J. Child Lang. **28** (2001), 805–820. © 2001 Cambridge University Press
Printed in the United Kingdom

REVIEWS

Melissa Bowerman & Stephen C. Levinson (eds), *Language acquisition and conceptual development*. Cambridge: Cambridge University Press, 2000. Pp. 585.

J. Child Lang. **28** (2001) DOI: 10.1017/S0305000901215013

This is a landmark book that radically changes the terms of debate and ways of thinking about semantic development, particularly word learning, but more generally how concepts and linguistic forms relate in development (the 'mapping problem'). Right off, we can note two major conclusions:

(1) The Sapir–Whorf hypothesis has been given new life with impressive evidence in its favour.
(2) Specific linguistic constraints on word learning and meanings are now outmoded.

The importance of the book goes far beyond these bare conclusions, however. Outstanding scholars with strong credentials in cognition, language, or both present convincing cross-cultural data and solid theoretical arguments on a broad range of related issues. It should be said at the outset that the book is superbly edited. The chapters emerged from a conference held in Nijmegen, the Netherlands, in November, 1995, but it is obvious that the book version has greater coherence of both presentation and thematic content than any set of conference papers could have done. Without exception the chapters are well written and speak directly to major issues. Because of the time lag between the conference presentations and publication date, many of the chapters contain material that is likely to be familiar to readers from other sources. Bringing them together in this volume, however, highlights the importance and breadth of the issues. The book is divided into four parts, with 19 chapters in addition to an introduction by the editors. The emphasis in this review is on the theoretical propositions offered, in the context of the major themes.

Foundational issues

In this section the authors lay out different views of the basic cognitive and conceptual systems established in infancy and early childhood, and of their interaction with language acquisition. Langer presents a 'comparative Piagetian' theory, based on his research with non-human primates on tasks that require different levels of simple to complex relational thinking, which reflect early Piagetian stages. Langer's claim is that both in phylogeny and ontogeny cognition begins prior to language, and forms its foundation, and that in humans cognitive development continues beyond the acquisition of language. His conclusion, consistent with Piaget, is that language and

cognition do not interact because cognition leads language. Symbolic processes complement but do not change cognition. This general position is, I think, standard in the field today, although now not usually couched in terms of Piaget's theory.

Gopnik's chapter moves away from a strictly cognitive constructionist position to one that is open to linguistic influence. Her position is aligned with contemporary cognitive science which, she notes, is 'realist and anti-relativist almost by definition' (p. 45), assuming general procedures for learning shared by all humans. Gopnik adopts the framework of 'theory theory' to reconcile her evidence (that language affects cognitive development) with the tenets of cognitive science. A strong assumption of her position is that infants and young children form complex, coherent, and articulated theories, similar to scientific theories within specific domains such as the physical, biological, and psychological. These claims imply an underlying language of thought of considerable power, power equivalent to that of a natural language.

Cognitive development for Gopnik is in its essence a process of theory revision. Language plays a role as learning new vocabulary leads to the understanding of new concepts and their relations, each type of learning facilitating the other, whether in learning about social relationships in infancy or physics in school. Evidence for such an interaction between words and concepts comes from Gopnik's cross-linguistic and cross-cultural studies of differences in the relation between vocabulary and categorization by English-speaking and Korean children. She concludes that different languages may provide evidence of different new concepts to be incorporated into existing theories. In later development, language plays a crucial role in understanding the world, and in leading to change in culture-specific behavior. What exactly the relation of cultural differences, language differences and conceptual differences may be seems obscure in this account. Theory change seems to leave open the possibility of variation in outcomes on both the individual and cultural levels, but the strongest examples (physical theory, theory of mind) are generally claimed (by Gopnik as well as others) as universals.

Spelke & Tsivkin address the universality and variability of human knowledge systems and note that traditional accounts are incomplete, emphasizing learning mechanisms on the one hand, or innate endowment within specific domains on the other. They propose a 'third way' wherein core systems of knowledge are seen as limited by virtue of being both domain specific and task specific. The limitation can be overcome, they believe, as humans conjoin modules in flexible ways to yield new representations.

The relevant new claim is that language makes this possible by virtue of two central features: first, it allows domain general expression, thus providing a medium in which separate domains may be brought together. Second, as a

computational system it has the flexibility to conjoin. The bottom line is a revision of the standard cognitive science view that language transmits but does not transform thought; rather, Spelke & Tsivkin argue that by learning language children gain a new and more powerful system of representation. They provide examples of how conjoining through language might work in two domains – spatial representation and numerical representation. Acknowledging the power of language as a representation system with the potential to unify and generalize processes that are initially modularized is an important addition to the core knowledge theories. (See MacWhinney, 1999 for a similar idea.)

The Foundations chapters do not attempt to revise the standard models of infant cognition to reconsider the basis for acquiring language and developing concepts. Alternative views of infancy can, I believe, provide a more promising beginning point. Mandler's (2000) view of the baby as making sense through the construction of global conceptual categories is one proposal. Event knowledge, mimesis and derivative structures (Nelson, 1996) also provide general evolved cognitive mechanisms that combine with a strong social interaction base and lead to both universal topological understanding of the world and culturally specific understanding prior to acquiring first words. These proposals seem to me to lead more readily to the conclusions of the chapters that follow than do the standard theories on which these Foundations chapters are based.

Constraints on word learning

Smith, Tomasello and Bloom, authors in the second section, all agree that there are no specific linguistic constraints on word learning, but they have different reasons for so claiming. Smith's case relies on domain-general perceptual association mechanisms, endowing the child with the capability of making connections between word and referent object without domain-specific mechanisms. She borrows from developmental processes in biology to claim that you can get something specific from something general through a history of activity. Her work on children's learning and extension of novel words for novel objects shows that children improve over the course of word learning in focusing on shape as a dimension of extension, and that training can establish this bias. Smith provides a domain-general cognitive view of infancy that was missing from the first section. However, it remains incomplete, ignoring any necessity for acquiring meaning or concepts, as well as ignoring the social context of learning.

In contrast Tomasello emphasizes the importance of shared intentionality and of the child's social history, which establish the ability to interpret the intention of another in the word learning context. He contrasts constraints positions with social-pragmatic positions, focusing on social cognition and the communicative context of the learning situation. In his view 'children

acquire symbols as a kind of by-product of social interaction with adults in much the same way they learn many other cultural conventions' (p. 135). He supports this claim with research on children's inferences about adults' communicative intentions in using words in context. He states that the cognitive requirements for learning first words not only rest on the ability to interpret intentions, but also include conceptualizing the world in ways similar to adults. The 'similar conceptualization' assumption is invoked in many of the succeeding chapters as well, as the key to understanding how cognition and language interact in the early years. But in the end this assumption is severely challenged, and positions like Tomasello's may need to be rethought.

At the outset of his chapter Paul Bloom asks the question: 'What biases or constraints exist solely for the purpose of lexical acquisition?' And he answers: 'There are none' (p. 159). He reviews the motivation for and current state of the constraints proposals and argues that none of the apparent supports for special mechanisms actually requires them. Instead, he claims that the general cognitive system, including rich conceptualizations, a capacity for interpreting the intentions of others, and the ability to use syntactic cues to meanings of words, suffice. He argues that word learning is simply a case of a more general conceptual problem of induction.

It is refreshing, but also somewhat surprising, that new leaders in the field have finally come down to this position, which is remarkably similar to where we were 30 years ago, for example, in my (1973) monograph (also, Nelson, 1988). Did we really need to make the radical turn to special constraints? Has the work pro and con on this issue added significantly to our knowledge of word learning? The answer must be guardedly affirmative, as new studies have brought out previously unnoted social and cognitive capacities of infants and have added richly to our data base. Without the strong theoretical claims as a challenge, it is doubtful that the word-learning issue would have generated as much scholarly interest. At the same time, some equally interesting and puzzling questions in this area, such as wide individual differences in the pace and type of acquisition, remain basically unexplored.

The chapters in this section do not speak directly to the central question of the Whorfian hypothesis. From different bases they all assume that the child's conceptual structure is adequate to support language acquisition, specifically word learning, but they do not address the question as to whether or how acquiring words may affect concepts or cognition in general. The next two sections do.

Entities, individuation and quantification

To begin, Carey boldly embraces a version of the Whorfian position: '... the language we speak both reflects and shapes our conceptualization of the world', and 'Accepting the existence of genuine conceptual change in the

https://doi.org/10.1017/S030500090122501X Published online by Cambridge University Press

course of cognitive development is tantamount to accepting the Whorfian hypothesis' (p. 185). She also states that theory change may involve the construction of a new language adequate to describing a phenomenon. Embracing Whorf as an implication of her theory theory position results from the standard cognitive science assumption of identity between words and concepts, an assumption also implicit in the notion of intuitive theories.

Research on infants' understanding of spatio-temporal continuity and quantification in terms of *one* and *another*, as well as studies of the object/mass distinction form the background of Carey's discussion. She asserts that preverbal children have 'articulated' the concepts of sortal object and of the basic quantifier *one/another*, both of which are required for language learning. However, she concludes that infants younger than 12 months do not have concepts of specific objects, concepts that are also required for word learning. The studies are fascinating and the outcomes often startling. The conclusion is even more stark. Although infants represent objects with certain properties, recognize similarity, and so on, according to Carey (p. 203): 'One could recognize examples of objects which exemplify cuphood, or Mammaness, and have particular experiences about objects with such properties without representing Mama as a single enduring individual or representing *cup* as a distinct sortal from *book*. … Prior to age 12 months or so, such is the human infant's representational system'.

Carey concludes that infants come to language with universal concepts (sortals and quantifiers) that support their entry into language, leaving open a range of language-related concepts which may be acquired only in the context of language learning itself and may therefore be language-specific. For example, numerals provide a new language for dealing with numerical distinctions, and children learn to use them only after acquiring (some of) the relevant language.

To my mind, these proposals are still somewhat obscure. What does it mean to say that intuitive theories often require the construction of a NEW language? It is confusing to talk about the articulation of concepts and theories prior to language as though they involved language, but language which cannot be externalized or shared. This suggests an internal symbolic code on the same order as that of a natural language, as Fodor (1975) argued, but for Carey and some others who use this vocabulary this does not seem to be what is envisioned. To me this is a weak point for all of the 'theory theorists' and it requires clarification of the basic underlying assumptions that are usually taken for granted.

Gentner & Boroditsky present a modification and sharpening of Gentner's earlier arguments on the universality of the noun bias in early language learning. They assert that most semantic concepts are learned through language, but propose two alternative routes, namely COGNITIVE DOMINANCE and LINGUISTIC DOMINANCE. In cognitive dominance concepts are organized

in the cognitive sphere and simply named in the linguistic sphere, whereas in linguistic dominance the language picks out bits of the perceptual-cognitive stuff and clumps them together into words. Gentner & Boroditsky propose that cognitive dominance applies to open class words (nouns, verbs) and linguistic dominance to relativistic closed class items, items that serve grammatical roles. (Later chapters point out that this division is not so clear in languages other than English.) They propose that differences across languages can be attributed to differences in the degree to which 'objectness' is highlighted in the grammars. They also argue that perceptual individuation should be most salient for animate objects that are self-moving, in comparison with either easily-moved objects or stationary objects, and that therefore the ease of learning words for objects of these types should reflect this order (animate > movable > stationary). Their analysis of early vocabulary data supports their prediction (a finding similar to one I put forth in 1973 on different grounds). However, the authors report that vocabulary data from different languages actually reflect different biases, which aligns with Bowerman's findings on the early influence of specific languages on word-concept acquisition.

The chapter by Lucy & Gaskins stands in the physical and discursive center of the volume as it addresses the Whorfian idea most directly. They present a strong methodological point, that resonates through the rest of the book. They ask how we can account for the wide linguistic and cultural diversity that exists within a single species. Research on this topic, according to Lucy (1992) must meet four requirements: (1) It must be comparative, contrasting different language communities; (2) there must be an external 'reality' against which to measure differences; (3) language analyses should involve significant categories of reference; (4) language-related cognitive predictions should be evaluated against non-verbal performances. Lucy & Gaskins maintain that these requirements in the whole have rarely or never been attained.

The empirical focus of the chapter is on differences in nominal number marking in Yucatan (a Mayan language) versus English. Yucatan requires numeral classifiers to accompany nouns (such as 'piece' in English 'pieces of bread'). Most nominals in Yucatan are equivalent to mass nouns. For example the equivalent of 'candle' is 'long thin (classifier) wax'. A non-verbal classification task indicated that this marking draws the attention of Yucatan speakers not to shapes but to materials; in contrast for English speakers nouns draw attention to similarity of shape. Further studies show that the differences emerge among both language groups during later middle childhood years (8 to 12 years), suggesting that a long period of latent influence is necessary to establish a language effect on cognition.

The last three chapters in this section are concerned with person use and quantification. The chapter on person use (*I*, *me*, *my* and the child's name)

by twins, singletons, and siblings by Deutsch, Wagner, Burchardt, Schulz & Nakath focuses on the implications of individual experience with language and the social world. Their analyses demonstrate the fluidity of preverbal conceptions, and the influence of language on development of these concepts as well as of the specifics of social context and communication patterns observed within sibling groups.

Brooks, Braine[1], Jia, & Dias studied differences between English, Portuguese and Mandarin Chinese in the development of the universal quantifiers *each* and *every* under Braine's assumption of a natural mental logic underlying language. They focused on children's errors in identifying pictures accompanying such statements as 'every boy is riding an elephant.' Young children typically interpret *every* as applying to elephants as well as boys, and thus produce errors when one of the elephants in the illustration is not carrying a boy. Brooks *et al*. conclude that (1) the canonical interpretation of *each* in all the languages studied is one-to-one correspondence, (2) this is a likely linguistic universal and an innate characteristic of thought, and (3) particular forms in each language give rise to particular (collective or distributive) biases of interpretation. In his chapter Drozd identifies two types of children's errors: exhaustive and under-exhaustive pairings that are common in the preschool years but decline during the school years. Pragmatic factors as well as factors such as weak and strong determiners in English and contextual biases enter into children's interpretations. Drozd suggests further that children's growing counting skills may dispose them to use these abilities in tasks where they are not appropriate, such as the universal quantifier tasks. These two chapters indicate that the underlying cognitive skills that children bring to the language of logic are easily misapplied in some critical cases; there is no easy one-to-one correspondence between abstract concepts and natural language symbols.

Relational concepts in form-function mapping

Much of the last section calls into question the claims of earlier chapters, but at the same time in the end it puts everything prior into a new and challenging context. In her chapter Clark assumes that children universally bring to language some conceptual categories that lead them to acquire pretty much the same vocabulary and to construct the same kinds of sentences early in the language learning process. This position generally reflects current theory, but it conflicts with the positions of many of the other contributors to this section.

Clark's main proposal is interesting – that children's EMERGENT linguistic categories can reveal something about their underlying conceptual organization. Emergent categories appear when children use aspects of the target language to stand for meanings that are not categories in that language;

they contrast with ROBUST categories, ones that are categories of the adult language. A simple example comes from children's overextensions of early words; for example, toddlers' frequent use of the word *dog* to apply to all four-legged animals signifies an emergent category. Clark identifies a number of emergent categories, but the assumption that these represent universals of child concepts is questionable. For one thing these categories emerge during the 2- to 4-year-old age range, and Bowerman's research has made a strong case that children are sensitive to linguistic categories such as prepositions during the second year even before production of the relevant forms. Later emerging categories seem to be misanalyses of existing linguistic organization rather than children's own *a priori* categories.

Furthermore, the assumption that children's initial categories reflect linguistic universals or a conceptual basis for human languages in general implies that human languages arise from children's, not adult's, concerns and concepts. This seems unlikely from an evolutionary perspective. Surely languages reflect the conceptual bases of communities of speakers of all ages, not simply the concepts of their infant members. These reservations aside, the emergent categories Clark and others have identified are valuable for what they suggest about children's conceptualization processes.

Slobin's chapter on form–function relations challenges many standard accounts of child language acquisition. He backs far away from the position so often cited from his 1973 paper (elaborated in his 1985 volume on cross-linguistic studies) – that children use universal operating principles to enter into and unpack the language they must acquire. Instead, he revisits a position originally stated in 1966, away from 'helpful' initial categories, whether semantic or syntactic, and toward learning from language. The discussion is organized around the idea of 'grammaticizable notions'. Considering the two usually opposed positions deriving from nativism or cognitivism, Slobin faults both for placing the origins of linguistic structure in the mind of the child rather than in the communicative process. He emphasizes that it is important to differentiate between the development of linguistic categories by children and linguistic structure *per se*. He sees communicative function as the source of cross-linguistic diversity and rejects the assumption that there is an ordered set of notions that children come to language with, enabling them to discern which are closed class items, and which are open class. Cross-linguistic variation along this dimension makes it impossible to define a set of prelinguistic categories that would solve the child's learning problem. Slobin argues that solving this problem requires three interacting factors: social/pragmatic competence, an experiential knowledge base, the characteristics of the form–function mappings themselves, which often are more transparent than is generally assumed.

A chapter by Behrens on the use of time language by German-speaking children addresses issues of language diversity in the abstract domain of time.

Behrens found that children in their earliest productions of tense reflect language-specific patterns. This is consistent with Bowerman & Choi's findings on space reported next, although it is less surprising, given that time concepts, unlike spatial concepts, do not appear in language-relevant form in infancy. A plausible proposal with respect to temporal concepts, consistent with Behrens' study, is that children do not come to language with preconceptions but actually learn about time from learning the language of time (Nelson, 1996).

Bowerman & Choi provide further support for the thesis emerging from Slobin's chapter,but the thesis appears less radical here because their version of it is by now well-known. Indeed, Bowerman's (1985) challenge to Slobin's 'operating principles' on the basis of her data from children learning ergative languages was an important opening statement of the general position now taken by both theorists. Here Bowerman & Choi take a modified interactive Whorfian position relating nonlinguistic conceptual development and semantic categories of the language being learned in the domain of space. This topic is of particular interest because it is usually assumed that human infants, and people generally, have universal nonlinguistic concepts of space. That languages represent spatial concepts in diverse ways and that children learn these without difficulty is then somewhat surprising. Three of the chapters to follow also focus on spatial categories and language.

Bowerman & Choi report on the different ways that English and Korean languages divide up the spatial domain through lexical and grammatical means for referring to concepts of containment, support, attachment, movement up and down, and opening and closing. The longitudinal study of children acquiring these languages reveals that by the second half of the first year 'children categorized spatial events language specifically – there was no evidence that they relied on the same set of basic spatial concepts' (p. 488). Preverbal concepts provide the material out of which children then construct their spatial semantics to match their language.

The three remaining chapters treat the unusual (to English speakers) spatial semantics of Mayan languages spoken in the Yucatan area of Mexico. The first by Brown focuses on talk about motion in Tzeltal to express concepts of up and down. De Leon's chapter describes language and behavior with respect to verticality in Tzotsil. The last chapter by Levinson wraps things up for this domain and for the book as a whole. That children learn these Mayan spatial systems at all may strike many readers as puzzling, because they rely on an absolute North–South dimension for describing locations. In contrast English categories reflect a basic 'intrinsic' system of left–right and front–back with respect to the speaker, or the 'relativist' system of using similar terms with respect to the object located. It is more than unlikely that Mayan children, any more than American children, bring the abstract spatial delimiters to the language as preverbal concepts.

In a series of experiments Levinson and his colleagues presented adult Mayan and English speakers with nonverbal spatial tasks. For example in one task subjects were presented an array of three objects and asked to remember them. The participants were then rotated 180 degrees and asked to place the objects in the same order. English speakers responded by placing them from left to right, thus reversing the 'objective' order. Mayan speakers, however, obeyed the 'absolute' north-south directional order, thus replicating the objectively identical placement. These studies convincingly demonstrate, as Lucy & Gaskin demanded, that the language spoken affects the cognition of adult speakers. The Mayan speakers have interiorized the abstract spatial dimensions of their language, just as presumably the English speakers have of theirs (after all left-right is not an easy dimension for many English speakers to acquire and use). The system used in the language works its way into different kinds of mental representational systems; semantic representations, imagistic representations, and kinesthetic representations are brought into concordance, enabling unreflective use in action contexts.

Levinson emphasizes the radical implications of these findings for the 'mapping' problem, which even at its simplest (preverbal concept to word) has been claimed by Quine among others to be logically unsolvable. Now that we know that the concepts to be matched to language-specific word meanings are not pre-verbal universals but culture-specific concepts, it follows that there is no necessary commonality between adults' everyday concepts and infants' concepts. Under these conditions the child 'must somehow discern the conceptual parameters that the adult is using to construct the semantic distinctions that show up bundled in morphemes' (p. 572). Levinson suggests that an assumption of intentionality by both child and adult, in conjunction with the fact that the adult's non-verbal behaviour reflects the categories of the language, can get the process started. Once started, a pattern begins to reveal itself. To conclude this discussion and the book, Levinson states:

> This crosscultural variability in what is most easily accessible to the child suggests that many linguistic categories are simply not *natural* in any straightforward sense at all. They have to be learnt from instances of usage … the point is that languages *construct* concepts that otherwise might not have been. And that is precisely the added cognitive value of language: it provides 'unnatural' concepts … On the new view, when a child learns a language she is undergoing a cognitive revolution … *Language invades our thinking because languages are good to think with* (584, italics added).

This conclusion has such profound implications for how we think about and study language acquisition and cognitive development that it deserves further emphasis. The central point, latent in much of the book, is that

children's preverbal concepts about the world cannot help them to solve the meaning mappings of any given language. As a whole, this work implies that this is true for several interlocking reasons:

(1) There are no universal guiding principles built in to the child's mind. Universals based on universal person-world interactions, such as object permanence and means-end relations are insufficient as guides to specific linguistic structures, whereas the concepts that children derive from individual experience tend to be either over-general (e.g. global categories) or specific to particular contexts (e.g. person concepts) and thus do not map neatly onto specific language forms.

(2) Diversity of linguistic structures and of function–form relations is such that no set of principles applies to all possible languages.

(3) The solutions that languages of different cultures arrive at are imperfect accommodations to competing demands of communication in adult social interactions. These competing demands have only a vague relation to the interests, knowledge base, and communicative problems of young children.

Why then have scholars for so long expected that we could uncover the key to the separate puzzles of language structure and language acquisition by studying the minds of infants and children that are unfettered by language itself? Chomsky led us down this path by his claim that there must be built-in linguistic structure to the child's mind, a universal language module. But almost from the outset of response to this claim there has been strong evidence that no module of this kind exists, that language acquisition for the most part is hit and miss, with diverse individual and cultural patterns, and that social interaction drives language acquisition. The search for a strong base in Piagetian concepts long ago went aground, replaced by universal constraints on word learning, now abandoned. This volume attests to the futility of these efforts to endow the child with the 'right stuff' for solving the problem. Meanwhile, one thing has been clear: no child ever solves this problem on his or her own; children need adult guides. Language is above all and first of all a social game.

The focus on the unfettered child mind as the key to the language problem has effectively blinded researchers to the really radical effects that the acquisition of language has on the child's understanding of the world and on her social and cultural cognitive development. Now that we understand that children's concepts are accommodated to the language they are learning we can begin to take a new look at how this process proceeds in all its messy, and often idiosyncratic ways. Levinson's claim that language 'invades our thinking' with 'unnatural concepts' takes us onto ground that Vygotsky (1986) broke (although Vygotsky is virtually absent from this volume, with only two brief citations), and would lead us beyond 'thinking for speaking' to consider how language as an external and internal representational system

and symbolic tool affects thinking in all its many guises. It would be very appropriate and important to the field if this pathbreaking book on cognitive development and the acquisition of language were to be followed by a similar collection of papers on language development and cognitive acquisition of cultural ways of thinking.

REFERENCES

Bowerman, M. (1985). What shapes children's grammars? In D. I. Slobin (ed.), *The crosslinguistic study of language acquisition, vol. 2. Theoretical issues*. Hillsdale, NJ: Erlbaum.

Fodor, J. A. (1975). *The language of thought*. New York: Crowell.

Lucy, J. A. (1992). *Language diversity and thought : a reformulation of the linguistic relativity hypothesis*. Cambridge: C.U.P.

MacWhinney, B. (1999). The emergence of language from embodiment. In B. MacWhinney (ed.), *The Emergence of Language*. Mahwah, NJ: Erlbaum.

Mandler, J. M. (2000). Perceptual and conceptual processes in infancy. *Journal of Cognitive Development* **1**, 3–36.

Nelson, K. (1973). Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development* **38** (1–2, Serial No. 149).

Nelson, K. (1988). Constraints on word learning? *Cognitive Development* **3**, 221–46.

Nelson, K. (1996). *Language in cognitive development : the emergence of the mediated mind*. New York: Cambridge University Press.

Slobin, D. I. (1966). Comments on 'Developmental psycholinguistics': a discussion of McNeill's presentation. In F. Smith & G. A. Miller (eds), *The genesis of language : a psycholinguistic approach*. Cambridge, MA: MIT Press.

Slobin, D. I. (1973). Cognitive prerequisites for the development of grammar. In C. A. Ferguson & D. I. Slobin (eds), *Studies of child language development*. New York: Springer.

Slobin, D. I. (1985). Crosslinguistic evidence for the language-making capacity. In D. I. Slobin (ed.), *The crosslinguistic study of language acquisition, vol. 2. Theoretical issues*. Hillsdale, NJ: Erlbaum.

Vygotsky, K. (1986). *Thought and language*. Cambridge MA: MIT Press.

Reviewed by Katherine Nelson
City University of New York Graduate Center

[1] Martin Braine attended the conference and coauthored this paper, but died shortly thereafter. The volume is dedicated to his memory.

Miguel Pérez-Pereira & Gina Conti-Ramsden, *Language Development and Social Interaction in Blind Children*. Psychology Press Ltd, 1999. Pp. 197.
J. Child Lang. **28** (2001) DOI: 10.1017/S030500090122501X

This book combines a review of literature on blind children's acquisition of language (mostly English) with a summary of research on blind children's acquisition of Spanish and their social development, primarily by the first author. The authors [PP&CR] note that the term 'blind' legally means different things in different countries; it includes both persons who have no or minimal response to light and those who are severely visually impaired. It is used in that sense both in the book and this review.

There are seven chapters, which can be conceptually subdivided into four

sets: 1 and 2: background; 3 and 6: social aspects of the development of communication; 4 and 5: the development of some, more 'central', aspects of language; 7: possible interventions.

Chapter 1 presents helpful background on the overall population of blind children, and on existing studies of the development of blind children. Several methodological difficulties are introduced (small population, possibility of other handicaps, comparability of observed behaviours), and these reappear throughout the rest of the book.

Chapter 2 continues laying the groundwork with a relatively brief survey of what is known about blind children's motor and cognitive development (object permanence, symbolic play, operational thinking, representation of space), and how these compare with what has been observed in sighted children.

Chapter 3 reviews studies of blind children's social interaction and early communication, with an eye to the probable effects of lack of visual information, particularly regarding eye-gaze and the ability to develop a theory of mind. An important question raised in this chapter is whether behaviors such as 'echolalia' and pronoun 'reversal' which are often observed in these infants are underlyingly similar to those of autistic children or only seem so on the surface.

Chapter 4 presents what is known about blind children's development of phonology, lexicon, and morphology. Little has been done on syntax. In all these areas blind seem similar to sighted children, although there is quite a range of individual variation. The conclusions here are less clear than one might hope both because of the small number of children studied in most research (usually 1 to 4, never more than 20), and because of individual differences and the important effects of the kinds of verbal interaction provided by caregivers (discussed in Chapter 6).

Chapter 5 covers several more pragmatic areas of language development, including personal reference (pronoun reversal), pragmatic development (telling, requesting, querying, self-guidance), and the potentially facilitating roles of verbal routines and imitation.

Chapter 6 reconsiders the results presented in Chapters 4 and 5 in the light of what is known about conversational interaction between blind children and their parents. The wide range of individual differences in amount and types of parental responsiveness makes it difficult to draw firm conclusions, but it also allows PP&CR to raise a number of interesting questions. The important point is made here as well as elsewhere that, because language can provide blind children with an important channel for otherwise inaccessible information, it can play a particularly important role in their development, socially, cognitively, and linguistically. I, too, have argued that language must play a more important role for blind than for sighted children (Peters, 1994).

Chapter 7, which is the most practical, follows naturally from the social discussion in Chapter 6. Here PP&CR summarize their accumulated wisdom about intervention with blind children, beginning with the ways in which parents' expectations of normal development are violated in the first few months of life. They then present several principles that they believe should underlie any intervention: the goal is to anticipate and prevent possible developmental problems; it should be based on careful evaluation of the particular child's developmental profile; parents must be educated about what to expect, i.e. about the 'normal' development of blind children. PP&CR's concrete suggestions are embedded in Vygotsky's social-interaction view, including his 'zone of proximal development'. Another important principle that they articulate is that '[T]he key is to take blind children's behaviors as meaningful and communicative' (p. 158). I agree wholeheartedly and would extend this guideline to the design of research as well. If we expect deviance we will find it; if we expect meaningful communication we will be open to the linguistic and pragmatic strategies children use to meet their communicative needs, which, after all is what language is 'for'.

I did encounter a few problems in reading this book, mostly in presentation of the data. I was confused by the fact that PP's subjects are not uniformly presented across the chapters. In Chapter 2 data from six blind children are presented as Child 1–6 (Figs. 2–6, pp. 25–27). In Chapters 4 and 5 (e.g. Tables 4·3, p. 97 and 5·3, p. 116) five children, including one who is sighted, are presented as Subjects 1–5. In Chapter 6 we see data from only four children, who are now identified by name rather than subject number. It was not clear to me how these groups of children map onto each other. Also Table 5·3 is hard to interpret, plus it would have been more helpfully placed a few pages later (e.g., p. 120).

Reading the book as a researcher on children's language, I found two memorable themes. The first is methodological: throughout their presentation PP&CR note the following deficiencies in the existing body of research on the language development of blind children.

Small numbers of subjects. PP&CR complain that little quantitative, much less statistical, work has been done on blind children, but the small Ns and (often) short corpora make this difficult.

Control subjects. PP&CR suggest that these should include children of the same ages who are sighted as well as those who have other handicaps. In addition, when manipulative tasks are involved, a control group of blindfolded sighted children would also be informative (although I think that the results have to be interpreted cautiously because it is likely the case that blind children are much more efficient at interpreting nonverbal information than are blindfolded sighted children).

Importance of asking functional as well as structural questions. PP&CR point

out that if blind children necessarily take a different route to a common state of adult language, we should not always/only ask whether they have acquired structure X. We also need to understand how these children develop in their ability to *use* the language they have acquired to achieve the ends they desire.

More research needed on the nature and role of input to blind children. PP&CR note that it seems that not all parents manage to be equally facilitative of their blind children's attempts to communicate. This suggests that systematic study of such variation might shed light on the effects of input on language acquisition in general. More systematic studies of intervention are also needed. I would add that there is a need for more crosslinguistic work, especially on languages that are more morphologically complex than English or even Spanish. In my view, these deficiencies are not limited to the study of this population and can be seen as challenges to the language acquisition field in general.

The second, more consequential theme regards the perspective on normal language development that can be provided by the study of otherwise unimpaired children who lack access to visual information. Although this point is not original with these authors, it is an important theme throughout the book. Awareness of both the similarities and differences between the developmental trajectories of visually deprived children and those not visually deprived naturally leads to a rethinking of the assumptions underlying research in language acquisition and conclusions about the universality of developmental paths and their detachment from social and cognitive development. I list here six fairly widespread assumptions that I think this book calls into question.

1. *Language as independent of social interaction.* If language development in this population can be shown to be deeply grounded in social interaction, to what extent does language constitute an independent strand of development for 'normal' children? What clues do the blind offer us about less obvious developmental processes that may also be taking place in the sighted?

2. *Only one path to adult language.* To the extent that blind children reach some shared adult state of language competence, what light can their developmental differences shed on heretofore unrecognized developmental paths that are available to all children? This theme is contiguous with the concern of those interested in individual differences among normal children.

3. *Differences are deficiencies.* If multiple paths to adult competence exist, might some of the differences in blind children's language be due to perfectly plausible attempts to achieve similar functional (communicative) ends by finding ways to compensate for 'missing' information? To what extent does language itself serve as a compensatory device, both socially and cognitively? A more socially grounded view leads to an increased awareness of the intricate contextualization of language and the multiple roles it plays for the developing child.

4. *Imitation and formulaic speech are necessarily non-creative*. A perspective that acknowledges the communicative goals underlying language use leads to asking questions about why a child might include imitation in an utterance. As PP&CR point out, 'imitation' can serve multiple functions: filling a turn, providing a basis for further analysis, and serving as a scaffold for what others have called 'buildups'. In multiple ways this strategy can provide a learner with a foundation for expansion of what is known about the language system.

5. *The development of language is isolated from the functions it serves*. To the extent that blind children's motivation to acquire and use language is generally more socially driven than that of sighted children, we should be asking what a given child at a given stage is trying to accomplish with her language and how these goals are affecting the developmental trajectories we see.

6. *Language development proceeds in discrete stages*. If language development is driven by interaction with the social and linguistic environment (input) as well as internally (language as a formal problem space), we need to be willing to look at how this interaction affects development. This in turn leads to a focus on process as well as to an awareness of the multidimensionality of the task of language acquisition.

Although PP&CR's approach is more empirical than theoretical, their review is of potential interest not only to those specifically interested in the development of the blind but also to those interested in any of the following questions: *How does language development differ when learners are deprived of visual information? In what ways is it indistinguishable from the development of sighted children? What light can this population shed on universals of language acquisition?* Because the latter two questions are not addressed head-on, readers will have to draw their own conclusions. *Language Development and Social Interaction in Blind Children* can provide the open-minded reader with much to reflect on concerning the development of language in this interesting population, as well as about the underpinnings of normal language development.

REFERENCES

Peters, A. M. (1994). The interdependence of social, cognitive and linguistic development: Evidence from a visually-impaired child. *Constraints On Language Acquisition: Studies Of Atypical Children*. In H. Tager-Flusberg (ed.), (195–219). Hillsdale, NJ: Lawrence Erlbaum Associates.

Reviewed by Ann M. Peters
Department of Linguistics
University of Hawai'i