J. Child Lang. **30** (2003), 237–251.
Printed in the United Kingdom

REVIEWS

DOI: 10.1017/S0305000903215634

PING LI & YASUHIRO SHIRAI, Y., *The acquisition of lexical and grammatical aspect*. Berlin: Mouton de Gruyter, 2000. Pp. 261.

The authors set three major goals for the book: to increase our understanding of the 'relationship between lexical semantics and morphology in language acquisition' (p. 8), to review and evaluate pertinent hypotheses 'with respect to empirical evidence from crosslinguistic studies of English, Chinese, and Japanese, in both first and second language acquisition' (p. 8), and to investigate 'the learner's remarkable ability to extract input patterns and form linguistic associations' (p. 9). The authors accomplish these goals, and in doing so, they have written a book that makes a valuable contribution to the issue of language learning. The authors promote a prototype hypothesis that is supported by a connectionist model. Their fundamental claim is that 'children create a semantic representation of tense–aspect morphology which is restricted to the prototype of the morphological category' (p. 66). This argument is focused on two prototypes. One prototype has the semantic features of dynamic, telic, punctual, and resultative. The morphemes that are connected to this prototype are as follows: the perfective aspect marker *-le* in Chinese, the past tense form *-ta* in Japanese, and the simple past *-ed* /irregular in English. The second prototype has the features dynamic and atelic, and this semantic concept is connected to the following: the progressive marker *zai* in Chinese, the durative marker *-te i-* in Japanese, and the progressive marker *-ing* in English. The two prototypes will be referred to as the perfective achievement (PA) and the imperfective activity (IA). What is the nature of the knowledge attributed to the child by prototype theory? The child can construct a semantic feature set, and he/she can form an association. For example, a child learning English might associate the verb *to spill* with the *-ed* morpheme, and he/she might connect *to cry* with *-ing*. Given the constraints of the theory, what is the nature of the knowledge that has NOT been explicitly attributed to the child? Regarding aspect, we cannot infer that the child uses a morpheme to code external versus internal perspective (or bounded versus unbounded), and regarding tense, there is no basis to infer that the child knows how to specify deictic relations such as event time prior to/subsequent to speech time. In short, we cannot infer that these morphemes represent operators that have independent status within the child's grammatical system.

Obviously, the authors are aware that it is impossible to explain the acquisition of aspect without also considering tense and modality. One of the strengths of the book is that the authors maintain their focus on aspect.

However, for both first and second language acquisition, relatively strong arguments have been made by others that morphemes within the tense–aspect–modality system code deictic relations. A stronger book would have had a more inclusive approach to the research on tense. Such an approach might take a more substantial look at the relationship between tense and aspect within alternative theories (e.g. Van Valin, 1991; Sano & Hyams, 1994).

Chapter 2 contains the definitions of lexical and grammatical aspect. The authors base their lexical distinctions on Vendler-type categories as developed by Smith (1991). Since these categories are critical to the goals of the book, I will repeat them here. There are four categories of predicates as follows: STATES 'encode situations as homogeneous, with no successive stages or endpoints, involving no dynamicity' (p. 15), ACTIVITIES 'encode situations as consisting of successive stages over time with no inherent endpoint' (p. 15), ACCOMPLISHMENTS also involve successive stages, but 'they encode a natural endpoint and often a change of states' (p. 15), and ACHIEVEMENTS also encode a natural endpoint, but 'they encode events as punctual and instantaneous' (p. 15). Li and Shirai, like Smith, add the category semelfactive where a semelfactive predicate has the features dynamic and atelic, like an activity, but also has the feature punctual, like an achievement. These lexical categories are viewed as 'universal semantic notions'. The authors correctly point out 'the lexical aspect value is determined by both the verb and its arguments' (p. 18), but they do not provide the logical structure that integrates concepts of lexical aspect with argument structure (cf. Van Valin & LaPolla, 1997). The authors' semantic analysis begins and ends with a list of features, e.g. punctual.

The authors define grammatical aspect as follows: perfective aspect 'presents an external view of the situation as a single whole in its entirety without reference to its internal structure' (p. 25), and imperfective aspect presents 'an internal view of the inner constituency of the situation without regard to the situation's initial or final boundaries' (p. 25). As these distinctions relate to the prototype hypotheses, the achievement category provides the best fit for the PA prototype and the activity category has the core properties of the IA prototype. The theoretical expectation is that children will initially associate perfective aspectual morphemes with achievement verbs and imperfective morphemes with activity verbs.

While they cite research on other languages, they limit any penetrating analysis to English, Chinese, and Japanese. There has been a reasonable amount of work on the acquisition of Slavic languages, in particular Polish and Russian. A stronger cross-linguistic comparison would have probed into the Slavic system further (e.g. Stoll, 1998). From time to time during this review, I will mention some of the insights that I feel have been overlooked because of this omission.

According to Li and Shirai, 'the English past tense is aspectually perfective' (p. 24). Chung & Timberlake (1985) made the typological distinction between

'dynamicity' languages like English and 'closure' languages like Polish. In a dynamicity language, progressive aspect has a narrow semantic range and stative verbs are non-progressive, whereas in a closure language, perfective aspect has a narrow semantic range, and stative verbs are imperfective. In a closure language, the perfective form of a stative verb has an ingressive meaning. If the simple past in English were considered to be aspectually perfective, then it would have the narrow semantic range of a closure language. For the fluent speaker of English (and Japanese), Li and Shirai explain that the simple past is 'highly grammaticized' and it applies freely to stative verbs. In contrast, according to the prototype account, the child's language would combine the properties of a dynamicity with those of a closure language. As a result, the semantic constraints on the simple past in child English should resemble the constraints on past perfective in child Polish. Contrary to this prediction, the acquisition pattern for atelic and telic predicates is vastly different for children learning English and Polish (see Weist, 2002). Furthermore, the typological differences are reflected in the acquisition patterns from the initial emergence of the tense–aspect forms.

Regarding first language acquisition, the chapter features the classic studies on aspect, and three hypotheses that have had a specific bearing on this acquisition issue: LANGUAGE BIOPROGRAMS (Bickerton, 1984), BASIC CHILD GRAMMAR (Slobin, 1985), and the DEFECTIVE TENSE HYPOTHESIS (Weist, Wysocka, Witkowska-Stadnik, Buczowska & Konieczna, 1984). According to Bickerton, the semantic distinctions between *state* and *process* and between *punctual* and *nonpunctual* are genetically programmed. Within Slobin's Basic Child Grammar, children were seen as having the capacity to take two temporal perspectives, RESULT and PROCESS. The authors bring these concepts into their prototype argument in Chapter 8.

Regarding L2, Andersen's research on the acquisition of Spanish (e.g. Andersen, 1991) provided the core of the Li–Shirai argument and the initial stimulus for the 'aspect hypothesis'. Andersen found that the preterite (or past perfective) emerged prior to the imperfect (or past imperfective). Regarding lexical aspect, achievements were likely to be perfective and states were likely to be imperfective. As acquisition proceeded, perfective forms extended from achievements to accomplishments to activities to states, and imperfective forms emerged along the opposite path. The aspect hypothesis formalizes Andersen's findings and adds that in languages with progressive aspect, the initial progressive forms will be activities, and incorrect stative progressives will be unlikely. This hypothesis has been extended to L1 by Shirai & Andersen (1995). The claim that perfective past will precede imperfective past in L1 has been challenged by Weist (2002). In Polish, the imperfective-past form of atelic predicates was found to emerge in child language during a similar phase as the perfective past form of telic predicates. The argument that the initial past tense forms code deictic relations as contrasted with purely

aspectual relations can also be found in second as well as first language (e.g. Dietrich, Klein & Noyau, 1995).

Chapter 4 concerns the acquisition of English as a first and second language. For Li and Shirai, 'our discussion of the acquisition of past tense in English is at the same time a discussion of the acquisition of perfective aspect' (p. 55). A symptom of this approach is that the authors cite but do not penetrate research designed to discover the child's understanding of deictic relations versus aspectual relations, e.g. Weist, Wysocka & Lyytinen (1991). One way to discover this kind of understanding is to investigate tense and aspect contrasts, i.e. for English, simple past versus simple future and simple past versus past progressive. The authors do not discuss either future tense or past progressive.

Speculating about the emergence of temporal systems in general, the authors say 'the exact age at which children are able to use the full function of tense is debatable (Weist, 1986), but it is surely before the concrete operational stage' (p. 68). By 'full function' the authors are referring to the capacity to utilize a reference time system (Weist, 1986). Today, we have considerable experimental evidence that this system is emerging between about 3 and 4 years of age, and this would place the linguistic innovation within the Piagetian preoperational stage, i.e. well in advance of the concrete operational phase (e.g. Weist, Lyytinen, Wysocka & Atanassova, 1997). This linguistic evidence is complemented by research on the development of autobiographical memory (e.g. Fivush & Hamond, 1990).

Li and Shirai propose three stages in the acquisition process. The initial stage is a lexical learning stage during which lexical items are associated with event representations in episodic memory. In the second stage, children begin to construct 'abstract lexical representations' characterized by features such as dynamic and telic. The next stage involves a 'morphological and correlational analysis' (p. 63). Having noticed that interlocutors use verb + *-ing* to refer to an action in progress (and presumably *-ed* to refer to a change of states), the child abstracts *-ing* as 'a separate morpheme'. At this phase in development, children construct two prototypes: *-ing* means [+dynamic & atelic], and past tense means [+dynamic, +telic, +punctual & +result]. While it is conceivable that the child might limit the learning process to associations between contiguous morphemes (e.g. verb + *ed*), there is no conceptual motivation for such a limitation. At this point in development, the child is conceptually ready to think about events that are remote in time and space. In other words, they have the capacity to understand deictic relations.

Among the alternatives to prototype theory under review is syntactic bootstrapping which includes 'morphological bootstrapping'. According to the authors, 'children are unlikely to use syntactic or morphological bootstrapping as a process in the initial learning of lexical categories' (p. 72). However, in Naigles's (1990) preferential looking experiments, 2-year-old

children demonstrated sensitivity to differences between sentences with transitive versus intransitive argument structure. Furthermore, Pye (1992: 187) has shown that children learning K'iche Maya mark transitivity distinctions in a very early phase of acquisition. These children are apparently utilizing a valence distinction within their lexical representations. Thus, in addition to the lexical features proposed in Li and Shirai's second stage, there is evidence that this stage requires an analysis of the logical structure of predicates that goes beyond a list of semantic features.

The discussion of second language acquisition contains a well-rounded review of the relevant research. Two corollaries of prototype theory are explored at length: the two starting points, i.e. PA and IA, and the concept of SPREAD from these points of departure, i.e. PA spreads from achievement to accomplishment to activity to state, and IA spreads from activity to accomplishment to achievement. In short, the prototype combinations have been found to be the most frequent in L2, and a recent study by Bardovi-Harlig (1992) produced results that were close to the Li–Shirai predictions: the PA and IA prototypes formed the starting points, and higher-level learners were better able to assign (or SPREAD) past tense to states and activities. However, the transition from prototype to nonprototype forms is not consistently observed (see p. 84).

Chinese is obviously an interesting language for the study of aspect as it has aspect but not tense. Chinese has a general imperfective marker *-ne*, a durative *-zhe*, a progressive *zai*, and a perfective *-le*. *Zai* is ungrammatical with stative verbs and with 'resultative verb constructions' (RVC), e.g. *xue-hui* 'study-know'. This incompatibility shows the salience of the resulting state in the meaning of the RVC verbs. In Chinese, achievement verbs do not accept imperfective markers *-zhe* or *zai*. Another type of verb is the 'mixed telic-stative verb, e.g. *chuan* 'put on/wear'. The meaning of the verb depends on the aspect marker. When it is marked as progressive with *zai*, the process is in focus, e.g. putting on, and when the durative *-zhe* is used, the meaning shifts to the resulting state, e.g. to be wearing.

The chapter focuses on the set of three experiments found in Li & Bowerman (1998). In general, sentences having internal perspective on atelic predicates and external perspective on telic predicates were easier for children to comprehend, produce, and imitate. Li and Shirai interpret these results as disconfirming the Bioprogram Hypothesis. Regarding the STATE–PROCESS constraint, the children in Experiment 1 performed similarly on stative and activity verbs, i.e. they did well with imperfective and poorly with perfective, and in Experiment 2, the children over-generalized *zai* to stative verbs. If '*punctual*' refers to duration and not telicity, an additional argument can be made against the genetic programming of a *punctual–non-punctual* distinction as the children demonstrate a similar response pattern for activity and semelfactive verbs.

Concerning Slobin's RESULT versus PROCESS perspective, the concept of result is more salient in the accomplishment–result verbs than accomplishment–location verbs. Contrary to the RESULT–PROCESS prediction, there was no significant comprehension advantage for accomplishment–result verbs with *-le* (p. 111). The important feature within the semantic representation of the verbs is telicity and not punctuality or resultativity. These findings diminish the importance of the features punctual and resultative, which characterize the PA prototype. Li & Shirai concluded this chapter by saying that the data are accounted for by 'the learner's ... ability to extract patterns of association between lexical and grammatical aspect' (p. 125) rather than the preexisting distinctions imagined in bioprograms.

Chapter 6 contains a brief but thorough and competent review of the first and second language acquisition research on Japanese. Japanese has a past tense morpheme *-ta* and a non-past *-(r)u*. Imperfective aspect is marked by *-te i-*. Imperfective aspect can specify ongoing action during reference time like progressive in English, or it can refer to a 'resultative state' when used with an achievement verb. The acquisition data reviewed yielded a strong association between past tense and achievement verbs and individual differences in the strength of the association between imperfective and activity verbs. The children did not use imperfective aspect with stative verbs although this is possible in the adult language (depending on the verb).

In a comparison of children acquiring English and Japanese, Li & Shirai point out that children acquiring Japanese (but not English) produce stative verbs in the past tense, i.e. the non-prototypical form. They attribute this to the fact that there are no bare stems in Japanese. Hence, verbs with unanalysed 'functional' morphology are likely to be found during lexical learning (or their Stage 1). This is true of many languages, and this is why it makes sense to use the notion of contrast as a measure of acquisition (e.g. Gathercole, Sebastian & Soto, 1999).

The research concerning second language acquisition shows that L2 learners 'follow the prototype hypothesis' (p. 144) more closely than L1 learners. Like L1 learners, they are likely to use the past tense for achievements. However, they are more likely to utilize the progressive meaning of *-te i-* with activity verbs than the resulting state meaning with achievement verbs. This fact is seen as solid evidence for transfer from the first language of L1-Chinese and L1-English learners whose L1 prohibits the use of the progressive aspect marker with achievements or allows such a use only with altered meaning, e.g. creating an iterative meaning, *The children are finding the Easter eggs*.

Chapter 7 presents a connectionist model of the acquisition data. Tables 7.1 and 7.3 demonstrate that the proposed 'self-organizing neural network' can be used effectively to model the acquisition process. According to Li and Shirai, their network utilizes a 'biologically motivated computational principle called Hebbian learning (Hebb, 1949)' (p. 155). According to Hebb (1949, p. 70)

'any two cells or systems of cells that are repeatedly active at the same time will tend to become ''associated'', so that activity in one facilitates activity in the other'. It should be noted, however, that what might potentially constitute a system within contemporary neurophysiology is vastly more complex than Hebb had imagined over 50 years ago. Today, we know that a system may contain a highly organized stream of information-processing components such as the magno versus the parvo cellular streams in the visual system (e.g. Tanaka, Saito, Fukada & Moriya, 1991), and similar modularity could also characterize the linguistic system. The Li–Shirai connectionist model is no more or no less believable because of the Hebbian principle.

According to the authors, their associative learning model provides 'insights into the acquisition of lexical and grammatical aspect' (p. 183). I disagree. I think that it is more insightful to apply linguistic theory as opposed to associative theory to the problem of language acquisition. The acquisition of lexical and grammatical aspect requires a theory that has a clearly elaborated semantic–syntactic interface such as in Role and Reference Grammar (e.g. Van Valin & LaPolla, 1997). Within such a theoretical framework, it is possible to relate the acquisition of aspect to other acquisition problems such as the acquisition of a privileged syntactic argument (see Weist, 2002).

Li and Shirai make a very clear distinction between the acquisition pattern in L1 and in L2. From their perspective, children begin the acquisition of aspect by constructing two prototypes and then they gradually 'spread' to non-prototypical forms. In L2 acquisition, the learners often 'violate' the spreading pattern assumption. This difference is attributed to an interaction of two networks with the existing L1 network influencing the establishment of the L2 network. The authors conclude with the following summary statement: ' ... the learner implicitly tallies and registers the frequency of co-occurrences (strengthening connections) among grammatical morphemes, semantic features, and lexical forms' (p. 206). They claim that this learning process will 'give rise to native, adult-like representations of linguistic categories' (p. 206).

Instead of giving rise to adult-like representations, it occurs to me that the acquisition of the perfective-achievement and the imperfective-activity concepts would create an impediment to the acquisition of the tense–aspect–modality system. A child learning a Slavic language would begin with concepts that integrate one value of aspect and one value of tense with a set of semantic features. In order to acquire the adult system, the child would have to abandon these concepts and acquire the grammatical and lexical dimensions to which these values belong, i.e. tense, aspect, and the semantic representations of predicates. Contrary to this picture, these dimensions appear to be operating from a very early phase of acquisition (Weist, 2002).

In summary, the authors give a coherent account of the acquisition of Chinese and Japanese, and their domain of expertise extends from first to

second language acquisition, especially in Japanese and English. The scope of the book was intentionally limited to their areas of maximum expertise. If no insights had been lost with this approach, it might have been a good decision. I have argued that insights have been lost. Following their zeitgeist, I have made reference to work on Slavic languages with which I am intimately familiar. In my opinion, an analysis of this research would lead the reader away from the prototype theory to an alternative theory that provides an explanation for the child's acquisition of the relationship between semantic and syntactic principles.

This book is very well written. The problem is analysed with a cross-linguistic perspective, and this approach is crucial for any attempt to explain the acquisition of aspect. The important properties of the languages that are in focus have been made transparent for the reader. The application of the connectionist model to the acquisition of verb morphology is clearly explained. In my review, I have presented some motivation to consider an alternative theoretical framework and an extended cross-linguistic perspective, but this only goes to show that Li and Shirai's book stimulates an argument.

REFERENCES

Andersen, R. W. (1991). Developmental sequences: the emergence of aspect marking in second language acquisition. In T. Huebner & C. A. Ferguson (eds), *Crosscurrents in second language acquisition and linguistic theories*. Amsterdam: Benjamin.

Bardovi-Harlig, K. (1992). The relationship of form and meaning: a cross-sectional study of tense and aspect in the inter-language of learners of English as a second language. *Applied Psycholinguistics* **13**, 253–78.

Bickerton, D. (1984). The language bioprogram hypothesis. *Behavioral and Brain Science* **7**, 173–88.

Chung, S. & Timberlake, A. (1985). Tense, aspect, and mood. In T. Shopen (ed.), *Language typology and syntactic description*. Cambridge, UK: CUP.

Dietrich, R., Klein, W. & Noyau, C. (1990). *The acquisition of temporality in a second language*. Amsterdam: John Benjamins.

Fivush, R. & Hamond, N. R. (1990). Autobiographical memory across the preschool years: toward re-conceptualizing childhood amnesia. In R. Fivush & J. A. Hudson (eds), *Knowing and remembering in young children*. Cambridge: CUP.

Gathercole, Sebastian, E. & Soto, P. (1999). The early acquisition of Spanish verbal morphology: across-the-board or piecemeal knowledge? *The International Journal of Bilingualism* **3**, 133–82.

Hebb, D. (1949). *The organization of behavior: a neuro-psychological theory*. New York: Wiley.

Li, P. & Bowerman, M. (1998). The acquisition of lexical and grammatical aspect in Chinese. *First Language* **18**, 311–50.

Naigles, L. (1990). Children use syntax to learn verb meaning. *Journal of Child Language* **17**, 357–74.

Pye, C. (1992). The acquisition of K'iche Maya. In D. I. Slobin (ed.), *The crosslinguistic study of language acquisition*, Vol. 3. Hillsdale, NJ: Erlbaum.

Sano, T. & Hyams, N. (1994). Agreement, finiteness, and the development of null arguments. *Proceedings of NELS* 24.

Shirai, Y. & Andersen, R. W. (1995). The acquisition of tense–aspect morphology: a prototype account. *Language* **71**, 743–62.

Slobin, D. I. (1985). Crosslinguistic evidence for the language making capacity. In D. Slobin (ed.), *The crosslinguistic study of language acquisition*, Vol. 2. Hillsdale, NJ: Erlbaum.
Smith, C. (1991). *The parameter of aspect*. Dordrecht: Kulver Academic Publishers.
Stoll, S. (1998). The role of lexical Aktionsart for the acquisition of Russian aspect. *First Language* **18**, 351–78.
Tanaka, K., Saito, H.-A., Fukada, Y. & Moriya, M. (1991). Coding visual images of objects in inferotemporal cortex of the macaque monkey. *Journal of Neurophysiology* **66**, 170–89.
Van Valin, R. D. (1991). Functional linguistic theory and language acquisition. *First Language* **11**, 7–40.
Van Valin, R. D. & LaPolla, R. J. (1997). *Syntax: structure, meaning, and function*. Cambridge: CUP.
Weist, R. M. (1986). Tense and aspect. In P. Fletcher and M. Garman (eds), *Language acquisition*. Cambridge: CUP.
Weist, R. M. (2002). The first language acquisition of tense and aspect. In R. Salaberry & Y. Shirai (eds), *The L2 acquisition of tense–aspect morphology*. Amsterdam: Benjamin.
Weist, R. M., Lyytinen, P., Wysocka, H. & Atanassova, M. (1997). The interaction of language and thought in children's language acquisition: a crosslinguistic study. *Journal of Child Language* **24**, 81–121.
Weist, R. M., Wysocka, H. & Lyytinen, P. (1991). A cross-linguistic perspective on the development of temporal systems. *Journal of Child Language* **18**, 67–92.
Weist, R M., Wysocka, H., Witkowska-Stadnik, K., Buczowska, E. & Konieczna, E. (1984). The defective tense hypothesis: on the emergence of tense and aspect in child Polish. *Journal of Child Language* **11**, 347–74.

Reviewed by RICHARD M. WEIST
SUNY College at Fredonia,
Fredonia, NY 14063

DOI: 10.1017/S0305000903225630

KARMILOFF, K. & KARMILOFF-SMITH, A., *Pathways to language: from fetus to adolescent*. Cambridge, MA: Harvard University Press, 2001. Pp. ix + 256.

This book is an overview of language development ranging from fetuses and their earliest sound perception in the womb through 14-year-olds with Williams syndrome, although the focus is primarily on the first three years of development. Very clearly written in an engaging style, it is accessible either as a textbook suitable for students with no previous background in linguistics or psychology, or as a resource for the educated lay reader eager for a solid grounding in child language development. It is not a general 'how to' book for parents or educators, nor does it focus on how scientific knowledge can be applied in child rearing or schools. This is the second collaboration by the mother–daughter team of Karmiloff-Smith (the mother), a well-known pioneering researcher in the field of language development, and Karmiloff (the daughter), who also conducts language development research. It comprises eight chapters, as well as a chapter-by-chapter guide for further reading and an index.

The book begins by introducing the marvel of language development in Chapter 1 and offering a brief overview of the chapters to come. Particularly

highlighted are two recurring themes: a focus on new research methodologies which push our knowledge of language development to ever-earlier ages, and a multi-faceted treatment of theoretical accounts of language acquisition.

Chapter 2 focuses on paradigms for language development research, situating them in the light of historical developments in the field. The range of techniques covered is quite thorough, including those for speech perception (fetal kick rate, fetal heart rate, high-amplitude sucking, head-turn preference), language production (diary study, spontaneous speech recording, parental questionnaire, elicited production with nonce words, elicited imitation, elicited transformation, elicited narrative), language comprehension (preferential looking, act-out task, picture pointing, reaction time, parental questionnaire), and brain imaging (ERP). Ample examples and several helpful illustrations of the apparati involved complement the very clear descriptions. The authors are careful to elucidate the advantages and disadvantages of each method, while also stressing the importance of using multiple techniques to converge on a full picture of development.

Early sensitivity to speech input is addressed in Chapter 3, with discussion ranging from the fetus's perception of intonation patterns in the womb to knowledge of word-internal stress patterns at 11 months of life. Careful summaries of the speech perception abilities of infants refute the commonly held assumptions that language acquisition begins with the first word and always proceeds from smaller to larger units; rather, infants are actively taking in language information at many levels at once, and begin doing so as early as the seventh month of gestation. Indeed, it is well known that babies only hours or days old recognize their own mother's voice, and prefer listening to their own language over others. A short section on child-directed speech focuses on the value of its prosodic contours and turn-taking properties. A longer section on segmentation highlights infants' knowledge about distributional regularities, phonotactic constraints, and sound and stress patterns within words and at clausal boundaries.

Chapter 4 details the intricacies of vocabulary development. Acknowledging the huge variability in the onset and rate of vocabulary development, the chapter begins by presenting some of the influences responsible for this, including biology, social environment, and language input. For example, girls' brains mature somewhat faster than those of boys, and they thus gain earlier control over their articulatory apparatus and produce language earlier than boys. In addition, mothers with higher SES typically speak to their children more often, with a more diverse vocabulary and longer utterances – all features of the input which have been shown to correlate with earlier vocabulary development. A section on the composition of early vocabulary mentions both the range of word classes found at early stages (nouns but also verbs, adverbs, etc.) and how children develop slowly toward the target in determining the function of these words. The authors suggest that over- and under-extension

result more from limited vocabulary resources than from incomplete conceptual understanding, citing research showing that three-month-olds can perceive very subtle differences both within and between categories. A discussion of constraints on word learning is particularly useful in presenting this often complex literature both clearly and succinctly. The constraints are divided into three categories – lexical/cognitive (mutual exclusivity, fast mapping, whole object, taxonomic), social (joint attention, gaze alternation, pointing), and linguistic (syntax, morphology, principle of contrast). A brief discussion of relevant research is presented for each constraint, and the interplay between the constraints is stressed. A short section deals with how children represent and store words in the brain; processing strategies change to deal with the growing vocabulary at early stages, but primed monitoring tasks show that storage is highly organized and hierarchical from quite early on. At the end of the chapter, a discussion of developing metalinguistic awareness again illustrates the importance of methodology in acquisition research: new online tasks reveal that five-year-olds know that both abstract nouns (e.g. *silence*) and function words (e.g. *the*) are words, whereas previous studies requiring conscious reflection on the part of the child (e.g. asking the child to answer the question: '*Is* "*when*" *a word?*') failed to reveal this knowledge until as late as seven or ten years of age.

The acquisition of morphology and syntax is the topic of Chapter 5. It begins with a summary of findings about early knowledge of grammar as discovered through the head-turn and preferential-looking procedures; highlighted among these are the child's ability to differentiate order of sounds in the input by two months, to detect meaning from word order by 17 months, and to detect meaning from the transitivity of the sentence by 21 months. A section on early morphology covers Brown's 14 morphemes, MLU as an indicator of grammatical complexity, and what overgeneralization and omission of grammatical morphemes show about children's knowledge of grammar. The syntax section discusses use of pivots as a reflection of development of relevant cognitive concepts (e.g. *allgone* reflects disappearance) and the association of variable meanings with variable word orders at the two- to three-word stage. Tantalizingly introduced but not developed are the single vs. dual process mechanisms for past tense storage and the role of explicit vs. implicit correction in learning grammar. The chapter includes no information on aspects of syntactic development beyond word order, such as interrogatives, passives, causatives, null subjects, relative clauses, anaphoric reference, and the like, or on the effects of developing literacy on the development of more complex syntax. In compensation, however, the book is unusual among overviews of the field in presenting a very even-handed review of the different theoretical perspectives on grammatical development, including some that do not often find their way into such books. Perspectives covered include nativism, bootstrapping (prosodic, semantic, and syntactic), sociopragmatic

approaches, cognitive approaches, processing approaches (operating principles, competition model), construction-based approaches, and connectionist modeling. The authors are exemplary in comparing and contrasting each of the approaches, showing the strengths and weaknesses of each, and pointing out ways in which they might be complementary. They are careful to note that all researchers believe that some things are innate and some are learned, and they present the theories on a continuum between nativism at one extreme and construction-based approaches at the other.

Chapter 6 looks beyond the single sentence, focusing on the pragmatics of dialogue and the development of narrative in children aged three through nine years. Issues related to dialogue include the origins of turn-taking within early caregiver–child speech, the difference between child–child and adult–child interactions, and the development of the skill of maintaining conversation by creating links between utterances and initiating further responses. A quick peek at some data offers evidence that dialogic interactions change radically between ages three and five years, from a series of unrelated utterances or two-sentence question–answer exchanges to a more sustained interaction focusing on both content and form. The section on narratives covers both coherence (i.e. the overall structure of the narrative and how it serves to elaborate a goal-directed story that makes sense) and cohesion (i.e. the linguistic devices used to link sentences together). Development of coherence in both production and comprehension, based on data from English, is discussed relatively briefly. A longer section presents information on cohesion. Crosslinguistic studies based on the Frog Story are described, but only one result is mentioned (language-specific differences in focusing on manner or path in event descriptions). More information is given about a study in French and English based on a six-picture stimulus; results concerning the various syntactic forms used in subject position and how they function at different ages are discussed in some detail.

Atypical development is covered in Chapter 7, with sections on language development in individuals who are deaf and blind, and in children who have specific language impairment (SLI), Williams syndrome (WS) or Down syndrome (DS). A well-written section on language acquisition by children who are deaf begins by making a strong case for signed languages being real languages, and touches on acquisition in a variety of situations (deaf children of native-signer and L2-signer deaf parents, deaf children of hearing parents, and hearing children of deaf parents); cochlear implants and oral instruction are not dealt with. The effects of lack of access to visual context and of changes in input to account for this (e.g. more directives, fewer pronouns) are highlighted in the discussion of acquisition by children who are blind. Specific language impairment is treated in some detail with a focus on both different types of SLI and possible causes for SLI. Particular attention is paid to recent work on grammatical SLI and the effect of perceptual salience, as well as to

the relative plausibility of SLI being caused by a defective 'grammar gene' on the one hand vs. by a malfunction of some aspect of the general developmental process on the other. A very good section on WS reviews current research showing severe early delay in language acquisition by children with WS, followed in later childhood by quite fluent language mixed with subtle syntactic deficits. Results from brain imaging studies show that language is processed differently in WS brains than in normal brains, leading the authors to question whether atypical development can adequately serve as a window into typical development. The chapter ends with short sections on language development in individuals with DS, and on brain plasticity evident in studies of individuals with focal brain injury.

Chapter 8 finishes the book by explicitly addressing the nature–nurture debate, which is a subtext throughout the book. A treatment of communicative capacities in non-human primates concludes that while many primates indeed have complex systems of communication, the evidence to date indicates that these abilities are nonetheless significantly different from those of both child and adult humans, especially in the domain of morphosyntax. Although the authors agree that crucial aspects of language are indeed species-specific and thus that something about them must be innate, they nonetheless argue against the idea that all individuals come with a fully specified grammar at birth. They claim instead that humans are programmed with a more general capacity for learning, which includes learning grammar, and that the brain becomes specialized for language only over developmental time. They conclude the chapter and the book with the prediction that the next significant set of answers to the nature–nurture question and to the full story of language development will be found in longitudinal brain imaging studies.

Several features make this overview stand out from others available in the field. First, while amply fulfilling the task of covering the most important knowledge accrued over the years, this book also particularly emphasizes the latest research and latest techniques that often do not find their way into general overviews; in addition to the chapter on research paradigms, this focus is especially evident in the sections on speech perception and WS, as well as in references to brain imaging research sprinkled throughout. Second, the treatment of theoretical approaches to language development is especially thorough and diverse for an overview. Although the authors are carefully even-handed in the first half of the book, their own position becomes more evident in the final two chapters when they use evidence from language disorders and the domain-specificity of language to argue against a strong view of the innateness of language. Third, this book is eminently readable in a way that makes one eager to find out more about an exciting topic rather than struggling to get to the end of the chapter before nodding off. I would happily recommend it to anyone seriously wanting to learn about the miracles of language acquisition, and would feel confident that they would thoroughly

enjoy the book while also getting a very accurate and up-to-date view of the field.

Those who might think of using this book for a class on language acquisition, however, should be aware of three factors that might present some difficulty. First, although the book is admirable in covering as much as it does given its length, it leaves out several topics which might be expected in an introductory text. These include development of communicative intent, babbling and productive phonology (although phonological knowledge evidenced by perception is covered), morphosyntax beyond about age 2;6, pragmatics (e.g. routines, speech acts), use of language in social contexts (e.g. register, politeness, dialect, gender), and acquisition by children who are autistic. Second, information on acquisition in languages other than English is not presented as consistently as would be optimal. Several references are made in the early chapters to the differences in features of child-directed speech (CDS) between Western mainstream cultures and other cultures in North America and around the world; the authors point out that particular features of CDS prevalent in Western cultures but not present universally cannot be necessary for language development. However, virtually no detail is given about the characteristics of CDS in other cultures so one must take these statements completely on faith. In addition, little information is presented about general language development in languages other than English. Notable exceptions are found in discussions of processing approaches to acquisition in Chapter 5 and of cohesion in Chapter 6.

A third difficulty for use as a class text involves the treatment of references. In a book such as this which is written to be readable, it is perfectly understandable that the text is not peppered with references and instead has a bibliography for each chapter at the back. However, it is unfortunate that research is often discussed without being attributed to a particular researcher in the course of the prose. This makes it difficult for students to get a picture from their own reading of the major figures in the field; it also does not help students to extend their knowledge by further reading on a topic since it is often difficult to link the references in the back of the book with a particular topic discussed in the text. Typical examples of lack of attribution include the section on changing meanings of words at the end of Chapter 4, the section on cohesion in French narratives at the end of Chapter 6, and the section on language in non-human primates in Chapter 8.

A more general complaint is with the subtitle 'From Fetus to Adolescent'. Although the authors do an excellent job of covering a variety of research on language abilities of the fetus, very little treatment is given to adolescent language. Only a tiny bit of information about language learners older than about 3 years of age is presented in the first 5 chapters of the book (i.e. metalinguistic understanding of the term 'word' in Chapter 4), even though research certainly exists on the development of vocabulary and morphosyntax

in children of older ages. Chapter 6 discusses narratives from children as old as 10, although the older ages are not the main focus of the chapter. Chapter 7 on atypical development pays more attention to development in older learners up to age 14, although the language skills discussed are often equivalent to those in much younger typical learners. Thus, readers who are looking for detailed treatment of language abilities in the adolescent will almost certainly be disappointed.

All in all, this book deserves to be heartily recommended. Its engaging style makes it one of the most readable introductions to language development that I have come across. The few shortcomings are more than made up for by the many strengths. I expect this to become a landmark book for lay readers and students alike.

Reviewed by Shanley E. M. Allen
Boston University