Waxman, Sandra R. (in press). Finding the points of contact: Language acquisition in children raised in monolingual, bilingual and multilingual environments. In W. Li (Series Ed.) & E. Hoff & P. McCardle (Vol. Eds.), *Multilingual Matters*.

Finding the points of contact: Language acquisition in children raised in monolingual, bilingual and multilingual environments

Sandra Waxman, Northwestern University

Running head: Cross-linguistic research points of contact
Key words: language acquisition, cross-linguistic, bilingual

Address for correspondence:
Sandra Waxman
Northwestern University
2029 Sheridan Rd.
Evanston, IL. USA 60208-2710
Phone: (847) 866-9156
Fax: (224) 717-0238

Abstract:

The rapidly increasing number of children being raised in bilingual and multilingual homes and communities raises important questions and serious challenges for researchers, educators, and policy-makers. This paper offers fundamental findings from basic psychological research on early monolingual acquisition as a springboard to identify future points of contact with research from bilingual or multilingual perspectives. Using the cross-linguistic developmental approach to study early word learning and its relation to conceptual organization, I have focused exclusively on monolingual acquisition in infants and young children. The field has accumulated considerable evidence concerning early linguistic and conceptual development in both in English-speaking monolinguals and in monolingual children acquiring languages other than English. Armed with this evidence, the field is now poised to launch a full research agenda that focuses squarely on language acquisition in bilingual and multilingual children. In this commentary I outline some possible goals of such an agenda. The time has come to consider carefully the course of language and conceptual development in children raised in monolingual, bilingual, and multilingual environments. Building a truly developmental program of research on this topic will enrich our theories of acquisition even as it advances our educational and social goals.

The rapidly increasing number of children being raised in bilingual and multilingual homes and communities raises important questions and serious challenges for researchers, educators, and policy-makers alike. In this article, I will focus on a few fundamental findings that have emerged from basic psychological research on early language acquisition in monolingual children, and will use this as a springboard to identify some future points of contact for research on language acquisition from monolingual, bilingual or multilingual perspectives. In my own research laboratory, I have adopted a cross-linguistic developmental approach to studying early word learning and its relation to conceptual organization, and I have focused exclusively on acquisition in infants and young children who are in the process of acquiring a single language. Although on the face of it, word learning in this population would appear to be a rather straightforward task, a more careful examination reveals that there are layers of complexity in this task.

In fact, to be successful word learners, infants must (a) parse the relevant word from the continuous speech stream, (b) identify the relevant concept in the world, and (3) establish a mapping between them. See (Waxman & Lidz, in press) for a full discussion. More difficult still, there are many different words – indeed many different kinds of words – that can all be correctly applied to the very same scene or event in the world, and each kind of word directs attention to a different aspect of that experience. Consider for example a flamingo that is running behind a bluff. As speakers of English, we know that a count noun ("It's a flamingo") will refer to an individual object and can be extended to other members of the same object category (e.g., other flamingos), but that a proper noun ("That is Frieda") will refer to an individual but cannot be extended further. In contrast to these words that can refer to the individual qua individual, adjectives ("She's so graceful (or pink)") do not refer to the individual itself, but rather to a property of an individual (or category), and adjectives are extended to other entities sharing that property, independent of the category membership (e.g., "pink" can be used to describe a flamingo, a coffee cup and a t-shirt).

Research with monolingual children has shown that by 2 years of age, they are quite sensitive to many of the links between kinds of words (e.g., nouns, adjectives, verbs) and kinds of meaning (e.g., roughly speaking, the object categories, object properties, actions). In essence, they have discovered the relevant linguistic units (words and grammatical categories) as well as the relevant conceptual units (individual objects, categories of objects, properties of objects, and actions or relations among objects). More to the point, the evidence suggests that children as young as two years of age have also gathered some rather precise expectations about the mappings between these linguistic and conceptual units. As a result, they can use the grammatical form of a novel word as a clue to discovering its meaning (Hall & Lavin, 2004; Markman & Jaswal, 2004).

Cross-linguistic investigations offer some important perspective on how these links between linguistic and conceptual units might be acquired (Gathercole & Min, 1997; Waxman, 2004). These investigations reveal that languages differ not only in the words that they use (*chien* vs *dog*), but also in the grammatical forms that are represented in the language and the way these forms are recruited to convey meaning. For example, although the grammatical distinction between count nouns (e.g., This is a dog) and proper nouns (e.g., This is Magic) is quite clear in English, this is not the case in Japanese, where the grammatical distinction between these two forms is scant, at best (Imai & Haryu, 2004). Nonetheless, speakers of both languages – indeed speakers of any human language -- can use the resources of their language to distinguish between categories of objects and individual objects. As another example, there are differences in the kinds of meaning that are permissible for adjectives in English and French, on the one hand, as compared to Spanish and Italian on the other (Waxman & Guasti, in preparation; Waxman, Senghas, & Benveniste, 1997). Therefore, these links between kinds of words and their associated kinds of meaning must be shaped by the structure of the particular language under acquisition.

With a clear view of these issues, the developmental question becomes: How do infants discover which grammatical forms are represented in their language, and how do they learn to map these linguistic forms to meaning? In my program of research, I have focused on these issues, asking which links, if any, are available early enough to guide the process of acquisition at the start, and how are these shaped by the language under acquisition. Any links that are available early in acquisition will be good candidates for universality; these may guide the initial stages of acquisition in all languages, and then become fine-tuned as the infant discovers the particular properties in the language being acquired. We have addressed these questions primarily with monolingual infants acquiring either English, Spanish, French, or Italian (Hall, Waxman, Bredart, & Nicolay, 2003; Waxman & Guasti, in preparation; Waxman et al., 1997). Our strategy has been to select particular links (e.g., the link between nouns and object categories, or between adjectives and object properties) and ask (1) when this link becomes available, (2) how each link is supported or shaped by the structure of the native language being acquired, and (3) how these various links unfold over the course of development. (See Waxman & Lidz, in press, for a review of the theoretical perspective and the empirical evidence supporting it.)

We have argued that infants cross the threshold into word learning equipped with a powerful, but very general, expectation that links words and concepts. We have suggested that this broad initial link is universal, that it gets the process of word learning off the ground, and that it sets the stage for subsequent developments in the lexicon and in the grammar (Fulkerson & Haaf, 2003; Waxman & Markow, 1995). Of course, infants move beyond this initially broad link, and the evidence suggests that as they do, they first tease out the grammatical category *noun* from among the other grammatical forms, and map these specifically to individual objects and to categories of objects (Waxman, 1999). Only later do they tease apart the other grammatical forms in their language and discover their links to meaning.

The early emergence of a noun-to-category link serves as the foundation that enables infants to discover the other essential grammatical forms that are present in their language (e.g., adjectives, verbs) and map these grammatical forms to their respective meanings. The patterns of acquisition for these latter forms appear to differ importantly

from the acquisition of nouns, and appear to depend upon the prior acquisition of (at least some) nouns. This 'cascading' developmental picture, with nouns emerging early followed by the other grammatical forms, may well be universal, and may follow directly from the distinct informational requirements and conceptual entailments of each of these grammatical forms.

We can take English as a case in point. Dana Markow and I (Waxman & Markow, 1995) used a novelty-preference design to discover whether infants harbor any links between linguistic and conceptual organization at 12- 14 months of age. This is the point at which most infants are just beginning to produce words on their own. During a familiarization phase, an experimenter offered the infant four different toys from a given object category (e.g., four animals), one at a time, in random order. This phase was immediately followed by a test phase, in which the experimenter simultaneously presented both a) a new member of the now-familiar category (e.g., another animal) and b) an object from a novel category (e.g., a fruit). Infants manipulated the toys freely throughout the task. We used the infants' total accumulated manipulation time as the dependent measure. Each infant completed this task four times, with four different sets of objects.

To identify any influence of novel words, infants were randomly assigned to one of three conditions that differed only during the familiarization phase of the experiment. Infants in the Noun condition heard, for example, "See the *fauna*?"; those in the Adjective condition heard, for example, "See the *faun-ish* one?"; those in a No Word control condition heard "See here?". At test, infants in all conditions heard precisely the same phrase ("See what I have?"). The experimenters presented novel words, rather than familiar ones, because their goal was to discover what links, if any, infants hold when it comes to mapping a new word to its meaning. If they had used familiar words (e.g., *dog*), performance would have been influenced by their understanding of that particular word, and could not speak to the more fundamental issue of the links between words and meaning.

The predictions were as follows: If infants noticed the category-based commonality among the four familiarization objects, then they should reveal a preference for the novel object at test. If infants detected the presence of the novel words, and if

these words directed their attention toward the commonalities among the objects presented during familiarization, then infants hearing novel words should be more likely than those in the No Word control condition to reveal a novelty preference. Finally, if the initial link between words and concepts is general at the start, then infants in both the Noun and Adjective conditions should be more likely than those in the No Word condition to form categories.

These predictions were borne out. Infants in the No Word control condition revealed no novelty preference, suggesting that they had not detected the category-based commonalities among the familiarization objects. In contrast, infants in both the Noun and Adjective conditions revealed reliable novelty preferences, indicating that they had successfully formed object categories.

This result provides clear evidence for an early, foundational link between word-learning and conceptual organization. In essence, the words served as *invitations* to form categories (Brown, 1958). Providing infants with a common name (at this developmental point, either a noun or an adjective) for a set of distinct objects highlighted the commonalities among them and promoted the formation of object categories. More recent work has revealed that this invitation does more than "simply" highlight concepts that infants may already represent; it also supports the discovery of entirely novel concepts, comprised of entirely novel objects (Booth & Waxman, 2002; Fulkerson & Haaf, 2003; Gopnik, Sobel, Schulz, & Glymour, 2001; Maratsos, 2001; Nazzi & Gopnik, 2001). Moreover, this invitation has considerable conceptual force: Although novel words were presented only during the familiarization phase, their influence extended beyond the named objects, directing infants' attention to the new – and unnamed -- objects present at test.

The first evidence of a more precise link between kinds of words and kinds of meaning comes from infants at roughly 14 months of age. Retaining the logic of the novelty-preference task described earlier, Waxman and Booth, (Waxman & Booth, 2001; Waxman & Booth, 2003) shifted the focus to include objects (e.g., purple animals) that shared both category-based commonalities (e.g., animal) and property-based commonalities (e.g., color: purple things). This design feature permitted them to ask (1) whether infants could construe the very **same** set of objects (e.g., four purple animals)

flexibly, either as members of an **object category** (e.g., animals) or as embodying an **object property** (e.g., color: purple), and (2) whether infants' construals were influenced systematically by novel words.[i]

At 14 months, infants hearing novel nouns performed differently than those hearing novel adjectives. They mapped nouns specifically to object categories, but not to object properties (e.g., color, texture). However, at this age, infants' expectation for adjectives was less well-defined. Although they sometimes mapped novel adjectives to properties of the objects, in most cases they mapped adjectives broadly to either object categories or object properties.

Taken together, this research suggests that by 13-14 months, infants are sensitive to (at least some of) the relevant cues that distinguish among the grammatical forms, and they recruit these distinctions actively. At this developmental moment, they map nouns rather specifically to object categories, but their expectations for adjectives and verbs remain underspecified. The more specific expectations regarding adjectives is a subsequent developmental achievement, occurring at roughly 21 months of age (Waxman & Markow, 1998).

The evidence that the mappings between adjectives and object properties emerges later than the mappings for nouns fits well when considered from a developmental, cross-linguistic perspective. All languages have a grammatical form *noun*, and across all languages, a core function of nouns is to refer to objects and object categories. In contrast to nouns, there is substantially more developmental and cross-linguistic variation associated with the form *adjective*. Although many languages (like English) have a richly-developed adjective system to refer to properties of objects, in others (like Bantu and other African languages) the adjective system is sparse, including as few as 10 words for denoting property terms. In such languages, the types of meaning typically conveyed with adjectives in one language are expressed with a different grammatical form in another (Choi & Bowerman, 1991; Dixon, 1982; Talmy, 1985; Wierzbicka, 1986). With regard to acquisition, adjectives tend to be acquired later than nouns (Fenson et al., 1994; Gentner, 1982; Maratsos, 1991; Waxman, 1999), and we have seen that infants' specific expectations for adjectives emerges later that their expectations for nouns (Booth & Waxman, 2003; Waxman, 1999). Moreover, because adjectives are semantically,

morphologically, and syntactically dependent upon the nouns they modify (Booth & Waxman, 2003; Klibanoff & Waxman, 2000; Mintz & Gleitman, 2002; Waxman & Markow, 1998), it stands to reason that their acquisition would follow that of the nouns.

Taken together, these cross-linguistic and developmental observations suggest (1) that the link between nouns and object categories, which emerges early in infants, may be a universal phenomenon (Gathercole & Min, 1997; Gentner, 1982; Gleitman, 1990; Maratsos, 1991; Waxman & Markow, 1995), and (2) that the specific link between adjectives and their associated meaning, which emerge later in development, may vary systematically as a function of the structure of the language under acquisition (Dixon, 1982; Waxman & Markow, 1995; Wierzbicka, 1986). Recent evidence from children acquiring English, French, Spanish and Italian provides support for the view (Waxman & Guasti, in preparation; Waxman et al., 1997) that across languages, children extend novel nouns to object categories, but that their extension of novel adjectives varies as a function of language under acquisition.

One of the clear 'lessons' to be gained from cross-linguistic research in monolingual populations is that there is structure both within the linguistic input and within language learners. We know that learners are exquisitely sensitive to the input that they receive and that at the same time, that there is structure within the learner that guides acquisition. This lesson will be valuable as the field moves forward to consider acquisition in bilingual and monolingual populations. What is required is that we be as precise as possible about the balance between these sources (structure in the input and in the mind of the learner) and the interplay between them as development unfolds.

In the case of word-learning, this interplay between expectations inherent in the learner and the shaping role of the environment is essential (Bloom, 2000; Chomsky, 1980; Gleitman, 1990; Gleitman, Cassidy, Nappa, Papafragou, & Trueswell, In press; Goodman, 1955; Jusczyk, 1997; Quine, 1960). Certainly, infants gather information from the environment, for they learn precisely the words and the grammatical forms of the language that surrounds them, and precisely the concepts to which they are exposed (e.g., gameboys and groundhogs in the US; scythes and peccaries in rural Mexico). But just as certainly, infants are guided by powerful internal expectations that guide the process, and that themselves evolve over the course of acquisition. This is especially

important because, as noted earlier, human languages differ not only in their cadences and their individual words, but also in the ways in which kinds of words (e.g., nouns, adjectives, verbs) are recruited to express fundamental aspects of meaning. A viable theory of word-learning must be sufficiently constrained to account for what appear to be universal patterns of acquisition in the face of this cross-linguistic variation, and also sufficiently flexible to accommodate the systematic variations that occur across languages and across developmental time.

The rich and detailed evidence regarding early language acquisition in monolingual environments provides an important foundation as we move on to consider the process of acquisition in bilingual or multilingual environments. It provides an excellent descriptive base and permits us to consider whether, and in what ways, learners who are acquiring more than one language may diverge from those acquiring a single language. It also provides a broad range of research tools, from experimental methods (e.g., novelty-preference tasks, categorization tasks, grammaticality judgment tasks) to observational tools for analyzing children's language production (MacWhinney & Snow, 1990). These tools and methods can be tailored readily to meet the demands of researchers focusing on acquisition in bilingual and multilingual environments.

As we move into the arena of acquisition in bilingual and multilingual environments, several lessons that we have learned in the monolingual research enterprise seem relevant. First, if the fruits of this new generation of research are to be useful, the research questions that we pose must be precise. Broad questions (e.g., "Are bilingual learners slower/faster than monolingual learners?") are likely to provide only murky answers. More precise questions ("How does the onset and rate of early word learning in bilingual learners compare to that of monolingual learners?" or "How does the bilingual infant's discovery of a particular grammatical form or a particular kind of grammatical rule compare with that of monolingual learners?") are more likely to yield information that will be relevant to the larger scientific and educational goals.

Another lesson from the evidence on monolingual acquisition is that all words are not "created equal". Across languages, infants seem to distinguish the nouns first (before the other grammatical forms) and map them specifically to categories of objects. This early acquisition of the noun-category link then serves as the gateway into the discovery

of the other grammatical forms (e.g., adjectives, verbs) and their links to meaning. It will be important to examine how these developmental processes unfold in learners acquiring languages other than English, and in learners acquiring multiple languages.

It is also important that we consider the structural properties of the particular languages under acquisition. At this point, we know very little about whether, when and how the structural features of L1 influence the acquisition of L2. For example, is L2 more readily acquired if it is structurally quite similar to L1? And what are the consequences for acquisition when L1 and L2 differ in the grammatical forms that they represent and their mappings to meaning? For example, do native speakers of English have more difficulty mastering the verb system in their L2 if the L2 is a language like Spanish (where the verbs may encode different aspects than in English) than if it is French (where the verbs appear to highlight different aspects of the action than in English)? As another example, consider grammatical gender. Do learners have more trouble mastering grammatical gender in L2 (e.g., French) if their L1 marks grammatical gender (e.g., Spanish) than if it does not (e.g., English)? Going one step further, we can ask, what are the consequences of moving from a binary system of grammatical gender (e.g., Spanish, French) to a three-way system of grammatical gender (e.g., German) (and vice versa)? The examples that we have just considered (verb systems, grammatical gender) are tied closely to syntax. But similar issues of "translation" can also be seen in the semantic system. For example, consider the spatial predicates (Bowerman, 1996; Choi, McDonough, Bowerman, & Mandler, 1999). Some languages, like Korean, make a semantic distinction between tight- and loose-fit, naming loose-fitting spatial relations with one word and tight-fitting spatial relations with a different one. English speakers carve up the semantics of space quite differently, naming all relations having to do with containment with on term (in) and those having to do with contact with another term (on). Infants acquiring either language as L1 master its spatial semantics with apparent ease. But what are the consequences of having English as L1 when it comes to acquiring Korean as L2? Is it more difficult to "re-draw" semantic space after having "drawn" it in a very different way in the first place? Are new distinctions more easily acquired than distinctions that cut across those already established? In sum, we know very little about the ways in which acquisition of L2 differ as a function of the L1 that has already been

(or is simultaneously being) acquired. L1-L2 mismatches may occur in the semantic system, the syntactic system or in the mapping between them. Each genre of mismatch is an important topic in its own right.

We also know relatively little about age effects and their relation to the acquisition of L2. We know that there are windows for optimal acquisition of a first language, and we also know that it is better to learn a second language early than to (try to) learn it late. But it is time to be more precise about these issues. For example, what are the consequences of introducing L2 at various developmental points? Are these consequences seen primarily in the mastery of syntactic, prosodic, or semantic components of L2? And does the acquisition of L2 feed back on L1, influencing the learner's performance or processing of L1? We also know very little about the differences, if any, between infants who are raised bilingual from the start and those who are introduced to L2 later.

In sum, at this point we have accumulated considerable evidence concerning early linguistic and conceptual development in monolingual (especially English-speaking) children. And the evidence concerning acquisition in monolingual children acquiring languages other than English is currently accumulating.

Armed with this evidence, the field is now poised to launch a full research agenda, one that focuses squarely on language acquisition in bilingual and multilingual children. A primary goal in this enterprise will be to discover the linguistic and conceptual consequences of acquiring more than a single language. We suspect that the multilingualism will offer the learner significant advantages as well as some challenges. These advantages and challenges will best be viewed from a truly developmental and multidisciplinary perspective. With regard to development, it will be crucial to pinpoint the age effects by weaving this into the very core of our experimental designs. It will also be crucial to consider whether, how, and in what contexts (e.g., classroom, playground, home) the various languages are reinforced. Another key factor will be to consider seriously whether and how the semantic, syntactic and pragmatic differences between two languages influences the acquisition of each. The time has come to consider carefully the course of language and conceptual development in children raised in monolingual, bilingual, and multilingual environments. Building a truly developmental program of

research on this topic will enrich our theories of acquisition even as it advances our educational and social goals.

References

Bloom, P. (2000). How children learn the meanings of words. Cambridge, MA: MIT Press.

Booth, A. E., & Waxman, S. R. (2002). Object names and object functions serve as cues to categories for infants. Developmental Psycholgy, 38(6), 948-957.

Booth, A. E., & Waxman, S. R. (2003). Mapping words to the world in infancy: On the evolution of expectations for count nouns and adjectives. Journal of Cognition & Development, 4(3), 357-381.

Bowerman, M. (1996). The origins of children's spatial semantic categories: Cognitive versus linguistic determinants. In J. J. Gumperz & S. C. Levinson (Eds.), Rethinking linguistic relativity. Studies in the social and cultural foundations of language, No. 17 (pp. 145-176). Cambridge, England: Cambridge University Press.

Brown, R. (1958). Words and things. Glencoe, IL: Free Press.

Choi, S., & Bowerman, M. (1991). Learning to express motion events in English and Korean: The influence of language-specific lexicalization patterns. Cognition, 41(1-3), 83-121.

Choi, S., McDonough, L., Bowerman, M., & Mandler, J. (1999). Comprehension of spatial terms in English and Korean. Cognitive Development, 14, 241-268.

Chomsky, N. (1980). Rules and representations. London: Basil Blackwell.

Dixon, R. M. W. (1982). Where have all the adjectives gone? Berlin: Mouton Publishers.

Fenson, L., Dale, P. S., Reznick, J. S., Bates, E., Thal, D. J., & Pethick, S. J. (1994). Variability in early communicative development. Monographs of the Society for Research in Child Development, 59(5), v-173.

Fulkerson, A. L., & Haaf, R. A. (2003). The influence of labels, non-labeling sounds, and source of auditory input on 9- and 15-month olds' object categorization. Infancy(4), 349-369.

Gathercole, V. C. M., & Min, H. (1997). Word meaning biases or language-specific effects? Evidence from English, Spanish, and Korean. First Language, 17(49), 31-56.

Gelman, S. A., & Kalish, C. W. (1993). Categories and causality. In M. L. H. R. Pasnak (Ed.), Emerging themes in cognitive development (Vol. 2, pp. 3-32). New York: Springer-Verlag.

Gentner, D. (1982). Why nouns are learned before verbs: Linguistic relativity versus natural partitioning. In S. Kuczaj (Ed.), Language Development: Language, Thought, and Culture, Vol. 2 (pp. 301-334). Hillsdale, NJ: Erlbaum.

Gleitman, L. (1990). The structural sources of verb meanings. Language Acquisition: A Journal of Developmental Linguistics, 1(1), 3-55.

Gleitman, L. R., Cassidy, K., Nappa, R., Papafragou, A., & Trueswell, J. C. (In press). Hard Words. Language Learning and Development, 1.

Goodman, N. (1955). Fact, fiction, & forecast. Cambridge, MA: Harvard University Press.

Gopnik, A., Sobel, D. M., Schulz, L. E., & Glymour, C. (2001). Causal learning mechanisms in very young children: Two-, three-, and four-year-olds infer causal relations from patterns of variation and covariation. Developmental Psychology, 37(5), 620-629.

Hall, D. G., & Lavin, T. A. (2004). Preschoolers' use and misuse of part-of-speech information in word learning: Implications for lexical development. In D. G. Hall & S. R. Waxman (Eds.), Weaving a Lexicon . Cambridge: MIT Press.

Hall, D. G., Waxman, S. R., Bredart, S., & Nicolay, A.-C. (2003). Young children's understanding of proper names and descriptions. Cognition.

Imai, M., & Haryu, E. (2004). The nature of word-learning biases and their roles for lexical development: From a cross-linguistic perspective. In D. G. Hall & S. R. Waxman (Eds.), Weaving a lexicon . Cambridge: MIT Press.

Jusczyk, P. (1997). The Discovery of Spoken Language. Cambridge: MIT Press.

Klibanoff, R. S., & Waxman, S. R. (2000). Basic level object categories support the acquisition of novel adjectives: Evidence from preschool-aged children. Child Development, 71(3), 649-659.

MacWhinney, B., & Snow, C. (1990). The Child Language Data Exchange System: An update. Journal of Child Language, 17, 457-472.

Maratsos, M. (2001). How fast does a child learn a word? Behavioral and Brain Sciences(24), 1111-2.

Maratsos, M. P. (1991). How the acquisition of nouns may be different from that of verbs. In N. A. Krasnegor, D. M. Rumbaugh, & e. al. (Eds.), Biological and behavioral determinants of language development (pp. 67-88). Hillsdale, NJ: Lawrence Erlbaum Associates.

Markman, E. M., & Jaswal, V. K. (2004). Acquiring and using a grammatical form class: Lessons from the proper-count distinction. In D. G. Hall & S. R. Waxman (Eds.), Weaving a Lexicon . Cambridge: MIT Press.

Mintz, T. H., & Gleitman, L. R. (2002). Adjectives really do modify nouns: The incremental and restricted nature of early adjective acquisition. Cognition, 84(3), 267-293.

Nazzi, T., & Gopnik, A. (2001). Linguistic and cognitive abilities in infancy: When does language become a tool for categorization? Cognition, 80(3), B11-B20.

Quine, W. V. O. (1960). Word and object: An inquiry into the linguistic mechanisms of objective reference. New York: John Wiley.

Talmy, L. (1985). Lexicalization patterns: Semantic structure in lexical forms. In T. Shopen (Ed.), Language typology and syntactic description (Vol. 3, pp. 249-291). San Diego: Academic Press.

Waxman, S. R. (1999). Specifying the scope of 13-month-olds' expectations for novel words. Cognition, 70(3), B35-B50.

Waxman, S. R. (2004). Everything had a name, and each name gave birth to a new thought: Links between early word-learning and conceptual organization. In D. G. Hall & S. R. Waxman (Eds.), Weaving a lexicon . Cambridge: MIT Press.

Waxman, S. R., & Booth, A. E. (2001). Seeing pink elephants: Fourteen-month-olds' interpretations of novel nouns and adjectives. Cognitive Psychology, 43, 217-242.

Waxman, S. R., & Booth, A. E. (2003). The origins and evolution of links between word learning and conceptual organization: New evidence from 11-month-olds. Developmental Science, 6(2), 130-137.

Waxman, S. R., & Guasti, M. T. (in preparation). Cross-linguistic differences in children's extensions of novel count nouns and adjectives: Evidence from Italian. .

Waxman, S. R., & Lidz, J. (in press). Early word learning. In D. Kuhn & R. Siegler (Eds.), Handbook of Child Psychology (6th ed., Vol. 2,).

Waxman, S. R., & Markow, D. B. (1995). Words as invitations to form categories: Evidence from 12- to 13-month-old infants. Cognitive Psychology, 29(3), 257-302.

Waxman, S. R., & Markow, D. B. (1998). Object properties and object kind: Twenty-one-month-old infants' extension of novel adjectives. Child Development, 69(5), 1313-1329.

Waxman, S. R., Senghas, A., & Benveniste, S. (1997). A cross-linguistic examination of the noun-category bias: Its existence and specificity in French- and Spanish-speaking preschool-aged children. Cognitive Psychology, 32(3), 183-218.

Wierzbicka, A. (1986). Does language reflect culture? Evidence from Australian English. Language in Society, 15(3), 349-373.

---

[i] For a discussion of the psychological distinction between category- vs property-based commonalities, see (Waxman, 1999; Waxman & Booth, 2001) and (Gelman & Kalish, 1993), this volume.