CSCanada
Studies in Literature and Language
Vol. 5, No. 3, 2012, pp. 108-112
DOI:10.3968/j.sll.1923156320120503.1775

ISSN 1923-1555[Print]
ISSN 1923-1563[Online]
www.cscanada.net
www.cscanada.org

Prototype Account of Tense-Aspect Morphology Acquisition—A Review and Its Prospect

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Received 11 October 2012; accepted 19 December 2012

Abstract
Language is one of the greatest human inventions. Linguists have been working on how language works and how people learn language. Theories in second language acquisition and cognitive science have been combined to explain how verbs are acquired. Tense and aspect are two of the most important grammatical systems of verbs for expressing temporal concepts in the world. According to past research, prototypical verbs would be acquired more easily and readily than the less prototypical verbs. This review would cover recent studies on prototype account of tense-aspect morphology acquisition and suggest future research possibilities.

Key words: Second language acquisition; Prototype theory; Morphology

AN Xuehua, GUAN Xiaowei (2012). Prototype Account of Tense-Aspect Morphology Acquisition—A Review and Its Prospect. *Studies in Literature and Language, 5*(3), 108-112. Available from: http://www.cscanada.net/index.php/sll/article/view/j.sll.1923156320120503.1775
DOI: http://dx.doi.org/10.3968/j.sll.1923156320120503.1775

INTRODUCTION
Language is defined as "the human capacity for acquiring and using complex systems of communication, and a language is any specific example of such a system", according to Wikipidia. Human language is unique of human behavior. Human language has the basic function of referring to time, which is one of the earliest and most important tasks in language acquisition. People use language to talk about events or situations as being in the past, present, or future, and we talk about events as ongoing or completed (Li & Shirai, 2000). Tense and aspect are two of the most important grammatical systems of verbs for expressing temporal concepts in the world, which learners often encounter difficulties and exhibit varieties in the development of acquisition. Therefore, there has been quite extensive research conducted on verb tense-aspect morphology (Shirai & Andersen, 1995; Shiai, 1998; Haznedar, 2007; Wagner, 2009). The studies on the development of tense-aspect acquisition in L2 have included a wide variety of languages – English, Spanish, Italian, French, Chinese and Japanese (Rafael & Shiai, 2002). In order to interpret sequence of verb morphology in both L1 and L2, there have been some theoretical approaches proposed. Proposals accounting for verb morphology sequence include Bickerton's (1981, 1984) Language Bioprogram Hypothesis, Slobin's (1985) Basic Child Grammar, and Robinson's (1995) Aspect Hypothesis (Li & Shirai, 2000). What this review focuses on is Andersen and Shirai's prototype account – children will create semantic representations of tense-aspect morphology which are restricted to the prototype of morphological categories at the early stage of language acquisition (Shirai 1991, 1994; Shirai & Andersen, 1995). I will have a brief review of concepts of tense-aspect morphology, aspect hypothesis (in Part 1), prototype theory and then focus on how prototype theory is employed to account for tense-aspect morphology acquisition (in Part 2) and then propose some suggestions for further study (in Part 3).

1. TENSE-ASPECT MORPHOLOGY AND ASPECT HYPOTHESIS
Tense and aspect are basic linguistic concepts, consisting temporality encoded implicitly and explicitly on verbs. Tense locates a situation in time with respect to other time (such as speech time). Aspect, which is not concerned with relating a situation with some other time, concerns the different perspectives which a speaker can take and

express with regard to the temporal course of some event, action, process, etc. (Klein, 1994, p. 16; cf. Shirai, 1995). Aspect can be further divided into grammatical aspect (or viewpoint aspect) and inherent lexical aspect (or situation aspect) (Smith, 1983; Shirai, 1995). Grammatical aspect is aspectual distinction explicitly marked by linguistic devices, like inflections or auxiliaries. Inherent lexical aspect refers to the inherent characteristics of lexical item, which exhibits semantic features. Vendler's (1967) four-way distinction of verbs and verb phrases with respect to the temporal properties they encode, is most widely and highly accepted and marked the beginning of subsequent research on lexical aspect (Li & Shirai, 2000). The four categories of verbs or verb phrases, are summarized by Shirai (1995) and can be expressed in the following way (Shirai, 1995, 1998):

1) Achievement – that which takes place instantaneously, and is reducible to a single point in time (e.g. recognize, die, spot, reach the summit, etc.).

2) Accomplishment – that which has some duration, but has a necessary endpoint (e.g. run a mile, make a chair, build a house, paint a picture, etc.).

3) Activity – that which has a duration, but without a necessary endpoint (e.g. run, walk, play, sing, study, live, etc.).

4) State – that which has no dynamics, and continues without additional effort or energy being applied (eg. see, like, disgust, desire, think, etc.).

However, it should be noted that Vendler's proposal for classification cannot be done by solely focusing on the verb itself. "Its arguments and/or adjuncts also are an important part of the classification". (Shirai, 1995) (e.g. *run* & *run a mile*). Although, the terms are used here as Vendler has identified, we should bear in mind that the classification should take specific items into account.

Each of Vendler's four categories of inherent semantic aspect can be characterized in terms of the semantic features: TELIC, PUNCTUAL, and DYNAMIC, which is summarized in Table 1, with "+" denoting the presence of the feature and "–" denoting the absence of the feature. (adapted from Smith 1991; cf. Li & Shirai, 2000)

Table 1

	Achievement	Accomplishment	Activity	State
Punctual(denoting havingno duration)	+	-	-	-
Telic(denotingan inherent endpoint)	+	+	-	-
Dynamic(denoting energy is required)	+	+	+	-

Systematic studies on the acquisition of verb morphology have revealed that the inherent aspect of the verb decides the attached verb morphology, which include (if there are such case markers in the target languages): (perfective) past marker, imperfective past marker, progressive marker. Research has observed a general tendency in the sequence of verb morphology sequence, with some exceptions due to language-specific features, in the acquisition of Chinese, French, Italian, Polish, Spanish, Portuguese, Greek, and other languages in L1 acquisition, and in English, Spanish, Japanese and French in SLA (Shirai, 1998). Certain tense-aspect morphology is initially attached to a type of verbs and later extended to other types. The generalization of the sequence is called Aspect Hypothesis (Andersen & Shirai, 1996; Robinson, 1995), which can schematically represented in Table 2.

Table 2 predicted order of development of tense-aspect morphology (Li & Shirai, 2000, p. 50).

Table 2

	State	Activity	Accomplishment	Achievement
(Perfective) Past	4	←3	←2	←1
Progressive	?	1→	2→	3
Imperfective	1→	2→	3→	4

?combination rarely ccurs

2. THE PROTOTYPE THEORY

Categorization and Prototype Theory

The notions of "categorization" and "prototype" are primarily derived from renowned American psychologist Eleanor Rosch (1973, 1977, 1978) "…human categorization should not be considered the arbitrary product of historical accident or of whim but rather than the result of psychological principle of categorization, which are subject to investigation." (Rosch, 1978, p. 27).

According to Rosch (1978, p. 36), objects are characterized on the basis of the resemblance between them and the prototypical members of the category. Prototypes can be defined as "clearest cases of category membership defined operationally by people's judgments of goodness of membership in the category". A prototype of a category is therefore viewed as a salient exemplar of the category. Some instances are more typical, while some less typical. This categorization is against tenets of the classical theory, which holds that category is defined by a necessary and sufficient set of features and assumes an all-or-nothing membership in a category.

Cognitively-oriented linguists have, in the past 30 years, applied the theories in the study of languages. Prototype theory has been applied in theoretical discussions of cognitive patterns underlying linguistic categorization (Lakoff, 1987; Langacker, 1987; Taylor, 1995, 1998; cf. Hu, 2002). Its tenets have also been used to construct plausible accounts of data on L1 acquisition of various grammatical constructions (e.g. Bates & Mac Whinney, 1982; Bybee & Slobin, 1982; de Villiers, 1980; Shirai & Andersen, 1995; cf. Hu, 2002). The studies so far have suggested that L2 learners' acquisition and use of grammatical structures can be influenced by linguistic prototypicality (Hu, 2002).

The Prototype Hypothesis of Tense-Aspect Acquisition

How to account for tense-aspect morphology acquisition with the prototype theory? The notion of category with better exemplar(s), prototypes, peripheral members can be employed to explain language acquisition in a straightforward way – children acquire prototypical members in a category earlier and easier than peripheral, or less prototypical cases. It was further proposed that the relationship between inherent aspect and verb morphology can be used to account for the acquisition sequence from prototypical to less prototypical members with respect to "tense" and "aspect". For example, prototypical "past tense" involves [+punctual], [+telic] semantic features. Therefore, there is high correlation between past tense morphology with achievement verbs, but rarely state verbs. Similarly, prototypical progressive is primarily associated with "action-in-progress", which explains why progressive marker –ing is attached to activity verbs and then accomplishment verbs, although progressive with accomplishment verbs is slower in development at least in L1 acquisition of English (Shirai, 1991). This prototype account nicely explains the observation in L1 acquisition of English verb inflectional morphology.

In Shirai's (1995) study, however, pointed out that extensive studies on explaining language acquisition by the frequency of particular linguistic input (Gallaway & Richards, 1994) for reviews of studies on "caretaker speech/motherese" or "child-directed speech" had been conducted, but not much research has been done on the acquisition of tense and aspect morphology from the perspective of input analysis (Shirai, 1995). Shirai (1995) supplemented the earlier study (1991) by concluding that the distributional feature, that is children's tendency to first use past inflections with achievement verbs, and progressive inflections with activity verbs, is also detected in the research by caretakers addressed to children. In other words, parents also preferred prototypical linguistic groupings, although not as strongly as their children did. Shirai (1995) suggested that the pattern of the development should be attributed to input and to prototype formation by children. Applying the prototype theory to language acquisition, it is claimed that "children start to acquire prototypes of linguistic units, and later extend the boundary to less prototypical ones, and eventually acquire adult norm" (Shirai, 1995; Shirai & Andersen, 1995).

However, Shirai (1998), argues that the learners' form-meaning association starts out from prototypes of which inherent aspect is just one. Hence, Shirai's study (1998) was concerning one of the many prototypical features associated with past and progressive/durative forms: habituality. The result showed that if habituality is not involved, activity verbs result in action-in-progress meaning, but when repetition over several occasions is involved, they do not, which suggests that learners are still restricted to the prototypes of the durative form – activity verb (Shirai, 1998). This empirical study refined the prototype theory to some extent.

Prototypicaility explanation of tense-aspect acquisition is extended and perfected in recent study by Wagner's study (2009), who claimed that lexical aspect, grammatical aspect, and tense are independent semantic dimensions of language, and they can be freely and independently combined with each other. The prototypical pattern of temporal/aspectual matching found in L1 acquisition development, however, is summarized in Table 3.

Table 3
Prototypical Temporal/Aspectual Groupings (Wagner, 2009)

	Group 1	Group 2
Lexical aspect	Telic (punctual)	Atelic (durative)
Grammatical aspect	Perfective	Imperfective
Tense	Past	Present

Children's early production is to combine the values for each dimension into utterances according to the matching patterns outlined in Table 3. That is children prefer *telic*, *perfective and past* combinations (e.g. broke) and *atelic*, *imperfective* and *present* combinations (e.g. running). The existence of these groups in L1 acquisition production has been well documented in several languages, including English (Bloom *et al*., 1980; Shirai & Andersen, 1995), French (Bronckart & Sinclair, 1973), Italian (Antinucci & Miller, 1976), Polish (Weist *et al.*, 1984; Bronckart & Sinclair, 1973), Mandarin (Li, 1990), Japanese (Risoli, 1981; Shiari, 1998), and Hebrew (Berman, 1983; cf. Wagner, 2009). The prototypical grouping results in a systematic underextension, with children failing to utter cross-group grouping, such as atelic-perfective-past (Jack flew) or telic-imperative-present (Wendy is making a sandwich) (Wagner, 2009), although the groupings are legitimate and comprehensible for children (Weist, 1991; Weist *et al.*, 1997; Weist *et al.*, 1999; Smith *et al.*, 2002; cf. Wagner, 2009), but less prototypical.

One explanation of the aspectual groupings is the prototype account (Shirai & Andersen, 1995; Li & Shirai, 2000). Children identify specific linguistic forms and ascribe prototypical meaning to them, which is best exhibited by a combination of semantic features. Cross-group combinations conform less well to the prototype, and thus are generally acquired later and less preferred in production. In other words, the *telic-perfective-past and atelic-imperfective-present* combinations are supposed to be more prototypical than, say *telic-imperative-present and other* matching, and thus with prototypical combination acquired earlier then the less prototypical.

Then what makes the above *telic-perfective-past* more prototypical than the *telic-imperative-present* grouping? What Li and Shirai (2000) essentially come up with is a frequency based definition – the most frequently

present groups are prototypical. It follows by another question: Why are the prototypical groupings than frequent than the less prototypical ones? In other words, why do people prefer to use prototypical forms than the less prototypical forms? Li and Shirai (2000) offered as explanation: "the semantic features that that organize temporal/aspectual space are not distributed randomly in our conceptualization of the world. What these prototypes offer us is actually a window on how we process time and event information and translate it into linguistic form." (Wagner, 2009), which goes in hand in with what Rosch (1973, 1977, 1978) has advocated in her categorization and prototype theory discussed above.

Wagner (2009) therefore claimed that if prototype reflects not only the structure of linguistic categories but also humans' cognitive constraints on the use of linguistic categories, prototypical groupings should be found in other situations. Wagner (2009) in his essay titled "I will never grow up: continuity in aspect representations" concludes that it is suggestive that under some circumstances, adults may talk, aspectually speaking, like children and prototypical groupings persist into adulthood. It echoes Shirai's (1995) findings "The similarity in the patterns of child and adult responses suggests that the difference between the groups is one of degree, not kind." (Wagner, 2009, p. 1061).

3. CONCLUSION AND IMPLICATIONS

Prototype theory was initiated in cognitive psychology and applied to account for linguistic phenomena. The claim is that in language acquisition is that learners in L2 acquisition are first ready to accept prototypical use of tense-aspect inflection in the category and then extend its application to peripheral cases; and in children's L1 acquisition, they exhibit similar stages as L2 acquisition and finally adopt the adult dorm. Research concerning both L1 and L2 acquisition has produced the above similar results, which reflect human being's cognitive constraints on linguistic categories.

Due to my superficial understanding and small amount of reading, I may fail to come up with insightful ideas for future research. However, I am daunted enough to propose several points for further study, with special purpose of better informing L2 teaching practice:

1) Methodological implication for L2 teaching

The prototypical groupings are generally better combinations, better understood and more easily produced. Children will acquire the prototypical forms first, and will not adopt the adult norm till the age of five (Wagner, 2002). Children's much exposure to the caretakers'/motherese frequent use of prototypical groupings (Shirai, Andersen, 1995) help children gain an intuitive cognitive and thus linguistic abilities, which further result in children's ready production of the prototypical forms. This serves as a good implication for L2 acquisition methodologically. L2 learners with less exposure to the target language will not gain intuitive judgment as naturally as in L1 acquisition. Therefore, more exposure to the target language is considered to be helpful and beneficial. One of the possibilities might be to resort to the corpus, with a large amount of language in use, which may assist language learners gain a better understanding of the prototypical usages, letting frequency save the work of teaching the "correct" forms. Admittedly, there still remains a question whether sheer exposure will do the job satisfactorily or not.

2) L1's transfer in tense-aspectual morphology acquisition study

Since Li and Shirai (2000) have claimed that the temporal/aspectual space are not distributed randomly in the conceptualization of the world, which reveals how people process time and event through languages is a matter of the development of universal cognitive ability. Shirai (1998) has conducted experiment on the use of prototypicality when "habituality" is involved in Japanese, which indicates there might be some influences caused by L1 use. Similar research can be conducted in different language contexts to verify whether other languages would have similar consequences. Therefore, more research on differences in the universal cognitive ability caused by different languages might be interesting and enlightening for the L2 teaching.

3) More research on written language

The empirical researches mentioned here so far have studied children's L1 acquisition, some adults L2 acquisition, including caretakers by Shirai (1995), Shirai (1998) and adults Wagner (2009), *et al*. Furthermore, most of the research has focused on spoken form of a relatively small number of subjects for study. It might be interesting and convincing to enlarge the research into the study of written form. Due to new techniques, such as the use corpora in collecting data, it might be more efficient and effective to collect more language data to see the prototype theory works in language acquisition. The analyses of dominant, deliberate uses of either prototypical or non-prototypical groupings (I am loving it in Mcdonald's slogan), might reflect more about the behaviors and characteristics of verbs in certain genres and might possibly shed new light on the prototype theory explanation of verb morphological reflections.

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