

What L2 Processing Strategy Reveals about the Prototypical Relationship: A Case of Japanese Modal Markers of Possibility*

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Abstract. Grammaticalization deals with a diachronic process whereby a lexical word evolves into a grammatical word. The typological study recognized the common directionality of grammaticalization among different languages. Two common directionalities in grammaticalization are recognized in the case of the modal markers of possibility: (1) ability > root possibility > permission¹ and (2) ability > root possibility > epistemic possibility. On the contrary to this, the modality of possibility in Japanese is encoded by different modal markers. The aim of this study is to analogize the relationship among them based on the data of second language acquisition, especially based on the processing strategy adopted by learners. This survey suggests that both permission and epistemic possibility seem to develop out from root possibility in Japanese.

Keywords: prototypicality, the Competition Model, cues, processing strategy

1 Introduction

Grammaticalization deals with a diachronic process whereby a lexical word evolves into a grammatical word. Modality in the area of general linguistics is defined as “a grammatical/semantic category expressing speakers’ psychological attitude” (Narrog 2005:165). The auxiliary verbs representing modality is defined as modal markers (Palmer 2001:4). It is cross-linguistically not uncommon for a single modal marker to represent several subcategories of modality. This phenomenon is defined as ‘polysemy’, which is considered as a result of semantic change on accordance with grammaticalization. According to the typological study of grammaticalization by Bybee *et al.* (1994), the common path of grammaticalization of modality among 75 languages is recognized. As such, it has often been analyzed from the perspective of universal human cognition in the areas of cognitive linguistics and grammaticalization .

2 The Grammaticalization of Modal Markers of Possibility: The Typological Perspective

Bybee *et al.* (1994) recognized four categories as typological common categories of modal markers of possibility: they are ability, root possibility, permission and epistemic possibility. Ability means that the enabling conditions exist in the agent such as mental or physical conditions. Root possibility means that the enabling conditions exist. Permission stems from some kind of authority such as rules or the law, typically and frequently the authority is the actual speaker, who gives permission (Bybee *et al.*, 1994: 192). Epistemic modality applies to

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¹ The mark > indicates the directionality of semantic change. In this case, the modal meaning of ability derives the modal meaning of root possibility and the modal meaning of root possibility derives the modal meaning of permission.

assertions and indicates the extent to which the speaker is committed to the truth of the proposition. Epistemic possibility indicates that the proposition may possibly be true (ibid: 179). We will explain the each usage of modal markers of possibility using the example of *can*.

(1) He <i>can</i> run a mile in five minutes.	(he has the ability)	Ability
(2) He <i>can</i> escape.	(the door is not locked)	Root Possibility
(3) He <i>can</i> go now.	(I give permission)	Permission
(4) It <i>can</i> take me up to four hours to get there.	(Someone estimates the time of arrival)	Epistemic

(Palmer 2001:10)

Two common directionalities in grammaticalization of modal markers of possibility, (5) and (6), are reported by the cross-linguistic survey by Bybee *et al.* (1994).

- (5) ability > root possibility > permission
- (6) ability > root possibility > epistemic possibility

(5) is explained as follows. The transition from the generalization from ability to root possibility can be seen as the loss of a specific component of the meaning, the component that requires that the enabling conditions reside in an agent. This generalization resembles the one just described: since the enabling conditions for an agent to perform an act do not lie entirely in the agent, but also depend on the external world, *can* would also be used in cases in which the enabling conditions are both in the agent and outside the agent. Permission is that an agent is permitted to do something. The general enabling conditions expressed by root possibility include both physical conditions and social conditions, and permission is simply the presence of social enabling conditions. Therefore, it is natural to regard that the permission use developed out of the root possibility sense (Bybee and Pagliuca 1985).

A shift from root possibility to epistemic meaning in (6) involves a change in scope. Root possibility modal is part of the propositional content of the clause and serves to relate the agent to the main predicate. The epistemic modal, on the other hand, is external to the propositional content of the clause and has the whole proposition in its scope (Bybee *et al.*, 1994: 197).

3 Typological Characteristics of the Modal Markers of Possibility in Japanese

Unlike this typological tendency, root possibility, permission and epistemic possibility are generally encoded by three distinctive modal markers in Japanese: root possibility are encoded by *-reru, -rareru*, permission is encoded by *-temoii*, and epistemic possibility is encoded by *-kamoshirenai*. Thus, Modal markers in Japanese, do not exhibit the phenomenon of polysemy. This non-existence of polysemy in Japanese suggests that the relationship between root possibility and permission and the relationship between root possibility and epistemic possibility cannot be explained by the perspective of grammaticalization. This raises intriguing questions as to which modality is more prototypical between root possibility and permission and as to which modality is more prototypical between root possibility and epistemic possibility. Yamada (1990), therefore, maintains that both categories of modality originated independently, neither of them is more prototypical than the other.

A most common method to examine the prototypicality of modal meaning in a language is to examine the process of diachronic grammaticalization in that language. Grammaticalization in the area of modality means the process of semantic change of modal markers: the prototypical meaning emerged earlier than peripheral one. The evidence of diachronic grammaticalization, however, is not available to explain the prototypicality of Japanese modal markers, because the development of the modal markers in Modern Japanese is independent of the modal markers in Classical Japanese (Onoe, 2001). Therefore, we examine the relationship between root

possibility and permission and the relationship between root possibility and epistemic possibility using the data of second language acquisition as the alternative method.

4 Studies of Chinese Learners' Acquisition of Japanese Modal Markers

4.1 The Parallelism between L2 Acquisition and Diachronic Grammaticalization

Certain parallelism between grammaticalization and the order of acquisition of polysemic words has been recognized: the emergence and the acquisition of core meaning is prior the emergence and the acquisition of peripheral one. Recently, this parallel relationship was extended to a research program that describes the typological characteristics of grammaticalization of a language based on the language acquisition order of polysemic words (e.g. Giacalone-Ramat, 2003; Giacalone-Ramat and Crocco-Gales, 1995).

Unlike L1 acquisition, the order of acquiring polysemous words by L2 learners does not involve the creation of new patterns of grammaticalization like diachronic grammaticalization but that of various ways of approximating to a subsystem (Giacalone-Ramat, 2003: 28). Therefore, L2 acquisition, especially the strategy utilized by adult learners, recapitulates the internal factors of the diachronic grammaticalization in the target language more obviously. Hence, we consider that the data of second language acquisition will be an appropriate method to analogize the relationship among the modal markers of root possibility, permission and epistemic possibility in Japanese.

4.2 The Target and the Hypothesis

According to the parallelism between the order of acquisition of meaning and diachronic grammaticalization, learners acquire more prototypical modal markers earlier than non-prototypical ones. This suggests that the modal marker acquired earlier is more prototypical. The notion of the parallelism between the order and the degree of prototypicality is also appreciable to the acquisition of Japanese modal markers, in which root possibility, permission and epistemic possibility are encoded by three distinct modal markers.

In this study, we will deal with the case of Chinese learners' acquisition of three Japanese modal markers. These three modal markers correspond to a single modal marker *ke* or *neng* in Chinese. Chinese is a language in which the polysemy among root possibility, permission, and epistemic possibility is manifested, with the meaning of root possibility is more prototypical than permission and epistemic possibility (Li, 2003). The mapping patterns of three modal markers and the degree of prototypicality are thus different between the two languages.

Our null hypothesis is that (i) learners acquire more prototypical modal marker earlier than non-prototypical ones and (ii) neither of them is more prototypical than the others if learners acquire them simultaneously. We define the survey of prototypicality based on the order of acquisition as the survey 1.

5 Survey 1: The Prototypicality of Japanese Modal Markers based on the Second Language Acquisition

5.1 Methodology

The tasks in Survey 1 were given in the form of multiple choice questions. Chinese learners of Japanese were instructed to choose one appropriate modal marker out of three alternatives for a question. Three choices given were *-reru/-rareru*, *-temoii*, and *-kamoshirenai*, which competed with each other. There were 60 questions in total. The learners had to choose *-reru/-rareru* as the correct answers for 20 questions, *-temoii* for another 20 questions and *-kamoshirenai* for another 20 questions. (7) is an example of the task. Learners are instructed to read the sentence

and to choose the appropriate modal marker among the three alternatives. In this question, the correct answer is root possibility (b).

- (7) *kono kuruma-wa 5nin made ()*
 This car-TOP 5.people up.to ().
 This car () up to 5 people.
- (a) *nottemoi* (b) *noreru*
 give a permission to ride has capacity to accommodate
- (c) *norukamoshirenai*
 possible to conclude that this car ride

In this experiment, Chinese learners were divided into 3 groups according to the results of a pretest (the grammar test of the second grade Japanese proficiency test), i.e. beginners, intermediate, and advanced groups. Each group consisted of 20 examinees.

This task is developed based on the Competition Model (MacWhinney and Bates, 1989). The Competition Model is a functionally oriented model for second language acquisition. The model is based on a functional theory of grammar wherein the relationship between the underlying meaning/intention and its expression in surface form is stated as directly as possible (Givón, 1979). Hence, this modal is suitable to analyze the process of the acquisition of grammatical features where the form-meaning correspondences in L1 and L2 are in competition.

An analysis was conducted of the learners' differential choice of modal markers for each block of 20 questions that required each modal marker as the correct answer. Specifically we examined the learners' differential choice of correct modal markers, i.e. the choice between the correct modal marker (e.g. *-reru/-rareru*) and the competing modal markers (e.g. *-temoi* and *-kamoshirenai*).

5.2 The Results of Survey 1 and the Examination of the Prototypicality

The figures below indicate the relationship between the choice of modal markers and the proficiency levels of learners for questions requiring each modal marker as the correct answer.

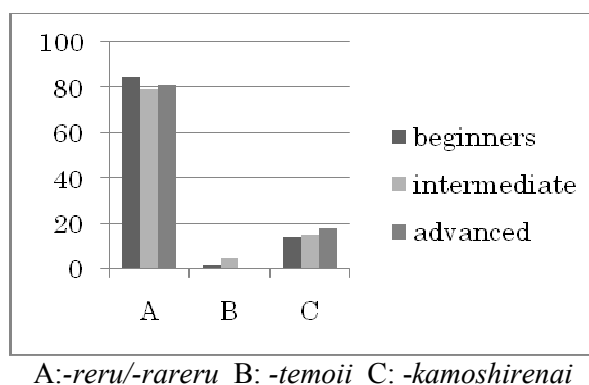
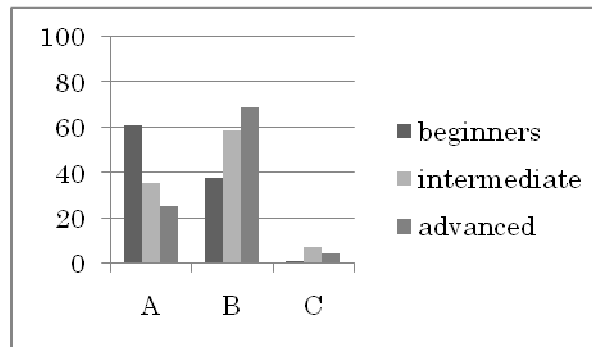
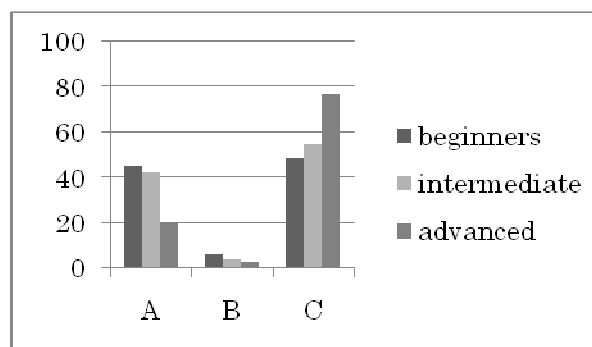


Figure 1: Questions for *-reru/-rareru*



A: *-reru/-rareru* B: *-temoii* C: *-kamoshirenai*

Figure 2: Questions for *-temoii*



A: *-reru/-rareru* B: *-temoii* C: *-kamoshirenai*

Figure 3: Questions for *-kamoshirenai*

The results of Survey 1 are summarized as follows: (i) learners at all levels can choose appropriate modal markers for the questions which correct answers are *-reru/-rareru*² (ii) the numbers of learners who can choose appropriate modal markers for questions which correct answers are *-temoii* and *-kamoshirenai* steadily increase in proportion to their proficiency level, whereas there are certain numbers of learners who choose *-reru/-rareru* for these questions at each level; (iii) the learners who choose *-reru/-rareru* outnumber than the learners who choose *-temoii* at the beginner level for the questions which correct answers are *-temoii*³; (iv) there are certain numbers of beginners and intermediate learners who choose *-reru/-rareru* for the questions which correct answers are *-kamoshirenai*⁴.

The acquisition process of these modal markers suggests: (I) modal meanings of *-reru/-rareru*, *-temoii*, and *-kamoshirenai* are not developed independently as Yamada (1990)

² There is no significant difference among the choice of three modal markers by learners of different proficiency, but there is a significant difference between the choice of *-reru/-rareru* and other modal markers by learners of each stage.

³ There is a significant difference between the choice of *-reru/-rareru* and *-temoii* by learners at all levels. There is a significant difference between beginners and intermediate learners who choose *-reru/-rareru*. There is also a significant difference between beginners and intermediate learners who choose *-temoii*.

⁴ There is no significant difference between the choice of *-reru/-rareru* and *-kamoshirenai* by beginners and intermediate learners, whereas there is a significant difference between the choice of *-reru/-rareru* and *-kamoshirenai* by advanced learners. There is a significant difference between intermediate and advanced learners who choose *-reru/-rareru*. There is a significant difference between intermediate and advanced learners who choose *-kamoshirenai*.

maintained; (II) there is a certain continuity between root possibility and permission and root possibility is more prototypical than permission; and (III) there is a certain continuity between root possibility and epistemic possibility and root possibility is more prototypical than epistemic possibility. We will confirm this finding based on the processing strategy that the learners utilized in the next section and we define this task as survey 2.

6 Survey 2: the Cue-based Analysis

6.1 The Parallelism between Processing Strategy and the Notion of ‘Cues’

Similar to the parallelism between language acquisition and diachronic grammaticalization, there is arguably also a parallelism between the processing strategy adopted by adult L2 learners and the internal factors of diachronic grammaticalization. The notion of ‘cue’ by the Competition Model is a useful method to describe this parallelism.

The connector between the underlying meaning and its surface manifestation is defined as a ‘cue’. This term includes all the information utilized by speakers and hearers to determine the relationship between form and meaning. Cues include case-marking particles, word order, inflectional morphology etc (MacWhinney, 1987). This model focuses on the understanding of sentence processing, therefore cues normally refers to surface forms of the sentences to activate the underlying function utilized by learners. Hence, the difference of the surface forms between root possibility and permission can be the cues for learners to differentiate both modalities. Similarly, the difference of the surface forms between root possibility and epistemic possibility can be the cues for learners to differentiate both modalities. The notion of the difference between local cues and global cues by Kail (1989) is adopted in this study.

6.2 The Definition of Cues for Survey 2

Kail (1989) categorized the types of cues into two types, **local cues** and **global cues** according to the difference of the amount of effort in the sentence processing. Local cues refer to the cues requiring local processing. In the case of local cues, we can recognize particular usage based on one lexical word and it is not necessary to consider other lexical words. On the other hand, global cues require topological processing in which we need to consider other lexical words. We will categorize cues utilized by learners on the process to differentiate root possibility and permission and to differentiate root possibility and epistemic possibility into local cues and global cues.

6.2.1 The Cue-based Analysis of *-Reru/-rareru* and *-Temoii*

The table below is the cues of *-reru/-rareru* and *-temoii*.

Table 1: The cues of *-reru/-rareru* and *-temoii*

Subject	Explicit/Implicit ± Animacy
Predicate	Action verb
Voice	Active

As Table 1 indicates, the surface structure of the sentence of *-reru/-rareru* and those of *-temoii* are identical. This indicates that these cues are global cues of *-reru/-rareru* and *-temoii*.

The sentence (7) and (8) are the examples of *-reru/-rareru* and *-temoii* respectively.

- (7) *tsugino tesuto-de josho-wo m-ireru.*
 next exam-LOC dictionary-ACC look.up.possible
 In the next exam, you can use dictionaries.
- (8) “*tsugino tesuto-de josho-wo m-itemoii.*”
 next exam-LOC dictionary-ACC look.up.possible
 “In the next exam, you can use dictionaries.”

In these sentences, the subjects “you” who perform certain action are implicit. (7) is a generic statement by the speaker, therefore this is the sentence of root possibility. (8) is used in a dialogue and it is explicit that the speaker is the social entity who enables the subject to do certain action. This indicates that learners should be sensitive to the existence of the social entity who gives enabling condition to the subject in order to distinguish permission from root possibility, which is the local cue of permission.

Figure 2, the result of the questions which correct answers are *-temoii*, demonstrates; beginners who choose *-reru/-rareru* outnumber those who choose *-temoii*; whereas intermediate and advanced learners who choose *-temoii* outnumber those who choose *-reru/-rareru*. From the viewpoint of cue-based analysis, this indicates that beginners are not sensitive to the local cue of *-temoii* and both intermediate and advanced learners can utilize local cue of *-temoii*.

6.2.2 The Cue-based Analysis of *-Rreru/-rareru* and *-Kamoshirenai*

Table 2 is the cues of *-kamoshirenai*.

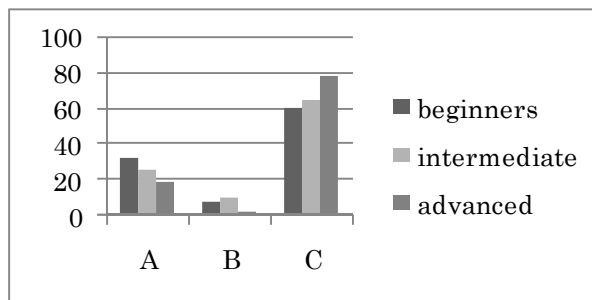
Table 2: The cues for *-kamoshirenai*

(Semantic) subject	The speaker
Thematic subject	Explicit or implicit, [+ or – animate]
Predicate	Verb, noun, adjective
Voice	Active, passive, potential

Compared to Table 1, it is obvious that an epistemic modal marker *-kamoshirenai* has more variable surface formal manifestations than its root possibility counterpart *-reru/-rareru*. Some formal (or grammatical) features are specific to *-kamoshirenai* such as the possible occurrence of an inanimate subject, of noun and adjective in the predicate position, the availability of a negative, passive or potential form of the embedded predicate. Therefore, we can presume that learners are guided by these formal features to become sensitized to the usage conditions/constraints on epistemic *-kamoshirenai*. Hence, it is possible to define that the cues unique to epistemic possibility are local cues.

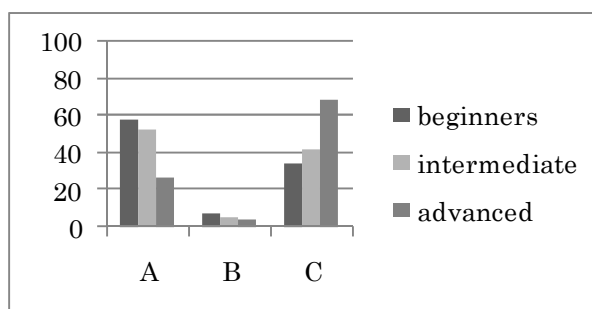
However, there can be a sentence with epistemic *-kamoshirenai* whose surface structure is identical to that with root possibility *-reru/-rareru* a. e.g. an epistemic sentence with the animate subject and the present action verb. Such formal manifestations of *-kamoshirenai* are defined as global cues.

Figures 4 and 5 below are the result of the questions comprising of local cues of epistemic possibility and the result of the questions comprising of global cues of epistemic possibility.



A: *-reru/-rareru* B: *-temoii* C: *-kamoshirenai*

Figure 4: Questions composed of local cues of *-kamoshirenai*



A: *-reru/-rareru* B: *-temoii* C: *-kamoshirenai*

Figure 5: Questions composed of global cues

As these figures indicate, learners at all levels can choose *-kamoshirenai* for the questions which are composed of local cues. Beginners and intermediate learners tend to choose *-reru/-rareru* and advanced level learners can choose *-kamoshirenai* for the questions composing of global cues.

6.3 The Relationship of Modal Markers of Possibility in Japanese

Thus, the survey 2 of cue-based analysis confirmed the findings of the survey1. These also indicate that the continuity between *-reru/-rareru* and *-temoii* and the continuity between *-reru/-rareru* and *-kamoshirenai* are the global cues. The survey 2 also reveals that the relationship between *-reru/-rareru* and *-temoii* and the relationship between *-reru/-rareru* and *-kamoshirenai* are different. The modal meaning of *-temoii* developed out from the modal meaning of *-reru/-rareru* and the special case (the pragmatic use) of *-reru/-rareru* is encoded by *-temoii*. In the case of *-kamoshirenai*, the domain of *-kamoshirenai* expressed by local cues developed out from independently but the domain of *-kamoshirenai* expressed by global cues has the continuity with *-reru/-rareru*.

7 Conclusion

This study examined the prototype relationship between root possibility and permission and the prototype relationship between root possibility and epistemic possibility in Japanese based on Chinese learners' L2 acquisition data. Three periphrastic modal markers in Japanese *-reru/-rareru*, *-temoii*, and *-kamoshirenai*, which correspond to single modal marker in Chinese, were objects of our inquiry. This result has the following implications. Though the three semantic categories are formally distinguished by means of different periphrastic modal markers, unlike

their counterparts in languages like English and Chinese, the two categories are in a pseudo-prototype relationship, i.e. root possibility being more prototypical than permission and root possibility being more prototypical than epistemic possibility. These characteristics parallels to the directionality of grammaticalization as Bybee *et al.* (1994) reported. These results suggest that modal markers of possibility in Japanese exhibit the similar characteristics of the typological grammaticalization of modal markers of possibility despite the fact that they are not polysemic.

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