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[REVIEW]

Rich Languages from Poor Inputs

Ed. by Massimo Piattelli-Palmarini and Robert C. Berwick, Oxford University Press, Oxford, 2013, vi+358pp.

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Keywords: *Generative Grammar, structure dependence, child language, poverty of the stimulus, literacy*

1. Introduction

The book *Rich Languages from Poor Inputs* contains 16 articles dedicated to Carol Chomsky written by scholars interested in "the dilemma posed by the Poverty of the Stimulus (POS), i.e., the richness of the language acquired by the child on the meager basis of the episodic, variable, and only implicitly structured, linguistic input she receives" (p. 1). The book presents papers mainly on the three topics in which Carol Chomsky has played an important role in bringing linguistic theory to bear on psycholinguistics: (i) the problem of POS, (ii) linguistic knowledge which is acquired slowly, and (iii) the issues in reading and writing. The coverage of the material in the book is broad: it deals with questions on how linguistic knowledge is acquired and what role innate knowledge, if any, might play in that process, as well as the mechanisms of reading and writing for which human beings are not basically hardwired. The three questions are discussed in the three parts of the book, i.e. Part I through Part III, respectively, which offer new perspectives on the arguments on the POS.

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2. Part I: Poverty of the Stimulus and Modularity Revisited

Part I, "Poverty of the Stimulus and Modularity Revisited," is comprised of five chapters that offer new explanations for questions regarding why children acquire sophisticated and rich language based on poor inputs. Chapter 1 is the introduction. Part I starts with three chapters by Berwick, Noam Chomsky and Piattelli-Palmarini (Chapter 2), Kam and Fodor (Chapter 3), and Noam Chomsky (Chapter 4), which together reexamine the problem of POS, relating their argument to the famous issue of structure dependence exemplified in (1) below.

(1) Can eagles that fly swim?

Native English speakers unconsciously share the knowledge that the *yes-no* question given in (1) is about the predicate *swim* in the main clause, rather than *fly* in the embedded clause, despite the fact that the verb *swim* is located in a linearly farther position from the sentence-initial auxiliary *can* than the verb *fly* is. The authors question the recent claim in linguistics that a child acquires the knowledge of auxiliary-inversion on the basis of a statistical analysis of a corpus of data. For example, Kam and Fodor, based on the analysis of word-learning bigram models, and Berwick, Chomsky and Piattelli-Palmarini, based on the analysis of two other models, argue, based on different empirical sources, that linear order is simply not available to language learners, and the children are guided by a very simple principle of Universal Grammar (UG), looking for minimal structural distance, which is the only strategy available in language acquisition. They argue that UG determines the general architecture of language, and it is actually computationally natural.

Curtiss (Chapter 5) points out that the POS arguments have been controversial in the research of the modularity of mind. Curtiss is well known for conducting an extensive study on Genie, whose inadequate language stimulation during her early life (before the critical period) interfered with language aspects of left-hemisphere development. In this chapter, Curtiss discusses two types of module: Big modularity (BMod) and Little modularity (LMod). She shows a variety of cases (e.g. Specific Language Impairment, Alzheimer Dementia) and other types of evidence (e.g. the evidence for the dissociations between language and non-linguistic cognition) for the BMod, and basically claims that grammar represents a domain-specific mental faculty independent from the other mental faculties. She also argues for LMod by discussing cases such as aphasia and Klinefelter's syndrome, among others, and shows that language is not 'one piece'. Language is composed of separate pieces containing different independent subsystems

such as lexicon, pragmatics and grammar, and they can be selectively impaired in human development and breakdown.

Chapter 6, presented by Gleitman and Landau, shows that linguistically isolated children naturally construct, out of their own knowledge, the systems of their mother tongue. To use a famous example, Carol Chomsky observed that a deaf-blind child (19 months) enthusiastically described a recent field trip, as shown in (2) below.

(2) I saw one cab flattened down to about one foot high. And my mechanics friend told me that the driver who got out of the cab that was squashed down by accident got out by a [narrow] escape. (Chapter 6, p. 92)

The usage of the embedded relative clauses and the verb *see* in a semantically appropriate way shows that the lack of visual and auditory input cannot bar a child from acquiring the complex structure of the sentence or the meaning of the verb *see*. Likewise, Gleitman and Landau report their discovery that congenitally blind infants acquire words that refer to visual experience such as *see* and *look* at ages two to three, although the blind child connects the word *look* to the haptic sense. They report that a blind child told to "Look up!" raised her hands rather than her face, while sighted blindfolded children interpreted *look* to implicate vision and turned their faces upward. They also found that even the blind child understood color terms such as *red* and *blue*, and had the knowledge that color refers to a quality of tangible objects such as *dogs*, but not to intangible concepts such as *ideas*.

Deaf-blinds can get linguistic input by using the Tadoma method of speech reading introduced in the Epilogue of this volume by Carol Chomsky. With the Tadoma method, direct contact is made between the hand of the deaf-blind receiver and the face of a speaker to monitor the various articulatory actions that occur during speech. To perceive speech, they "place their fingers strategically at the mouth and throat of the speaker, picking up the dynamic movements of the mouth and jaw, the timing and intensity of vocal-cord vibration and release of air" (p. 92). However, children cannot acquire their mother tongue solely on the basis of properties available in the primary linguistic input data. Carol Chomsky, Gleitman, and Landau's findings suggest that innately-endowed grammatical knowledge enables children, even if they are blind and/or deaf, to eventually acquire complex and abstract linguistic knowledge based on degenerated, impoverished, and paltry input.

3. Part II: Discrepancies between Child Grammar and Adult Grammar

3.1. Overview of Part II

In the second part of the book, Part II, the contributors pay attention to two related issues regarding POS, which are implicit in Carol Chomsky's work: to identify the cues that children employ to acquire their mother tongue, and the acquisition process that proceeds beyond the age of five.

Hochman and Mehler (Chapter 7) and Legate and Yang (Chapter 11), based on the principles-and-parameters approach, propose their learning models, arguing that phonological properties and frequency play an important role in helping the learners set the parametric value of the mother tongue.

Hochman and Mehler discuss the infants' employment of a statistical heuristic (e.g. the contrast between 'frequent' and 'infrequent' elements) and the low-level cues such as syllables and the categories of consonants and vowels.

Legate and Yang, assuming that child learners can readily detect the prominence of stress, propose that UG provides a core set of parametric options that delimit a range of possible metrical structures and possible computational operations (e.g. projection, foot building, and edge marking), and a tolerance principle, a heuristic that can help identify a rule by comparing the number of lexical items that follow the rule to the number of exceptions, which together lead the children to attain their mother tongue.

Legate and Yang's insights are further pursued by Bever (Chapter 12), who argues for the synthesis model of language acquisition. In this model, both inductive and deductive computation for hypothesis formation and confirmation are assumed, and both UG and the learner's access to relevant statistical regularities and characteristic template sentences play a crucial role in language acquisition.

The remaining chapters (Chapters 8, 9, and 10) deal with the development of syntax in children beyond the age of five, the issues that Carol Chomsky is probably best known for (Chomsky (1969)). In her book *The Acquisition of Syntax in Children from 5 to 10*, Chomsky (1969) argued that certain syntactic properties such as subject control with *promise*-type verbs (e.g. *I promise Bozo to jump.*) are acquired late. In her innovative experiments, Carol Chomsky observed that children misunderstood *promise*-type sentences as being similar to *tell*-type sentences (e.g. *I told Bozo to jump.*), for example, and argued that children initially adhere to the Minimal Distance Principle (Rosenbaum (1967), i.e., the structurally closest NP argu-

ment of the upstairs clause is the mandatory subject of the infinitive in the embedded clause. The Minimal Distance Principle bars subject control, but not object control, and hence, subject/object asymmetries are observed here. The exceptions to the Minimal Distance Principle, such as *promise*-type sentences, are acquired at later points in language development.

Belletti and Rizzi (Chapter 8) and Laka (Chapter 9) shed light on the issues of subject/object asymmetries well known in the comprehension and production of relative clauses: Relative clauses containing subject gaps as in (3a) are acquired earlier than relatives containing object gaps as in (3b) (Brown (1972)).

(3) a. The woman$_i$ [that e_i saw the man] arrived early.
b. The woman$_i$ [that the man saw e_i] arrived early.

Belletti and Rizzi argue that relative-clause processing asymmetries emerge from a general linguistic principle. They present an argument that object-gap relative clauses are difficult to process and to acquire because of the intervention effects on the resolution of the syntactic dependency between the gap (e_i) and its antecedent (*the woman*$_i$). In other words, an antecedent-like phrase structurally intervenes between the antecedent and the gap, which makes the processing more difficult. They argue that "children cannot compute a local relation across an intervener close enough in structural type to the target of the relation" (p. 115), and this follows from Relativized Minimality, or a general locality principle (Rizzi (1990)). They explain the delay of subject control with *promise*-type verbs through a general principle as well: PRO and its controller must be connected by a search operation (Chomsky (2000)) constrained by Relativized Minimality, by which the Minimal Distance Principle shown above is subsumed. Thus, subject control across an intervening object should be barred in principle, and children misinterpret such sentences as (4) below as cases of object control.

(4) I promised Bozo [PRO to jump]

Laka, on the other hand, casts doubt on the universality of the subject/object asymmetries on descriptive grounds. She reports that in Basque, an ergative language which has prenominal relative clauses similar to Japanese as well as postnominal relative clauses such as in (3), the prenominal relative clauses with object gap are processed faster and more easily than those with subject gap, while in postnominal relative clauses, those with subject gap are processed faster and more easily, thereby indicating that subject-object language processing asymmetries are not, in fact, universal.

The inverse asymmetry, or the fact that the object gap preference found in prenominal relative clauses is reversed in postnominal relatives, indicates

that precedence relations are relevant in explaining the asymmetry in processing. Pointing out that the arguments of the verbs in ergative languages are, unlike those in nominative languages, morphologically marked, Laka argues that the morphological markedness of the core grammatical functions such as 'subject-of' and 'object-of', and sentence-initial processing choices, would possibly explain the results gained from Basque.

Wexler (Chapter 10) discusses the late acquisition of *tough*-construction, which is another case for which Carol Chomsky (1969) is well known. In her seminal experiment, she showed that a child, being asked if the blindfolded doll is easy to see or hard to see, erroneously answered "hard to see" to the question, even when the doll was in plain sight of the child. That is, children after five misunderstood the *tough* (*easy*)-type construction given in (5a) as being like the *eager*-type construction given in (5b) below.

(5) a. The doll is easy to see.
b. The doll is eager to see.

According to Carol Chomsky, the *tough* (*easy*)-type construction is acquired late, because the sentence in (5a) involves movement of the subject *the doll* from the object position of *see*, which is derivationally more complex than the construction in (5b), where the subject *the doll* is base-generated in the position and no syntactic movement is involved.

In order to explain such observations indicating a difference between child grammar and adult grammar, Wexler (Chapter 10) argues, based on the minimalist theory, that the difficulty of 'tough movement' sentences such as (5a) arises from the Universal Phase Requirement, which states that children (to about age eight), unlike adults, take all *v*P and CP to define phases, rendering passives, unaccusatives, and (subject-to-subject) raising structures ungrammatical. That is, the requirement does not allow the adult derivation, and children regard all potential phase categories as phases. Thus, object movement in such sentences as (5a) is barred initially, and the *tough* (*easy*)-construction is acquired at a later stage.

3.2. Some Notes on Part II

The papers in Part II raise many interesting questions, some of which have been already discussed in earlier papers. Belletti and Rizzi's analysis, for example, naturally leads us to question why it is the case that subject control, which violates a general principle, is ever possible in adult grammar. They provide an analysis where the intervention configuration is destroyed by the movement of a verbal chunk, termed smuggling, which bypasses the intervener. Smuggling operations are costly, and the analysis

also explains the later acquisition of passives as well as *promise*-type sentences.

Likewise, Wexler's analysis creates a new research question regarding the way children delearn the Universal Phase Requirement. Why and how do children find that the relevant *v*P is defective and not a phase, and hence, eventually learn that passives, unaccusatives, and raising structures are actually grammatical in adult grammar?

As Hochman and Mehler (Chapter 7) and Legate and Yang (Chapter 11) argue, the role of frequency is important in explaining language acquisition and in determining whether a linguistic generalization is productive enough to be extended to new items that meet its structural description. However, it is also well known that children voluntarily produce sentences that parents never provide. For example, it is widely known that Japanese-speaking children, at around the age of two to four, produce such "erroneous" relative clauses as (6) shown below.

(6) Babar-ga tabeteru no gohan
Babar-Nom eating *no meal
'the meal that Babar the elephant is eating'

Murasugi (1991), building on Saito's (1985) proposal, argues that there are two types of relative clauses in world languages, CP-relatives (relative clauses with a Complementizer) and TP-relatives (relative clauses without a Complementizer), and Japanese- (and Korean-) speaking children, whose adult language selects TP-relatives naturally overgenerate the Complementizer, *no* (or *ga* (Toyama dialect) and *kes* (Korean)), that appears in cleft sentences such as (7) below.

(7) Hajimete lobustaa-o tabeta-no-wa Bosuton de da.
first lobster-Acc ate-C-Top Boston in Copula
'It is in Boston that (I) ate lobster for the first time.'

Murasugi (1991) argues that children are endowed with a possible parametric value for the structure of relative clauses from birth, and hence there is a stage in acquisition where children employ the unmarked value (CP-relative) for the relative clauses. This explains why they "erroneously" produce relative clauses with a Complementizer that parents never do. If the argument holds, evidence for the claim that frequency does not solely explain the process of language acquisition can be gained from Japanese acquisition. More generally, the fact that children voluntarily produce the strings which are ungrammatical in the mother tongue but are grammatically possible in other languages, would provide strong evidence for UG discussed in Part I of the volume.

Finally, let us go back to the argument of Belletti and Rizzi (Chapter 8), and Laka (Chapter 9) about extraction in SVO languages with postnominal relative clauses, which is widely acknowledged (King and Just (1991), among others). Laka's finding from Basque strongly invites researchers to ascertain its cross-linguistic validity. In particular, the study of processing asymmetries in Japanese becomes crucially relevant, because Japanese relative clauses are prenominal and the arguments of the verbs are morphologically "Case"-marked overtly. Herewith, we would like to provide some comments on the issues on subject/object asymmetries.

As Laka herself notes, some researchers find that contextual cues make the processing of the object-relative easier (e.g. Ishizuka et al. (2006) for Japanese; Wu and Gibson (2008) for Chinese). However, many studies report that subject-gap relatives like (3a) are processed faster and are easier to process than object gap relatives such as (3b) even in languages with prenominal relative clauses (e.g. Lin and Bever (2006) for Chinese; Miyamoto and Nakamura (2003), Ishizuka (2005), Ueno and Garnsey (2008) for Japanese; Kwon et al. (2003) for Korean).

Japanese relative clauses are different from English in that relative clauses precede their fillers, and the linear gap-filler distance is longer in subject-gap relatives than in object-gap relatives, as shown in (8) below.

(8) a. [___ giin-o hinansita] kisha
GAP senator-Acc attacked reporter (=FILLER)
'the reporter [(who) ___ attacked the senator]'
b. [giin-ga ___ hinansita] kisha
senator-Nom GAP attacked reporter (=FILLER)
'the reporter [(who) the senator attacked ___]'

Nevertheless, interestingly enough, Japanese object-gap relatives are found to take longer to read just like English object-gap relatives.

One possible reason for this would be that in both English and Japanese, object-gap relatives involve a longer structural filler-gap /gap-filler distance in their syntactic representations (e.g. Ishizuka et al. (2003), Miyamoto and Nakamura (2003)). Ueno and Garnsey (2008), in fact, using reading times and event-related brain potentials (ERPs), investigate the processing of Japanese subject-gap/object-gap relative clauses. They investigate how the gap-filler association in Japanese might be compared to the filler-gap association in English, and whether it is linear distance or structural distance that determines comprehension difficulty.

The results of their experiment show a higher processing costs for object-gap relatives than subject-gap relatives in both reading times and

ERPs. That is, Japanese object-gap relatives are harder to process than subject-gap relatives. They also conclude that both ERP and reading time data are more consistent with the structural distance than the linear distance account for Japanese relative clauses.

At the end of their paper, Ueno and Garnsey also suggest another possible reason for the extra processing cost to object relatives. According to their analysis, subject relatives are easier because of the discourse prominence of subjects, given the analysis that Japanese relative clauses do not involve movement, and the gaps are actually null argument pronouns as Matsumoto (1989) and Murasugi (1991, 2000), among others, propose. That is, in the experiment without discourse context, the gap in the relative clause is identified in the same way as a pronoun by a cataphoric link with the head noun, and hence, the results obtained in the experiment of Ueno and Garnsey (2008) indicate that the subject *pro* is easier to link cataphorically with the head than the object *pro*.

If a subject-gap advantage is consistently found in the processing and/or acquisition of such prenominal-relative-clause languages with morphological "Case" marking, such as Japanese. As Ueno and Garnsey (2008) suggest, Laka's analysis may need reconsideration, and this would also contribute to the syntactic analysis of relative clauses in adult grammar.

Belletti and Rizzi's syntactic analysis of the subject/object asymmetries, which suggests that the asymmetries emerge from a general linguistic principle (Relativized Minimality), is not problem-free either. In fact, we can find some direct evidence conflicting with their proposal as shown below.

Noam Chomsky (1981) observes that the normal control properties can sometimes be reversed as shown in (9) below.

(9) a. John asked the teacher to leave early.
b. John asked (begged, pleaded with,...) the teacher to be allowed to leave early.

(9a) is ambiguous as to the controller: either *John* or *the teacher* can be the controller. Furthermore, in (9b), subject control is rather preferred to object control. It is known that the thematic object of *promise* cannot be a controller even in passive sentences such as (10a). But Chomsky (1981) notes that (10b) allows this control relation.

(10) a. *John was promised to win.
b. John was promised to be allowed to leave.

Likewise, our English-speaking informants also made a grammatical judgment for us that the controller is ambiguous in the example with the main verb *promise* shown in (11): it can be either the subject *John* or the object *Mary*.

(11) John promised Mary [PRO to be able to reach the goal soon]

Chomsky (1981) suggests that "the choice of controller is determined by theta-roles or other semantic properties of the verb, or perhaps pragmatic conditions of some sort" (Chomsky (1981: 76)). He argues that if this is the case, then, example in (12a) would be expected to allow subject control just like (12b), and the expectation is actually met.

(12) a. John asked Bill to get (receive) permission to leave early.
b. John asked the teacher to leave early.

Chomsky (1981) also notes that predictions of this kind are not always borne out. Nevertheless, the description and the explanation illustrated above suggest that the subject/object asymmetries in control are not due solely to syntax (and the principle of Relativized Minimality) contra Belletti and Rizzi (Chapter 8).

4. Part III: Broadening the Picture: Spelling and Reading

4.1. Overview of Part III

The final part of this volume, Part III, turns from the issues of oral language to those of literacy. Part III is comprised of four chapters, investigating the links between oral and written language development, and their pedagogical implications. The authors of the four chapters all concur with Carol Chomsky's insights into the research of 'invented spelling' exemplified in (13) (Chapter 13, p. 195).

(13) DOT MAK NOYS. MY DADAAY WRX HIR. B CWIYIT.
(Don't make noise. My daddy works here. Be quiet.)

Children of around four and five years of age, who know the alphabet but do not yet read well, "use the letters of the alphabet according to their names, or their sounds if they know them, and represent words as they hear them, carrying out splendid phonetic analysis" (Chomsky (1975)). Carol Chomsky reported that "the writing before reading (or early on in learning to read) was not an individual quirk but was practiced by large numbers of children: and that the specific spelling features invented by these children were not idiosyncratic, but shared by all of them. They all made up their spellings in the same way!" (Chomsky (1990), cited in Chapter 16, p. 223).

Following Carol Chomsky, Read and Treiman (Chapter 13), Gottwald and Wolf (Chapter 14), and O'Neil (Chapter 15) look into the mechanism of such children's invented spellings such as (13) above and find that there are phonological and phonetic systems governing the invention. For example,

"long vowels represented by letter names (BOT boat, FEL feel); short vowels represented by the letter name which contains the closest sound (BAD bed, WOTR water); nasals omitted before consonant (WOT won't, PLAT plant), and some words which are spelled using the full name of the letter (YL while; THAQ thank you)" (Chapter 14, p. 211).

Read and Treiman (Chapter 13), based on close phonological analysis, provide cross-linguistic research on the invention, and report that there are variations in inventive spelling among languages. For example, Brazilian children learning Portuguese use more vowel letters (Pollo et al. (2009)) than children learning English.

O'Neil (Chapter 15) argues that English inventive spellings aim for a taxonomic phonemic representation phonetically grounded, and that the representation does not take the morphology of the language into account. Hence, children inventing spelling need to learn "an archaic, cumbrous, and ineffective orthography, whose acquisition consumes much time and effort" (p. 226) at around the second grade of elementary school.

The pedagogical implications of the invented spellings are also suggested in Part III of the volume. For instance, Read and Treiman (Chapter 13) admit that children's spellings are creative achievements, and propose that it is important for children to get feedback and to be taught conventional spelling. Gottwald and Wolf (Chapter 14) examine the role of linguistic knowledge in vocabulary, morphology, syntax, and semantics in the acquisition of reading skills, and argue that the explicit awareness of such linguistic components helps a child to be a better reader. Goldberg (Chapter 16) encourages such invented spelling because they are creative achievements just like artistic creations. Goldberg introduces the "picto-spell," a method of using visual representations of spelling words that incorporate the spelling of the word into pictures.

Part III, altogether, shows that children commonly create spellings, which are surprisingly uniform, before they can read. The invented spellings are wonderful, and their characteristics are common across children. The inventors, at the same time, need guidance and instruction in spelling. As Read and Treiman (Chapter 13) note, "explicit instruction is more important for learning to spell and read than for learning to speak and understand, for which humans are better equipped" (p. 208). The invented spellings manifest the child's potential and by encouraging invention, elements such as desire/care, passion, perseverance, wonder, creativity, engagement, confidence, participation and imagination, which Goldberg (Chapter 16) calls the top ten concerns for education (p. 234), are expected to emerge.

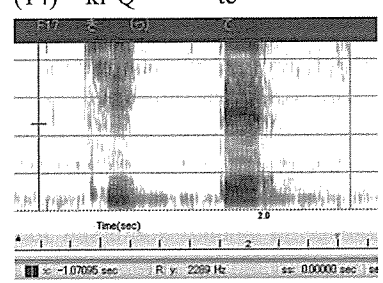
4.2. Some Notes on Part III

The papers in Part III convincingly tell the readers that there are phonological and phonetic systems governing children's invented spellings. The invented spellings show that children, at around the age of four to six, represent language at the level of phonemic segments, primarily, and they represent some phonetic details that are not reflected in English orthography. If the invented spellings are a window into children's conceptions of language in general, the cross-linguistic similarities are expected to be observed as Read and Treiman (Chapter 13) suggest. In this section, we will briefly discuss some cross-linguistic contributions available from Japanese.

Adult Japanese features consonant gemination, and there are a lot of examples containing such consonant doubling as *kitte* (/kiQte/([kʲit:e] / [kʲitte] / [kʲitte])) (a stamp) and *assari* (/aQsari/([as:aɾʲi] / [assaɾʲi])) (plainly) in the primary linguistic data. The examples contrast with *kite* ([kʲite]) (come) and *asari* ([asaɾʲi]) (sea shells), respectively, in that the geminate (represented as "Q") takes up an extra mora by inserting a pause which corresponds to the length of one short vowel. The National Institute of Special Education (2008) reports that Japanese-speaking children at around six years old (the 1st graders) typically have difficulties in spelling out such consonant gemination.

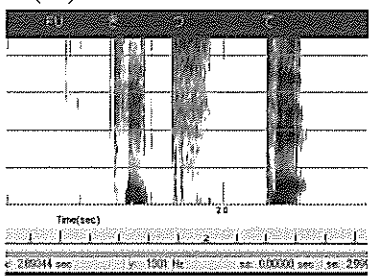
The National Institute of Special Education (2008) finds that the consonant gemination actually contains clear auditory gaps. Compare the spectrographs of *kitte* (a stamp) and *kitsute* (an intentionally made-up word with the overt realization of the geminated consonant), shown in (14) and (15), respectively. (14) indicates the spectrograph of the production of *kitte*; (15) indicates that of *kitsute*. In (15), "っ," which spells the initial part of the geminate, is overtly pronounced.

(14) ki Q te



(The National Institute of Special Education (2008: 7))

(15) ki tsu te



(The National Institute of Special Education (2008: 7))

The contrast between (14) and (15) clearly indicates that the former only contains a salient pause (with no phonological realization of "Q"). That is, the initial part of a geminate is not audibly salient to the listeners.

The National Institute of Special Education (2008) reports that the non-saliency discussed above makes a lot of Japanese-speaking children find it difficult to spell out the consonant gemination. They show that children write, for example, *oishikata* (おいしかた) instead of *oishikatta* (おいしかった), and *tanoshikata* (たのしかた) instead of *tanoshikatta* (たのしかった), respectively, as shown in (16) and (17) below.

(16) a. *おいしかた (Child Japanese)
oisikata
b. おいしかった (Adult Japanese)
oisikatta
'(It) was tasty.'
(The National Institute of Special Education (2008: 2))

(17) a. *たのしかた (Child Japanese)
tanosikata
b. たのしかった (Adult Japanese)
tanosikatta
'(It) was a lot of fun.'
(The National Institute of Special Education (2008: 3))

Thus, Japanese-speaking children's early spellings represent phonetic features, just like other languages discussed in Part III.

Jun Ogawa (personal communication) has an example where G (6;0), a Japanese-speaking child, wrote a sentence in a note addressed to Santa Claus, using letters of the alphabet, *hiragana* and *katakana*, as shown in (18a), different from the 'correct' spelling in Adult Japanese given in (18b).

(18) a. U うをっち と こんぷーりい U3 せとお ください (G: 6,0)
U uwocchi to kompuurii U3 seto-o kudasai

b. Uウオッチ と コンプリート U 3 セットを ください
(Adult Japanese)
U-wacchi to kompuriito U3 setto-o kudasai
U-watch and complete U3 set-Acc please-give-me
'Please give me a U-watch and the U3 complete set.'

The child G found it difficult to spell out the consonant gemination as we discussed above, and he wrote *seto* instead of *setto* 'set.' In addition, interestingly enough, he also had difficulty writing the Japanese macron (—) for the long vowel and he wrote *kompu—rito* instead of *kompuri—to* 'complete.' Furthermore, the child invented a new way to represent the Accusative Case marker "を," which is actually pronounced as /o/ but is written in the letter "を" (/wo/) in Japanese orthography. The child wrote "お"(/o/) instead of "を." Thus, the phenomenon of invented spelling is common even among Japanese-learning children, although the invented spellings represent some details with roughly mora-sized units.

As Read and Treiman (Chapter 13) state, cross-linguistic research on writing and reading is still relatively sparse, although it seems clear that cross-linguistic research conducted by native speakers of different languages can provide deep insights and broaden the perspectives for the issues discussed in English linguistics. Japanese contributions to the acquisition of literacy would, just like the famous subject/object asymmetries discussed in Part II, definitely push forward research of linguistic theory in general, in both description and explanation.

5. Conclusion

The discussion of the question of POS, approached from three different angles in Part I through Part III of the book under review, points to the following conclusions.

As for the oral language, any person, whether deaf, blind or neither, based on the input available in the primary linguistic data, naturally attains complex grammar with properties such as structure dependence, as exemplified in (1): *Can eagles that fly swim?* This is simply because there is a grammar endowed to the human mind innately. The caretaker, therefore, does not have to teach the child which sentence is grammatical and which one is not, and why this is the case. The unconscious knowledge of grammar, innately given to children, enables them to attain rich target grammar without much effort.

In contrast, young writers, without being given the direct teaching of

spelling, naturally invent spelling in a unique way. Learners need direct guidance to spell correctly, because knowledge of orthography is not innately endowed to human beings. Rich inputs are necessary for people to learn to read and write, even for those with a high IQ, because human beings are not basically hardwired to read and write. To provide effective feedback to the spelling-inventors, teachers need to know about the characteristics and mechanisms of early spellings, as Read and Treiman (p. 208) point out. Here, the knowledge of psycholinguistics is needed for people involved in language education.

The conclusion for the dilemma posed by the POS is thus drawn from syntax, acquisition, processing, and literacy standing upon the foundations of Carol Chomsky's insights in *Rich Languages from Poor Inputs*.

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