V. Van Geenhoven (ed.), ????????,

types of information derived from your encounter with the utterance, e.g. location, gender, emotional state of the speaker, etc. Some take this intuition about the unity of our experience at face value — this I take it is the

way of making reference to a certain body part than *hind end*, and that *derrière* (in English) is almost affectedly silly, in most contexts, despite common reference. Such social/emotional meaning is omnipresent in language, is an essential part of its overall meaning, and seems most highlighted in poetry, song lyrics, and corporate presentations; but it is a type of meaning clearly present in nonlinguistic artistic objects and events as well. A further component of meaning arises from background cultural knowledge. For instance, the significance of the color red varies from culture to culture. And, in language, it is not a good idea (in English) to wish someone a refreshing night's sleep by saying *Rest in peace*, as this is a formulaic phrase that is associated with gravestones.

The purpose here is not to enumerate or catalogue the variety of meanings that the use of natural language gives rise to. Rather, it is to make the point that when we begin to talk about the semantics of a quantifier or the scope of tense marking, and how they might be acquired, we are already a long distance out of the starting gate in considering the general issue of meaning and language. Meaning comes at us — and people learning a language — from a variety of different directions, at a large numbers of levels, and only one among them is the subject of the kinds of semantic theories that are intimately connected with the syntax of language. Learners must somehow identify this level.

2. LEXICAL SEMANTICS

How this is accomplished remains something of a puzzle. But let us assume it gets done. Even then, when we restrict consideration to just this semantic, truth-conditional aspect of meaning, the difficulty of the problem of learning hardly abates. Obviously, perhaps most obviously, one must learn the meanings of the words of the language (or, a significant subset of them, at any rate), and there are many terrifically interesting learning issues that have been explored within this domain, at least in the area of learning meanings of the content words, noun, verbs, adjectives, in the main (e.g., Gleitman, 1990; Bowerman 1980; Clark, 1993; Bates *et al*, 1979). One absolutely immediate problem that comes up here is that of ambiguity. I would like to point out that the problem, even at the lexical level, is of mind-boggling proportions. In the early 1960's the linguist Charles Fries did a count of how many meanings were listed in the Oxford English Dictionary for the 500 most common words of English; there were in excess of 14,000, or about 28 different meanings per word, on average. Granted, many would be regarded as different 'senses' rather than different meanings proper, and a good many of them are low-frequency or even archaic usages that are learned later in life, if at all. further, in context none are remotely as ambiguous as in citation form (though again,

the question is how learners could marshal the context to narrow down the possibilities in the first place). On the other hand, many ambiguities are not included in this count. Type/token ambiguities are systematically associated with nouns (e.g., the ambiguity of *All the machines at the arcade are for sale*, whether it is those actual machines or other individual machines of the same design). Metonymic reference is not reflected there, as in the practice commonly cited of waitpersons referring to customers by their orders,

phenomenon of having to 'rearrange' functional elements semantically extends well beyond Wackernagel position particles such as these. Consider how common it is to treat tense, for instance, both syntactically and semantically as a higher-level operator, and for good reason. A very common type of example from English Verb Phrase Ellipsis will illustrate this point-- the deleted VP in (3) does not carry the tense information of the (underlined) antecedent VP, even though tense is expressed as an inflection on the verb in that antecedent:

(3)   John *wrote a paper* because he had to (*wrote a paper).

Or, it appears plurality must be dissociated from the noun it appears attached to, by similar evidence:

(4)   John has two *dogs* and Fred has one (*dogs).

This listing of functional elements that appear 'out of place', from the point of view of where in the structure the meaning is contributed, is easily extendible to the point where one can easily conclude that it is a common and possibly essential feature of language that learners must somehow master. Is this something we are born knowing already? That would help, it seems, but how can one tell?

The appearance of items that do not seem to be 'in the right place' is but one of the issues learners must face in dealing with the meanings of functional items. Coalescence phenomena between adjacent functional elements are extraordinarily common — it is the classic definition of an inflectional language as opposed to an agglutinative one. Coalescence may also occur with otherwise free morphemes, as with the preposition/article coalescence found in Germanic and Romance; thus, French *du* is in some sense the equivalent of *de+le*. From the commonsense point of view taken here, a learner is required to assign a composite meaning to such elements as *du*, but not to other elements such as *le*, or any lexical items. A very similar process that well could cause increasing difficulties is when a sequence of two formally identical functional elements is reduced to one (a variant of haplology). This does not, to my knowledge, occur with lexical items (thus, *a bare bear* does not reduce to *a bear,* meaning, 'a BARE bear'). Consider the case of Japanese *-no*

(5) a. *Kore   wa   anata   no no   desu   ka
         This   TOP   you   POSS   one   be
         'Is this yours?' (lit. 'Your one')

     b. *Kore wa anata no desu ka*

Again, this is hardly a funny little isolated fact. One can multiply examples by the dozens in familiar and unfamiliar languages alike, and, as usual, when one looks for something like this, it seems to be everywhere. The Swahili negative past *ku* occurring right next to the infinitival marker *ku* reduces to a single *ku-* prefix, yet both meanings remain. In certain Turkish word forms (in the instance of NP's like *their books* where both the possessors and things possessed are plural) two plurals 'ought' to appear in a row, but only one appears; there are, however, two plurals, semantically. The special problem that examples like these raise is that, from a surfacy point of view, you have one element with two meanings, or the same meaning assigned two different scopes, as in the Turkish example. But I thought it was almost an axiomatic fact of perception that a single form could *not* be assigned two different meanings. Not only does this apply to lexical items. *He sat by the bank* cannot mean he sat by the river *and* a financial institution but this applies to perception more generally — this is Necker cube stuff. This would seem a prime case of putting the learner squarely behind the eight ball; yet, there it is.

   We not only have the case of one form with two meanings to be concerned about, but also its converse. Two (or more) forms that add up to a single meaning. One reflection of this is discontinuous morphology. For instance, Nida (1978) cites the Kekchi examples in (6):

(6) a. *oçcoçc*   b. *roçcoçce'p*
         'house'   'their house'

French *ne ... pas* would be a possible candidate for a more familiar example. But far more commonly this is found in agreement or concord forms: an agreeing plural article, two plural adjectives, and a plural noun add up one simply one plurality, not four. A definite article combined with the definite form of a noun still add up to one definite. Multiple negations, as given in the Old English example in (7) add up to a one single negative:

(7) Ac   he   ne   sealde   nanum   nytene   ne
     and   he   NEG   gave   NEG   beasts   NEG
     nanum   fisce   nane   sawle.
     NEG   fish   NEG   souls

'And he did not give beasts or fish souls.'

Such examples are so familiar we might easily overlook the language learning problem: if we build a signal-detector that generates an associated meaning upon encounter with a certain form, we are going to get extra meanings generated which are not parts of the actual interpretation. Note that the strategy of treating certain forms as meaningless, and localizing the meaning to just one of the forms, may work in some instances but not generally. Let us bWm6yd localizir1

which makes the point-time adverbial sound strange (as generalizations are often odd if given point-time readings); but not so in (9b). English pluralia tanta (*scissors*, *pants*), or dependent plurals (as in *Unicycles have wheels*) would be possible examples of a plural making no semantic contribution. I will not go on, but language seems to have many instances of interpretable elements that, in given constructions, bear no such or seemingly any meaning.

Or, what they can do is bear *other* meanings instead. An illustrative case is the Spanish spurious *se*, first discussed to my knowledge in the generative literature by Perlmutter (1971). In sequences of Spanish clitics, if the third person indirect object clitic appears before a third person direct object clitic, it is realized as *se*, which is normally taken to be a reflexive form (though it has other functions as well). However, the meaning is not (necessarily) reflexive:

(10) Se lo mandas.   *Le/*Les lo mandas.
      'You send it to {him/her}/them.'

Again, this might at first appear a funny little fact, but forms that are, from a transformational point of view, mapped to other forms in syntactic context are extraordinarily common. Consider sequence of tense phenomena, where a past tense appears in a subordinate clause, but it has a reading cotemporaneous with the interpretation of the higher tense as if, semantically, it were a present tense. In preposition/pronoun inversion in Germanic (now lost in English except in frozen forms like *thereupon* or *therefore*), a (neuter) personal pronoun seems expressed instead as a locative, as in German *damit, darauf*. In Modern Greek, we find in certain contexts imperfectives that appear to contribute perfective meaning, as in wishes and contrafactuals. Again, we are not looking at some spotty little curiosities, but rather some features which detailed analysis and study show recur time and again.

4. LEARNING

Even if one has a meaning, or a sets of meanings, paired with phonological forms, there remain serious issues about learning to put them together to form appropriate coherent meanings for the whole. The question I would like to pose is what minimal assumptions about the learning process can we make and account for the daily fact that language is, indeed, learned? Perhaps the most minimal assumption one could make is that this organization is also reflected in the learning of other domains (this is the 'there is nothing special about language' view). For example, perhaps there are organizational principles in learning to structure visual scenes, which encode this same
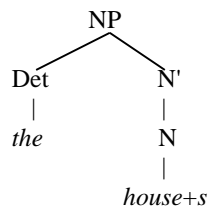
arrangement of matters. My own impression of the state of such research, however, is that principles of learning based on work in other domains has proven of limited value to the learning of a full language. While there may be some spotty successes in, for instance, learning the location of word or morpheme boundaries, or learning certain word meanings demonstratively, it has yet to be shown that such mechanisms yield anything like a system capable of learning language, much less extracting appropriate full sentence meanings for anything beyond *Man bites dog* types of structures (and even those ignore the tense).

Lack of success is hardly an argument that something cannot be done eventually, and this must remain a possibility. As long as one views the learning task of language as a matter of learning the syntax of the language, that is, as an arrangement of forms, it is a seductively easy step to take to believe that learning language form arrangements is just like all the other form arrangements we learn as well that are not constituted of language. But when one focuses on meaning, particularly entire sentence meanings, the ground shifts, and I believe this step becomes much more difficult to take. This is because it is in a language, and only in a language, that one finds the essential ingredients of a semantics — truth, reference, and predication — and that these are inextricably bound up with the syntax of a sentence. No other naturally occurring object, including (in all likelihood) animal communication systems, has these properties and characteristics. It is in studying semantics, then, particularly non-lexical semantics, that the unique properties of language become most starkly evident, and thus it becomes increasingly reasonable to believe that special domain-specific language learning measures are called for.
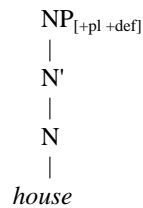
Let us return then to the empirical issues raised above, and ask again what sorts of minimal assumptions might be necessary for the learning of a

much more resistant to borrowing (for example, current English lexical vocabulary is about 60% of non-native origin, but among the function items nearly 100% is of native Germanic origin). Whether a simple two-way distinction is an appropriate characterization remains unclear (e.g., prepositions, a closed class, nevertheless appear to have some lexical characteristics as well). This said, I am going to outline things in these binary terms.

Among the closed-class items are not only words, or free forms, but also inflectional morphology and clitics. As the discussion in the previous section indicates, these function items have syntactic/semantic properties not shared by open-class lexical items. Chief among these is that their interpretation may take place at a "higher" level of syntax than the interpretation of their host word (in the case of inflectional morphology and clitics). It is not fully certain, but appears a fact that their interpretation may not appear 'lower' in the syntax than surface constituency would indicate. In Carlson (1983), a point of view is developed which is designed to express this distinction between lexical items and function items in which the function items form a part of the *structure* in which the lexical items appear. One formalization of this idea is to treat the function items as expressions of features that appear on the syntactic categories. A rough representation of what a plural definite noun phrase might look like is not the usual:

$$
\begin{array}{c}
\text{NP} \\
\diagup\diagdown \\
\text{Det}\text{N}' \\
|| \\
\textit{the}\text{N} \\
| \\
\textit{house+s}
\end{array}
$$

but rather:

$$
\begin{array}{c}
\text{NP}_{[+pl\ +def]} \\
| \\
\text{N}' \\
| \\
\text{N} \\
| \\
\textit{house}
\end{array}
$$

It is the features that are then interpreted by the semantics, and not the phonological forms of the expressions of those features. Thus, *the* and *-s* as

These comments are of course highly speculative, and their value is found only in the extent to which they might provide a productive means of accounting for how a person might end up learning the semantics of a language, despite its challenging, even daunting, complexity.

5. AN EXERCISE IN DEFINITE ARTICLES

The point of this final section is to illustrate, using a certain domain of data, the types of problems of matching forms and interpretations that learners might encounter. The data we are going to examine first has to do with nouns that appear without any articles before them. As there is a vast literature in semantics on the topics of mass terms and bare plurals, I am going to focus on a somewhat lesser-studied topic: singular count noun forms without articles. While these are the norm in many languages that lack plural marking and articles, such as Chinese and Japanese, in Indo-European languages, for instance, they appear less often and in fewer contexts (see Kallulli, 1999; Borthen, 1998; Schmidt & Munn, 1999; Dayal, 1999). English presents in own special issues with the bare singular construction. An excellent overview of the English data and many theoretical matters is found in Stvan (1998).

The basic facts seem to be these. Bare singulars are both lexically and positionally restricted. So we have contrasts such as those in (11):

(11) a.   They put him in *jail/prison/*penitentiary*.
     b.   I took my son to *school/college/*university* (Am. English)
     c.   The men were found on *shore/*beach*.

These lexical restrictions are subject to considerable dialect (such as American vs. British English) and social variation (e.g., if one is a member of the art world, one is more likely to say or hear *She is in studio*, which to my inartistic ears sounds strange).

Syntactically, they often follow certain verbs and prepositions (as in (11) above), but may appear occasionally as subjects of certain verbs:

(12) a.   *Prison* has little to offer in the way of recreation.
     b.   *College* is a good place to learn.
     c.   *School* makes Jimmy very happy.

They may not be modified (unlike bare plurals); this follows from Stvan's arguments that these are, in fact, full one-word phrases and not simply nouns:

(13) a.   They sent him to *(big) jail.
     b.   I watched it on television *(that had a 31" screen)

Bare singulars can also appear, to a certain stylistic effect, in conjunction constructions and a couple others. In these particular instances the lexical restrictions are eliminated or reduced:

(14) a.   University and high school alike require much study.
      b.   Neither television nor radio has become serious educational tools.

Impressionistically, these structures appear to share many of the positional constraints of bare plurals in Spanish and Italian that have been analyzed as properly governing and empty D position (Contreras, 1986), and they seem to share the lexical constraints of incorporated and incorporation-like structures found in other languages.

The main semantic observation is that bare singulars appear to be non-referential, in the following way. Consider a situation in which Bob is watching television. There's a definite TV he is then watching, and one can refer back to that TV, e.g., by continuing

Now let us move to the title of this section, cases involving overtly definite noun phrases. If we use VP ellipsis in such cases, identity of reference is preserved. This is intuitively obvious because definite articles are used to pick out something salient or familiar or unique in the context; the English word *the* signals this:

(16) a.

article is expletive, that is, we *really* have an instance of a bare singular in each case, the semantics of which is similar to that of bare plurals.

It is misleading to think of such constructions as 'idioms', being surprisingly highly productive and lacking the figurative or clearly non-compositional meanings often associated with clear instances of idioms. One way of thinking about what is going on here is to think of the construction as a complex predicate of the type examined in Snyder (2001) regarding first language acquisition (Snyder also includes a cross-linguistic comparison of a variety of languages). Snyder considers the acquisition of a series of English constructions that have been suggested by syntacticians to be complex predicates, that is single predicates made up of two or more syntactic parts. For instance, one among them is the resultative construction, as in *He hammered the metal flat*, where *hammer flat* appears to function as a single predicate. Verb-particle constructions are another example. Based on theoretical concerns as well results of the cross-linguistic study, Snyder notes that there is a close connection between the availability of productive root compounding in nominals, and the appearance of what are analyzed as complex predicates in a language. Snyder's study with children indicates that there is a highly positive correlation in children learning English between the time of appearance of both productive root compounding, and of the verb-particle construction (as a representative of complex predicates). If the non-referential definites discussed above form a complex predicate with the verb, then there should also be a positive correlation between acquisition of compounds, complex predicates, and this particular reading of definites. Whether this (speculative) prediction is correct is presently unknown, but it would provide one starting place for further investigation.

To return to the overall point, how could one see through the complexity of language to learn such facts, though? There would appear to be considerable usefulness in such notions as meaningful things that occasionally mean nothing, and things like null determiners, as such seem a persistent part of the design of language. But how could this ever actually help a learner acquire an appropriate syntax and interpretations? From a surfacy point of view, things like this appear to be roadblocks to learning, as if messages which easily could have been encoded in a straightforward signal-to-meaning relationship have been cleverly garbled and disguised. But I am suggesting a perspective that is perhaps the opposite of this — that such 'mismatches' in fact contain cues and clues to meaning that enable learning the whole system, particularly the non-lexical semantics, and are not there to hinder it, as a surface signal-to-meaning notion would suggest.

6. CONCLUSION

Natural languages, from a commonsensical point of view, seem treacherously designed. We have some things that mean nothing, and nothings that mean something. We have two things meaning one thing, and one thing meaning two things. We have things in disguise, meaning in highly constrained contexts what something else means that it normally contrasts with. We have things, even if the meaning is a single, normal seeming meaning, that are put in the 'wrong' place and have to be figured instead for another.

Things like this are learned by scores of millions annually, and one task of language learning research is to produce sensible and effective ideas about how this could be. It would appear that such work would be most effective if embedded within a larger and comprehensive framework articulating the form-to-meaning mapping of the general sort worked on by semanticists and syntacticians, if only to provide some appreciation of the sheer difficulty of the task ahead.

University of Rochester

7. ACKNOWLEDGEMENTS

8. REFERENCES

Anderson, Stephen. "Wackernagel's Revenge: Clitics, Morphology, and the Syntax of Second Position." *Language* 96 (1993): 68–98.

Bates, Elizabeth, L???? Begnini, I???? Bretherton, L???? Camaioni and V????? Volterra. *The Emergence of Symbols: Cognition and Communication in Infancy*. New York: Academic Press, 1979.

Birner, Betty, and Gregory Ward. "Uniqueness, Familiarity, and the Definite Article in English." In *Proceedings of the 20th Annual meeting of the Berkeley Linguistic Society,* 93–102. Berkeley, CA: BLS, 1994.

Bloom, Lois. *One word at a Time.* The Hague: Mouton, 1973.

Borthen, Katja. *Bare Singulars in Norwegian*. Cand. phil. thesis, Norwegian University of Science and Technology, 1998.

Bowerman, Melissa. *The Structure and Origin of Semantic Categories in the Language-learning Child.* In M. Foster and S. Brandes (eds) Symbols as sense. New York: Academic Press. 1980.

Carlson, Gregory. "Marking Constituents." In Frank Heny and Barry Richards (eds.) *Linguistic Categories: Auxiliaries and Related Puzzles, Volume 1: Categories,* 69–98. Dordrecht Reidel, 1983.

Chierchia, Gennaro, and Sally McConnell-Ginet. *Meaning and Grammar* (2nd Edition). Cambridge, MA: MIT Press, 2000.

Clark, Eve. *The Lexicon in Acquisition.* Cambridge: Cambridge University Press, 1993.

Contreras, Heles. "Spanish Bare NP's and the ECP." In Ivonne Bordelois, Heles Contreras, and Karen Zagona (eds.) *Generative Studies in Spanish Syntax,* 25–49. Dordrecht: Foris, 1986.

Dayal, Veneeta. "Bare NP's, Reference to Kinds, and Incorporation." In Tanya Matthews and Devon Strolovich (eds.) *Proceedings of SALT 9.* Ithaca, NY: Cornell University, 1999.

Gleitman, Lila. "The Structural Sources of Verb Meanings." *Language Acquisition* 1 (1990): 3–55.

Grice, Paul. "Meaning and Conversation." In Peter Cole and J????? Morgan (eds.) *Syntax and Semantics 3*: *Speech Acts*, 41–58. New York: Academic Press, 1975.

Hale, W. and C. Buck. *A Latin Grammar.* Alabama: University of Alabama Press, 1966.

Iatridou, Sabine. "The Grammatical Ingredients of Counterfactuality." *Linguistic Inquiry* 31 (2000): 231–270.

Kallulli, Dalina. *The Comparative Syntax of Albanian: On the Contribution of Syntactic Types to Propositional Interpretation.* Ph.D. Diss., University of Durham, 1999.

Kuno, Susumo. *The Structure of the Japanese Language.* Cambridge, MA: MIT Press, 1973.

Lebeaux, David. *Language Acquisition and the Form of Grammar.* Ph.D. Diss., University of Massachusetts, Amherst, 1988.

Longobardi, Giuseppe. "Reference and Proper Names: A Theory of N-Movement in Syntax and Logical Form." *Linguistic Inquiry* 25 (1994): 609–669.

Nida, Eugene. *Morphology: The Descriptive Analysis of Words.* Ann Arbor: University of Michigan Press, 1978.

Perlmutter, David. *Deep and Surface Structure Constraints in Syntax.* New York: Holt, Rinehart, Winston, 1971.

Radford, Andrew. "Counter-Filtering Rules." In J????? Green and S????? Harlow (eds.) *York Papers in Linguistics* (7), 7–45. ?????: ?????, 1977.

Schmitt, Christina, and Alan Munn. "Against the Nominal Mapping Parameter: Bare Nouns in Brazilian Portuguese." In *Proceedings of NELS 29*, ???–???. ???: ????, 1999.

Snyder, William. "On the Nature of Syntactic Variation: Evidence from Complex Predicates and Complex Word Formation." *Language* 77 (2001): 324–342.

Stvan, Laurel. *The Semantics and Pragmatics of Bare Singular Noun Phrases.* Ph.D. Diss., Northwestern University, 1998.

Siskind, Jeffrey Mark. "Learning Word-to-Meaning Mappings." In P????? Broeder and J????? Murre, (eds.) *Models of Language Acquisition: Inductive and Deductive Approaches,* 121–153. Oxford: Oxford University Press, 2000.

Vergnaud, Jean-Roget, and Maria Luisa Zubizarreta. "The Definite Determiner and the Inalienable Constructions in French and English." *Linguistic Inquiry* 23 (1992): 595–652.