's false beliefs. In their experiments, Papafragou et al. asked adult participants to view short silent films in which a main protagonist performs series of actions. One type of film involves a situation in which the protagonist holds a false belief because a change-of-state has occurred of which she is not aware: False Belief scenario. The other type involves a situation in which the protagonist performs a series of actions without holding a false belief: Action scenario. They compared the propor-

tion of different verbs used to describe the scenes between the FB and Action scenarios. Their initial comparative study did not find any difference in the production of mental verbs. However, when they created a condition in which the participants watched the film and had to guess the words needed to fit in with the syntactic frameworks that were given, they found that the cues from the syntactic structure (syntactic complement) enabled the participants to use more mental verbs in the FB scenarios when compared with the Action scenarios. This trend was also found in the experiment with 4 year-old children.

From these experiments, a syntactic framework for an English-speaking population seems to play an important role in the production of mental verbs. Could this finding be replicated in a language in which the use of syntactic complement is less common in conversational discourses? In their study, Nomura and Suzuki (2016) compared the acquisition of mental verbs in English and Japanese and found that Japanese mothers and their children used much less mental verbs in a form of finite complement. In a language culture where speakers have less frequent experiences of using finite complement structures in conversations, it may be that a syntactic framework may not provide critical cues necessary to promote the use of mental verbs. Nomura and Suzuki argue that a lower use of mental verbs in finite complements in Japanese conversations may have an impact on the development of Japanese children's theory of mind, the ability to impute other people's thoughts and beliefs, which may not reflect reality. An investigation into the influence of using mental verbs on a child's conceptual development in different language-speaking populations would help extend our understanding of how language and cognition are interrelated and influence each other.

There is supporting evidence for this relation in evidence that language use influences cognition differently in English and Japanese (Fausey, Long, Inamori, & Boroditsky, 2010). They found that English and Japanese speakers perceive and describe a change-of-state differently when the situation involved non-intentional events. For example, when the participants saw the scenes in which a balloon broke unexpectedly when the protagonist was inflating it, English-speakers used agentive expressions such as 'she broke the balloon', whereas the Japanese-speakers tended to use non-agentive expressions such as 'the balloon broke'. This preferential difference also caused differences in the participant's ability to remember the information regarding the agent of the action. English-speakers remembered agent information, such as what colour shirt she was wearing, significantly better than the Japanese-speakers. Further, when the English-speakers were primed with either agentive expressions or non-agentive expressions, those people who were primed with agentive-expressions showed significantly better memory about the agent in comparison with those who were primed with non-agentive expressions.

These findings suggest that language use influences human cognition. In Fausey et al., the priming manipulation was performed with the English-speaking group only. Thus, it is unknown if the same manipulation would change the cognitive performance of the Japanese-speaking group. Because of the difference in language use between English and Japanese as discussed above, the same manipulation may not result in the same effects. Thus, to extend our understandings of language and its effect on cognition, it is important to examine the case of the Japanese language. The present study, following the paradigm of Papafragou et al (2007) examines how the syntactic framework influences the speakers' interpretation of false belief contexts in the Japanese language.

The present study. The present study has three aims. The first aim is to compare the proportions of different verb use in FB scenarios and Action scenarios, which do not include FB. It is expected that the FB scenarios elicit more mental verbs than the Action scenarios in the perceiver's linguistic description of the scenes. The second aim is to compare the verb use in the FB scenarios under

two independent eliciting conditions. It is expected that the perceivers who received syntactic frameworks are more likely to use mental verbs than those who received free description instructions. The third aim is to compare how well the perceivers in the two conditions depicted the protagonist's FB. It is expected that the perceivers who received syntactic frameworks are more likely to refer to the protagonists' FB in comparison with those who received the free description instructions.

Methods

Participants. Seventy-two university students (M_{age}=18.42 SD=1.24) participated in this study. They received a course credit for their participation. Thirty-eight students were assigned to the scene only (SO) condition group and 34 students were assigned to the scene+syntax (SS) condition group.

Materials. Four brief silent films showing a main actress engaged in various activities were prepared. Two films included false-belief (FB) scenes (FB scenarios, thereafter) and the other two included action scenes (Action scenarios). FB scenarios involve: 1) the female actress preparing to make a cup of instant coffee. She then accidentally picks up a pen because the spoon that she had brought was replaced with the pen by a third party, but she does not notice her mistakes until she puts the pen into the cup to give it a stir; and 2) the female actress finishes her writing and leaves her pen on the table. Her phone then rings and she picks up her phone and accidentally picks up a spoon to take notes because the pen was replaced by the spoon by a third party. She does not notice it until she tries to write with the spoon.

Action scenarios involve: 1) While the female actress is drawing pictures, a third party comes and picks up a cup placed near her; 2) while the female actress is cutting paper, a third party comes and picks up a pen near the woman.

Procedure. The participants watched a series of 4 brief films in a group. The order of presenting the films was fixed. The Action and FB film scenarios within a group were alternated. They were told that in each film, something would happen to a woman. At the end of each video, they were asked to write down the event that they saw on a sheet of paper. For the SO condition, the participants were given an answer sheet with blank spaces for each film. For the SS condition, the participants were given an answer sheet with four incomplete sentences in which only syntactic frames that matched with the scenes were given. The participants in the SS condition need to fill the words that corresponded to the description of the scene they saw (see appendix 1).

Coding. Two types of coding were involved. One identified verb types by partially following Papafragou et al (2009). There are four verb types: belief verbs, desire verbs, action verbs and other verbs. The present study differed from Papafragou et al. in that action verbs included those verbs with an active voice from the main actress's perspective only and other verbs included state verbs and those verbs in passive voices or action verbs from the supporting actress's perspective. The other coding identified the false belief description in FB scenarios. The criteria for the FB reference is that the description included the main actresses' misinterpretation of the intended objects.

Results

Verbs used to describe events in SO condition. A summary of belief verbs, desire verbs, other verbs and action verbs used in the Action and FB scenarios are given in Table 1. The proportion of each type of verb was calculated for the participants' responses and these were compared between the Action and FB scenarios (Figure 1). As no desire verbs were used in the Action scenario, this category was merged with belief verbs and referred to as mental state verbs. Chi-squire tests indicated that there were significant differences in the proportion of verb use: $\chi^2(2)=16.15$, $p<.0001$. The adjusted standardized residuals in each cell were examined to see if they exceed the +/-2.0 criteria (MacDonald & Gardner, 2000). The analyses suggested that a significantly greater proportion of mental state verbs were used in FB scenarios than

Table 1. Verb types and frequency used in the FB and Action scenarios in Scene Only condition

FB scenario 1		FB scenario 2		Action scenario 1		Action scenario 2	
Belief verbs							
machigaete~	9	machigaete~	12	kiduite-nai	8	shuchu-site	1
shuchu-site	1	muchuni-naru	1	kinishinai	1	kiduite-nai	6
ishiki-shitenai	1	kiduite-nai	7	shuchu-site	1	miteminufuri-suru	1
kiga-tsuku	2	shuchu-sita	1	muchuni-naru	2	muchuni-naru	1
kiduite-nai	7	omoikomu	1				
shiranai	1						
muchuni-naru	1						
~to omotte	2						
~shite shimatta	1						
tomadotte	1						
	26		**22**		**12**		**9**
Desire verbs							
~shiyo to omoi	4	~shiyo to suru	13				
~shiyo to suru	1						
nomou-to ~	3						
mazeyou-to ~	5						
	13		**13**		**0**		**0**
Other verbs							
motte-kuru/-iku	9	torikae-rareru koukan-suru	27	motte-iku	15	totte-iku	10
oku/okareru	15	motte-iku	2	totte-iku/ torareta	10	oku	2
utsushiireru	1	itazura-suru	1	katadukeru	2	motte-kuru	19
irekae/torikae	6	okareta	4	sageru	6	kasu	1
ido-saseru	2	katadukerareru	1	nakunaru	1	yattekuru	1
		noseru	1				
		denwa-ga naru	5				
	33		**41**		**34**		**33**
Action verbs							
nigiru	1	kaku	23	kaiteita	37	kiru	35
ireru	19	nomu	17	suwaru	3	sawaru	2
nagashi-komu, sosogu	5	denwa de hanasu	20	kakidasu		hanasu	1
teni-toru	2	denwa ni deru	6	tsukau	1	suwaru	1
katamukeru	1	tojiru	11	kuru	3	sagyo suru	1
kakimazeru/tokasu	21	tsukeru	1	toridasu	2	tsukau	3
nomu	1	hiraku	4	toru	1		
tukutteiru	5	motteiru	2	motsu	1		
oku	4	kuru	1	sagyo suru	2		
kaku	3	owaru	5				
akeru	2	tewo dasu	1				
ocha wo tsukuru	1	hitoyasumi	3				
kuru	1	kaeru	1				
		memo suru	2				
		tenitoru	2				
		rennraku suru	1				
		mimi ni ateru	1				
		benkyo suru	1				
		sagyo suru	1				
		oku	3				
	66		**106**		**50**		**43**

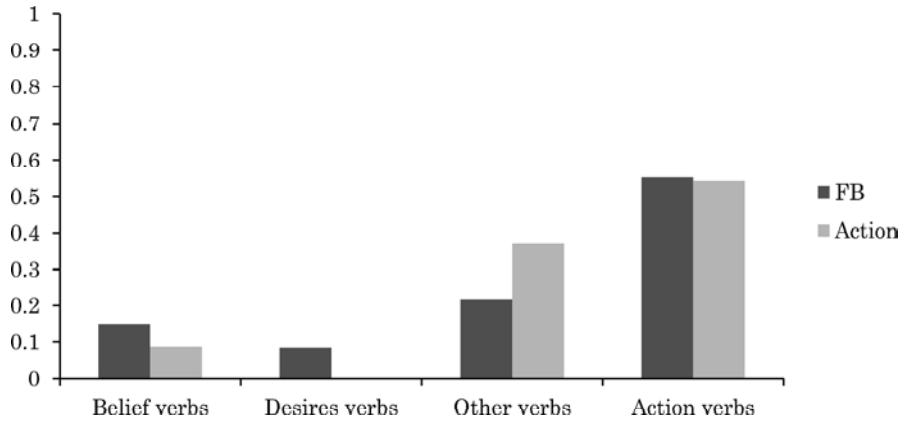

Figure 1. Proportion of different types of verbs used in the FB and Action contexts in the SO condition

Table 2. Cross-tabulation of verb types and scenarios in the SO condition

		Mental state	Other	Action
Action scenarios	Count (%)	21 (11.6%)	67 (37.0%)	93 (51.4%)
	Adjusted residuals	-3.2	3.3	-0.5
FB scenarios	Count (%)	74 (23.1%)	74 (23.1%)	172 (53.8%)
	Adjusted residuals	3.2	-3.3	0.5

in Action scenarios, whereas a greater proportion of other verbs were used in Active scenarios than in FB scenarios (See Table 2).

Verbs used to describe events in SS condition. In this condition, the participants were given syntactic frames and these frames served as clues to help describe events in terms of mental state references. A summary of verb usage for belief verbs, desire verbs, other verbs and action verbs used in Action and FB scenarios is given in Table 3. The proportions of usage of these verb categories were compared for the Action and FB scenarios (Figure 2). As no desire verbs were used in either the FB or Action scenarios, this category was merged with belief verbs and referred to as the mental state verbs. Chi-squire tests indicated that there were significant differences in the proportion of verb use: $\chi^2(2)=120.41$, $p<.0001$. The analyses of adjusted standardized residuals suggest that a sig-

Table 3. Verb types and their frequency of use in FB and action scenarios in scene syntax condition

FB scenario 1		FB scenario 2		Action scenario 1		action scenario 2	
Belief verbs							
machigaete~	28	machigaete~	28	kiduite-nai	1		
manchigai suru	2	~to omotte	2				
~to omotte	3	manchigai suru	1				
	33		**31**		**1**		**0**
Desire verbs							
	0		**0**		**0**		**0**
Other verbs							
		torikae-rareru koukan-suru	2	totteiku(torareta)	2	totteiku	1
				katadukeru	1		
				sageru	1		
	0		**2**		**4**		**1**
Action verbs							
mazeru	1	kaku	1	kaiteita	25	kiru	28
				miteinai	1	kurinuku	1
				akeru	1	miteinai	1
				motteiru	1	masu	1
				shiyousuru	1	tsukuru	1
	1		**1**		**29**		**32**

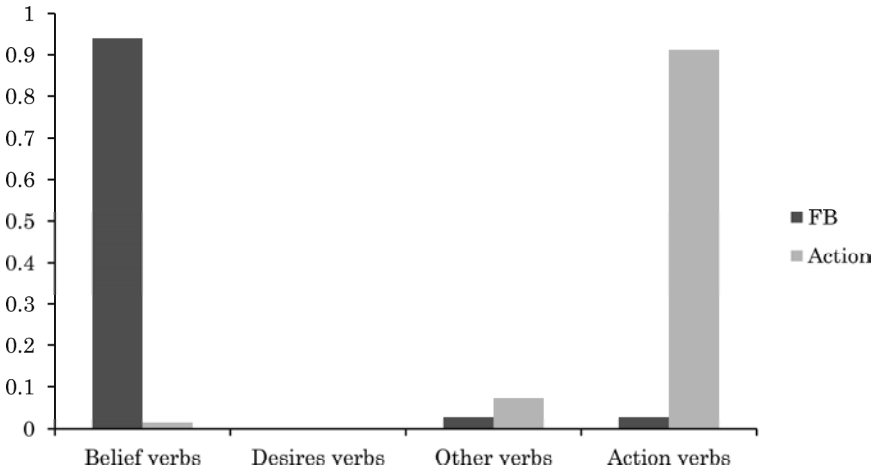

Figure 2. Proportion of different types of verbs used in the FB and Action contexts for the SS condition

Table 4. Cross-tabulation of verb types and contexts in the SS condition

		Mental state	Other	Action
Action scenarios	Count (%)	1 (1.5%)	5 (7.5%)	61 (91.0%)
	Adjusted residuals	-10.9	1.2	10.4
FB scenarios	Count (%)	64 (95.5%)	2 (3.0%)	1 (1.5%)
	Adjusted residuals	10.9	-1.2	-10.4

Table 5. Cross-tabulation of verb types and conditions for verb counts in FB scenarios

		Mental state	Other	Action
SO condition	Count (%)	74 (23.1%)	74 (23.1%)	172 (53.8%)
	Adjusted residuals	-11.1	3.8	7.7
SS condition	Count (%)	74 (94.10%)	2 (2.90%)	2 (2.90%)
	Adjusted residuals	11.1	-3.8	-7.7

nificantly greater proportion of mental state verbs was used in the FB scenarios than in the Action scenarios, whereas a greater proportion of action verbs was used in the Action scenario than in the FB scenarios (See Table 4).

Comparing the FB scenarios for the proportion of verb use. The proportion of verb use was compared for the FB scenarios between the Scene Only (SO) and Scene Syntax (SS) conditions. Chi-square tests indicated that there were significant differences between the conditions: $\chi^2(2)=129.24$, $p<.0001$. The analyses of adjusted standardized residuals revealed that the proportion of mental state verb use was greater in the SS condition than in SO condition, whereas the proportions of other verb and action verb use were greater in the SO condition than in the SS condition. This suggests that the syntactic framework effect produced a greater proportion of mental state verbs (See Table 5).

Comparing the FB reference between the condition groups. Two independent raters coded the descriptions for the scenes that depicted the false beliefs of the actress. Inter-rater coding for accuracy was examined using Cohen's kappa. Both the SO and SS conditions for the FB scenarios were $\kappa = .95$ and $\kappa = 1.0$, respectively. Disagreements were resolved upon discussions. The proportion of FB references were compared for the SO and SS conditions. In the SO condition, 47 out of a possible 76 FB references (61.8%) were made, whereas in the SS condition 64 out of a possible 68 FB references (94%) were made. The proportion of FB references in the SS condition was significantly greater than those in the SO condition: $z=4.60$, $p<.00001$, two-tailed.

Discussion

The present study examined three questions. The first test was to compare the proportions of different verb use in the FB scenarios and the Action scenarios. As expected, the FB scenarios elicited more mental verbs than the Action scenarios in the perceiver's linguistic descriptions of the scenes. This trend was found for both Scene Only (SO) and Scene and Syntax (SS) conditions. For the SO condition, the present results differs from

the previous study (Papafragou et al., 2009) in that this study found a greater use of mental verbs in the FB scenes in comparison with the Action scenes. This difference may be due to the instructions given to the participants. The present study asked the participants to view and describe what happened in the scenario, whereas Papafragou et al. (2007) asked the participant to guess what the mothers would say to their child when watching the video together. The hypothesized situation of mother and child interaction may change with the participants' perception of the child's age, which might have influenced the quality and quantity of information in their word use. However, the present study echoes with the previous study in that when the syntactic frameworks were given to the participants for the FB scenes, the participants were more likely to use mental verbs in comparison with the Action scenes. Although the previous study found a different proportion of mental verb use in FB scenes than in the Action scenes only in the SS conditions, the present study found the same trends for both SO and SS conditions. Thus the next test is to address whether a syntactic framework gave more clues to use of mental verbs more than non-syntactic frameworks.

The second test was to compare verb use in the FB scenarios under two independent eliciting conditions. As expected, the participants who received syntactic frameworks were more likely to use mental verbs than those who received free description instructions. In line with the previous study, the results suggest that the syntactic framework provided the participants with clues about the interpretation of the scenes from the mental state of the main actress. How did this happen? It is possible to speculate that the following psychological processes could have occurred in these two conditions. When the participants had complete freedom in describing the scenes, then they could focus on the main theme of the event and the peripheral information to enrich their description. In contrast, when a syntactic framework was given, the participant had to look for the best possible information to fit with the framework, and thus excluded the option of using peripheral information.

Given that the syntactic frameworks gave clues to the participants, one might expect that all participants would prefer to use mental verbs. However, when looking at the responses for the SS condition, there are four out of 68 occasions (5％) from different participants, where no mental verbs were provided as responses. These observations suggest that there are still possible word choices in this condition, and that a significantly larger proportion of participants choose to use mental verbs rather than other verbs.

The third test was to compare how well the perceivers in the two conditions depicted the protagonist's FB. As expected, the perceivers who received syntactic frameworks were more likely to refer to the protagonists' FB in comparison with those who received the free description instructions. Although the 61.8% of the participants in the SO condition clearly depicted linguistically the main actress's FB, the proportion of FB depiction (94.0%) was significantly greater in SS condition. Thus in the SO condition, although the participants used more mental verbs in FB scenarios than in the Action scenarios, this does not mean that they depicted explicitly the main actress's FB.

These results suggest two important implications. When people are faced with the FB scenes, although they may be aware of the protagonist's FB implicitly, they do not always make an explicit reference to it using linguistic means. However, syntactic frameworks could influence how they structure what they perceived and enable them to use a greater proportion of mental verbs. The role that syntax places on our cognitive process may be underestimated. As shown in Fausey et al. how we use language could influence how we perceive the world and that could make a significant effect in how we encode it. Despite Japanese-speakers' tendency to use less finite complements in conversations that could provide crucial cues to the use of mental verbs, when they are given explicit syntactic structures, they are more likely to use mental verbs in FB scenarios. However, in natural

conversations such syntactic constraints do not exist unless a linguistically competent adult provides such a framework. Thus it is possible to conclude that although Japanese language use does not naturally favor the syntactic structure leading to mental verbs, Japanese are sensitive to such syntactic frameworks and are ready to adopt them in interpreting the FB situations.

Japanese language use does not encourage finite complement structures and may have unfavorable consequences for children's conceptual development as argued by Nomura and Suzuki (2016). Although this is still a hypothesis, there is emerging evidence to support this possibility. A training study using perspective-shifting discourses that embedded finite complement structures facilitated Indo-European language speaking children, however similar training may not have the same level of efficacy in Japanese-speaking children (Tsuji, 2015). These findings suggest that although adult speakers of the Japanese language can adapt to given linguistic structures, young learners of the Japanese language may not be able to make full use of such frameworks.

Future studies need to examine whether Japanese-speaking children at around the age of 4 are able to benefit from the use of syntactic frameworks. Papafragou et al. found a syntactic structure effect on children's use of mental verbs in English-speaking populations. If Japanese-speaking children are unable to provide mental verbs with the aid of syntactic frameworks, then this important difference in language use for the purpose of acquiring mental verbs and the development of theory of mind needs to be highlighted.

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Appendix 1. Syntactic frameworks provide to the participants in the Scene Syntax condition

ビデオ 1
女の人は，（　　）で（　　）を（　　）。
The female *wa* (　　) *de* (　　) *wo* (　　).

ビデオ 2
女の人は，（　　）を（　　）と（　　）。
The female *wa* (　　) *wo* (　　) *to* (　　).

ビデオ 3
女の人は，（　　）で（　　）を（　　）。
The female *wa* (　　) *de* (　　) *wo* (　　).

ビデオ 4
女の人は，（　　）を（　　）と（　　）。
The female *wa* (　　) *wo* (　　) *to* (　　).

Appendix 2. Verb types and frequency used in FB and Action scenarios in Scene Only condition in Japanese descriptions and approximate meaning in English

FB scenario 1		FB scenario 2		Action scenario 1		Action scenario 2	
Belief verbs							
間違えた，間違えて~ misconstrue	9	間違えた，間違えて~ misconstrue	12	気づいていない unaware	8	集中して be focused	1
集中して be focused	1	夢中になる be fascinated with	1	気にしない not care	1	気づいていない unaware	6
意識していない be unaware of	1	気づいていない unaware	7	集中して be focused	1	見て見ぬ振り blink	1
気がつく be aware of	2	集中して be focused	1	夢中になる be fascinated with	2	夢中になる be fascinated with	1
気づいていない unaware	7	思い込む believe	1				
知らずに ignorant	1						
夢中になる be fascinated with	1						
ーと思って think that	2						
（ーして）しまった have done	1						
戸惑う be confused	1						
	26		**22**		**12**		**9**
Desire verbs							
ーしようと思い intend to do	4	ーしようとする be going to do	13				
ーしようとする be going to do	1						
飲もうとー to drink	3						
混ぜようとー to give it a stir	5						
	13		**13**		**0**		**0**

Other verbs							
持ってくる・持っていく bring/ take	9	取り替えられる・交換する switch	27	持っていく take away	15	取っていく taken	10
置かれた・置く place	15	持って行く take away	2	取っていく（取られた） taken	10	置いていく place	2
移し入れ transfer	1	いたずらをする trick	1	片付ける put away	2	持っていく take away	19
入替える・取替える switch	6	置かれる place	4	下げる clear away	6	貸す give	1
[illegible] move	2	片付けられる put away	1	なくなる gone	1	やってくる come	1
		のせる carry	1				
		電話がなる ring	5				
	33		**41**		**34**		**33**
Action verbs							
握る grasp	1	書く write	23	書いていた writing	37	切る cut	35
入れている get on	19	飲む drink	17	座る sit	3	触る touch	2
流し込む・注ぐ pour	5	（電話で）話す chat over the phone	20	書き出す start to write		話す talk	1
手に取る pick up	2	電話にでる answer a call	6	使う use	1	座る sit	1
傾ける Tip	1	閉じる close	11	来る come	3	作業する work	1
かき混ぜる・溶かす give it a stir	21	つける put	1	取り出す take out	2	使う use	3
飲む drink	1	開く open	4	取る take	1		
作っている make	5	もっている hold	2	持つ hold	1		
置く place	4	来る come	1	作業する work	2		
書く write	3	終わる end	5				
開ける open	2	手を出す reach out	1				
お茶を作る練習 practice to make a tea	1	一休みする rest	3				
来る come	1	替える switch	1				
		メモする memo	2				
		手にとる pick up	2				
		連絡する call	1				
		耳に当てる put near ear	1				
		勉強する Study	1				
		作業する Work	1				
		置く Place	3				
	66		**106**		**50**		**43**

Appendix 3. Verb types and frequency used in FB and Action scenarios in Scene Syntax condition

FB scenario 1		FB scenario 2		Action scenario 1		Action scenario 2	
Belief verbs							
間違えた，間違えてーした misconstrue	28	間違えた，間違えてーした misconstrue	28	気づいていない unaware	1		
勘違いする be confused	2	ーと思って think that	2				
思った・思い込んだ believe	3	勘違いする be confused	1				
33		**31**		**1**		**0**	
Desire verbs							
0		**0**		**0**		**0**	
Other verbs							
		取り替えられる・交換する switch	2	取っていく（取られた） taken	2	取っていく taken	1
				片付ける put away	1		
				下げる clear away	1		
0		**2**		**4**		**1**	
Action verbs							
混ぜる	1	書く	1	書いていた writing	25	切る cut	28
				見ていない not seen	1	くりぬく cut out	1
				開ける open	1	見ていない not seen	1
				持っている hold	1	貸す lend	1
				使用する use	1	作る make	1
1		**1**		**29**		**32**	

日本語話者が場面描写で心的動詞を用いる条件

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要　旨

本研究は、日本語話者が出来事を記述する場合どのように心的動詞を使用するのかについて検討した。実験には出来事の刺激動画として、ある人物が一連のアクションを行なっている間に、誤信念を抱くことになるシーンの有無を操作したものを用意した。実験対象者は、これらの刺激動画を見た後、場面についての記述を行なった。刺激場面を記述する条件として、実験対象者を構文的なフレームワークを与えられた条件群と自由記述条件群のどちらかに割り当てた。記述に用いられた動詞タイプとその頻度を場面の種類および記述条件間で比較した。どちらの記述条件においても誤信念に関与した場面の記述では、心的動詞が他のタイプの動詞より多く使用された。二つの記述条件群を比較した場合、構文的なフレームワークを与えられた実験対象者は、自由記述条件群よりも心的動詞を多く使用していた。これらの結果について、心的動詞の獲得と心の理論の発達に関連づけて議論した。

キーワード：心的動詞、日本語、誤信念、心の理論