1: Lexical Ambiguity Resolution: Language, Tasks and Timing | Kathleen Ahrens - www.enganchecubano.c

This volume is concerned with how ambiguity and ambiguity resolution are learned, that is, with the acquisition of the different representations of ambiguous linguistic forms and the knowledge necessary for selecting among them in context. SchÃ¼tze concentrates on how the acquisition of ambiguity is.

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2: Ambiguity Resolution — The Word Lab at UCL

of ambiguous language is ubiquitous during human language learning, and people appear to have little difficulty in resolving ambiguities. Gradient representations allow.

Three hypotheses are presented concerning the different results previously found for ambiguity resolution in English and Italian. The first hy- pothesis language-driven hypothesis is that the difference is language, based. A strong version of this hypothesis i. A second hypothesis speeded-selection hypothesis is that context-prominent lan- guages use context faster once lexical access has occurred. The third hypothesis concerns methodological issues, especially as pertains to the length of time that the visual target appears. I conclude by postulating that the key reason for the discrepancies in lexical ambiguity resolution to date are not because of cross- linguistic differences, but instead have to do with timing differences, and I suggest that experiments that adequately measure immediate, automatic lexical retrieval will demonstrate that the modularity hypothesis holds. Language thrives on ambiguity, at both the word and sentence level. Lexical ambiguity in one way simplifies language because it allows for a language to ex- pand its range of meanings without having to continuously add new phonological forms to its. However, lexical ambiguity at the Syntax and Semantic! Ahrens same time complicates language, because the processor must, upon encountering a phonological word with multiple meanings, determine which meaning is correct. There are two basic theoretical models of lexical ambiguity resolution: A context-dependent account postulates that the context that precedes an ambiguous word will aid the processor in access- ing only the contextually appropriate meaning, and the contextually inappropriate meaning will not be accessed. A context-independent account says that the pre- ceding context will not be able to influence which meaning is accessed at an ambiguous word. The context-dependent model is compatible with a language- processing account that says that information among different language subsys- tems such as lexical access and discoursal knowledge can interact in ongoing language processing at any point in time e. The context- independent model is compatible with a modular language-processing account Fodor, Under a modular view of language processing, processing must be completed in one language subsystem such as lexical access before information from another language subsystem such as discoursal knowledge can influence the results. Thus, the implications for lexical ambiguity resolution extend not only to the nature of the language-processing system, but also to the makeup of trw underlying cognitive architecture that support language. In this chapter I first discuss the evidence that pertains to each model, and then point out that lexical ambiguity resolution must be looked at within the paradigms of natural speech comprehension and reading comprehension separately in order to better understand the nature of lexical access. Next I point out that the findings in lexical ambiguity resolution differ along language lines, and postulate a hy- pothesis that accounts for this fact. I then test this hypothesis, and at the same time test the context-dependent hypothesis, and find that neither hypothesis holds. A strictly selective account says that context alone is enough for the processor to select the appropriate mean- ing of the ambiguous word e. This means that if the. Moreover, if the context is biased toward the subordinate meaning of a word, then only the subordinate mean- Lexical Ambiguity Resolution 13 ing is accessed. In effect, context can block the access of the noncontextually appropriate meaning, and select only the meaning that is contextually appropriate. A modified selective account says that when context and dominance frequency of meaning of the lexical item interact, only the contextually appropriate mean- ing of a word is selected e. The prediction of the modified selective account is as follows: When the contextually congruent meaning is also the dominant one, the sub- ordinate meaning Instead, when context constrains the subordinate meaning, the activation received from There are two types of context-independent models: This finding holds irrespective of whether the contextual bias is toward the primary or secondary meaning of the word. However, after lexical access has oc- curred, and by ms downstream, only the contextually appropriate meaning is left available e. That is, regardless of the contextually appropriate meaning, the most common meaning will first be retrieved and tested for its compatibility with the context. If it is found to be incompatible; then the next meaning is retrieved and tested, until a match is found. An ordered access model predicts that if the context is biased

toward the most frequent meaning, that will be the only meaning that is retrieved, but if the context is biased towards a less frequent meaning, then the contextually biased meaning and all more frequent meanings will be retrieved. Note that this model makes the same predictions as the modified selective- access account does for words with two possible meanings, although the models on which they are based are completely different. In both models, if the context 14 Kathleen V. Ahrens is biased toward the dominant meaning, the dominant meaning is activated, and if the context is biased towards the subordinate meaning, then both the dominant and subordinate meanings are activated. In cases where there are more than two meanings, it is possible that the modified selective access account will again make the same prediction as the ordered access account; namely, if any subordinate meaning is picked, all more dominant meanings will also be accessed. However, the modified selective access account could also predict that only the contextually appropriate subordinate meaning e. This conceptualization of the modified selective access could potentially differentiate it from the ordered access model, because an ordered access model does not concern itself with level of activation although it could easily incorporate this concept. However, what is crucial for the discussion at hand is that the modified selective access model is under either conceptualization still a context-independent model although Tabossi and colleagues originally postulated otherwise , because con- text does not select a meaning. Instead, all meanings are activated i. Whether or not the activation can be detected is a separate, methodological issue. The theoretical issue is whether preceding context does or does not select a single, appropriate meaning. Since the modified selective access account does not, and since it postulates activation of all meanings, it is an account that exists within the context-independent model. Even so, there is still evidence for the context-dependent view. In fact, the question as to why evidence can be found for both models has perplexed researchers working on lexi- cal ambiguity resolution for the past two decades. Simpson reviews the relevant empirical studies on lexical ambiguity resolution and concludes that there are no clear methodological reasons as to why different studies have supported different models. The methodological variations he considered include a method of presentation of the context either auditory Lexical Ambiguity Resolution 15 or visual ; b type of task such as lexical decision or naming or Stroop ; and c location of the ambiguity within the context sentence sentence-medially or sentence-finally. However, it could be the case that the question he is attempting to answer, given in 1 below, is too broad to allow a unified explanation. Question 1 refers to any type of comprehension process i. However, it is not clear that it is appropriate to conflate the different modalities, because a there are different areas in the brain that deal with auditory and visual stimuli; b speech or sign language is learned earlier than reading; and c that speech or sign language is the basis for learning how to read. Under these assumptions the time course of lexical ambiguity reso- lution in reading comprehension is a different question from that of lexical ambi- guity resolution in speech comprehension and should be examined separately. Cross-modal priming experiments involve subjects listening to a sentence spoken by a native speaker at normal speed over headphones and making either a lexical decision to a visual target that appears on the screen cross-modal lexical decision task or naming the visual target cross-modal naming task. The visual target usually appears at the offset of the ambiguous word, but there is no pause in the sentence that the subject is hearingâ€"she or he hears a complete and natural-sounding sen- tence. This type of technique is advantageous to studying the time course of lan- guage processing a because subjects are listening to natural speech as they would in nonexperimental settings; b because the presentation of the visual target can be precisely controlled in order to see the time course of ambiguity resolution; and c because the task either naming or lexical decision to the visual target does not require conscious reflection on the nature of possible relationship be- tween the information they are hearing over the headphones i. Ahrens When we concentrate on question 2 and review the work on cross-modal lexi- cal ambiguity resolution experiments, we find that there are, indeed, methodo- logical reasons as to why some researchers report findings for the strictly selec- tive access model Simpson, ; Glucksberg et al. The areas we will look at include a position of visual target; b experimental task; and c language. The position of the visual target in relation to the ambiguity is of paradigmatic importance in understanding the time course of ambiguity resolution. As a num- ber of researchers have pointed out McClelland, ; Onifer and Swinney, ; Simpson, , intervals that occur between the offset of the ambiguous word and the presentation of the visual target mean that the activation is not indicative

of immediate processing. One cross-modal study that found evidence of strictly selective access Simpson, presented the visual target with a delay from the offset of the ambiguity at ms. These findings might, in fact, represent the effects of context once the word has been accessed, and cannot be construed as supporting a model of selective access. The other cross-modal experiment found for strictly selective access was a cross-modal interference task with pseudowords. In Glucksberg et al. The idea was that the subjects would be slower to reject them as nonwords, because the pseudowords would remind subjects of related words. However, it is not clear that this interference task was measuring processing relating to ambiguity resolu- tion, nor is it clear that the interference task allowed a decision that was within the time window of lexical access. Please see Prather and Swinney for a dis- cussion of these and related issues. More importantly for our discussion here, an interference task with pseudowords has not been used in any other cross-modal lexical decision task for ambiguity resolution, and thus it is difficult to ascertain if the finding for selective access has to do with the fact that it was a different type of task i. Thus, the cross-modal on-line sentence-processing data in support of a strictly selective account is limited, and involve timing and task issues that make it diffi- cult to ascertain if the findings were artifacts of these issues. Because findings for a strictly selective account would be the clearest indicator that language process- ing is an interactive as opposed to modular process, we will test this hypothesis in Mandarin Chinese. The reason is that, as we will explain in the next section, Mandarin is a language that relies heavily on contextual information in order to arrive at linguistic interpretation, and is most likely to support a strictly selective account. Lexical Ambiguity Resolution 17 I turn now to the three works that find for a modified selective access account in a cross-modal priming paradigm, which are all in Italian Tabossi et ah, ; Tabossi, ; Tabossi and Zardon, When I compare these three experi- ments, which all find that context and dominance can influence lexical access, with experiments that have found that context and dominance do not influence access Swinney, ; Tanenhaus et al. In the Italian experiments, the ambiguities occur sentence-medially, whereas in the English ex- periments the ambiguities occur either sentence-medially or in the sentence-final position. The main methodological differences between the two groups of experiments are the following: This means instead of the usual task of pressing one button if the visual target is a word, and another button if it is a nonword, subjects only press a button if the visual target is a word, and do nothing otherwise. Third, the presentation of the visual target in the Italian experiments is ms, whereas in the English experiments, the presentation of the visual target is never more than ms. In what follows I will first explore the hypothesis that the difference in findings derives from the different linguistic properties of English and Italian. I will present an experiment that tests the strongest form of this hypothesis, and show that it does not hold. This experiment will, at the same time, test for the strictly selective access account. To foreshadow the results, the evidence will demonstrate that nei- ther hypothesis is correct. In the general discussion section I will return to the two methodological possibilities as alternatives for the differences in the findings. This would imply that the under- lying cognitive wiring for language processing in Italian and English is very difr ferent. What could be the reason that Italian allows a combination of context and dominance to influence lexical access, while English does not? English has an impoverished agreement system, which means that it relies more heavily on structural information for semantic interpretation i. In addition, English does not allow the omission of either the subject or the object. Italian has a richer agreement system, which means that the referents are often determined by the agreement markers on verbs and not necessarily by an overt noun. Italian also allows the dropping of the subject to occur. Thus, Italian is a language that requires more information to be recov- ered from context than English, because in Italian the referents can be missing, whereas English relies on overt referents that have a reliable syntactic-semantic association. A language-driven hypothesis would suggest that because contextual information is crucial to interpreting the incoming string of information, it is also available and able to influence lexical access. The language-driven hypothesis is formulated as in 3. If a language is context-prominent, then con- text will be able to influence lexical access immediately and automatically. A language is defined as being context-prominent if contextual information plays a prominent role in interpreting a sentence. For example, languages that allow dropping of the subject, or of the object, need context in order to interpret the missing information. One way to test the language-driven hypothesis is to look at ambiguity reso- lution in a language that relies even more heavily on contextual

information than Italian. Mandarin Chinese is one such language. In fact, in Mandarin both the subject and object can be omitted in situations where context allows the information to be reconstructed. For example, if someone asks, "Do you like ice cream? Moreover, even though in Mandarin subjects and objects are structurally en- coded as in English, when topicalization occurs, a subject and object can switch their surface position without changing the dominant interpretation, as shown in 4 and 5 Huang,

3: CiteSeerX â€" Citation Query Ambiguity Resolution in Language Learning

"The book is an enlightening investigation into the relationship between ambiguity resolution and language learning. It is unique in its focus on the disambiguation problem in leanrning, rather than in processing, in contrast to the main concern of much research in the NLP literature.".

4: ALAN JUFFS' Home page

Considering empirical evidence from a free-word-order language (German) we propose a revision of the principles guiding the ordering of discourse entities in the forward-looking center list within the centering model.

5: Ambiguity Resolution in Language Learning : Hinrich Schutze :

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6: "Three machine learning algorithms for lexical ambiguity resolution" by David Eric Yarowsky

The poverty of stimulus argument is one of the most controversial arguments in the study of language acquisition. Here we follow previous approaches challenging the assumption of impoverished primary linguistic data, focusing on the specific problem of auxiliary (AUX) fronting in complex polar interrogatives.

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