cessing alternatives. In clarifying this point, it is worth considering what is meant by automatic, as distinct from controlled, processing. Automatic processes have been defined by different criteria such as being unintentional, occurring outside of conscious awareness, not requiring cognitive resources, and being autonomous; but these criteria do not necessarily hold simultaneously (Bargh 1989). Speech perception involves controlled active processes that are not resource-free or autonomous, yet they do occur largely outside of awareness, do not require a conscious intention on the part of the listener, and are subjectively experienced as effortless. Likewise, the subjective ease and speed that subjectively characterize language use in dialogue may not reflect the complexity of the underlying processing. The variability and flexibility shown in the processes of language comprehension and production in dialogue call for dynamic adaptation rather than a passive automatic mechanism.

Top-down influences in the interactive alignment model: The power of the situation model

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Abstract: Pickering & Garrod's (P&G's) model is an innovative and important step in the study of naturalistic language. However, the simplicity of its mechanisms for dialogue coordination may be overstated and the hypothesized direct priming channel between interlocutors' situation models is questionable. A complete specification of the model will require more investigation of the role of top-down inhibition among representations.

Pickering & Garrod's (P&G's) new model of linguistic interaction in dialogue is an important contribution to the study of psycholinguistics. This model breaks new ground between two traditionally disparate areas of language research and combines the mechanistic detail characteristic of sentence processing research with the emphasis on language as a cooperative process characteristic of dialogue research.

The central mechanism of P&G's interactive alignment model is a process they term "alignment," whereby dialogue participants' linguistic and discourse representations become more similar over the course of an interaction. Alignment is an automatic process that results from priming between linguistic representations. Priming can occur among different levels of representation within a single individual, as when increased lexical or semantic overlap between a prime and a target causes increased syntactic priming, or between the representations of different individuals, as when a speaker who has just comprehended a particular syntactic form produces the same form in a subsequent utterance. The resource-free characterization of the system relies on the assumption that alignment at one level of representation increases alignment at other levels of representation, and therefore essentially complete alignment can be obtained through simple and automatic processes.

Though the strength of this model is in its elegance and simplicity, it is not clear whether these characteristics will survive a more explicit specification of the system. According to the characterization of the model as a network of linked representations where priming and alignment in one representation causes increased alignment in all others, alignment at the level of the situation model is simply an epiphenomenon of alignment at lower levels. Yet P&G acknowledge that in some cases priming at one level will decrease alignment at other levels and specifically note that alignment of the situation model takes priority over alignment at other levels of representation. This complicates the system, as lower-level priming is constrained by the very alignment it drives. In fact, lower-level priming, supposedly a driving force in alignment, can be inhibited by extremely subtle nuances of local context. For example, P&G discuss Garrod and Anderson's (1987) findings that participants used different words for horizontal groupings of boxes depending on whether the grouping was modified with an ordinal adjective or not. So participants who used the phrase "the second row" later spoke of "the bottom line," even though "the bottom row" was an acceptable, unambiguous, and more lexically primed alternative. From examples like this it is clear that priming and alignment at the level of the situation model are very powerful mechanisms in the system, and that they have significant inhibitory power over the automatic, lower-level priming that is hypothesized to drive alignment at all levels of the system. It remains to be seen whether bottom-up mechanisms are robust enough to drive alignment, as P&G claim, or whether top-down inhibition directs the system.

The interactive alignment model relies heavily on the assumption that the situation model of one individual can directly prime the situation model of another individual through the same automatic mechanisms that are responsible for phonological, lexical, semantic, and syntactic priming between individuals. This assumption seems hasty. Phonological, lexical, and syntactic priming are similar in that the representation that will eventually be primed is an inalienable part of the structure of the message that causes the priming. The words, sounds, and structural patterns that make up an input string necessarily activate representations for exactly those words, sounds, and patterns. Semantic priming is not as direct, as semantic representations cannot be directly read off an input string. However, semantic representations are generally similar across individuals. For example, it is safe to assume that the word "dog" will activate the concept "cat" more strongly than the concept "book" for the wide majority of individuals. This similarity of representation may allow for what P&G represent as a direct priming link between the semantic representations of different individuals. If an individual produces the word "goat," the concepts that will be primed in her own semantic representation are likely similar to the concepts that will be primed in her interlocutor's representation, because the representations are structured in a similar way. In this indirect way, it could be said that the semantic representation of one individual can prime the representation of another.

The same thing cannot be said of situation models. Like semantic priming and unlike phonological, lexical, and syntactic priming, there is no direct priming channel between individuals through physical aspects of a message such as sounds, words, or word patterns. Again, priming must be indirect, through the activation of words or phrases that suggest a particular state or property of a situation model. But unlike semantic representations, individuals do not necessarily begin dialogue with similar situation representations. Therefore the priming link between individuals' situation models in the interactive alignment model must be of a different sort from the priming channels between other representations.

The interactive alignment model opens a new and exciting area of inquiry into language processing. However, more research into the details of situation model priming and the complex interplay of priming and inhibition between different levels of representation will be necessary in order to fully specify the operation of the model and to evaluate its ascribed simplicity. Carrying out this research will not be easy, as it will be difficult to maintain the necessary experimental control in the sorts of experiments that will be required. But as P&G optimistically point out, "Well-controlled studies . . . may require some ingenuity, but such experimental ingenuity has always been a strength of psychology" (target article, sect. 1, para. 4).

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