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# REVIEWS

S. E. M. Allen, *Aspects of argument structure in Inuktitut*. Amsterdam/Philadelphia: Benjamins, 1996. Pp. xiii+248.

The book, based on Allen's PhD dissertation, adds to the ever-increasing body of crosslinguistic acquisition data. The focus is longitudinal data collected from four Inuktitut children aged 2;0 to 3;6 in a nine month period of data collection. Since the Inuktitut language is polysynthetic and has prolific nominal and verbal inflection, it poses segmentation problems for the children acquiring it. The main emphasis in the book is on providing evidence that the children have knowledge of three operations which change argument structure: passive, causative and noun incorporation. These operations all involve head movement into an affixal verb, following the Principles and Parameters framework which is adopted, though this is not evident until the last chapter. Where appropriate, Allen makes comparisons with data reported for West Greenlandic, and in chapter 5 comparisons are made with Mohawk.

Chapter 1 is an overview. Before discussing features of the language and the research, the author briefly outlines different approaches to language acquisition based on the dichotomies between structuralism, competence and performance, and nativism versus empiricism. Allen points out a problem in determining argument structure in a language like Inuktitut, whether to assign argument status to the bound agreement affixes or not (as argued by Jelinek, 1984, for Warlpiri; and Bresnan & Mchombo, 1987, for Chichewa). The Inuktitut language is described in the chapter, and this is supplemented by extensive footnotes. Discussion of the social context reveals that Innuit children are socialized to be silent, a sign of respect. As with a number of other societies discussed over the past 15 years (see Ochs & Scheiffelin, 1995 for a review), the adults do not engage in vocal interaction or play with the children, although they do make modifications to some of the words they use, and they adopt repetition routines.

Further details about the location and collection of data, and the family background of the four subjects (two boys and two girls) are provided in chapter 2, and the reader can appreciate the scope of the undertaking as well as the valuable assistance provided by native speakers. Researchers who have not had the opportunity for such quality assistance might be envious. Also in chapter 2, Allen raises the question faced by all acquisition researchers: what counts as evidence for productivity? There is no clear distinction between imitated and constructed utterances; even if a child produces alternative structures, both could be imitations. Allen suggests that a child who utters both *the plate fell* and *I made the plate fall* shows 'productive knowledge of

both the function and structure' of the causative, but this would only be supported if the child produced the structures in appropriate contexts and, preferably, each one more than once. A number of criteria are used by Allen throughout to determine productivity: self-corrections, overgeneralizations, novel utterances, variability in use, alternative structures and orders, and creativity.

Using the argument that children seem not to know the passive structure until the age of about four years, Borer & Wexler (1987) proposed a maturation hypothesis: some grammatical principles mature. However, this has been questioned by Demuth (1989), with data from Sesotho, as well as Pye & Quixtan Poz (1988), with data from K'iche' Mayan. Both groups illustrate that two-year-old children can use passive structures appropriately. Whether they produce passives before the age of four seems to depend on the functional use of the passive and other input factors. Allen argues that passives are used appropriately by two-year-old Inuktitut children (also see Allen & Crago, 1996). Not only do they use both short and long forms available in the language, they passivize experiential verbs as well as the prototypical action verbs. One criticism of the data presented in this section is that while there is some value in comparing the use of passives across language groups, the number of passives used per hour (as presented in Tables 14 and 21) does not seem to be a useful measure. Allen examines features of the language which might contribute to the early acquisition of passives in Inuktitut, including the avoidance of inflections, which are more complex in active than passive constructions. The typology of Inuktitut seems to contribute to the saliency of passives. Head-movement is required in a number of constructions; for example, as discussed in chapter 4, it is necessary to use an antipassive or passivized verb root in order to use a causative affix with transitive and ditransitive verb roots.

Both lexical and morphological causatives are early developments. Two causative markers are discussed: -*tit*- 'make', 'cause', 'let' and -*qu* 'tell', 'ask', 'want'. Allen does not discuss if the difference in meanings between -*tit*- and -*qu*- adds complexity to the task of acquiring them as causative markers. The examples provided show that the causative morpheme is used first in frozen forms. For example, the morphological causative morpheme *tit* from one child at 2;6 is combined with the polite morpheme -*lauq*- plus an imperative inflection, but with no overt verb stem. These are interpreted by Allen with a 'getting something done' meaning, for example, 'Make it do X' or 'Shall I make it do X?'. A second child (at 2;0) also used the combination of polite, causative and imperative morphemes but with overt verb stems, leading Allen to suggest that this child 'seems slightly more advanced in his understanding of the morphological requirements of -*tit*-' than the first child, but she adds that he also seems 'less advanced' because only one imperative inflection appears in the combinations. Such statements

need to be used with caution since lack of production does not necessarily reflect lack of knowledge; the context and the child's communicative needs will influence what the child produces in a particular session.

Allen reports that the four subjects used a causative morpheme in combination with a passive marker. In combination with the passive marker the forms -*titau*- and -*qujau*- are created; the first is illustrated in the following example (Allen's 71b):

| (71) | b. | Aanilu titaulaujugu ilai? | | |
|---|---|---|---|---|
| | | Aani-ø-lu | tit-jau-lauq-juguk | ilai |
| | | Annie-ABS.Sc-and | CAUS-PASS-PAST-PAR.1dS | right |
| | | 'Annie and I were made to, right?' | | |

In addition to these combined forms, a number of examples from the children aged 2;5–3;6 illustrate appropriate use of the causative without the passive marker. One child of 3;6 could use a verb in both the causative and non-causative forms (two examples only). Errors in allomorphs, the use of innovative forms and alternations are presented as further evidence for productivity, with three of the four examples of innovative forms from one child of 3;2. At the same age, the child appears to show variability in the use of the causative morpheme, although Allen argues there is something systematic in her use since she only uses the morpheme in imperatives. If it is predictable where the child uses the morpheme, there is support for a functionalist approach to acquisition since the child appears to have a narrower meaning than the adult. To become a mature speaker the child's meaning needs to be extended to cover all obligatory contexts. Other examples provided show the causative morpheme used in combination with noun incorporation and antipassive constructions. Allen's statement (p. 108) that the 'notion of causality and the exact structure of the causative seem to be mastered' is based on examples from different ages. It is only by examining the ages given with each example of morphological causatives and turning back to previous examples from the individual children that comparative information can be extracted, and this is a problem with the data presentation.

Explanations proposed for overgeneralizations in causative structures for other languages are discussed, but since the errors Allen reports are of omission rather than inappropriate addition, none of these explanations seems to be adequate to explain the Inuktitut data. She proposes instead that an 'agentivity hypothesis' is a more likely explanation since causative forms are used appropriately in imperative constructions, suggesting that the agency component of 'causation' is salient for the children.

A syntactic account of noun incorporation is assumed in chapter 5. Allen argues that noun incorporation is productive by the age of 2;0, much younger than proposed for Mohawk by Mithun (1989). Examples of

overgeneralizations and overuse are presented to support the argument for productivity. Without further information it is not possible to interpret why one child overused incorporation structures as in Allen's examples (142) and (143), which are given below, and whether, for example, they represent topic-comment structures rather than basic clauses, since the problem is in incorporating a nominalized phrase. It is of interest that both contain negatives.

(142) a. *Una sinittualuunngitu
u-na sinik-juq-aluk-u-nngit-juq
this.one-ABS.SG sleep-NOM-EMPH-be-NEG-PAR.3sS
'This one isn't sleeping [= This one is not one who is sleeping]'.

(143) a. *Unaalu ilangitaalugijara
u-na-aluk
this.one-ABS.SG-EMPH
pi-langa-nngit-jaq-aluk-gi-jara
do-FUT-NEG-PP-EMPH-have.as-PAR.1sS.3sO
'I'm not going to have this yucky stuff as mine'

Also of interest is that the children were not found to use inappropriate verbs in incorporation structures, indicating that the incorporation feature is acquired early, as part of the lexical entry of a verb. The examples and interpretations are generally clear and well organized, but sometimes the examples raised questions which it was difficult to work through. For instance the two sentences in (139) are included in a set of examples which support the second criterion for productivity 'occurrence of the incorporated noun in other environments than the noun incorporation structure' (p. 166). It was only after determining that both must illustrate noun-incorporation that I read footnote (13), which tells the reader that this is so.

The final chapter does not sit as well as it might in that it raises some of the assumptions of the Principles and Parameters approach to language acquisition, with the purpose of showing how the data support them, but as Allen points out, data from younger children would be needed to address some of the issues. The conclusion drawn is that the data from Inuktitut is more consistent with a lexical learning hypothesis, as supported by Clahsen and his colleagues (e.g. Clahsen, 1990), that is 'learning grammar involves learning lexical and morphological items and their associated properties' (p. 200).

Collecting and analysing longitudinal naturalistic data is time consuming. It means the number of subjects is low. For this reason, it is appropriate to focus on individual patterns, which can provide valuable insights into the acquisition process, more so than providing the total number of instances of a particular form across all children of different ages and in all sessions, and so it would have been valuable if Allen had focused more on individual

differences. It would also have been of value to know more about the input; for example are the two most common verbs used in noun incorporation ('be' and 'have') frequent in the adult samples, and are there differences in the extent to which the children imitate or partially imitate utterances in the input, if at all, or model their productions on structures used in the individual sessions? The chapters provide more information about the non-linguistic than the linguistic context. In spite of these quibbles, I recommend the book. It is of particular interest for comparative acquisition research. Allen has exemplified that children faced with the problem of acquiring a polysynthetic language like Inuktitut identify the morphemes and combine them productively according to the rules of the language between 2;0 and 3;0. While overgeneralizations and errors of omissions are made, these are comparatively few. Readers will probably make their own comparisons with accounts of acquisition in other polysynthetic languages.

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Peter W. Jusczyk, *The discovery of spoken language*. Cambridge MA: MIT Press, 1997. Pp. 314.

When considering the major theoretical questions of the field of langauge acquisition, scholars have tended to focus on syntax, semantics, and pragmatics. In contrast, speech perception and phonology, though objects of serious scientific inquiry, have at times taken a backseat in these grander debates. In *The discovery of spoken language*, Jusczyk rightly places speech perception abilities back in the forefront. As is by now well known, infants possess amazingly sophisticated speech perception abilities. These abilities

had been largely unsuspected until the advent of recent experimental techniques. Jusczyk details the wealth of data on speech perception, and explores what they may tell us about the acquisition of language more broadly. The volume is lucidly written, thoughtful, and far-reaching, though somewhat understated in tone relative to Jusczyk's powerful impact on the area. It appeared that the author's goals were to introduce uninitiated readers to the area and not necessarily to steer readers strongly toward particular theoretical views. Ironically, Jusczyk might be faulted for not having intruded his perspective more into these pages.

The first two chapters provide an overview that will be familiar to most scholars in the field of language development, but are useful for setting the stage. Chapter 1, 'Surveying the terrain', is a concise introduction to some of the broader issues that will be explored. Jusczyk makes a compelling case that different linguistic levels interact during language use and development, and thus that speech perception has important implications for the acquisition of syntax and semantics. In this chapter and the next, there is somewhat of a trade-off between detail and accessibility (e.g. some readers may quibble with Jusczyk's definition of the phoneme, p. 9), but this trade-off is probably inevitable in conveying a broad set of issues in such short space.

Chapter 2, 'A brief historical perspective on language acquisition research', provides a chronological review of several perspectives on language acquisition, starting with Brown's Word Game analogy, and continuing with universal grammar, learnability theory, and parameter-setting. He also discusses the cognitive and perceptual resources necessary for language acquisition and various theories of boot-strapping. A number of critical questions are raised: how much information is available at the initial stages of language acquisition? How is this information organized? Is it necessary to posit an innate language capacity, or can language acquisition be explained in terms of more general perceptual and cognitive abilities? These issues are all addressed in the pages that follow.

Chapter 3, 'Early research on speech perception', is an historical survey in roughly chronological order of the fundamental literature on speech perception from the 1950s to the early 1990s. An impressive amount of material (40+ years of research) is presented in 28 pages, resulting in a useful (but abbreviated) summary. The chapter starts with research demonstrating that phonemes cannot be recognized simply by invariant acoustic properties, and that categorical perception is a psychophysical (not purely physical) phenomenon. One of the key issues discussed is how much of speech perception is unique to humans and whether this ability is specific to language or shared with more general cognitive processes. The evidence on these issues is inconclusive, although Jusczyk makes a case for favouring the view that speech perception is rooted in general cognitive abilities rather than a language-specific processing system.

Having laid out much of the groundwork on infant speech perception in chapter 3, in chapter 4 ('How speech perception develops during the first year') the author turns to the question of what perceptual abilities develop in young language learners during the first year of life. As an introduction, the concept of innately guided learning is mentioned as a possible explanation for how infants segment speech. Roughly, innately guided learning suggests 'that many organisms are preprogrammed to learn particular things and to learn them in a particular way' (p. 76). In speech perception this amounts to saying that there are some pre-wired pathways dedicated to recognizing and segmenting speech signals (and possibly very particular kinds of speech signals) from the vast array of auditory stimuli in the input. The author presents some evidence that even very young infants are biased to attend to speech stimuli, as opposed to other environmental sounds, findings which seem to support the notion of innately guided learning. However, towards the conclusion of the first section the author states the following: 'The point I wish to emphasize is that explaining the many changes that occur in speech perception during the course of the first year does not necessarily depend on the existence of dedicated, hard-wired, specialized speech-processing mechanisms' (p. 8). We can infer from this statement that Jusczyk wishes to retain the notion that language is an innately guided process without necessarily referring to the existence of pre-wired pathways in the brain. Nevertheless, we struggle (as do many others) with whether there is a clear distinction between innately guided and hard-wired. The discussion would have benefited greatly had the author made clear his stance on this issue.

The bulk of chapter 4 is devoted to a summary review of studies that were designed to determine how speech discrimination in infants develops in the first year. A good deal of this evidence suggests a general pattern. At first, infants display discriminatory abilities which span a broad range of phonetic pairs. As they approach roughly ten months of age, these abilities begin to diminish. Finally, by the time an infant has reached his or her first birthday, phonemic discrimination is limited to those sounds which are contrastive in the native language. The second half of the chapter is devoted to the possible reasons behind such a perceptual shift. The author takes the stance that these changes in perception serve as the first stepping stones toward word recognition. In this discussion, however, there is no mention of exactly what is meant by 'word' recognition: are we to assume that what an infant first segments has conceptual information attached to it, or is it just the segmentation of conceptually empty phonological shapes? At the conclusion of the chapter the author points out that despite the vast amount of data presented on phonetic and prosodic discrimination, we must keep in mind that these processes are not the ultimate goal of any speech system. Rather, these processes contribute to a system of word segmentation and recognition.

Chapter 5 ('The role of memory and attentional processes in the de-

velopment of speech perception') focuses on the issue of how infants represent the sounds of speech. Jusczyk's position is that infants' representations are syllabic (and not segmental) in nature. This intriguing claim is controversial, and not always supported by the experiments themselves. Thus, the results of a number of studies could be explained by assuming some level of segmental representation as well as syllabic representation. For example, on pp. 119–20, Jusczyk reviews a study showing that nine-month-old infants listen more to syllable onsets than syllable rhymes. In a further study, when the syllables had common manner of articulation (e.g. /b/, /d/, and /g/) and children continued to listen longer to these lists, the author concluded that they were probably therefore not listening to the initial segments. However, it seems possible that infants were doing both (listening to initial segments and using manner of articulation) in these studies. On p. 115, the author concludes that at present there is no indication that infants under 0;6 represent utterances as strings of phonetic segments. A possible experiment that would determine whether infants less than 0;6 have segmental representations in addition to syllabic representations, would be to present syllables such as [soo] versus [oos]. If such syllables are treated identically, we might infer that infants truly lack segmental representations.

The theoretical view presented in chapter 5 is that different aspects of the speech stream are activated or become the focus of attention at different points during development. This view is extremely compatible with the coalition model of language comprehension developed by Hirsh-Pasek & Golinkoff (1996) and a principles and parameters model by Dresher & Kaye (1986). In addition, it is compatible with a Gibsonian perspective (as the author points out, p. 121) because it suggests increasing differentiation of the elements of the speech stream and increasing attention to higher order invariants.

The author reviews research examining how much variability infants can cope with in the speech stream. For example, can infants make discriminations if they hear different voices in the stimulus? He also begins to develop the evidence – necessary for the theoretical model (WRAPSA, Word Recognition and Phonetic Structure Acquisition) he will develop in chapter 8 – that infants can store specific instances of speech sounds and not just abstract prototypes. Part of this section argues that infants can store words in memory before they attach meaning to them. The chapter concludes with the well-supported assertion that infants are especially sensitive to the distributional frequencies of certain patterns in the input (p. 133), and that we must continue to study the nature of the representations which result.

Chapter 6 ('How attention to sound properties may facilitate learning other elements of linguistic organization') addresses a question that is in some ways the heart of the book: how do speech perception abilities help babies learn about other aspects of language (including meaning and syntax)?

The author reviews why a STRONG version of this view could not work for syntax, since as McNeill (1966) (and Nespor & Vogel, 1986) have argued, properties of the speech signal are insufficient to recover the ENTIRE syntactic description. Nonetheless, prosodic information could help simplify the child's task, as Morgan (1986) has argued. 'Prosodic bootstrapping' is the notion that speech signal information can help children discover the syntactic organization of their language. This chapter reviews many fascinating studies showing that infants are sensitive to prosodic markers in the input, and that this prosodic information is actually used in the encoding and storage of speech information. However, whether finding these prosodic boundaries gives infants an advantage in later syntactic learning remains to be demonstrated empirically. The final portion of chapter 6 addresses the question of how aspects of speech input help children develop their lexicon. This section, though brief, is well-organized, and valuable for outlining some of the major issues that need more research.

Chapter 7 ('Relating perception to production') departs from the rest of the book by examining speech PRODUCTION. First, the chapter reviews theories and research related to babbling and examines a number of time-worn issues inspired by Jakobson. For example, is babbling continuous or discontinuous with later speech, and are the set of sounds produced during babbling broader or narrower than those in the repertoire of the language the child is learning? Jusczyk provides a clear, concise overview of this literature. The following sections examine the relation between babbling and word production, and (the core issue in the chapter) how perceptual representations are related to productions. Jusczyk discusses the interesting suggestion that children develop generalizations about phonological universals through the process of coordinating the outputs of perception and production systems.

The final chapter (chapter 8, 'Wrapping things up') attempts to integrate many of the theoretical issues raised throughout the book. The first issue that Jusczyk revisits is his suggestion from chapter 4 that the development of speech perception abilities involves innately guided learning, and that development is neither fixed and hard-wired, nor totally unrestricted (p. 198). Instead, à la Gould, Marler, and Chomsky, development is constrained. This allows for the rapid learning that was elegantly demonstrated in the many empirical studies reviewed. Jusczyk also revisits the issue of whether phonology serves as a mediator between perception and production (as discussed in chapter 7). The last issue he revisits is the impact of a developing lexicon on speech perception.

Jusczyk ends with a detailed consideration of his WRAPSA model, first proposed in the mid-80s, but here revised to accommodate many new findings. The model makes the psychologically meaningful assumption that infants' speech processing will continually change as a result of their continued exposure to speech. The main components of the model include:

preliminary analysis of the speech signal by auditory analysers; an attentional weighting scheme (whereby infants' sensitivity to the input changes due to language-specific input); a pattern-extraction process (also being modified to match language-specific properties of the input); and matching and storing the candidate word representation. This ambitious framework sets out to provide a model for the speech perception process as a whole, for development changes in speech perception, and for changes due to exposure to language-specific information. One of the controversial assumptions of the WRAPSA model is that infants do not just remember abstract representation of words, but store specific utterances, including extralinguistic information such as speakers' voices. Only time will tell if the newer version of the WRAPSA model can indeed incorporate the varied phenomena associated with infant speech perception. Jusczyk ends the chapter with a discussion of 'some loose ends to tie' (p. 228), including a need to examine the nature of the input more closely, to seek greater knowledge about the memory and attentional abilities of infants, and to consider individual differences.

The volume ends with an Appendix summarizing various experimental techniques used for studying infant perception. This is very useful for those readers who may be unfamiliar with these methods.

In sum, *The discovery of spoken language* is a necessary resource for any serious scholar of language acquisition. The volume provides a comprehensive overview of outstanding issues and research in the development of speech perception. With clear and thoughtful prose, the author manages to present a highly complex and technical field in an engaging, accessible manner. Yet because the work of Jusczyk and his colleagues has in many cases defined the field, we wished that the author had provided more of his personal stamp, particularly when discussing the more controversial issues. Noneless, by the conclusion of the book, the reader is left enriched by the presentation of a vast knowledge base, and challenged by the questions raised.

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