Developmental Language Impairment in Japanese: A Linguistic Investigation

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Abstract

Gopnik (1992, 1994, 1995) attributes the linguistic deficits characteristic of a developmentally language-impaired (DLI) English familial aggregation to an impairment in the underlying grammar—more specifically, to an inability to construct implicit morphological rules that govern inflectional properties. This paper evaluates this hypothesis with preliminary empirical data from Japanese DLI individuals. If the impairment were one of the underlying grammar, its linguistic manifestations should be similar across diverse languages. A series of linguistically principled tests—tasks of syntactic comprehension (SC), grammaticality judgement (GJ), and tense-marking production—was administered to 8 DLI children, ranging in age from 8;9 to 12;1, 3 of whom had a positive family history of language impairment, and to 8 age-matched non-DLI children. A significant difference between the groups' performance levels was found. The data indicate that the manifestations in Japanese do, in fact, resemble those in English. Thus, the results from this study provide further empirical support for the linguistic hypothesis and suggest that some cases of DLI are genetic in origin.

0. Introduction†

This paper will present the results from a preliminary linguistic investigation of DLI[0] in Japanese. We will examine the hypothesis of Gopnik (1992, 1994, 1995) that the deficits characteristic of this disorder result from an inability to construct implicit grammatical morphological rules. If the manifestations observed in English were neither idiosyncratic nor due to particularities of the language, they should remain virtually constant across languages.

More specifically, Gopnik argues that DLI individuals are unable to construct abstract symbolic rules in their underlying grammar for certain inflectional properties such as TENSE and NUMBER. She hypothesizes that they can learn individual words such as *books* and *walked* by means of an association network, stored in declarative memory, but cannot generalize from these individual instances to build modularized implicit rules that would operate on an abstract category, such as a rule for constructing regular past-tense: STEM TENSE+PAST = LEXICAL STEM+-*ed*.

Unlike English and other Indo-European languages in which research on DLI is currently being conducted, such as German (Clahsen 1989; Clahsen, Rothweiler,

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[0] In the literature, the terms 'developmental language impairment (DLI)', 'specific language impairment (SLI)', and 'developmental dysphasia' are all used to denote roughly the same clinical diagnosis.

Woest & Marcus 1992), Italian (Leonard, Bortolini, Caselli, McGregor & Sabbadini 1992), French (Le Normand, Leonard & McGregor 1993), and Greek (Dalalakis 1994), Japanese is an agglutinative language, rich in verbal morphology. Although Japanese exhibits poor nominal inflection (e.g., NUMBER & GENDER), and verbal ageement, it does have rich verbal inflectional morphology (e.g., TENSE, ASPECT, NEGATION, CAUSATIVES and PASSIVES). Therefore, hypotheses concerning the inability of DLI speakers to construct inflectional rules can be directly addressed.

1. Linguistic Properties of DLI in English

In this section, those properties of language that are reported to be affected in English DLI speakers are discussed. We argue that, in DLI, language alone is implicated as a result of an impairment to the underlying grammar, not as the result of a general cognitive or peripheral disorder.

The fact that language alone is impaired in this disorder is not meant to imply that all aspects of language are affected. "Language is not a unitary phenomenon" (Gopnik 1992: 6); on the contrary, as has been argued by numerous researchers, it is a complex system composed of a hierarchy of abstract implicit rules which organize arbitrary words into constituents with internal structure. The data indicate that certain rules within this complex hierarchical system are implicated, such as morphological rules that govern the inflectional properties, while others are spared, such as syntactic rules that govern binding and word-order.

English DLI individuals are often reported to experience particular difficulty with morphological properties of language (Crystal, Fletcher & Garman 1976; Trantham & Pedersen 1976; Eisenson 1984; Crystal 1987; Johnston 1988; Leonard 1989; Gopnik 1990; Gopnik & Crago 1991; Loeb & Leonard 1991; Gopnik 1992; Leonard et al. 1992; Goad & Rebellati 1994; among others). Results from a wide variety of comprehension and production tests as well as from both spontaneous speech and written samples reveal that the DLI speakers are unable to systematically manipulate morphological marking. Gopnik (1992), for instance, reports that DLI individuals not only have difficulty producing appropriate morphological endings consistently, but, when asked to judge whether or not a sentence was grammatical with respect to its morphological features, performed no better than chance. Non-DLI individuals were able to judge ungrammatical sentences as unacceptable and made the appropriate feature-error correction, whereas the DLI individuals either missed the feature error altogether or incorrectly changed correct parts of the sentence. The morphological manifestations of the properties of TENSE, NUMBER, AGREEMENT, and ASPECT seem to be the most problematic for DLI speakers.

1.1. Tense

It has often been reported in the literature that English DLI speakers are unable to systematically manipulate the morphological marking of TENSE (Crystal et al. 1976; Miller 1981; Gopnik 1992, 1994, 1995; Leonard et alia 1992, among others). A closer examination of the property TENSE further indicates that the DLI children not only experience difficulty with this feature, but do not seem to have it encoded in their grammar (Gopnik 1994; Rice, Wexler & Cleave, in press) . With data from a wide variety of sources—spontaneous speech samples, elicited narratives, grammaticality judgement tasks of appropriately and inappropriately tense-marked verb forms and tense-changing tasks—Gopnik (1994: 109) argues that "the language impaired subjects do not have the intact underlying obligatory syntactic rule for tense, though they do appear to have the semantic notion of "pastness". She hypothesizes that is not the semantic notion of 'pastness' that they lack, since they do seem to mark events

which occurred in the past with lexical items such as temporal adverbials, it is simply the grammatical category of TENSE.

In addition, Ullman and Gopnik (1994), with data from a production task of past-tense inflectional morphology with regular, irregular, and novel verbs, demonstrate that DLI individuals produced past-tense marked forms when the frequency of past-tense form was high, relative to its stem, and unmarked forms when the frequency of the stem was high.

1.2. Number

Similarly, an analysis of the feature NUMBER reveals that English DLI individuals experience no difficulty differentiating between singular and plural, as evidenced by their performance on comprehension pointing tasks (Gopnik & Crago 1991; Gopnik 1992); however, they do have difficulty constructing plural forms (Crystal 1987; Crystal et al. 1987; Eisenson 1984; Leonard 1989; Gopnik 1990; Gopnik & Crago 1991; Leonard et al. 1992; Goad & Rebellati 1994). On a pilot nonsense plural formation task, Gopnik and Crago (1991) report that these individuals perform significantly differently from non-DLI individuals. This significant difference does not capture the actual nature of the responses of the DLI individuals: the so-called 'correct' responses of the DLI individuals were the by-products of the application of explicit grammatical rules. 'Add an *-s*' was a rule employed by one adult impaired speaker who continuously repeated it under her breath while applying it not only to nonsense nouns such as *wug*, but also to sibilant-final nonsense nouns such as *sass*, producing an illicit response (*sass-s*). Another subject used explicit analogies to produce plurals: by analogy with *zash-es* she produced the illicit *zoop-es* as the plural of *zoop* and *tob-es* as the plural of *tob*. Subsequent analysis of these data (Goad 1994) revealed that the DLI speakers were also using a strategy of substitution to construct plurals, namely substituting phonetically similar real plurals for the nonsense plurals such as *soup-s* for the plural of *zoop*. Goad also noted that on some occasions the DLI speakers did not assimilate the voicing specification of the plural affix *-s* to that of the stem-final obstruent, producing illicit forms such as [wʌgs] while on other occasions they seemed to be assigning stress to the syllabic affix, producing [Ɛs] for [Iz].

A follow-up study confirmed the results of the pilot study. Goad and Rebellati (1994) report that on an extended nonsense plural formation test the DLI speakers employed the same strategies that they had in the pilot study. They argue that these strategies are some of the same strategies that non-DLI children employ in the earliest stages of plural acquisition. Non-DLI children, however, only employ such strategies until they stop treating PLURAL as a separate word and incorporate it as an affix whereas the DLI speakers appear to employ them throughout their lives.

1.3. Aspect

It has been widely observed that English DLI individuals also experience difficulties with ASPECT (Trantham & Pedersen 1976; Crystal 1987; Gopnik 1990). In English it is marked by two independently generated morphemes: the *-ing* affix, which is freely generated on the verb and marked with the feature [+progressive] and *be* which is freely generated in the preverbal position and also marked [+progressive] (Travis 1984). Crystal (1987) reports that his impaired subject produced equivalent numbers of correct and incorrect aspectual constructions with both *be* and *-ing*. Gopnik (1990) reports that in spontaneous speech samples of the DLI speakers the following three forms are most prevalent: 'This *one is look*'; 'The *dragon drying* hisself'; 'The *witch is coming*' (p. 155). The DLI individuals also judged such illicit aspect-marked phrases as the first two types as acceptable on a grammaticality judgement test (Gopnik 1990). In a repetition task, the impaired subjects were able to correctly

repeat short simple aspect-marked phrases but were unable to do so with longer, more complex sentences such as 'All the girls sing and they are dancing' which was repeated as 'When the girls sing, *they dancing*' (p. 157). Trantham and Pedersen (1976) report that, on a 20-item test, the impaired child in their study produced 19 aspectual constructions: 7 proper constructions with both *be* and *-ing*, and 12 improper constructions: 6 with only *be* and 6 with only *-ing*.

2. Predictions for Japanese DLI Speakers

In this section, we will provide our predictions about the manifestations of DLI in Japanese, based on the hypothesis of Gopnik (1992) that the deficits characteristic of DLI can be attributed to an inability to construct implicit grammatical morphological rules. If the deficit is in the underlying grammar, as Gopnik argues, the manifestations observed in English should be manifested across diverse languages. More specifically, we predict that Japanese DLI speakers will experience difficulty constructing abstract implicit morphological rules which govern those inflectional properties shared by the two languages, namely TENSE and ASPECT. As indicated in the introduction, since Japanese does not exhibit nominal inflections there are no manifestations for the features of NUMBER and GENDER within noun phrases. In addition, we expect that this inability to construct implicit morphological rules will have the following language-specific manifestations: difficulty in manipulating morphological Case-marking, which will in turn trigger problems with both passive and causative constructions, and difficulty with complex verb formation. Finally, we also predict that those properties of language that appear not to be implicated in the English DLI individuals, such as the ability to construct syntactic rules that govern binding and word order, will not be affected in the Japanese DLI individuals.

2.1. Tense

Unlike in English, the grammatical feature of TENSE in Japanese is morphologically realized on both verbs and adjectives. In the verbal paradigm, it is realized in the form of an inflectional bound morpheme which attaches either directly to the verb root or after all other inflectional suffixes such as NEGATION and PASSIVE. There are two TENSE morphemes: *-(r)u*, which represents the present tense (or the non-past) and *-ta*, which encodes the past. There is no special morphology which denotes the future tense, however, the future is expressed by using either the present-tense morpheme or both the present-tense morpheme and an auxiliary which encodes probability (e.g., *-daroo* and *-deshoo*). The verbal paradigm is provided in (1).

(1)	Present[1]	Past[2]	
a. Consonant-Final Roots:	*kak-u*	*kai-ta*	'write'
	yom-u	*yon-da*	'read'
b. Vowel-Final Roots:	*tabe-ru*	*tabe-ta*	'eat'
	mi-ru	*mi-ta*	'see'

In contrast to the verbal paradigm, there are two kinds of adjectival paradigms: adjectives and adjectival nouns. Both kinds of adjectives are inflected for TENSE. In

[1] Several Researchers disagree about the status of [r] in Japanese verb conjugation. Ashworth & Lincoln (1973) and de Chene (1982) argue that the [r] is actually a part of the present-tense morpheme while Sato (1975, 1985), Mester & Ito (1989) argue that it is an epenthetic consonant inserted to break up the illicit vowel hiatus. In this paper, we assume the latter, which allows a single present-tense suffix *-u*, is the right analysis.

[2] The past-tense suffix is underlyingly *-ta*. When it is added to a consonant-final stem, however, it triggers several morphophonemic rules: Velar Vocalization, Gemination, Coda Nasalization, and Voicing Spread, and thus is realized as *-da* (Itô & Mester 1986; Mester & Itô 1989). The *t*-initial suffix *-tara* of the conditional and that of the gerundive suffix *-te* exhibit the same morphological behaviour.