

Some Morphological Principles in Early Child Grammar: Evidence from Innovations

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1. Introduction

The process of lexical innovation has been discussed from the viewpoints of adult speech (Downing 1977, Quirk et al. 1985, Rice and Prideaux 1991, Morita 1995) and child speech (Clark and Clark 1979, Clark 1993), and the functions of nonce-word formation and its influence on the morphological mechanism have been pointed out. Lexical innovation (cf. *plot-stealer*) considerably reflects word creation by some device rather than extraction of a word listed in long-term memory. It may therefore be an excellent indicator of what word formation devices are used at a developmental stage.

The present study explores certain aspects of the lexical acquisition process in terms of children's lexical innovations. It is organized as follows. Relevant morphological theories are presented in section 2. Section 3 inspects the principles on lexical acquisition proposed by Clark (1993), using naturalistic production data from two young children acquiring Japanese as their mother tongue. Then we elucidate to what extent morphological principles/rules are at work in early child grammars and state some theoretical implications of the developmental process to the adult grammar. Finally, concluding remarks are given in section 4.

2. Previous Studies

2.1. Morphological Theories

2.1.1. Lexical Innovations

We can produce and understand lexical expressions which we have never heard before. For example, we can understand the odd use of the verb *teapot* in *Max teapotted the policeman*, given the proper context: Max has a queer habit of rubbing the back of the leg with a teapot (Clark and Clark 1979: 786). Additionally, a novel compound is used instead of a phrasal expression as non-generic and deictic device (cf. *apple-juice seat*) (Downing 1977: 823). Words like *teapot* and *apple-juice seat* are called lexical innovations, which are temporarily created for the purpose of expressing concisely what is usually conveyed by phrases. As illustrated above, it is context-dependent nonce word formation that plays a major role in innovation.

There are three essential functions of innovative words: (i) economy of expression, (ii) contrast, and (iii) defocusing old information. The first function reflects "the speaker's desire to pack a maximum

amount of information into a minimal amount of linguistic structure” (Downing 1977: 823); the compound *apple-juice seat* is expressed compactly in place of the circuitous phrase *seat which is near the apple juice*. The second factor is exemplified by the sentence *Margaret 747'd to London*, where flying by 747 contrasts sharply with other modes of flying (Clark and Clark 1979: 797). Lastly, innovation plays a role of backgrounding old information in a discourse. In the discourse “Automatically *the guest who ordered a bottle of liquor* a few minutes after arrival aroused the credit manager’s suspicion. The immediate *bottle orderer* was often starting on a drunk ...,” the compound *bottle orderer* is used with its first element being simplified to show that the prominence of the direct object *a bottle of liquor* is diminished in a subsequent context (Rice and Prideux 1991: 290).

2.1.2. Morphological Conditions

This section outlines two conditions on word formation rules (WFRs) and a general morphological constraint which are relevant to this article. The first type of condition on a WFR concerns noun pluralization. In general, the plurality of Japanese nouns is not morphologically marked. Some types of nouns, though, can signify plurality by means of *joogo*-type pluralization, which makes a plural form by reduplication of a root noun. The examples are *yama-yama* ‘mountains’ composed of *yama* ‘mountain’ plus *yama* ‘mountain’ and *ie-ie* ‘houses’ which is a reduplication of *ie* ‘house.’ Among the conditions on the rule are (i) the *wago* status of a root noun, (ii) the “individuality” plural, and (iii) unspecified plurality (Kunihiro 1980: 13). *Joogo* plural is limited to *wago* (native word) root, so that the *kango* (Sino-Japanese) reduplication **juu-juu* ‘guns’ or the foreign reduplication **choko-choko* ‘chocolates’ is precluded. The second condition states that what is implied by a *joogo* is a collection of things which are of the same kind but different in size or color. Thus, *yama-yama* entails a collection of mountains of different size and *shina-jina* ‘thing-thing’ denotes a group of various things. The final condition prevents *joogo* from occurring with a specific numeral, as in **sangen-no ie-ie* ‘three houses.’

The second type of condition on a WFR relates to compounding. Japanese has “N+*suru* ‘do’” compounding, which gives rise to a verbal compound such as *kenkyuu-suru* ‘research-do’ i.e. ‘to research.’ There is a condition on the rule: the first element of the compound exhibits the feature [+activity] (Kageyama 1982: 225). This condition rules out such compounds as **yunomi-suru* ‘teacup-do’ or **yopparai-suru* ‘drunken.man-do,’ where the first element denotes instrument or agent.

Let us now consider a general constraint. A common idea on the syntax-morphology interaction in the Standard or GB theory is the Lexicalist hypothesis, which makes the strong claim that no syntactic operation can refer to word-internal elements. According to the hypothesis, complex words are generated in the lexicon and then enter the syntactic component to act as a syntactic atom, with the consequence that no part of such words correlates with syntactic units. It follows from this that the interior constituent *wife* of the compound *wife beater* cannot be modified by a relative clause, as in “*Wood’s father had been a [wife, beater]_N who_i had died of alcoholism.” Similarly, there is no nominal projection within a word, as in **[[every animal] eating]_A (dinosaur)*. The non-mixture phenomenon takes place in Japanese as well as in English. In accordance with the above hypothesis, Kageyama (1982: 248) presents the “No

phrase constraint,” which bans a phrase within a word, so that words such as **[[seiyooshi-no-kenkyuu]_{NP}-suru]_N* ‘[[Western.history-of-study]_{NP} do]_N’ are correctly ruled out.¹ In sum, morphology and syntax are fundamentally “autonomous” systems of the grammar, each with its own elements and its own characteristic constraints, which generally prevents the “intermixture cases” (Di Sciullo and Williams 1987).

2.2. Principles of Morphological Acquisition

How do children discover word formation patterns for making up words and how do they map meanings to complex words? Clark (1993) proposes three principles for lexical acquisition and demonstrates how they cause effects on children’s lexical innovations. First, complex words which consist of familiar elements are more transparent than unfamiliar combinations. Children tend to yield semantically transparent words—combinations of known roots and combinations of a familiar root plus a familiar affix. The Principle of Transparency is operative in the process of child’s word formation (Clark 1993: 116). According to this principle, children are likely to innovate N-N compounds such as *magic-man* and *animal-doctor* by combining familiar roots before they draw on established derived words like *magician* and *veterinarian*. Novel verbs are also formed by conversion from familiar nouns, as in *to flag* ‘to wave like a flag’ and *to rug* ‘to vacuum the rug’ (Clark 1993: 117). The second acquisitional principle claims that children depends on simplicity, that is to say, they initially construct new words from bare root(s) only. Given the Principle of Simplicity, it is not surprising that at the earliest stages of word production children coin novel verbs from nouns by means of conversion, as in *to pillow* ‘to throw a pillow at’ and *to monster* ‘to act like a monster towards’ (Clark 1993: 120). It is also predicted from the Simplicity principle that children produce a combination of roots like *coffee-churn* ‘coffee-grinder’ earlier than a combination of roots plus an affix like *wagon-puller* (Clark 1993: 120-121).

The third acquisitional principle is the Principle of Productivity. Productivity can be defined as the potentiality of creating neologism; the potentiality rests on contemporary preferences, but not on conventional words already listed in the lexicon. This means that when asked to coin a word to convey a novel meaning, speakers will choose a productive word formation device among the word formation options available. The Productivity principle claims that productive options in adult language should be acquired earlier by young children since they are accepted more easily (Clark 1993: 126-127). Clark (1993: 163) remarks that whereas French-speaking children construct no innovative compounds before age four, they frequently generate innovative nouns by means of 18 different nominal suffixes. This is attributable to the Productivity principle; productive pattern of derivation in French is opted for French-speaking young children’s word production.

Finally, we will take a brief look at the relationship among the three principles. Transparency and Simplicity are compatible in general since zero-derived verbs and root compounds are generally built from both simple and well-known roots. It is not always the case, however. In some languages, where affixation is more common than compounding, Transparency may take priority over Simplicity; words may be innovated with familiar affixes by very young children. But in other languages, where compounding and zero derivation are available as well, Simplicity may take precedence over Transparency; zero-derived

words and root compounds, but not derived words are coined at the earliest stages of word production (Clark 1993: 124-125). With respect to the Productivity principle, the other two principles take precedence over it because it is feasible only after children master what is productive in adult speech (Clark 1993: 243).

3. Inspection

3.1. Method

In this section, we will make some predictions for the morphological theories outlined in section 2 and then inspect them with the data of the child's spontaneous utterances. More specifically in section 3.2, after stating what the acquisitional principles predict for lexical acquisition of Japanese children, it will be shown that the predictions are borne out by innovative words produced spontaneously by Japanese children. In section 3.3, we will discuss, with the same data, a developmental change in the application of some Japanese WFRs. Sections 3.4 will indicate what is predicted from the Autonomy hypothesis and then inspect the predictions with the same innovation data.

The data to be presented come from the author's two children, Junich and Yumi, with whom I had interacted for half an hour every two months. The interview started in June 1993, when Junichi was three years old, and each interview was audio-recorded and later transcribed. Besides, I had kept a record of interesting expressions found in their naturally occurring speech. From the longitudinal observational data, nonce complex words are picked out and classified.² The total of 66 innovative compounds and 13 innovative derivatives are obtained through interview and diary study of two native Japanese children for five years, from age 3 to 7 years. These novel words are judged to be words that do not have an entry in the child lexicon and accordingly they reflect the child's lexical creativity.

3.2. Result 1: Acquisitional Principles

This section examines the acquisitional principles outlined in § 2.2, using production data from young children acquiring Japanese. The Japanese lexicon mainly consists of *wago*, familiar native Japanese words/morphemes, and *kango*, words/morphemes that are of Chinese origin and are often used in expressing abstract notions. An element of one type is primarily combined with an element of the same type, and both types of word formation devices may be productive in adult Japanese. There are two significant characteristics of *wago* (cf. Tamamura 2008: 64-69, Nishio 1988: 134-138). The first one is the transparency of its meaning. The meaning of *wago* is clear and easy to understand without particular presuppositions, so that compounds of *wago* are usually understood without particular preliminary knowledge. Because of its transparency many of *wago* are learned naturally as the most familiar words from childhood. For instance, the *wago* words *omocha* 'toy' and *kawa* 'river' are transparent and familiar, whereas the understanding of their *kango* counterparts *gangu* 'toy' and *kasen* 'river' requires particular background knowledge. The second characteristic of *wago* is its commonness. According to a survey on written language, *wago* tokens are more frequent (53.9%) than *kango* tokens (41.3%), although *wago*

types are less frequent (36.7%) than *kango* types (47.5%). The result suggests that *wago* is characterized as common word which can be used in any case or material and accordingly *wago* words become central members of basic vocabulary. For instance, the typical *wago* words *mono* ‘thing’ and *suru* ‘do’ are primary words which have a wide range of use.

Some interesting predictions are made for novel-word formation by Japanese children. As already mentioned, the acquisitional principles of Transparency—to construct a semantically transparent word from familiar elements—and Productivity work in the child’s word production, and Transparency may take priority over Productivity. Given these acquisitional principles and the aforementioned properties of Japanese, it is predicted that *wago* compounds/derivatives form a major part of Japanese children’s spontaneous innovative words. Confirmation of this prediction is the subject of the next section.

3.2.1. Compounding

First, we will consider compounding. The innovative compounds are classified in terms of structural patterns and then they are subclassified with regard to the lexical stratum of constituent roots. The classification of the findings is shown in (1).³

(1) Innovative compounds

I. N+*suru*

(a) *wago*(+*wago*) +*suru* (=wago)

o-uchi-suru (Y: aged three years, one month; henceforth 3;1) ‘honorific-house-do’ i.e. ‘to do house’⁴ *o-ekaki-suru* (Y: 3;4) ‘honorific-drawing-do’ i.e. ‘to do a drawing’ *o-yama-asobi-suru* (Y: 3;9) ‘honorific-mountain-play-do’ *wataame-suru* (Y: 4;1) ‘cotton.candy-do’ *mado-suru* (Y: 4;1) ‘window-do’ *o-sumoosan-suru* (Y: 4;5) ‘honorific-sumoist-do’ *asobi-narai-suru* (J: 4;7) ‘play-learning-do’ *tsumiki-suru* (Y: 4;8) ‘building.blocks-do’ *odori-suru* (Y: 4;11) ‘dancing-do’ *gottsunko-suru* (Y: 5;0) ‘bumping (onomatopoeic)-do’ i.e. ‘to do bumping’ *takibi-suru* (Y: 5;0) ‘bonfire-do’ *urusai-koe-suru* (Y: 5;1) ‘raucous-voice-do’ *kooiu-gokko-suru* (Y: 5;1) ‘such-play-do’ *fuyu-yasumi-suru* (Y: 6;3) ‘winter-vacation-do’ *kata-momi-suru* (Y: 6;3) ‘shoulder-massaging-do’ *ura-waza-suru* (Y: 6;3) ‘outwitting-trick-do’ *kotae-suru* (Y: 6;3) ‘answer-do’ *iro-gime-suru* (J: 6;8) ‘color-decision-do’ *nanka-asobi-suru* (J: 6;11) ‘some-play-do’ *okaasan-suwari-suru* (J: 7;2) ‘mother-sitting-do’

(b) foreign-word(+*wago*)+*suru*⁵

taiya-mawashi-suru (J: 4;4) ‘tire-rolling-do’ *shabon-dama-suru* (J: 4;4) ‘soap-ball-do’ i.e. ‘to blow bubbles’ *booru-nage-suru* (J: 4;4) ‘ball-throwing-do’ *marason-suru* (J: 4;4) ‘marathon-do’ *botan-suru* (Y: 4;5) ‘button-do’ *tabako-suru* (Y: 4;5) ‘cigarette-do’ *sukaato-mekuri-suru* (Y: 4;7) ‘skirt-turning-do’ *koppu-suru* (Y: 4;9) ‘glass-do’ i.e. ‘to cover something with a glass’ *toire-suru* (Y: 5;6) ‘toilet-do’ *buranko-suru* (Y: 6;3) ‘swing-do’ *biidama-korogashi-suru* (Y: 6;3) ‘marble-rolling-do’ *baiorin-suru* (Y: 6;3) ‘violin-do’ *koosu-suru* (J: 6;6) ‘course-do’ i.e. ‘to run a toy car in a lane’ *beruto-suru* (Y:6;6) ‘belt-do’ i.e. ‘to fix a belt to a bicycle’

(c) *kango(+wago)+suru*

untenshu-suru (J: 3;3) ‘driver-do’ *jitensha-suru* (J: 4;4) ‘bicycle-do’ *suberi-dai-suru* (Y: 6;2) ‘sliding-platform-do’ i.e. ‘to slide on a slide’ *ichirinsha-suru* (Y: 6;4) ‘monocycle-do’ *kami-hikooki-zukuri-suru* (J: 6;8) ‘paper-plane-making-do’

II. V+V

(a) *wago+wago*

hane-nigeru (J: 3;0) ‘jumping-escape’ i.e. ‘to escape by jumping’ *warai-komu* (Y: 4;1) ‘laughing-do.thoroughly’ i.e. ‘to laugh thoroughly’

III. N+V

(a) *wago+wago*

ushiro-nugu (Y: 5;1) ‘back-remove’ i.e. ‘to undo the back buttons’

(c) *kango+wago*

byooki-hiku (Y: 6;6) ‘illness-draw’ i.e. ‘to become ill’

IV. N+deverbal N

(a) *wago+wago*

tako-age (Y: 6;3) ‘kite-flying’ for flying kite *ka-tsubushi* (Y: 6;4) ‘mosquito-squashing’ *ha-migaki* (Y: 6;4) ‘tooth-brushing’ for toothbrush *kao-arai* (J: 7;0) ‘face-washing’ *iro-nuri* (Y: 7;0) ‘color-putting’

(b) foreign-word+*wago*

koppu-ire (Y: 5;5) ‘glass-putting (in something)’ for the container of glasses *kaadogeemu-ire* (Y: 6;3) ‘card.game-putting (in something)’ for card-case *pan-kire* (J: 7;0) ‘bread-cutting’ for a knife for slicing bread

(c) *kango+wago*:

hana-benkyoo (J: 5;5) ‘flower-study’

V. deverbal N+N

(b) foreign-word+*wago*

nokori-aisukuriimu (J: 5;10) ‘remainder-ice.cream’ *biiru-nomi-koppu* (Y: 6;11) ‘beer-drinking-glass’

(c) *kango+wago*

nobori-tetsuboo (J: 6;9) ‘climbing-iron.bar’

VI. N (A)+N

(a) *wago+wago*

aka-akachan, shiro-akachan (J: 3;7) ‘red-baby, white-baby’ *kodomo-tamago* (J: 4;10) ‘child-egg’ *daijina-mono-bako* (Y: 6;2) ‘important-thing-box’

(b) foreign-word+*wago*

gohan-man (J: 4;0) ‘rice-man’ *kurisumasu-omocha* (J: 4;6) ‘Christmas-toy’ *tsuru-san-aisukuriimu* (Y: 4;8) ‘crane-honorific-ice.cream’ *ushiro-botan* (Y: 4;10) ‘back-button’ *pengin-ishi* (Y: 6;6) ‘penguin-stone’ *hitori-beddo* (Y: 7;7) ‘one.person-bed’ i.e. ‘my own bed’

(c) *kango+wago*

shooyu-mizutamari (Y: 6;6) ‘soy.sauce-water.puddle’

VII. N+A

(a) *wago+wago*

jiwaru-kusai (Y: 6;6) ‘mean-looking’

Structurally, the innovative compounds are divided into seven types: (I) noun+*suru* ‘do,’ (II) verb+verb, (III) noun+verb, (IV) noun+deverbal noun, (V) deverbal noun+noun, (VI) noun (or adjective)+noun, and (VII) noun+adjective. Patterns (I)-(III) are compound verbs, patterns (IV)-(VI) are compound nouns, and pattern (VII) is compound adjective. Pattern (I) of verbal compounding is the most powerful device for word coinage at the developmental stages involved. This pattern is so strong that it may incorporate a noun phrase as well as a noun into the first position of compound.⁶ The other two types of verbal compounding are not so productive. The three types of nominal compounding are productive and each may produce a significant sum of coinages. Pattern (IV) generally makes process nouns like *ka-tsubushi* ‘mosquito-squashing, but it may further make innovative “result nouns” such as *tako-age* ‘kite-flying’ meaning flying kite.⁷ Pattern (VI) consists of a noun (or adjective) plus a noun, both of which are non-derived words.

From the viewpoint of the lexical stratum of words or roots, the innovative compounds are divided into three types: (a) *wago+wago*, (b) foreign-word+*wago*, and (c) *kango+wago*. Compounds of (a)-type are homogeneous ones, while compounds of (b)- and (c)-types are hybrids, which consist of roots of different origin. The *wago+wago* compounding is the most productive; out of 66 innovative compounds listed in (1), 48.5% (n=32) are compounds of this type. Furthermore, all the compounds in (1) contain *wago* as their constituents. It is therefore observed that Japanese innovative compounding by young children is principally made by the use of *wago* materials. This fact stems naturally from the principle of Transparency. The principle states that young children coin semantically transparent words with familiar elements. Given this principle, it is natural that the children should innovate compounds by the combination of *wago* materials, transparent and basic.

There are many innovative compounds which contain roots of foreign origin as their constituents. Compounds of this type count 25 and make up 37.9% of the whole innovative compounds recorded. Most of the foreign roots used in the compounds were loaned chiefly from English long ago and they are now firmly established in the Japanese vocabulary. Thus, words such as *taiya* ‘tire,’ *pan* ‘bread,’ and *botan* ‘button,’ can be judged as familiar everyday words. In contrast, there is only a small amount of nonce compounds containing *kango* elements: only nine compounds of this sort are present in the data (13.6%). In this connection, it is noteworthy that the *kango* roots concerned, like the roots of foreign origin, are familiar and common in the present Japanese. For instance, *jitensha* (bicycle), *byooki* (illness), and *benkyoo* (study) are well-known ordinary *kango* words. Although non-*wago* words, especially *kango* words, are likely to express abstract notion and they are thus often not semantically transparent, young children may yield a hybrid compound by choosing a familiar word among words of foreign or Chinese origin to combine it with a *wago* root. This is exactly what is expected from the Principle of Transparency.

Let us turn next to the question of productivity on compounding and its relation to Productivity as

acquisitional principle. Research is undertaken to find out what patterns are productive in the Japanese compounding system (Nomura 2008). The investigation is carried out as follows. Comparing the 1960 version and the 1980 version of a glossary of modern terms, all the entries which are newly listed in the new version are extracted and then only compound nouns are selected among these entries.⁸ These selected compounds can be judged as neologisms. They are classified in terms of their composition and the lexical stratum of their constituents. The findings of the research are (i) combinations of *kango* roots quantitatively form a majority of the compounds in the observational data (e.g. *chiiki-kenkyuu* ‘region-study’) and (ii) a *wago* root itself is low in productivity although it possesses enough strength to combine other kinds of roots (e.g. the *wago+kango* compound *mono-busoku* ‘things-shortage’ i.e. ‘shortage of things’).

The adult word coinage just presented stands in a sharp contrast to the child word coinage observed earlier. We have observed that *wago* but not *kango* provides young children with key materials for nominal compounding. Among 22 nonce compound nouns found in our child corpus, there is no compound which consists of only *kango* roots and there are only four compounds (18.2%) which contain *kango* roots. Contrastively, there are nine *wago-wago* compounds (40.9%) and all the compounds contain *wago* elements.

What is predicted from the Principle of Productivity—young children draw on productive word-formation devices in a given language—is that young Japanese children innovate many compound nouns by the combination of *kango* roots, since *kango* nominal compounding is very productive in Japanese. However, contrary to what the principle expects, they do so by the combination of *wago* roots, which accords well with the Principle of Transparency. In view of these facts, we are justified in asserting that Transparency shows its preponderance over Productivity in word creation by young children.

3.2.2. Derivation

Turning now to derivation, it is said that Modern Japanese is not a language with rich affixes, and yet it has a set of productive derivational affixes. Two features of the Japanese derivational system are prominent: (i) suffixes are more productive than prefixes and (ii) *kango* affixes are more productive than *wago* affixes (Morita et al. 1989: 59). Productive *kango* affixes include the negative prefixes *fu-/mu-/hi-*, the adjective-forming suffix *-teki*, and the noun-forming suffixes *-sha/-nin*.

The innovative derivatives in our diary data are classified in terms of the lexical stratum of affixes:

(2) Innovative derived words

I. Suffixes

(a) *wago*

-poi (chotto) hen-poi (Y: 6;3) ‘(a little) odd-ish’

-ya watagashi-ya (Y: 4;1) ‘cotton.candy-shop’ *tsukue-ya* (Y: 6;3) ‘desk-shop’ *ehon-ya* (Y: 6;4) ‘picture.book-shop’ *ishikoro-ya* (Y: 6;6) ‘pebble-shop’ *ashi-ya* (Y: 6;9) ‘foot-shop’ i.e. ‘place where one’s foot is cured’

-ba keshigomu-ire-ba (Y: 6;10) ‘eraser-putting-place’ i.e. ‘a place to put an eraser in’

(b) *kango*

-*chuu origami-chuu* (Y: 6;4) ‘origami (the art of folding paper into figures)-in.the.middle.of’

tsukuri-chuu (Y: 7;1) ‘making-in.the.middle.of’

-*jun(-de) chiisai-ko-jun(-de)* (Y: 6;1) ‘little-child-in.the.order.of’

II. prefixes

(a) *wago oo- oo-taihen* (Y: 5;6) ‘very-hard’

(b) *kango choo- choo(-suupaa)-kantan* (J: 7;1) ‘super(-super)-simple’

As we notice from the examples just given, derivation is not fruitful in early childhood; there is a small amount of affixes available and all the affixes except *-ya* produce very few types. Derived words with the *wago* suffix *-ya* are often found in the speech of young children, while the corresponding *kango* derived words like *sho-ten* ‘book-shop’ are rarely found there. Neither *wago* nor *kango* affixes are dominant, however; the total number of *wago* affixes is comparable with that of *kango* affixes at the ratio of 4 to 3. Importantly, any of the productive Sino-Japanese derivational affixes are virtually excluded from young children’s lexicon. For example, *kango* negative prefixes such as *fu-* and *mu-* are almost never used in child’s early word formation, but the *wago* negative auxiliary *-nai* ‘not’ is used instead. In addition, the productive *kango* suffixes *-sha/-nin*, which form agentive nouns like *wa-sha* ‘speak-person’ and *annai-nin* ‘guide-person,’ are rarely used by young children and so the agentive notion is expressed with noun phrases like *toru hito* ‘one who takes’ (Y: 4;1). Compared with compounds, derived words are unlikely to be innovated by young children. Our research detects as many as 66 compounding innovations; more than 84.6% of the attested innovations are compounds (see (1)), whereas 15.4% of them are derived words.

As discussed in the last section, the combination of familiar roots gives rise to a variety of innovative compounds, showing that the Principle of Transparency works well in the developmental stages concerned. By contrast, many of the productive derivational affixes in adult tongue are not available in the acquisitional stages. Since speakers have difficulty in recognizing productive affixes, the Principle of Productivity does not seem to be at work in child’s early word creation.

In concluding this section, examination of spontaneous lexical creations by young children has shown the dominance of *wago* over *kango* and the superiority of compounding over derivation in creation of novel Japanese complex words. This gives empirical support to the Principle of Transparency and its priority over the Principle of Productivity.

3.3. Result 2: Conditions on WFRs

In early child grammars the conditions laid on each word formation rule may be relaxed, with the consequence that complex words can be ‘over-generated.’ As such cases we will deal with plural-forming rules and the verbal compounding of *N-suru*.

3.3.1. Plural-forming Rules

As laid out in § 2.1.2, Japanese exhibits a convention that the plural is generally not marked, while there are some marking devices to use when it is worthwhile to distinguish the plural from the singular. One of

them is *joogo*-type, reduplication of a root noun. We have stated three conditions on the pluralization: (i) the *wago* status of a root noun, (ii) the “individuality” plural, and (iii) unspecified plurality. Examining the child use of the pluralization in point, however, we can see that the preceding conditions are not always satisfied, as evidenced by the following production data from two or three-year olds:

(3) the *joogo*-type plural

(a) *wago*

o-me-me (Y: 2;3) ‘honorific-eye-eye’ i.e. ‘eyes’ *te-te* (J: 3;7) ‘hand-hand’ *ha-ha* (J: 3;7) ‘tooth-tooth’

(b) *kango*

ji-ji (J: 3;4) ‘letter-letter’ *hon-hon* (J: 3;7) ‘book-book’

The use of the *joogo* pattern is motivated by the emphasis of plurality (cf. *hana-bana* ‘flower-flower’ i.e. ‘various flowers’). We generally use a reduplicated word to indicate a large amount or number of what is referred to by the root. The example of noun-noun type is *yona-yona* (*jazu-ga ensoo sareta*) ‘night-night i.e. every night (jazz was played)’ and a verb-verb form is exemplified by (*sakuya-wa nomini-nonda*) ‘(last night I) drink-drunk i.e. drank heavily.’ The pluralization by the repetition of a noun constitutes a part of the general process of reduplication. The *joogo* words produced spontaneously by young children show well the general property of reduplication, as exemplified in (4); the large quantity of the referents is emphasized in each example.

(4) a. Kore *ha-ha* miga-iteiru-ne. (J: 3;7)

this.Top tooth-tooth.Acc brush-Prog.Pre-particle ‘This is brushing its teeth.’

b. *Ji-ji* ka-iteiru. (J: 3;4)

letter-letter.Acc write-Prog.Pres ‘I am writing letters.’

It seems that reduplications of a *wago* root like (*o-*)*me-me* and (*o-*)*te-te* are acceptable as “baby talk” and children hear such words in daily conversation with their parents. Receiving such inputs, children as young as three years of age may utilize the pluralization pattern to create *joogo* plurals like *hon-hon* and *ha-ha*, which are usually not used even as child talk. Significantly, the words *hon* and *ji* are *kango* and furthermore these *joogos* do not imply a collection of things different in size and color. That is to say, children at the earlier developmental stage have no mastery of the present conditions and may over-generate *joogo* plurals. It is only after learning these conditions that the children can form error-free *joogo* plurals.

The suffix *-tachi* is another device for marking plurality. Its use is generally limited to a noun which denotes a human being (Kunihiro 1980: 14). The suffix in question used by two children is exemplified in (5).

(5) a. *Kanako-chan-tachi* (Y: 3;7) ‘Kanako-dimimutive-plural.suf’ *kono-hito-tachi* (J: 3;11) ‘this-person-Pl’ *otoko-tachi* (Y: 5;1) ‘man-Pl’

b. *juusu-kun-tachi* (J: 4;0) ‘juice-Mr.-Pl’ *tora-tachi* (J: 4;4) ‘tiger-Pl’ *kaijuu-tachi* (Y: 4;11) ‘monster-Pl’

The examples in (5a) are created in accordance with the condition of *-tachi* suffixation: *-tachi* attaches to

only [+human] nouns. By contrast, the examples in (5b) show that the restriction is loosened in the speech of young children and thus *-tachi* is allowed to attach to [+animate] nouns. The example *juusu-kun-tachi* in (5b) is interesting in that the base consists of an inanimate noun and the suffix *-kun*, which makes a [+human] noun. Accordingly, children seem to know that *-tachi* does not combine with [-animate] nouns.

To sum up, we observe that constraints on pluralization may be overruled by children in their developmental stages and that the children reset the constraints suitably at some later stage on their way to acquiring the final, more complex grammar.

3.3.2. Verbal Compounding of N-*suru*

The same phenomenon as the pluralization discussed above can be seen in N-*suru* compounding: a condition is not placed on a WFR in the early grammar, so that children would make some systematic errors, which will be corrected after the condition is introduced. Novel compounds of this type are listed in (6), which are extracted from (1.I). They are classified according to the semantic role which the constituent N takes.

(6) The roles of N in N-*suru* compounds

- (a) Instrument: *koppu-suru* (Y: 4;9) ‘glass-do’ i.e. ‘to cover something with a glass,’ *jitensha-suru* (J: 4;4) ‘bicycle-do’ (b) Agent: *o-sumoosan-suru* (Y: 4;5) ‘honorific-sumoist-do’ (c) Location: *koosu-suru* (J: 6;6) ‘course-do’ i.e. ‘to run a toy car in a lane,’ *suberidai-suru* (Y: 6;2) ‘slide-do’ (d) Duration: *fuyu-yasumi-suru* (Y: 6;3) ‘winter-vacation-do’ (e) Manner: *urusai-koe-suru* (Y: 5;1) ‘raucous-voice-do’ (f) Goal: *toire-suru* (Y: 5;6) ‘toilet-do’ (g) Theme: *o-uchi-suru* (Y: 3;1) ‘honorific-house-do,’ *mado-suru* (Y: 4;1) ‘window-do’

As noted in § 2.1.2, there is a condition on the N-*suru* WFR requiring that the base N be of [+activity] feature. All the examples in (6), though, run counter to this condition. The compound *koppu-suru* ‘glass-do,’ for example, has its constituent *koppu* functioning as Instrument and the root noun of *o-sumoosan-suru* ‘honorific-sumoist-do’ functions as Agent, the N constituents themselves being irrelevant to the [+activity] feature. In the adult grammar, the root noun of N-*suru* verb is semantic head and determines the substantial meaning of the action verb. Thus, the root noun *kenkyuu* in *kenkyuu-suru* ‘study-do’ carries the semantic content of the compound as a whole and *-suru* is semantically “light” verb, functioning only as marker of the verb category. In contrast, *-suru* of the child innovations in (6) plays a crucial role in determining the meaning of the whole compound and the root noun designates how its entity is typically associated with the designated action. In *koppu-suru*, the root noun *koppu* may typically take part in the action as instrument and accordingly the root verb *-suru* is naturally interpreted as ‘to drink’ or ‘to cover,’ the latter being chosen in the proper context. By the same token, the root noun of *o-sumoosan-suru* is prototypically linked to agent and correspondingly *-suru* is construed as ‘to wrestle’ in a natural way.

To conclude, the N-*suru* data offers some interesting implications for how children acquire a WFR. It can be seen that the acquisition of N-*suru* compounding proceeds in steps: the semantic bleach of *-suru* is done and the accompanying semantic restriction of the root N to a verbal noun is imposed in the process of lexical acquisition to establish the N-*suru* WFR.

3.4. Result 3: Autonomy Hypothesis

In this section, we will examine child lexical innovations from the viewpoint of the Autonomy hypothesis (Lexicalist hypothesis), centering on context-dependent nonce-word formations, and then discuss their theoretical implication for the adult grammar.

We will begin by classifying child innovations and confirming their functions. Child lexical innovations are classified into three classes: (i) the contextuials which depend on inter- or intra-clausal contextual factors, (ii) the contextuials which depend on mutual knowledge of speakers/listeners, and (iii) non-contextuials. The examples of each class are enumerated in (7)-(9).⁹

(7) contextuials, depending on inter- or intra-clausal contextual factors

a. *Asobu-no narat-tetanda-yo. Asobi-narai-shi-tetanda-yo ...* (J: 4;7)

play-nominalizer.Acc learn-Prog.Past-particle play-learning-do-Prog.Past-prt

‘We were learning to play. We were doing “play-learning.”’

b. Ah *nokori-aisukuriimu-ga aru. Boku-ga tabeta nokori-no aisukuriimu-da.* (J: 5;10)

ah remainder-ice.cream-Nom be I-Nom eat.Past remainder-Gen ice.cream-be’

‘Ah, there is a “remainder-ice cream.” It is the remainder of the ice cream which I ate.’

c. *Chiichai tamago-da-na. Kodomo-tamago-da.* (J: 4;10)

small egg-be-prt child-egg-be

‘This is a small egg. It’s a child-egg.’

d. *Ehon-o kat-temoratta-no. Ehon-ya-san-de.* (Y: 6;4)

picture.book-Acc buy-Pass.Past-prt picture.book-shop-honorific-at

‘A picture book was bought for me. At a picture-book shop.’

e. *Ashi-ya-san. Ashi-o naoshi-temorau-no.* (Y: 6;9)

foot-shop-honorific foot-Acc cure-Pass.Pres-prt

‘(It is) a foot-shop. One has one’s foot cured (there).’

(8) contextuials, depending on mutual knowledge of speakers/listeners

a. *Doon-chan-ga okkochicha-ikenai-kara mado-shite-aru-no.* (Y: 4;8)

Doon-diminutive-Nom fall.down-Not-because window-do-keep-prt

‘The window is kept shut lest Doon falls down.’

b. *Koppu-shi-toka-nai-to-ne mazuku-nacchau-kara koppu-shite-aru-no.* (Y: 4;9)

glass-do-keep-Not-if-prt unpalatable-become-because glass-do-keep-prt

‘Because (the food) will become unpalatable if it is not kept covered with a glass, it is done so.’

c. *Pan-kire-wa?* (J: 7;0)

bread-cutting-Top

‘Where is the bread-cutter (=knife)?’

d. *Kyoo hantaini neru-kara-ne. Hitori-beddo tsukuru-kara-ne.* (Y: 7;7)

today reversely sleep-will-prt one.person-bed make-will-prt

‘Today I will sleep reversely. I will make my own bed.’

e. Kono ko *sakkaa* mot-teru. (J: 3;11)

this boy soccer have-Pres

‘This boy has a soccer ball.’

f. Father: Dooshite ha-o migaku-no?

why tooth-Acc brush-Inter ‘Why do you brush your teeth?’

J: Ha-ga *mushi*-ninacchau-desyo. (J: 3;6)

tooth-Nom worm-become-would ‘My teeth would become wormy, i.e. decayed.’

(9) non-contextuals

(a) *wataame-suru* (Y: 4;1) ‘cotton.candy-do’ (b) *hane-nige-ta* (J: 3;0) ‘jumping-escape-Past’

(c) *warai-kon-da* (Y: 4;1) ‘laughing-do.thoroughly-Past’

We see here that contextually derived complex words have much the same semantic functions as their adult counterparts. In (7a), an activity which is expressed in a phrase is compactly expressed by the N-*suru* compound *asobi-narai-suru* in a subsequent context. The compound is a nonce word which would not be previously encountered. As is seen in (7b) and (7e), complex words are sometimes innovated first and then the supplementary notes follow. The notes are needed partly because the speaker may think that his/her intention is not easily understood. The examples in (8) illustrate a case in which a speaker coins a word, judging that the hearer can infer the word’s meaning from the context. The coined word therefore is not interpreted well unless the hearer clearly understands the situation of the utterance. The meaning of *mado-suru* in (8a), for instance, is hard to figure out without knowing the context of fitting up the sideboard of a (toy) bed. In (8d) an activity which is usually expressed in a phrase is named with the compound *hitori-beddo*. As sketched above, context-dependent innovation has the function of carrying out the economy of expression. The information to interpret the word is recoverable from the context.

Examples (8e) and (8f) well illustrate the function of defocusing old information; by eliminating a known element and preserving only a new and important element, it is shown that what is eliminated is backgrounded while what is left is foregrounded. Thus, *booru* ‘ball’ and *ha* ‘tooth’ in the compounds are defocused and eliminated while *sakkaa* and *mushi*, which carry higher information value, are kept and spotlighted here. Some non-contextual creations are illustrated in (9). The compounding pattern of N-*suru* fruitfully creates such words as *wataame-suru* in (9a) without contextual force, just as the productive pattern of N-to-V conversion permits the coinage of a lot of verbs in English (cf. *to teapot*). The compound verbs *hane-nigeru* and *warai-komu* in (9b) and (9c) are temporarily formed by the use of the verb-verb compounding pattern. These novel compounds exemplify the function of contrast: a certain manner of activity is made to stand out by the verbal element *hane-* or *-komu*.

We next turn to nonce formation of phrase-incorporating words—a phenomenon that allows a syntactic constituent to be recursively fed into a lexical rule. Japanese, unlike English, exhibits common constituent order both inside a phrase and inside a word, as in *miyori-o sagasu* ‘to search a relative’ and *miyori-sagashi* ‘relative-search.’ This enables us to construct a compound from the comparable phrase without changing the constituent order, and it is then sometimes possible to form a compound containing a certain kind of noun phrase, as in $[[\text{higaisha-no miyori}]_{NP} \text{sagashi}]_N$ ‘search of victim’s relative.’ Given the fact

the same complement-head order within a phrase and a word in Japanese, it is predicted that Japanese children can readily innovate compounds of this type with the aid of contextual force.

As predicted, our children yielded nonce words containing a phrase in the following way:

(10) contextuials, depending on inter- or intra-clausal contextual factors

(Y enjoys collecting pebbles and opens a “pebble shop” at a riverside.)

Watashi *ishikoro-ya-san* yat-teru-no.

I(-Top) pebble-shop-honorific(-Acc) do-Prog.Pres-prt

Chiisai-hoo-no *ishikoro-ya-san*. (Y: 6;6)

small-def.Compar-Gen pebble-shop-honorific

‘I am keeping a pebble shop. The smaller-pebble(s) shop.’

(11) contextuials, depending on mutual knowledge of speakers/listeners

a. Miimii-no usagi-san-wa *kokono-untenshu-shi-terunda-ne*. (J: 3;3)

Miimii-Gen rabbit-honorific-Top at.this.place-driver-do-Prog.Pres-prt

‘Miimii, the rabbit, is doing “at-this-place driver”.’

b. Watashi-ne *kooiu-gokko-yaru*. (Y: 5;1)

I(-Top)-prt this.sort.of-play-do

‘I will do play of this sort.’

c. *Inu-no-odori-suru*. (Y: 6;4)

dog-Gen-dance-do’

‘I will do dog’s dance.’

(12) non-contextuials

a. “Otoosan”-te *urusai-koe-shite* ... (Y: 5;1)

“father”-conj raucous-voice-do

“‘Father,” I do raucous voice (i.e. I cry in a raucous voice) ...’

b. *Daijina-mono-bako-da-yo*. (Y: 6;2)

important-thing-box-be-prt

‘(This is) an important-thing box.’

In each of the examples just given, a phrase-incorporating innovation is created on the spur of the moment by some productive word formation pattern: N-*suru* compounding in (11) and (12a), noun-noun compounding in (12b), and suffixation in (10).

As outlined earlier, a name is temporarily constructed for an entity or activity by combination of minimally essential units in order to carry out one or all of the functions (economy, contrast, defocus). Since a constructed word is required to be expressed in a simpler form, a phrase is normally left unexpressed in it. There may be a case, however, in which certain information should be manifested while the properties of lexicalization are preserved. In (10), (11a), and (11b), the constituent noun is specified by means of non-generic, deictic device. More specifically, a felicitous name is given to an activity or entity by utilizing deictic expressions, which refer directly to things right in front of the speaker and thus form an essential part of early child speech. As a result, complex words containing a maximal phrase like *kokono-untenshu-*

suru may be coined, overriding the “non-mixture” constraint.

We are now in the position to argue how child’s lexical innovation affects the Autonomy thesis. There is a claim that a certain aspect of language acquisition is mirrored in the adult grammar. Clark and Clark (1979: 806-807) suggest that some types of child’s innovations may remain and be conventionalized in the adult grammar, triggering innovation of the adult grammar or language change. The nub of their discussion is as follows. Children learning their first language do not always form innovations the way adults do. For example, innovative denominal verbs are sometimes formed contrary to adult constraint on word coinage; verbs like “*to car to Mexico*” and “*to airline to Mexico*” are created although they are normally pre-empted or blocked by the well-established verbs *drive* and *fly*. In addition, children may interpret an innovative denominal verb very differently from adults, as in the interpretation of *to chopstick* as ‘to have Chinese food’ rather than ‘to use chopsticks.’ If innovative verbs like *to chopstick* (as opaque idiom) and *to car* become accepted as canonical words, it would lead to extension of a word’s meaning or introduction of new words in English. Children’s “errors” may therefore play a considerable role of promoting language change.

The child’s complex words that we saw in (10)-(12) differ from adult usage in two important respects: (i) an intra-word element is above X^0 and (ii) an intra-word element is non-generic. The second semantic feature notably disappears in later stages of development, following the convention that words concern generic notion. Consequently, a complex word containing a deictic maximal phrase is disallowed in the adult grammar. In comparison, innovated words which contain non-deictic and relatively small phrases may survive into adult’s grammar to become canonical words, which in turn can serve as the basis for generation of new “hybrids.” *Inu-no-odori-suru* in (11c), *urusai-koe-suru* in (12a), and *daijina-mono-bako* in (12b) are the phrasal compounds at issue. Thus, on the model of these institutionalized words, intermixtures of this sort may be constructed by adult speakers without reference to the preceding context. What emerges from this comparison is that the first formal property is in the process of being integrated in the word formation mechanism, leaving the Autonomy thesis minimally violable.

It is interesting to note here Alegre and Gordon’s (1996) psycholinguistic study. They carried out a psycholinguistic experiment to see how young children (3-5 years old) interpret the compound types of *red rat eater* and *red rats eater*. The result showed that the children are likely to give an interpretation of ‘red [rat eater]’ to *red rat eater* and give an interpretation of ‘[red rats] eater’ to *red rats eater*. It is argued with this observation that the plural ending *-s* in the first noun triggers a phrasal combination of adjective plus noun inside an A-N-N compound, in spite of the restriction on syntax-morphology interaction. Alegre and Gordon accordingly suggest that children are initially unaware of the Autonomy thesis, allowing a WFR to apply to phrases that cannot be morphological atoms in the adult grammar. Under this suggestion, innovative phrasal compounds would rather freely be constructed by English-speaking children. In fact, innovations of this kind seem not to be discerned in a corpus of child utterances; further, to my knowledge, there is no psycholinguistic study that induces children to generate mixed expressions in discussion.¹⁰ Detailed examination of young children’s ability of word creation from this perspective would then be necessary to verify that the restriction on syntax-morphology interplay is partially lifted in the early

grammar.

In summary, Japanese-speaking children may contextually construct phrase-incorporating words which fall short of the legitimate constraints. Some of these discourse-dependent lexical innovations may continue to persist through successive developmental stages and into the mature system, which in turn may lead to the proliferation of words of the same kind. This would facilitate the reconstruction of the Autonomy hypothesis and hence offer a step-by-step guide to reorganization of the whole framework of the adult grammar.

4. Conclusion

We have collected novel complex words produced by two Japanese-speaking children and conducted an in-depth analysis of the corpus. The analysis has confirmed two predictions: (i) predominance of *wago* novel complex words—all the innovations obtained involve *wago* elements—and (ii) young children’s production of a specific type of phrase-incorporating words, parallel to the adult ones. This supports the Principle of Transparency, its priority over Productivity, and the notion that an aspect of language acquisition is mirrored in the adult grammar. The developmental change in the conditions of some Japanese word formation rules is also demonstrated based on the innovation data. Hopefully, our analysis of child’s early innovations has shed some lights on the creative and innovative nature of our mental lexicon. Future research may focus on what cues are present in revising linguistic conditions and how children use these cues in acquisition.

Notes

- ¹ It is pointed out, however, by Kageyama and Shibatani (1989: 159) that an NP which contains a certain kind of modifier can be incorporated into a compound; for example, $[[\textit{taken-karano-jukensei}]_{NP} \textit{zooka}]_N$ ‘[[other.prefecture-from-examinee]_{NP} increase]_N’ is a well-formed Japanese compound. We can see then that in Japanese the constraint concerned is relaxed in a certain limited way and hence the constraint is not imposed so tightly as in English.
- ² Hart et al. (1977), Edwards et al. (1978), and Okubo (1974) are informative and helpful as a basis for collecting and analyzing child production data.
- ³ It seems difficult to strictly distinguish *wago* from *kango*, since the identification of *wago* requires consideration of the etymology and historical change of a word (Tamamura 2008: 66). Here we take *wago* to be the word which is pronounced with its Japanese reading (*kun-yomi*), distinguished from *kango* which is read with its Chinese pronunciation (*on-yomi*).
- ⁴ Here we focus on innovative derivation, and so inflectional affixes such as *-san* (honorific suffix) and *o-* (honorific prefix) are not considered. The meaning of the honorific prefix *o-* has developed, resulting in its function as marker of friendliness or intimacy. Children’s use of *o-* mainly has this function.
- ⁵ In patterns (b) and (c), the order of constituents is irrelevant.
- ⁶ It is pointed out by Okubo (1974: 65) that *suru* is one of the most frequent general words and is used

by children as young as one year of age. She also points out some interesting nonce *suru*-compounds:

(i) Kyuuri-mo *kinou-no-ohiru-shita* janai? (4;3) (Okubo 1974: 267)

cucumber-also yesterday-of-lunch-did not

‘You also ate cucumber at lunch yesterday, didn’t you?’

(ii) ... *ohayoogozaimasu-shite* ... gohan tabete ... *oyatsu-shite* ... (5;3) (Okubo 1974: 276)

good.morning-do meal(-Acc) have snack-do

‘... (I) say good morning ... have a meal ... have a snack ...’

⁷ In English, the action and instrument interpretations of a synthetic compound are distinguished by affixes (cf. *paper cutting* and *paper cutter*). There are no such markers in Japanese synthetic compounds, as in *neji-mawashi* denoting both ‘screw-turning’ and ‘screwdriver.’ It is for this reason that children sometimes “make a mistake” on formation of a synthetic compound: *ha-migaki* ‘tooth-brushing’ is construed as ‘toothbrush’ (Y: 6;4), although it is conventionally taken only as action meaning.

⁸ The glossary used is *Gendai-yogo no Kiso-chishiki* (Basic Knowledge of Modern Terms).

⁹ It might be difficult to distinguish (7)-type from (8)-type. The point is that only a case in which an explicit context is given belongs to the class of (7).

¹⁰ In a longitudinal corpus of transcribed child speech presented by Fawcett and Perkins (1980), we find context-dependent compounds like (i), but there is no case in which phrasal compounds such as **[your tree] house* are contextually created.

(i) (Children are making houses and gardens with Lego.)

D: You can use some of *my trees* if you want to, Gar.

G: Thanks. I’m making a *tree house*. (6;2)

(Fawcett and Perkins 1980: 126)

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