A Constraint-based Lexicalist Approach to Sentence Processing: Implications for Language Learning

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A Constraint-based Lexicalist Approach to Sentence Processing: Implications for Language Learning

by Kenneth Romeo

ABSTRACT

The online process of being able to understand the language we hear (and read) is known as “sentence processing”. For many years the predominant theories surrounding this phenomenon considered it a stepwise process: separating words from sounds, then finding some grammatical structure for those words to fit into, all the while deducing some sort of meaning from the input. However, recent theories about sentence processing place central importance on the lexical items (words or groups of words). Together with other aspects such as context and non-linguistic information, the properties of these lexical items (known as “constraints”) determine how we figure out what a sentence means. In addition, this act of processing sentences gives us certain statistical information about how lexical items are used: in active or passive voice, with certain kinds of objects, and in certain tenses and forms. This is stored in memory for future processing tasks and thus becomes acquired language. In the same way that this process is natural for infants learning a first language, it would seem reasonable to assume that second language instruction would be most efficient if it were based on similar principles.

Recent models of sentence processing, known as the constraint-based lexicalist approach, are built on the ideas described above. This approach draws upon the findings of connectionist models of learning and, in this sense, runs counter to the traditional view that language consists of innate rules or “Universal Grammar” that is simply activated by some amount of exposure. This paper explores some educational implications of a shift of focus from the traditional view that language is made up of rules to the idea that principles of perception, memory and learning are central. It is hypothesized that an effective curriculum would be “lexically” based, rather than consisting of progressively more “difficult” grammar points: it would be built around the frequency and usage of various words and phrases in the target language. It would also follow that explicit learning would be facilitated by helping learners to attend to the statistical properties of the target language, especially where they differ from their native language. It calls for an increased emphasis on listening curriculum in order gain familiarity with new patterns of usage. The strengths and weaknesses of using this approach to guide curriculum design and teacher education are discussed. In addition the paper explores the implications of individual differences.

This paper also compares and contrasts this approach with the theories of Stephen Krashen, in an attempt to offer a framework for reconsidering his ideas, which have been so influential in language pedagogy over the last 20 years. For example, the relative frequency of the various forms and argument structures of lexical items could give rise to a “natural order” of acquisition somewhat different than the Krashen model, based on grammatical morphemes. The concept of the statistical nature of language can begin to give insights into the question of roles of exposure, input, comprehension and implicit learning. In addition to classroom implications, this approach offers a useful paradigm for future second language acquisition research. The paper concludes that in the same way that these advances were made through interdisciplinary efforts between researchers studying sentence processing in the fields of psychology and linguistics, the impetus to give second language acquisition research a firm grounding in classroom realities falls squarely on the shoulders of those of us concerned about education.
INTRODUCTION AND BACKGROUND

One aspect of psycholinguistics that has received very little attention with regard to language education is sentence processing. This is the dynamic process of being able to understand the language that we hear (and read) by associating single words and groups of words with various levels of meaning. Traditionally, processing has been somewhat ignored by the Chomskyan model, because it was considered part of “performance” and therefore somehow less “pure”. The assumed separation of morphology from syntax implied that words could be studied in terms of lexical access while sentences could be described simply in terms of syntactic rules. The existence of apparent ambiguities created by the temporal aspect of comprehension – the end of a sentence is not revealed until after the beginning is finished – led to theories such as the Garden Path model (see Tanenhaus & Trueswell 1995 for a concise description) which gets its name from a perceived need for ambiguity resolution. A sentence may have two or more interpretations when analyzed in isolation: it is hypothesized that as the sentence progresses, the listener (or the reader) is unsuspectingly led toward assuming one interpretation, only to be forced to abruptly change to another understanding or be stuck in limbo with an ambiguous sentence, when the end is finally revealed. And indeed, with a little imagination, the examples presented in the context of such research could be thought of as potentially confusing in some given set of circumstances.

The horse raced past the barn . . . .
After reading the first six words, one might have a very clear image in one’s mind, having been led down the garden path. But upon encountering the last word, 

*The horse raced past the barn fell.*

a very different interpretation must be made. The word “raced” was not describing what the horse did in the past tense, it was in the past participle and simply tells which horse fell. Inserting “which was” between horse and raced makes this sentence clearer. Certain rules involving syntactic structure were postulated to show how the mind resolves ambiguities and comes to some sort of understanding about what the sentence means. However, as Seidenberg and MacDonald (1999) point out, in practice, comprehenders rarely actually misinterpret the speaker’s intention in sentences such as this, mainly because there are some interpretations that are significantly less common than others, and generally just one that actually fits the context in which it is used. They argue that context and aspects of language such as the frequency distribution of lexical items provide constraints to interpretation such that the listener generally understands what the speaker means.

This discrepancy between the theory and actual practice could be seen to point to certain deficiencies in traditional ideas about language, or what is known as the Standard Theory – transformational generative grammar. The key difficulty seems to be with the distinction between competence and performance. Allen and Seidenberg (1998) note that the exact nature of this relationship has been uncertain since Chomsky first proposed the theory. Although it has been a useful way to describe linguistic phenomena, the rules of
the grammar have never been able to fully encompass what people can actually say and understand. Nonetheless, Allen and Seidenberg point out that “many researchers have pursued a more literal-minded interpretation of grammar as the basis for accounts of how language is acquired” (p.116). Given this dichotomy in language, it was thought that acquisition is based on the ability to determine grammaticality, rather than simply on the performance aspects like communication. Further, according to traditional approaches, there is no choice but to assume that the ability to determine whether something is grammatical or not must be innate. Seidenberg and MacDonald assert that this characterization of acquisition is inadequate and ultimately “seems only remotely related to the child’s experience.” The only appropriate method is to directly consider performance because, “it is already clear that much more can be learned on the basis of the input available to the child, using simple and general learning mechanisms, than the generative approach assumes” (p.585).

To a large extent this new approach is based on the results of connectionist simulations. In their most basic form, these models are simply computer software that contains an array of inputs and outputs, with each input connected to each and every output. First the network is subjected to a training sequence in which the inputs are exposed to a set of input data and the outputs to its corresponding correct results. The physical connections between the two are weighted according to how much each one is used. Then new input is fed into the network and the output is checked to see how close it comes to human data. For example, in Rumelhart and McClelland’s pioneering work (McClelland, et al, 1986), the network was given a training sequence of 420 high and medium frequency verbs at the input and their correct past tenses at the output. In the actual testing runs, 86
low frequency verbs were fed into the input to determine whether the network could produce past tenses, which it did 91% of the time. Later researchers such as Elman (1990, 1993) and MacWhinney and Leinbach (1991) made improvements to Rumelhart and McClelland’s basic concept. By definition these simulations do not have any sort of syntactic rules programmed into them, but they have repeatedly been able to perform a wide variety of learning tasks, including separating continuous speech into syllables and words (Christiansen, et al, 1998; Nakisa & Plunkett, 1998; Plaut & Kello, 1998; Vroomen, et al, 1998), and morphological changes such as past tense and plural formation (N.C. Ellis & Schmidt, 1999, Hare et al 1995). Although there is a considerable body of literature criticizing this research as misguided (e.g. Pinker & Prince, 1988), these simulations nonetheless show surprisingly good fits with human data from a wide variety of situations including reading time and aphasic grammaticality judgment (Christiansen & Chater, 2001).

Specifically, this paper examines a constraint-based lexicalist approach to sentence processing as presented in several papers, including MacDonald, et al (1994) and Trueswell and Tanenhaus (1994). The general approach and its implications for first language acquisition are laid out in Seidenberg and MacDonald. MacDonald, et al give a concise account of the key elements:

“More radically our approach suggests that whereas there may be distinctly linguistic forms of representation, the processing principles that account for language reflect the general properties of memory, perception, and learning, properties that are involved in nonlinguistic domains as disparate as concept learning, pattern recognition, and decision-making” (p.700)

The central hypothesis of this approach is that when processing a sentence on line,
as it is spoken or read, the ability to understand what it means is determined by several factors, including the context, non-linguistic cues, various linguistic aspects such as voice (active/passive) argument structure (direct object, prepositional phrases, etc.), and the frequency distribution of the lexical items used. Three particular aspects characterize it: the importance of frequency distribution, the centrality of the lexicon, and the link between processing and acquisition. The consideration of frequency distribution is a condition which allows for the possibility that grammaticality is emergent. As noted by MacDonald, et al, Chomsky entertained the possibility that statistical information could play a part in understanding aspects of language: “Given the grammar of a language, one can study the use of the language in various ways; and the development of probabilistic models for the use of language (as distinct from the syntactic structure of language) can be quite rewarding.” (Chomsky 1962, p. 17, footnote 4) However he quickly dismissed it: “I think that we are forced to conclude that probabilistic models give no particular insight into some of the basic problems of syntactic structure” (ibid, p.17).

It should also be noted that this approach does not assert that nothing is innate. The ability to perceive and learn abstract information about statistical distributions is a uniquely human ability that is present at least from birth. MacDonald, et al note that the idea that humans are sensitive to frequencies of occurrence is quite uncontroversial in considering other events – they claim that their innovation is simply to extend this to lexical information (p.697). Seidenberg and MacDonald qualify their arguments by stating that they are only questioning the idea of an innate Universal Grammar while at the same time appealing to the potential implied by children’s ability to learn.

The role of the lexicon has been expanded compared to previous approaches.
These models assume that, rather than requiring a separate function for processing syntactic aspects of language, the lexicon contains all syntactic information in the statistical relationships between words. Previous concepts of “lexical access” would no longer be valuable since, upon perception, each particular definition of a word is calculated according to the other words with which it co-occurs.

Finally, the nature of acquisition is inextricably tied to principles of processing. Perhaps the most obvious statement of this relationship is that information about the adult processing system is necessary to determine how the child eventually ends up in that state. Seidenberg and MacDonald argue that children already use the same processes as adults: it is simply called “bootstrapping in acquisition is constraint satisfaction in adult processing.” (p.583). They see this as an emergent phenomenon: “Certain information will be acquired given the nature of the architecture, the learning rule, and the input data” (p.584). Quite simply “claims about what cannot be learned by the child need to be assessed in terms of the kinds of statistical information available to the child and learning mechanisms that are able to extract non-obvious regularities from it” (p.575). Their assertion seems obvious: before assuming some knowledge is innate it would be logical to assess how much can be learned. Specifically, constraint-based lexicalist approaches to sentence processing hold that grammaticality is emergent – connectionist models can deduce linguistic rules from exposure to raw language data. From this result Allen & Seidenberg theorize that grammaticality judgment “does not play a central role in the acquisition process itself. . . . there are no absolute criteria for making such decisions” (p.143). Again in what would seem obvious, the child’s primary task is “producing and comprehending utterances, whether they be grammatical or otherwise” (p.119).
Further,

“Linguistic representations emerge as a function of the interplay among several factors, including the physical components of the human brain that are active during language processing (and their characteristic manner of processing information), the tasks such components are engaged in, and characteristics of the language signals to which they are exposed, particularly their statistical aspects.” (p.119)

They argue that in general, comprehension simply is not dependent on having a full syntactic representation of the sentence (p.143). Although used in reference to first language acquisition, this concept is quite familiar to learners of a second language: being able to pick out a few words of a speaker’s statement often provides enough information to give a reasonable response.

This is not to suggest that there are not fundamental difficulties in the application of connectionist simulations to the problem of human language acquisition. Tanenhaus and Trueswell (1995) note that in past research, networks were often “underspecified, leaving them open to criticism that they do not make clear predictions beyond the general claim that context matters” (p. 233). Christiansen & Chater (1999) point out that

“... connectionist nets are not realistic models of the brain either at the level of individual processing unit, which drastically oversimplifies and knowingly falsifies many features of real neurons, or in terms of network structure, which typically bears no relation to brain architecture” (p.419).

In addition, even in the most cursory examination of connectionist research, including sentence processing studies, it quickly becomes apparent that there is no consideration of the constraints on the requirements for humans to actually attend to the data in the environment.
However, one thing that should be apparent is at the very least, modeling the learning process and comparing the results to human data hold the potential for providing valuable information about how we learn and use language.

“If realistic connectionist models of language processing can be provided, then the possibility of a radical rethinking not just of the nature of language processing, but of the structure of language itself, may be required. (Christiansen & Chater, 1999, p.433)

The operative word in the above being, of course, “realistic.” While it is conceivable that researchers will be able to obtain better and better fits with human data, determining the “real” structure of the brain will presumably be somewhat more difficult.

Although most of the issues introduced by these approaches and models explicitly apply to first language acquisition of infants, in this paper I will explore what I believe are some implications for second language learning by children and adults. These come from examining some of the direct implications of the basic proposed mechanism of sentence processing as well as from considering some of the obvious differences between first language acquisition and second language acquisition. There are of course, several steps that are necessary before most of the implications mentioned can be realized, the most important of which is a thorough corpus analysis of the target language and the native language of a given learning condition. It is, of course, quite impractical to hope to analyze the entire corpus of all varieties of English in all possible situations, but it is conceivable that a limited analysis of specific situations using constraints such as those listed in MacDonald, et al might yield information that could be useful in instruction. While students of such instruction would not be prepared for every possibility, they might
benefit from specific training in situations in which they were likely to find themselves. Efforts to characterize “academic English” in order to better instruct students are very much in the same spirit as this approach.

In the end, my own particular approach is not supported by any of the research presented, but I believe it is justified in that the model of sentence processing that Seidenberg and MacDonald hypothesize is adult language processing, rather than any process that is unique to infants. Indeed, this is one of the key tenants of their approach, as explained above. Many of the principles that they present seem to resonate with my own experience teaching and learning languages, especially in ways that I feel are lacking in the textbooks and curriculum based on other theoretical frameworks, such as the Standard Theory. This feeling is the basis for my re-analysis of the theories of Stephen Krashen: despite the lack of a solid theoretical framework (as discussed below) his ideas seem to touch upon important phenomena in the language classroom. Therefore I have included a section that looks very carefully at Krashen’s hypotheses and explores some of the ways that recent research on sentence processing models might give a better framework for the issues that he presents. Finally, I will attempt to analyze a specific classroom method – cloze listening – in order to illustrate how this approach could be useful to a teacher using an existing curriculum. In my conclusion I present some specific implications for schools of education and second language acquisition research.
EDUCATIONAL IMPLICATIONS

Curriculum Implications

Perhaps the most obvious educational implication of this sentence processing approach has to do with curriculum design for the language classroom. The centrality of the lexicon would point to the need to place more emphasis on lexical items, rather than syntactic structures. Instead of the “vocabulary list” approach of the past, an curriculum based on collocation would seem to be more appropriate. Sentence processing models hold that the brain is sensitive to distributional information, especially on an implicit learning level, and therefore it would seem reasonable to place the most resources in creating an environment in which the relationships between lexical items could be inferred. The concept that grammaticality is emergent, given the lexicon, also lends support to this approach. However, it would not prohibit explicitly teaching grammatical rules: syntactic rules are very succinct expressions of the realities of language and clear explanations of them serve to make students aware of certain processes that might be different in their native language. Lewis (1993) proposes just such a program based on collocations, and includes a wide variety of useful exercises. Unfortunately he does not fully explore the issue of how learners would get these collocations into their heads in the first place. He simply suggests a thorough listening program that would precede any production work but does not give any specifics about what form this would take and how it would be implemented. The reality is that many learners have been studying long enough that they have some experience to draw upon, but the issue of a coherent framework for introducing listening, especially at the beginning level remains unresolved. Many teachers have “a feeling” for what students at different levels will find easy and
difficult, depending on past exposure (or lack thereof) to similar material. This “feeling” is developed over years in the classroom – in much the same way as a “feeling” for a foreign language is developed. The possibility that an approach based on statistical analysis of language will give both teachers and students a more efficient way of transforming this subjective “feeling” into objective instructional practice is worth exploring.

Following from the importance that this model places on the statistical properties of language, exposure would seem to be a central issue. Whether it be through reading or listening, material with a wide variety of words and phrases used in many contexts could provide the evidence needed to facilitate both an explicit and an implicit learning process. However, one area that remains unresolved is the level of attention required for effective storage into memory. It would seem reasonable to assume that there is a continuum from passive auditory exposure to explicit memorization but neither the literature on constraint-based lexicalist approaches to sentence processing, nor research on connectionist learning models make any clarification as to how this factor affects short or long term memory. However, in a report on research on syntactic priming, Bock and Griffin (2000) connect the simple occurrence of processing with implicit learning. They postulate that priming effects are precisely what cause implicit learning and play a vital role in infants’ “learning to talk” (p.188). Indeed, one of the weak points of connectionist models, from which this approach draws heavily, is that they rely on pairing the problem with the correct answer for exposure to the network in training sequences. Probabilistic constraint approaches to sentence processing also rely on the inanely simplistic assumption that humans attend to all language in the environment.
There are several examples of research on how exposure affects language acquisition. Studies such as those of Saffran, et al (1996a) and Saffran, et al (1996b) indicate the speed at which both children and adults can acquire certain aspects of language. In the former study, infants as young as 8 months old exhibit signs of using statistical information in processing input after only two minutes of exposure. The latter shows that adults were able to discern words that were contained in an artificial language after just 20 minutes of exposure. In a later study, Saffran, et al (1997) reported that both adults and children learned the words of an artificial language simply through incidental exposure. However, Saffran and her colleagues are very cautious in their analysis, pointing out in later letters (Pesetsky, et al, 1997) that just because humans are able to determine word boundaries, there is no explicit indication that they can deduce syntactic structure. However, it should be noted that since Saffran, et al (1996b) and Saffran, et al (1997a) examined the acquisition of artificial languages, they both can actually be interpreted as evidence of statistically based second language acquisition.

This sort of research has very few equivalents in classroom studies. In one of the few, Leow (1999) explored teacher-centered vs. student centered across single vs. multiple exposures to certain syntactic structures in Spanish and found that multiple student-centered exposures gave the best recall. However, this study was only concerned with overt presentations of the target structures and made no attempt to include incidental exposure.

As stated earlier, the only way to assess the dynamics of the constraint-based lexicalist approach to second language learning is to perform a detailed corpus analysis similar to that of MacDonald, et al of the lexical items of both aural and visual input to
learners and their comprehension at various points in their acquisition. These sorts of studies have been done with artificial languages (e.g. N.C. Ellis & Schmidt (1997)) but a full analysis of even the first few weeks of second (natural) language learning might prove very rewarding. One example of such an opportunity to assess the value of this approach to sentence processing is to analyze the beginning of an immersion situation, such as the second year course in the Japanese department here at Stanford. In contrast to the first year course, lessons are conducted entirely in Japanese: preliminary interviews indicate that this condition is quite challenging for some students, but in the span of two to three weeks, they learn to cope and understand the material. A study involving students of Japanese has the added advantage that there is very little opportunity for exposure outside of the classroom. As such, a thorough analysis of the instructor’s speech and the lesson materials according to context and frequency distribution of aspects of lexical items could give some indication of how the students adapt to immersion. It might also give some indication if and how the instructor adapts her speech and actions to help students become accustomed to the environment. The study could probably be limited to the first ten fifty minute lessons and include interviews of individual students. It would also be even more productive if it could be run as a joint project with the linguistics department and the East Asian studies department.

Another issue related to the constraints-based lexicalist approach to sentence processing that points to educational implications is ambiguity. The problem of ambiguity resolution mentioned above becomes somewhat less obvious when dealing with second language learning, where native knowledge is not a given. A listener assuming the wrong usage of a word is much less of an uncommon occurrence, often because recalling even one
usage of a word takes considerable effort, especially in the confusion of attempting to understand a foreign language in conjunction with many other non-linguistic and contextual cues. Also, especially in the beginning, learners usually study “vocabulary”, where one word has one definition. However, as MacDonald, et al (p.677) point out, “almost all words in the English lexicon exhibit a nonzero degree of ambiguity, some acutely so.”

The issue is further complicated by the fact that one word, while having a direct “equivalent” in another language, may not always be used in the same way in both languages. Depending on the language, many of a word’s uses will be very different, or even non-existent, especially when considering idioms. While much of the literature on bilingual memory is concerned with “lexical access”, MacDonald, et al (p.680) argue that the meaning of a word must be computed instantaneously each time it is encountered, based on the various constraints of its usage.

In the presentation of new vocabulary, conveying to students the ideas that words have different uses and that translations are only similar up to a point would seem to be a key aspect of preparing them for exposure to “real” language. This would entail a concept of vocabulary as characterized by example rather than definition (or translation), as in the COBUILD series of dictionaries (Sinclair, 1995). The judicious choice of examples could be one step toward building a familiarity with the many collocations associated with a word.

Along these lines, Hubbard (1994) notes that verbs play a key role in determining the structure of a sentence. This issue has been explored extensively in sentence processing and linguistic literature (in particular in non-transformation approaches to grammar— see Hubbard). Tanenhaus & Trueswell (1995) mention that when considering
the mappings between individual verbs and complement types, processing difficulty is inversely correlated with the frequency of a verb (p.238). They also point out that both subcategorization and thematic information become available when a verb is encountered, providing key information for understanding the sentence (p.236). MacDonald, et al note that “prepositions also often provide highly constraining information for resolving this ambiguity, particularly in combination with the constraints provided by nouns and verbs” (p.695). The frequency distribution of verbs and prepositions, together with pertinent aspects such as argument structures, voice and co-occurring words could give an indication as to how curricula might be structured.

**Comprehension vs. Production**

One particularly noticeable aspect of second language acquisition is the fact that learners are able to understand more than they can produce. Recognition is a skill that precedes expression even in our first language: for example, we may be able to get some idea what a legal document is trying to say, but it takes years of training to be able to write in that particular style. Smolensky (1996) uses Optimality Theory to address this problem for the development of phonology in infants. It is quite obvious that children are able to understand adult speech long before they are physically able to produce it, but the progression of development does not follow a strictly linear path, especially when considering data from several different languages. Optimality Theory addresses this by a hierarchy of constraints: the most powerful constraints have the most influence over acquisition, but once they are overcome, other constraints come become influential. The development of phonology is constrained by the physical ability of infants, with some
sounds much more difficult to produce than others. In the same way, the possibility that second language acquisition is based on a hierarchy of constraints imposed by the native language on the target language is certainly worth exploring. In the past this has been addressed in concepts such as contrastive analysis, interlanguage and transfer, but it is possible that Optimality Theory could capture the effect of constraints such as those presented in the constraint-based lexicalist approach to sentence processing.

As indicated in Pica (1994), comprehension and production and their roles in pedagogy are important issues to language teachers. Krashen’s “Natural Approach” placed strong emphasis on comprehension and “comprehensible input” (see Implications for Krashen’s “Natural Approach” below), and while it is obviously necessary in the learning process, it is apparent that simply understanding is not the only part. An integrated approach using both comprehension and production in the framework laid out by the constraint-based lexicalist approach to sentence processing could be an effective tool in the classroom.

The gap between comprehension and production has educational implications in specific methods such as retention practice – simply listening to (or reading) a phrase or sentence and attempting to repeat it accurately without referring to the original. While this method is widely used, the principles behind it have not been fully explored. It also points to the wider issue of the exact process by which language that has been comprehended is turned into production, which the constraint-based lexicalist approach addresses. However, the issues of how much comprehension and under what conditions it must take place remain in need of further clarification.


**Individual Differences**

As stated by MacDonald, et al, one of the key premises to this approach is that, rather than assuming an innate language instinct, it is based on “the general properties of memory, perception, and learning” (p.700). Accordingly, this has some implications for individual differences in language learning. Just and Carpenter (1992) (also cited in Tanenhaus and Trueswell (1995)) propose that low memory span readers have difficulty when they encounter an ambiguous word that can only be determined by the context of the sentence. MacDonald et al (p.699) discuss a possible role for high and low memory span in language acquisition: higher memory span learners would have more ability to use the constraints available to them. Thus “better” language learning would be a result of a more accurate frequency representation, rather than “computational capacity”. However they caution that within this general qualification, it would be impossible to specify which had been more important for one particular individual, experience or some sort of ability (they offer no explicit definition of “ability”). Perhaps a more applicable interpretation would be that experience, not some definition of intelligence, determines the outcome of language learning.

MacDonald, et al cite the Competition Model of Bates and MacWhinney as being in the same spirit as their proposal (p.676). Interestingly, this is one area where there has been considerable research on the role of sentence processing in second language learning, for example in the effect of word order on comprehension and production. Sasaki (1991, 1994) and Rounds and Kanagy (1997) used the Competition Model as a framework in studies that varied animacy and word order in sentences presented to of learners English and Japanese. All three studies found that their results could be interpreted as an
interaction of cues from the learners’ native languages, Japanese and English. Sasaki (1994) found that beginning adult Japanese as a foreign language (JFL) learners relied more on word order than the more dependable case-markers, presumably because they had been exposed to material with primarily subject-object-verb (SOV) order. In addition their native language was English, which has a very reliable word order. However, since word order is ultimately unreliable in Japanese, learners eventually come to pay more attention to case marking. On the other hand, Rounds and Kanagy found that even after 7 years of classroom immersion, child JFL learners still showed very little tendency to rely on case-markers. These results are not necessarily conflicting: as Rounds and Kanagy indicated in their discussion, classroom exposure was still presumably primarily SOV, especially considering students were at the elementary school level. Another potentially decisive factor was the lack of explicit instruction on case-marker usage.

This line of research is not new. Well before research based on the Competition Model began to appear, Hakuta (1982) looked at how the interaction between particles and word order affected the way different age groups of native Japanese children interpreted sequences, and found that the even at the age of 6 years old, agreement between word order and particle position was necessary for correct interpretation. In addition to illustrating just some of the complex factors involved in learning a language, these studies give insights into possible interpretations of student errors. Besides being a useful illustration of how individual differences can be interpreted, these examples present yet another clear argument for both a rich source of exposure and possibly a role for explicit instruction on particular points to which students might not normally attend.
IMPLICATIONS FOR KRASHEN’S “NATURAL APPROACH”

The influence of Stephen Krashen on language education research and practice is undeniable. His theories, first introduced over 20 years ago, are still debated today. In 1983, with Tracy Terrell, he published *The Natural Approach*, which combined a comprehensive second language acquisition theory with a curriculum for language classrooms. The influence of *The Natural Approach* can be seen especially in current English as a foreign language (EFL) textbooks and teachers resource books around the world. Krashen’s theories on second language acquisition have also had a huge impact on education in the state of California, starting in 1981 with his contribution to *Schooling and Language Minority Students: A Theoretical Framework* by the California State Department of Education (Krashen 1981). Today his influence can be seen most prominently in the debate about bilingual education and perhaps less explicitly in language education policy: The *Revised Knowledge and Skill Areas Assessed on Tests 1-3 of the (Bilingual) Crosscultural, Language and Academic Development (CLAD/BCLAD) Examinations* (California Commission on Teacher Credentialing, 1998) contain the following specifications:

Test 1
LANGUAGE STRUCTURE AND FIRST- AND SECOND-LANGUAGE DEVELOPMENT
“5. Pedagogical factors affecting first- and second-language development.
Includes topics such as learning/acquisition (formal/informal), input/intake/output, natural order, monitor and communicative competence.”

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The terms are strikingly similar to those presented in Krashen’s Monitor Model. There is also explicit reference:

Test 2
METHODODOLOGY OF BILINGUAL, ENGLISH LANGUAGE DEVELOPMENT, AND CONTENT INSTRUCTION
“6. Instruction with a focus on English language development:
ESL methods.
Includes topics such as Total Physical Response, Natural Approach, Communicative Approach, constructivist approaches, content-based approaches (e.g., content-based ESL), and less-effective methods and approaches.”

It would appear that anything other than the listed approaches is somewhat “less-effective”.

As advertised, The Natural Approach is very appealing – many students profess to wanting to learn a language the natural way, and many language teachers that struggle with the kind of input to provide for students. However, Krashen’s theories have been the subject of very close scrutiny since their publication, most notably by Gregg (1984) and McLaughlin (1987). These and other authors have shown that Krashen’s approach lacks both a solid theoretical framework and sufficient empirical evidence. In my own experience as a language teacher, while the issues he discusses and the proposals he presents strike a resonant chord, implementing the principles contained in his model led to somewhat of a dead end. Specifically, if a teacher is to rely on some “naturalness” to language acquisition, provided by an innate Language Acquisition Device in the brain, then there is not much to do in the classroom except speak the target language and just wait for the students to “acquire” it.

In the following sections I will examine Krashen’s theories as well as some of his critics’ evaluations in an attempt to distill out what relates to the classroom experience. In
addition I will explore how the principles that can be learned from recent research in language acquisition, including a constraint-based lexicalist approach of sentence processing, might be used to reinterpret those theories in light of the gaps left by his lack of a theoretical foundation. This is intended as an exercise to explore how teachers might analyze their position in the larger curriculum with respect to Krashen’s theories and general principles of second language acquisition. All references to Krashen’s hypotheses are taken from *The Natural Approach* (Krashen & Terrell, 1983). Rather than use Krashen’s own label, which is to call his ideas simply “second language acquisition theory”, I will adopt McLaughlin’s (1987) terminology and refer to them collectively as “the Monitor Model”. This is distinct from “the Monitor Hypothesis”, which is the fourth of Krashen’s five hypotheses.

**The Acquisition-Learning Hypothesis and the Monitor Hypothesis**

Both of these hypotheses are based on a single concept: the difference between explicitly learned grammar and incidentally acquired exposure. In the Acquisition-Learning Hypothesis, which makes a distinction between “acquisition” and “learning”, Krashen defines “acquisition” as developing competence by using language for “real communication” and “learning” as “knowing about” or “formal knowledge” of a language. He draws upon one set of references from Roger Brown, which he claims shows that parents tend to correct the content of children’s speech rather than their grammar. Gregg (1984) first notes that Krashen’s use of the Language Acquisition Device (LAD) gives it a much wider scope of operation than even Chomsky himself intended. It was originally simply used as a construct to describe the child’s initial state, which would
therefore mean that it cannot apply to adult learners. Gregg contends that Krashen’s
dogmatic insistence that “learning” can never become “acquisition” is quickly refuted by
the experience of anyone who has internalized some of the grammar he or she has
consciously memorized. McLaughlin (1987) begins his critique by pointing out that
Krashen never adequately defines “acquisition”, “learning”, “conscious” and
“subconscious”, and that without such clarification, it is very difficult to independently
determine whether subjects are “learning” or “acquiring” language. MacWhinney (1997)
also returns to basic definitions pointing out that “explicit instruction” and “explicit
learning” refer to quite different phenomena. He cites several studies with convincing
evidence that, while implicit learning does indeed exist, explicit instruction simply does not
have negative effects. He adds that

“It is difficult to think of any study that has shown a linguistic
pattern for which students do worse when given additional
explicit instruction.” (p.278).

The role of conscious learning is defined in the Monitor Hypothesis: Krashen
argues that “learned” competence only act as an editor on what is produced. Output is
checked and repaired, after it has been spoken (or written), by the explicit knowledge the
learner has gained through grammar study. The implication is that the use of this Monitor
should be discouraged and that production should be left up to some instinct that has been
formed by “acquisition”. This hypothesis presents very little in the way of substantiation:
Krashen cites several studies by Bialystok and Frohlich as “confirming evidence” (p.31) as
well as several of his own studies on the difficulty of confirming acquisition of grammar.

Perhaps Krashen’s recognition of this factor was indeed a step forward – language
learners everywhere know the feeling that the harder they try to make a correct sentence,
the worse it comes out. However, Gregg points out that by restricting monitor use to “learned” grammar and only in production, Krashen in effect makes the Acquisition-Learning Hypothesis and the Monitor Hypothesis contradictory and completely ignores comprehension. McLaughlin gives a thorough dissection of the hypothesis, noting that Krashen has never demonstrated the operation of the Monitor in his own or any other research. Even the further qualification that it only works on discrete-point tests and on one grammar rule at a time failed to produce evidence of operation. McLaughlin notes how difficult it is to determine if one is consciously employing a rule, and that such conscious editing actually interferes with performance. However, his most convincing argument is the existence of learners who have taught themselves a language with very little contact with native speakers.

Krashen’s conscious/unconscious learning distinction appeals to students and teachers in monolingual countries immediately. Many people in the United States have struggled to learn a foreign language at school, often unsuccessfully, while residents of other countries seem to have just “picked up” their second language naturally in childhood. Taking a broad interpretation of this hypothesis, the main intent seems to be to convey how grammar study (learning) is less effective than simple exposure (acquisition). MacWhinney (1997) taking issue with Krashen’s theories, concludes that

“Eventually, we will need to replace the simple dichotomy of explicit and implicit learning with a fuller model that looks at the detailed mechanics of second language learning of particular target structures.” (p.280)

Clearly, what is at issue is learning processes. Indeed, Saffran, et al (1997), argue, “researchers studying children’s language acquisition would benefit from considering at least some of the mechanisms that have been uncovered by learning research” (p.104).
The constraint-based lexicalist approach to sentence processing addresses this aspect explicitly. Child acquisition and adult processing are dealt with separately in generative grammar – a concept that, especially when applied to second language learning, has obvious difficulties. One argument related to this purported lack of continuity is Gold’s theorem (Gold, 1967), which states that language is not learnable without negative examples, unless there is some sort of innate knowledge of rules. This is based on the assumption that language is nearly arbitrary and that no sentence may be withheld from the learner indefinitely. However, many researchers (e.g. Kelly 1992, Rhode & Plaut 1999) argue that if language is modeled as a stochastic process where the frequency and distribution of lexical items and grammatical constructions is assumed to be stable, then the necessary negative examples can be inferred. In support of this type of model of language, Rhode and Plaut point out that all proposed rules of child learning, such as uniqueness, competition, the principle of contrast, and mutual exclusivity, are based on implicit negative evidence. They also point out that a mere two years after Gold published his work; J. J. Horning made a similar argument based on linguistic analysis in his doctoral dissertation at Stanford.

**The Natural Order Hypothesis**

The second hypothesis is simply that grammatical structures are learned in a predictable order. Krashen cites a series of studies by Dulay and Burt which show that a group of Spanish speaking children and a group of Chinese speaking children learning English as a second language exhibited a similar “natural” order of acquisition for grammatical morphemes. He mentions other parallel “streams” of acquisition, but Gregg
notes that that their very existence rules out any order that might be used in instruction. Further, Gregg argues that if there are individual differences, then the hypothesis is not provable, falsifiable, and in the end, not useful. McLaughlin points out the methodological problems with Dulay and Burt’s 1974 study, and cites a study by Hakuta and Cancino (1977, cited in McLaughlin, 1987, p.32), which found that the complexity of a morpheme depended on the learner’s native language.

The contradictions for planning curriculum are immediately evident. Having just discredited grammar study in the Acquisition-Learning Hypothesis, Krashen suddenly proposes that second language learners should follow the “natural” order of acquisition for grammatical morphemes. The teacher is first instructed to create a natural environment for the learner but then, in trying to create a curriculum, they are instructed to base it on grammar. McLaughlin also points out that “correct usage” is not monolithic – even for grammatical morphemes, correct usage in one situation does not guarantee as correct usage in another. In this sense, the term “acquisition” becomes very unclear, even when not applying Krashen’s definition. When one examines this hypothesis in terms of comprehension and production, its insufficiencies become even more apparent. Many of the studies of order of acquisition, especially those in first language acquisition, are based on production. Comprehension studies with very young infants have the simple difficulty that it is very difficult to determine exactly how much and what the subjects understand.

One of the key issues in language curriculum design is level of difficulty. Since it is often difficult to maintain motivation if the material is too challenging, a stepwise approach from easy to difficult is taken. This is secondary to, but also a natural extension of the fact that more complex concepts can often be built upon simpler ones. Krashen’s
ideas seem to come directly from this principle, but as noted above, they lack a paradigm for implementation. However, a careful consideration of the constraints on the lexical items in the target language might provide a way to deduce certain valuable principles about ordering. As noted earlier, this would of course require a thorough corpus analysis of both the native language and target language with special attention paid to the frequency distribution of certain words according to voice, tense, argument and semantic role. Verbs (and to a certain extent prepositions) would play a central role in this application of statistical analysis.

A separate analysis of comprehension and production could be valuable as well. Issues that are not found in the literature but which could have a significant impact on pedagogy include whether or not the gap between the two is the same for every lexical item and the extent to which individual differences are a factor. There are also very few classroom methods which address these in a systematic way. The best way to assess comprehension and production is also a part of a larger debate on how to measure proficiency in general. However, these are all issues that might benefit from a framework based on the constraint-based lexicalist approach to sentence processing.

**The Input Hypothesis**

Here Krashen explains how successful “acquisition” occurs: by simply understanding input that is a little beyond the learner’s present “level” – he defined the present level as \( i \) and the ideal level of input as \( i + 1 \). In the development of oral fluency, unknown words and grammar are deduced through the use of context (both situational and discursive), rather than through direct instruction. Krashen has several areas which he
draws on for proof of the Input Hypothesis. One is the speech that parents use when talking to children (caretaker speech), which he says is vital in first language acquisition. He also cites evidence that the adult learners’ first utterances in a second language are often very similar to those of infants in their first language. However it is the results of methods such as Asher’s Total Physical Response that provide the most convincing evidence, producing what Krashen calls “nearly five times the [normal] acquisition rate.”

Gregg spends substantial time on this particular hypothesis, because, while it seems to be the core of the model, he argues that it is simply an uncontroversial observation with no process described and no proof provided. He brings up the very salient point that perhaps practice also has something to do with second language acquisition and cites several studies that shed some doubt on the connection between caretaker speech in first language acquisition and simplified input in second language acquisition. McLaughlin also gives careful and thorough consideration to this part of Krashen’s model. He addresses each of the ten lines of evidence that Krashen presents, arguing that the concept of a learner’s “level” is extremely difficult to define, just as the idea of i +1 is. Also, there is no evidence that a learner has to fully comprehend an utterance for it to aid in acquisition. Some of the first words that children and second language learners produce are formulaic expressions that are not fully understood initially. Finally McLaughlin points out that Krashen simply ignores other internal factors such as motivation and interaction.

This hypothesis is perhaps the most appealing part of Krashen’s model for the language learner as well as the teacher. He makes use of the gap between comprehension and production that everyone feels, enticing us with the hope of instant benefits if we just get the input tuned to the right level. One of Krashen’s cleverest catch-alls is that other
methods of teaching appear to work at times because they inadvertently provide this input. But the disappointment is that he never gives any convincing idea as to how it works. In the classroom a teacher can see when the students don’t understand and can simplify his or her speech to the point where they do. Krashen would have the teacher think that this was all that is necessary, and it is just a matter of time before the students are able to express themselves freely. A study by R. Ellis (1992) indicates quite clearly that it is the effort involved in attempting to understand input rather than simple comprehension that fuels acquisition. On the other hand, in the study by Saffran et al (1997), the subjects made no effort but learned the sound patterns of background noise.

While research such as that of Saffran, et al shows that humans are indeed sensitive to the statistical properties of language to which they are exposed, there is nothing to quantify the process. Nick Ellis and Richard Schmidt (1999) argue that their data from language acquisition reflects not a dual-mechanism approach, as suggested by Pinker and Prince (1988), but a continuous curve similar to the power law of learning in human performance. They cite data from Anderson that shows that “neural activation, which controls behavior, reflects the probability of an item occurring in the environment: thus the neural processes are designed to adapt behavior to the statistical properties of the environment.” While such a power law might be a very accurate description of human learning, other individual factors (including social and emotional factors) prevent any broad generalization.

Ellis and Schmidt’s model was based on data from human subjects learning an artificial language (as with Saffran, et al, it should be noted that this is, in fact, a second language acquisition study), which was then compared to a simulation on a connectionist
network using the same data. They found that the results from both sources showed the same properties when considered as *processes*. As part of their “learning sequences”, both the human subjects and the computer model engaged in repetitive study, not just simple comprehension. Practice and repetition, as well as the element of attention, are intuitively and empirically significant to the process of learning. In Saffran, et al’s (1997) experiments there was no explicit comprehension of the input, but the artificial language patterns were repeated several times and acquisition was found to be directly related to the frequency distribution of the individual elements of those patterns. Krashen’s expression of learning as *i + 1* seems to be related to the aforementioned comprehension/production gap, but I would argue that beyond this, it is necessary to hypothesize some sort of *process*. This is precisely what is addressed by the constraint-based lexicalist approach to sentence processing. Further research in the areas indicated by Saffran, et al and Ellis and Schmidt could yield concrete implications for classroom technique, especially in quantified guidelines for practice and assessment.

**The Affective Filter Hypothesis**

This concept receives the briefest treatment in *The Natural Approach*. Krashen simply states that attitudinal variables relate directly to language acquisition but not language learning. He cites several studies that examine the link between motivation and self-image, arguing that an “integrative” motivation (where the learner wants to “be like” the native speakers of a language) is necessary. He postulates an “affective filter” that acts before the Language Acquisition Device and restricts the desire to seek input if the learner does not have such motivation. Gregg notes several problems with this hypothesis,
including the fact that simply not being unmotivated would be the same as being highly motivated – neither is the negative state of being unmotivated. Also, he questions how this filter would selectively choose certain “parts of a language” to reject. McLaughlin argues much along the same lines as Gregg and concludes that while affective variables certainly play a critical role in acquisition, there is no need to theorize a filter like Krashen’s.

The idea that affective variables impact cognitive processes in a non-uniform way is somewhat difficult to imagine, and in the end, may not be terribly useful for the analysis of learning. Certainly they are important in terms of motivation, but for purposes of simplification, their effects are probably best considered separate from the cognitive aspects of the constraint-based approach to sentence processing.
**Method Analysis – Cloze Listening**

One of the most important aspects of any hypothesis of second language learning is its application to specific methods in the classroom. This can be done in several ways. One is to use it to understand the process that the students are undergoing by applying the hypothesis to error analysis in order to figure out why they make the mistakes that they do. However, while understanding the students is important for the teacher, the object of the enterprise is ultimately to increase their ability to understand and speak the target language, which requires going a step or two further. Guidelines for designing activities and a framework for these activities (a curriculum) could possibly be more useful. In order to do this, a thorough understanding of the dynamics of existing activities could serve as a foundation for future activities or more general methods. The next section is an example of how teachers might use some of the principles of the constraint-based lexicalist approach to sentence processing in a microanalysis of activities in their classrooms.

The method under analysis is a form of listening practice, known as cloze listening, which I have some experience with myself, but was most recently observed in the second year Japanese course at Stanford. The instructor plays a brief video clip in the target language several times, eliciting general information from the students:

- What is the occasion?
- What is the situation?
- What style are the speakers using?
- Are they using formal or casual speech?
- What contractions might be expected based on that style?
- Who is speaking?
- Are they male or female?
- What types of speech can we expect from this?

Next, the students open their textbooks, which contain a script of the video clip. However,
certain words and phrases are blanked out and the exercise is for the students to fill them in based on what they hear. Finally, the students answer several questions about the content of the video clip.

First and foremost, this activity is given context, before any answers are even required from the students. As the sentence processing model indicated, one of the key constraints to comprehension is the context. By using video rather than audio, several aspects of the context are provided. Further, by eliciting the orientating information before the exercise, the students are given even more context. In a “real” conversation situation, beginning learners might not be able to remain calm enough to consider all the possible constraints on a particular utterance or discourse. However in the controlled environment of the classroom it is possible to direct the students’ attention toward the value and importance of such aspects. Further, listening to the passage several times gives them multiple opportunities to determine all of the pertinent aspects, as well as slowly focus in on any parts of the clip that they do not understand. Thus repetition and practice, both important aspects of learning, are included on a process level.

Similarly, one other aspect of this exercise is the instructor’s ability to choose the material and the parts of the script that are blanked out: this determines the constraints to which the students must attend. The material can be chosen for pertinence to the students own experience: material from a variety of sources such as films, TV programs, news, or even custom produced video can be chosen according to the students’ level and particular needs. But even more importantly, the parts of the script that are blanked out can be chosen according to the type of linguistic constraints they contain. Beginners can be given a script with only the words that are easily discernable blanked out, while more
advanced learners can be given a script missing more difficult words, harder to hear articles or prepositions, words or phrases used in a unique or idiomatic way or even longer complete phrases. These words or phrases can be chosen based on previous exposure in other material, or as a way to introduce new ideas. While the expressed aim of the exercise is to fill in the correct words in the blanks in the script, the students nonetheless gain exposure to much more than that, allowing for possible incidental or implicit learning.

In one sense this exercise is a group activity, with each student in the class participating. However, the written aspect remains individual. While more able students fill in the blanks faster, the activity can be run long enough for all of the students to complete it. This individual work does not depend on other students, so there is not necessarily any pressure on less able students to perform above their level. However the repetitive nature of the steps involved in the activity increase all of the students’ exposure. Unfortunately, this exercise only works on recognition, without any attention to production. This shortcoming would have to be made up in other activities.

On a larger scale, cloze listening is adaptable to various aspects of the curriculum. Indeed, the concepts contained within it can be used as a guide for students’ development. The instructor can choose a graded and modular consideration of constraints on the lexical items in the clip: aspects of speed, familiarity with vocabulary, distributional aspects of that vocabulary, individual ability to focus in on new and unknown material, expanding from word to phrase level. All of these aspects are chosen according to the constraints of each individual student’s native language on the target language: some aspects are similar and therefore very easily transferred, while others are more difficult.

Missing in this analysis is specific information on the frequency distribution of
individual lexical items and their constraints compared between the native and target language. At this point it is up to the teacher’s “instinct” to choose the above conditions on a given set of materials. However, the possibility is worth exploring that this instinct can be objectively characterized to some extent through analysis. Each activity in the classroom is autonomous in its operation. However, each one nonetheless operates on multiple levels, as illustrated by the consideration of constraints. In this sense, designing a curriculum as a combination of activities would necessarily be inconsistent, especially when used with different groups of students. However, I would argue that by considering the constraints that are utilized by each activity, and assembling those particular concepts in an order that responds to the needs of a particular group of students, all in a framework with sufficient repetition and practice, teachers may gain access to a rational and potentially effective way of organizing and implementing material.
**DIRECTIONS FOR FUTURE RESEARCH**

MacDonald, et al give an indication of some of the areas where more research is needed. They point out that their claim that all probabilistic effects in language comprehension are directly linked to the frequency distribution of lexical items could be too strong. Indeed it is hard to imagine that single words would tell the whole story. Nick Ellis (1996a) hypothesizes that chunking, across all levels from the phonological level to the syntactic level, is the key paradigm for understanding how language is processed. MacDonald, et al also point out that exactly what contextual information is relevant and how this information relates to comprehension has not been fully explored. They note that the exact dynamics of processing are unclear, although a later study by Trueswell, et al (1999) tracks eye movements during listening and indicates some key differences between children and adults. The exact nature of individual differences and how they affect comprehension is also an area for research.

In addition to research specifically on sentence processing, other disciplines are exploring alternatives to ideas that came out of the Standard Theory. Several of the studies and reviews of the literature mention Lexical Functional Grammar as holding the potential for new insights into language acquisition (Hubbard 1994). This formal theory of syntax expressly set out to reflect what is known about language processing. Neuroscience research is also attempting to find a physical reality for psychological and linguistic theories. Bates and Dick (2000) give a brief but comprehensive summary of some of the key findings that offer the possibility of new directions. Paradis (1998) reviews a large number of studies that indicate that pragmatic effects (which deals specifically with context and meaning) may be processed in entirely different areas of the
brain from other aspects of language.

However, it should go without saying that simply because theories are new does not mean they should be adopted as the answer to all problems in the classroom. Hubbard’s caution is worth noting:

“Those of us associated with language teaching have to be very cautious in dealing with theoretical linguistics. Theories of grammar and the analyses which follow from them should not be blindly embraced, as has sometimes happened in the past. Nor, however, should they be ignored. They should instead be carefully and systematically considered in light of the context – teaching language – in which we are seeking to apply them.” (p.69)

I would argue that the same is true for findings from other disciplines as well, including sentence processing research.

While there are many issues that are as yet unresolved, a look at the current state of sentence processing research reveals that there is a large body of literature in support of a concept of language and acquisition very different than the Standard Theory. As Nick Ellis (1998) points out, it is not the descriptive value of generative grammar that is at issue, it is the basic assumptions and implications of the relationships that it describes. Ellis’s argument is similar to that of Seidenberg and MacDonald in that he asserts that the problem lies in studying language in isolation of aspects of acquisition and processing, but he goes further by extending that lack of inclusion to “semantics, the functions of language, and the other social, biological, experiential and cognitive aspects of humankind.” Referring to Gold’s theorem, his contention is that “the social environment may tune the learners’ input to something far more optimally scaffolding than the malevolent tutor of Gold’s learnability analysis” (p.638). Indeed, taken with this sort of broad perspective, the arguments and evidence against a nativist position hold much more faith in the learning
ability of humans, and thus are perhaps a more philosophically appealing case for the innate equality of all people.
SCHOOLS OF EDUCATION AND SECOND LANGUAGE ACQUISITION RESEARCH

In addition to the overarching philosophical issues, Nick Ellis makes one point that is very salient for those of us concerned with education: These advances in sentence processing were made through interdisciplinary efforts between researchers in the fields of both psychology and linguistics, indicating that “a complete understanding of language is not going to come from one discipline alone” (p.642). In a related argument, Rod Ellis (1997) asserts that the field of education should, first, understand the results of second language acquisition research and bring them into pedagogy and, second, provide grounding in educational realities to guide future research. He argues that what is needed to facilitate this “discourse” between acquisition research and language pedagogy is more classroom-centered research based on which, when connected to theory, applied linguists can make various proposals about pedagogy. Alternatively, language acquisition research can start with pedagogical issues that teachers feel are important. Ellis presents several concrete models for the relationship between SLA research and pedagogy: a behavioral view where research should change teacher practices; a view of teaching as cognition, where research can help teachers form theories; and a view of teaching as interpretation, where teachers interpret the results of research in the classroom, possibly through their own action research. He concludes that with all of these aspects and interpretations of the relationship,

“. . . researchers need to attend to the how of the application as well as the what. We [SLA researchers] need to consider how practitioners develop professional expertise . . . .” (p. 88)

His conclusion is something that is not terribly new to educational researchers, but the fact that he proposes it is an indication of the ideological distance between SLA research and
education. It is difficult to imagine any possible reasons for maintaining such a gap. At the very least, the university school of education is the one institution that has direct influence over both teacher training and language pedagogy.

However, while Ellis makes an eloquent case for second language acquisition research, I would argue that central importance should be placed on the teacher in the classroom. As mentioned above, many of the decisions in the classroom are based on a teacher’s “instinct” or “feeling”. Linguistic and psychological theory have been trying to capture this, and indeed teachers often look to theory to guide them, but in the end it is often the expert teacher’s judgment that is the only thing that can capture all of the variables in a given classroom. The similarities of this ability with attaining proficiency in a second language are quite interesting and also instructive. Perhaps a thorough analysis would reveal some general trends from which a theory can be deduced, but introspection and isolated analysis of language alone will not yield all of the answers we seek. This is evidenced by the limitations of the approaches based on the Standard Theory, not to mention the striking shift away from specific predictions that Chomsky’s theories have taken over the years. Krashen’s approach incorporated some realities that teachers find important, as evidenced by their continued use in second language acquisition textbooks and language policy, but again, as I found in my own experience in the classroom, they fall short of giving a useful set of answers for curriculum development.

But perhaps an even larger issue is at work here. Rorty (1982) comments on the nature and history of philosophy: “The idea in science or philosophy that we can substitute ‘method’ for deliberation between alternative results of speculation is just wishful thinking. . . . It is the myth that rationality consists of being constrained by rule” (p.164).
In the absence of a viable alternative, we teachers and learners may be able to accomplish more if we give up looking for a recipe to follow, a set of rules to abide by, or a pattern to copy. Whether the models of sentence processing referred to in this paper capture elements that have implication for education or not, it should be clear that our picture of language and learning have not been and are not yet complete. Even the preliminary analysis of natural languages and work with limited artificial languages reveal a system that can be analyzed and a mind with more than sufficient analytical power. If there is to be any integrity to our efforts, then the least we can do, as both researchers and educators, is to explore the possibilities that this presents.
CONCLUSION

In summary, recent sentence processing research, specifically the constraint-based lexicalist approach, hold great promise for a better understanding of second language acquisition. However, much of it depends on a thorough corpus analysis of language used in specific situations, with particular attention given to constraints on lexical items. Hopefully this will result in a more rational approach to curriculum design than that provided by approaches based on the Standard Theory or Krashen’s Monitor Model. As shown with the above analysis of cloze listening, this approach could also be used to develop a framework for teachers to analyze what works and what doesn’t work in classrooms. This particular ability would be especially valuable to teachers who have no choice but to follow a set curriculum decided by the school or the state. An accurate analysis could help decide between available methods and materials. Such a framework could also be used to inform teachers to attend to what they say in lessons, what they assign as materials, and what the students hear in the environment. It could also give teachers valuable information to help assess their students’ progress. Hopefully future research in this vein will provide new and experienced teachers with one more tool to bring to the classroom, to be used in conjunction with other tools, not only to advance the professionalism of their teaching, but also to somehow help the students who come to them to learn.
Bibliography


