Authors' Response

The interactive-alignment model: Developments and refinements

Martin J. Pickering[a] and Simon Garrod[b]

[a]*Department of Psychology, University of Edinburgh, Edinburgh EH8 9JZ, United Kingdom;* [b]*Department of Psychology, University of Glasgow, Glasgow G12 8QT, United Kingdom.* **Martin.Pickering@ed.ac.uk**
simon@psy.gla.ac.uk

Abstract: The interactive-alignment model of dialogue provides an account of dialogue at the level of explanation normally associated with cognitive psychology. We develop our claim that interlocutors align their mental models via priming at many levels of linguistic representation, explicate our notion of automaticity, defend the minimal role of "other modeling," and discuss the relationship between monologue and dialogue. The account can be applied to social and developmental psychology, and would benefit from computational modeling.

The target article set out to show how it would be possible to develop a theory of interactive language processing at the level of explanation normally associated with cognitive psychology. In our theory, successful communication involves the alignment of interlocutors' representations. We proposed that each level of representation becomes aligned via an automatic process that we treat as a form of priming, and that alignment at one level automatically strengthens alignment at other levels. The role of conscious or deliberate strategies involving explicit reasoning about the mental states of one's interlocutor is comparatively small in our account.

Our commentators have raised a number of insightful points that have caused us to refine our proposals. Many commentators have focused on the nature of the alignment process. At a basic level, they consider whether alignment is the primary mechanism leading to conversational success, to what extent it is automatic, and whether it can be explained by a single mechanism at all levels and in all contexts. Commentators have also questioned our downplaying of "other modeling" in ordinary conversation and our claims about the nature of the difference between monologue and dialogue. In responding to these and other comments, we have divided our reply into eleven sections whose order roughly follows that of the topics raised in our target article.

R1. To what extent do interlocutors align?

Perhaps the most basic issue about our model is whether interlocutors actually align their situation models, or, less dramatically, whether they align to the extent that we claim they do. **Schober** proposes that interlocutors may be much less aligned than they appear even when they believe that they have understood each other. Of course, this would not matter if it solely concerned rare cases of genuine misunderstanding (e.g., when two interlocutors refer to different people called *John*); see also **Branigan**, who points out that communication may be "successful" in some sense even when there is some misunderstanding. But Schober argues that misalignment is endemic to dialogue. His comments relate particularly to the interpretation of referring expressions with respect to the discourse model. He draws on examples from surveys where respondents interpret terms in ways that are very different from those intended by the survey compositors. Our response is that such surveys do not constitute dialogue: The compositors construct the survey, and the respondents then respond. There is no feedback, no possibility for repair, and hence no *interactive* alignment. Schober also raises the important point that people need not necessarily fully interpret expressions (Clark & Wilkes-Gibbs 1986). In fact, full interpretation probably does not always occur in the comprehension of monologue (Barton & Sanford 1993; Frazier & Rayner 1990; Frisson & Pickering 1999; 2001; cf. Sanford & Sturt 2002), with people often not determining the precise sense of referring expressions (e.g., *newspaper* meaning an object vs. a day's edition), and there is no reason to assume that dialogue is any different. We suspect that both producers and comprehenders determine meaning to the extent necessary for current purposes, and that one way in which interlocutors align is by each processing referring expressions to equal depth.

R2. What precisely are they aligning?

Several commentators appear concerned with the question of what exactly is being aligned within our model. At the "lower levels" of phonology, syntax, the lexicon, and so on, interlocutors presumably align the representational content of each of those levels (phonemes, syntactic structures, lexical items, etc.), but it is perhaps less clear what they align at the level of the situation model. In the target article, our intention was to argue for alignment of *structural* aspects of the situation model, as exemplified by our example of reference frames. Some of our commentators assume that we are referring to the *content* of the situation model. The questions about alignment of content are much more difficult, and we shall try to explain the issues below.

In our account, interlocutors align on representations relevant to the dialogue. These include lexical, semantic, and syntactic representations, but also the situation model. So if, at a given point in a conversation, one interlocutor has a situation model containing two individuals, Mary and John, with Mary in focus, with each at different locations, and so on, then the conversation will be successful to the extent that the other interlocutor constructs the same situation model. Of course, one interlocutor can now introduce another character (or a new relation between the existing characters) – indeed, introducing new information is central to any conversation that is not entirely repetitive. To do this, the speaker draws upon his knowledge (typically using long-term memory) and adds information to his situation model. The effect of the alignment is that the listener updates his model so that it remains similar to that of the speaker. For example, the listener will interpret ambiguous words and utterances in the way that the speaker has employed them.

A much bolder claim is that the choice of new topics is affected by alignment. We did not make this claim in the target article, although we believe that it is true to some extent. For example, if one interlocutor refers to *the couch*, then the other is more likely to refer to *the couch* as well (Brennan & Clark 1996; Garrod & Anderson 1987). As a result of this, the use of *couch* presumably activates knowledge about couches, and hence makes it more likely that the interlocutor will talk about couches rather than some

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

other topic. To this extent, alignment is surely unsurprising (and simply amounts to the claim that interlocutors will persist with particular topics).

It may also be that interlocutors align on particular styles of reasoning or accessing of knowledge. For instance, if one interlocutor is engaged in a careful search of long-term memory, then the other will tend to behave similarly (e.g., if you play a general-knowledge game seriously, then I am likely to do so too). Alignment on style of reasoning is relevant to the construction of the situation model (cf. Gentner & Markman 1997), but takes us beyond the scope of the target article, just as nonlinguistic imitation more generally does (e.g., Chartrand & Bargh 1999). For now, our goals are limited to understanding linguistic factors that assist in the alignment of situation models.

Cutting questions our characterization of interactive alignment as reflecting a direct link between interlocutors. He suggests that it only has an indirect effect on the language processes themselves. To answer this comment we need to clarify how interactive alignment relates to language processing. As we have said, our contention is that interactive alignment (and in particular the automatic alignment channels) affects the structures used in production and interpretation rather than directly determining the *content* of production and interpretation. In other words, we assume that alignment provides an explanation of the manner in which interlocutors produce and interpret contributions. So we propose that alignment channels only produce a direct link between the structures that the interlocutors use in language processing. Hence, the alignment process is automatic and direct, even though it does not determine exactly what the speaker produces (as this depends on his long-term knowledge) or how the addressee interprets what he hears "beyond" the level of the situation model.

Other commentators also query whether we have specified the appropriate mechanism for alignment of situation models. They raise this concern in relation to two more specific topics: whether there is one alignment mechanism or several (**Branigan**, **Glucksberg**, and **Markman**, **Kim**, **Larkey**, **Narvaez**, **& Stilwell** [**Markman et al**.]), and whether (or in what sense) alignment is automatic (**Krauss & Pardo**). All of these commentaries, in some sense, are concerned with the issue of how alignment could affect the content of situation models. We address these in the following two sections.

R3. The mechanisms of alignment

Several commentators question the details of the interactive alignment mechanism itself and point out that we have not fully specified a mechanistic account. **Brown-Schmidt & Tanenhaus** make a general plea for modeling, which we fully agree with (see sect. R11). **Goldinger & Azuma** argue that we do not give a detailed characterization of the process by which alignment comes about. We have no commitment to interactive-activation models and are open to the suggestion that Grossberg's (1980) adaptive-resonance theory may provide an appropriate framework for the interactive-alignment account.[1]

Beyond this, two somewhat different issues are raised. Some commentators argue that we assume alignment is based on transient activation, and they propose instead that it is based on facilitated memory retrieval or implicit learning. Others claim that we are wrong to assume a unified account for all levels of alignment.

Kaschak & Glenberg argue that alignment is not due to priming but rather to a facilitated memory retrieval mechanism. In response, we note that the interactive-alignment model is specified at a functional level and makes no commitment to specific mechanisms, and that we use the term "priming" to refer to both transient activation and facilitation in memory-based accounts. Our model attempts to capture the way in which representations used for both production and comprehension automatically become aligned as a consequence of the process of interaction. These representations may be subject to transient activation or, instead, there may be enhancement of the mechanisms underlying their retrieval from memory (as envisaged by Kashak & Glenberg).

Perhaps more likely, there may be two separate mechanisms involved in alignment. For example, some recent accounts of syntactic priming are based on implicit learning (Bock & Griffin 2000; Chang et al. 2000), whereas some are based on activation of grammatical nodes (Hartsuiker et al. 2004; Pickering & Branigan 1998). Some experimental research finds clear evidence for long-term priming that is largely unaffected by intervening material (Bock & Griffin 2000; Hartsuiker & Westenberg 2000), whereas others shows rapid decay (Branigan et al. 1999; Levelt & Kelter 1982; Wheeldon & Smith 2003). Most likely, different tasks and sentence types lead to very different time-courses of priming. Although most of this work does not involve dialogue (except Levelt & Kelter 1982), under our account we would expect similar patterns of results to occur in dialogue. We therefore suggest that transient activation explains some aspects of alignment, and memory-based mechanisms explain other aspects of alignment. In section R9 below, we suggest that alignment due to routinization is likely to involve the establishment of memory traces for semi-fixed expressions.

Schiller & de Ruiter argue that interactive alignment involves storing and re-using selected fragments from previous utterances (see sect. R9); this constitutes a specific version of a memory-based account. However, their argument is based on the claim that priming is insufficient to account for interactive alignment because syntactic priming effects are too weak. In fact, the 10–20% effects that they refer to, occur in monologue. In dialogue, our studies have shown 55% priming effects when the verb is repeated (Branigan et al. 2000) and up to 47% with a rare structure when the noun is repeated (Cleland & Pickering 2003). Likewise, lexical entrainment almost always occurs for ambiguous words (Brennan & Clark 1996; Garrod & Anderson 1987). In our model, percolation effects between levels also increase the degree of alignment, and extended dialogue iteratively reinforces alignment.

A number of commentators question whether alignment operates in the same way at all levels in our model. **Markman et al**. argue that there are different requirements on alignment at the different levels. In particular, they separate the situation model from lower levels of linguistic representation. We agree that the structural alignment process they identify may well be appropriate at the level of the situation model, because models reflect complex higher order relations between elements (see sect 2.2 of the target article). However, we disagree with their argument that, unlike

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

lower level representations, situation models have to be partially misaligned either to ensure that given-new conventions are followed, or for the maintenance of common ground. We propose that these requirements can be fulfilled through the implicit common ground which does not differentiate between the speaker's and listener's situation models.

Branigan also separates the situation model from other levels, but for reasons that differ from those of **Markman et al**. In our terms, she accepts channels of alignment at syntactic, lexical, and morpho-phonological levels but not at the level of the situation model, because she believes that utterances do not provide direct evidence about the situation model. She claims that *I am in row two* provides direct evidence about lower levels, whereas the listener has to interpret the utterance (presumably, by using background knowledge) in order to construct the situation model. We disagree with this, because all levels of analysis require a combination of top-down and bottom-up information. For example, resolving phonemes, ambiguous words, or syntactically ambiguous utterances requires the use of context. It is therefore wrong to assume that only the level of the situation model is "abstract." We therefore see no reason to assume that channels of alignment are used only at lower levels, nor do we see any reason to alter our assumption that alignment at lower levels leads to alignment at the level of the situation model.

Warren & Rayner argue that the priming link between individuals' situation models must be different from that for lower levels. This is because interlocutors do not necessarily begin dialogues with similar situation representations and so alignment has to be built up over a period of interaction. Again, we see no fundamental difference between situation models and lower levels in this respect – alignment at all levels is built up, though the rate of alignment may differ at different levels. Additionally, Warren & Rayner question how conflicts in alignment at different levels are resolved (e.g., when aligning on the same name, "John" might produce a semantic misalignment in contexts where there are two Johns present). In fact, the issue was briefly discussed in the target article where we argued that alignment at the level of the situation model would override alignment at lower levels (target article, endnote 4). Adopting a particular situation model will influence the way a speaker frames almost everything he says, whereas adopting a particular word or syntactic structure will only affect the subsequent choice of that word in preference to another or influence the subsequent use of that particular syntactic structure. Because the situation model is so pervasive, it will be constantly reinforced in implicit common ground, and misalignment at this level will be more likely to trigger interactive repair. This suggests that the timecourse of priming at the level of the situation model may be long-lasting, whereas priming at low levels, such as phonology, may be much more short-lived. Priming at the syntactic level might be intermediate in duration, or depend more on its precise context (as suggested above). It therefore might be the case that priming of the situation model depends primarily on memory representations, whereas priming at low levels might depend primarily on transient activation. All of this, however, requires detailed modeling.

We also believe that routinization plays an important role in reinforcing the links between lower and higher levels of representation. We take this up in section R9.

R4. What it means for interactive alignment to be an automatic process

The commentators raise two important issues about automaticity that require discussion. **Krauss & Pardo** argue against the idea that alignment can be accounted for in terms of automatic priming between interlocutors. **Shintel & Nusbaum** argue that speech comprehension processes may be far from automatic in dialogue. To answer these concerns we need to first explicate our notion of automaticity, and, second, indicate what we assume to be automatic.

Our notion of automaticity is derived from the perspective of perception-action relationships (e.g., Hommel et al. 2001) and, more particularly, social cognition and social cognitive neuroscience (e.g., Dijksterhuis & Bargh 2001; Hurley & Chater, in press). Just as Dijksterhuis and Bargh argue for an automatic perception-behavior expressway, we propose that the alignment channels are automatic (see sect. 3.2) – they operate without any intermediary decision process. Hence, the alignment process is automatic. To be more explicit, we propose that the automaticity of alignment may take place at what Bargh (1989) calls the postconscious level, whereby automaticity requires awareness of the stimulus when it originally occurred. This means that interlocutors have to attend to what the other is saying in order for automatic alignment to occur. Dijksterhuis and Bargh (2001, p. 29) also argue that automatic social influences can be inhibited when they conflict with current goals and purposes. We suggest that the same is true for interactive alignment (see Garrod & Pickering 2004). For example, if a maze game player wants to try a new description scheme because he has failed to understand the last description from his interlocutor (see sect. 2.1 of the target article), then this high level goal of introducing a new scheme may inhibit low level alignment arising from what his interlocutor has just said. However, in a similar vein to Dijksterhuis and Bargh, we predict that overriding alignment is going to be more difficult (or effortful) than adopting alignment. Additionally, this postconscious notion of automaticity can explain why alignment is affected by partner-specific factors (e.g., Branigan et al., submitted; Metzing & Brennan 2003), without invoking additional mechanisms such as "other modeling." It is also presumably relevant to many of the factors that affect the extent of speech accommodation (Giles et al. 1992). In general, we expect that rate of alignment may be affected by social factors even when the interlocutors are unaware that they are aligning. There is evidence for such alignment outside language (Epley & Gilovich 1999; Lakin & Chartrand 2003), and we expect it also to occur in language.

Krauss & Pardo agree with our claim that communication entails the alignment of situation models, but suggest that it does not principally take place via automatic priming. For example, they point to evidence that speakers accommodate to their listeners. This presents no problem according to the above conception of automaticity, which allows inhibition or facilitation by social factors. **Glucksberg** raises an interesting case, involving a difficult dialogue with a non-cooperative teenage son, in which degree of alignment may be reduced.

Shintel & Nusbaum argue that speech comprehension processes may be far from automatic in dialogue. We are quite happy to accept this general point but see no prob-

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

lems for our proposal. In our account, the process of aligning the structures used in comprehension (and production) is automatic, but other aspects of comprehension (and production) are presumably not automatic. Additionally, their conception of automaticity is that it "implies a passive process in which the input is processed in an invariant, inflexible manner, regardless of the beliefs and expectations of the listener." This is not the notion of automaticity that we intend, and we hope that the above discussion of Bargh (1989) helps to make this clear.

Our conception of automaticity also differs from a Skinnerian one, as suggested by **Pear**. Crucially, we assume that alignment is not due to reinforcement, just as Dijksterhuis and Bargh (2001) assume for the perception-behavior expressway. Instead, alignment follows from a primitive tendency to imitate that does not appear to be learned (e.g., Metzoff & Decety 2003). However, our account does share certain features with Skinner's (1957) account, in particular that alignment implicates low-level learning mechanisms.

R5. Parity

One concern is whether there is true representational parity between production and comprehension. **Ferreira** describes experiments in which participants plan to produce utterances that they know to be ungrammatical (i.e., participants do not simply make errors). She assumes that interlocutors use and understand such utterances during dialogue (which is almost certainly correct) and suggests that comprehenders in dialogue would regard them as illicit. Whereas it is possible that there are differences between monologue and dialogue with respect to judgments of grammaticality, we accept that such differences are unlikely. In her experiments, we suggest that speakers realize they are producing something ungrammatical, but do so anyway because they cannot think of any other way of saying what they want to say. As long as this realization takes place within the production system (i.e., does not purely occur during self-monitoring), there does not appear to be a problem for the parity assumption. Compare sports commentators who sometimes cannot identify a player at the point when they need to produce the utterance ("About to kick the ball, Smith"), which listeners might well regard as illicit. This account seems more likely than a real disconnect between grammars in comprehension and production. However, if there is a disconnect for some highly specific constructions, it merely leads to a very slight weakening of the parity assumption, not its abandonment.

Ginzburg argues that the interpretation of the same sequence of words can change according to whether it represents a single contribution from one speaker or two contributions from different speakers:

1. **A:** Which members of our team own a parakeet? **A:** Why? (= Why own a parakeet?)
2. **A:** Which members of our team own a parakeet? **B:** Why? (= Why are you asking which members of our team own a parakeet?)

He suggests that our interactive alignment mechanism cannot account for the fact that *Why?* has a different interpretation in interactions (1) and (2). This is an interesting observation, but the difference in interpretation between (1) and (2) hinges on the dialogue move (e.g., questioning, answering, checking, informing) being performed at that point. Because dialogue moves are generally associated with particular speakers, it is obviously crucial that interlocutors monitor the source of an utterance when interpreting it (as also follows from results like those of Metzing & Brennan 2003). For example, the speaker treats a question from his interlocutor differently from the way he would treat a question from himself. We accept that interlocutors can monitor the source of a contribution (i.e., they can differentiate between what they are saying and what their partner is saying) and can take this into account in their interpretation at the level of the dialogue move.

Cutting proposes parity for semantic but not phonological representations on the basis of picture-word interference experiments. From his brief description, we suggest that participants process the words that they actually produce both semantically and phonologically, but that they process the words that they are told to ignore semantically but not phonologically (or at least not to a sufficient depth to affect priming). **Krauss & Pardo** also question evidence for phonological alignment (and by implication for phonological parity). Although we accept that Goldinger (1998) does not directly demonstrate phonological alignment, recent evidence does support parity between production and comprehension at this level (Fowler et al. 2003).

Kempson defends a more radical proposal that parity comes from the symmetry between production and parsing processes. In her Dynamic Syntax account of parsing, syntactic information is combined with lexical information, which define semantic interpretations that are built up word-by-word. Production is assumed to work in essentially the same way. Hence, she sees interactive alignment as operating at the level of the production and parsing processes themselves. This is a challenging linguistic proposal, but it would need explicit modeling before it could be incorporated into a mechanistic account of language processing in dialogue.

R6. Is it only misunderstanding that drives interactive repair?

One concern is whether interactive repair is driven primarily by comprehension failure, as we proposed in section 4.3 of the target article. **Healey** points out that even in the context of Garrod and Anderson's (1987) maze-game dialogues, interlocutors change their description scheme in a systematic fashion (e.g., shifting from a *path* or *figural* scheme to a *line* or *matrix* scheme). He argues that it is unlikely that this systematic shift can be accounted for only in terms of an interactive repair mechanism based on comprehension failure. Of course we recognize (see sect. 4.4 of the target article) that alignment does not depend only upon this process. There are many things that determine what people choose to say and even how they do so which go beyond the simple automatic mechanisms discussed in the target article. For example, the shift in description scheme that Healey mentions probably reflects two opposing pressures. Whereas the abstract *line* and *matrix* descriptions are more efficient over a period of time than *figural* or *path* descriptions (e.g., a *line* or *matrix* description involves few words and is not influenced by whether the position is near a salient point in the maze or lies in a salient pattern), they are more difficult to align (e.g., *matrix* descriptions depend upon alignment of the origin and of the counting conven-

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

tions used). So they can often not be used securely until there is a richer implicit common ground (e.g., repeated use of path descriptions which begin at one corner of the maze can lead to this corner being adopted as the origin for matrix description). We suspect that once the implicit common ground has become sufficiently rich to support the more abstract description, a speaker is more likely to adopt that scheme when he encounters a position that is particularly awkward to describe even when it requires a violation of alignment.

Note that this shift occurs without the speaker having to take account of the listener's knowledge. **Healey** therefore brings up an important general point, that interlocutors can go beyond interactive alignment and repair in ways that do not require other-modeling or the establishment of a full common ground. For example, a speaker can decide that a representational scheme is unnecessarily complex or a referring expression is unnecessarily long even if the interlocutors have aligned on that scheme or expression. Similarly, in preparing lectures, I might change how I am speaking on the basis of my knowledge of the audience (full common ground), but I might also do it on the basis that "Hang on, I'm not doing this efficiently, given my own resources – I am trying to remember too much and can't manage it." This might be argued to involve access to a second model of one's own mental state, which is therefore costly, but less costly than keeping track of full common ground. Such decisions require there to be some inhibition of the basic alignment process in light of a conflicting goal (see sect. R4). In conclusion, Healey's point reflects something that is additional to our account rather than in conflict with it (cf. **Krauss & Pardo**, who point out that not only misunderstanding drives accommodation).

R7. Other modeling

Although interlocutors undeniably do pay attention to each others' mental states on occasion, our contention is that such other-modeling is resource-intensive, essentially because it involves storing two representations: a representation of one's own state of knowledge, and a separate representation of one's partner's state of knowledge. We therefore believe that most of the process of alignment occurs via the interactive-alignment mechanism where other-modeling is not required. But we stress that other-modeling is not purely used for "difficult" cases of interactive repair when automatic processes fail to work. When a boy decides to tell his mother what happened at school today, he presumably realizes that his mother does not know about the event in question, and therefore that he knows something that his mother does not know. This explicit modeling of the difference between knowledge states leads to him running to tell his mother about the event, and does not follow from the failure of interactive alignment and interactive repair. Similarly, a bilingual decides which language to speak on the basis of his assumptions about which language his listener knows. However, the undeniable use of such "broad-brush" other-modeling does not mean that other-modeling is employed in a fine-grained way to explain detailed decisions about one's individual contributions to an ongoing dialogue.

In this context, **Krauss & Pardo** point to evidence that speakers sometimes modulate their utterances to take into account their knowledge of the listener: They produce more informative contributions when they perceive their addressees to be less knowledgeable about the relevant topic (see also Isaacs & Clark 1987). The evidence from Kingsbury (1968) shows that speakers do not simply pay attention to what they believe about their specific interlocutor but make inferences about how much such a person is likely to know on the basis of the evidence at hand, which is, in this case, made quite deliberately apparent to the speaker (e.g., the questioner frames a question to stress his ignorance of the city). In general, we suspect that speakers make a one-off decision based on such issues as the perceived expertise of their addressees about how to frame their contributions (e.g., the decision not to make any assumptions about local geographic knowledge). A teacher can be much less explicit in the common room than in the classroom, and a mother does not speak motherese to her friends. Such decisions need not remain fixed for the whole conversation (e.g., they might change when the speaker guesses that his addressee is not a local but then realizes he is mistaken). But such a change is very different from a continuous, dynamic process of utterance accommodation based on full common-ground inference, which we argue to be implausible for reasons of resource limitations (see sect. 4.1 of the target article). We are therefore grateful to Krauss & Pardo for stressing that explicit modeling does not only occur when automatic processes fail to produce alignment, but we see no concern for our assumption that automatic mechanisms underlie alignment.

Fussell & Kraut argue that speakers with different views of a spatial scene take into account the listener's perspective, in effect modeling the listener's mental state. They describe a collaborative bicycle repair situation in which an expert helper guides a novice repairer. They note that when the repairer knows that he can be seen even when he cannot see his remote helper, he will use deictic expressions to describe the things in front of him (e.g., *See this piece*, while pointing at a cycle component), whereas the remote helper will not (e.g., *See the derailleur*). They argue that this is inconsistent with alignment and provides further evidence of other modeling. We are not convinced. We suspect that speakers in this situation prefer to use deictic expressions because they are shorter, do not require word finding, and so on. But deixis is not an option for the remote helper because he cannot point to anything. Instead, he has to fall back on more complex nondeictic descriptions. (One remote helper is quoted as saying in frustration, "If I could point to it, it's right there"; Kraut et al. 2003, p. 36.) So the circumstances may force the speaker to use a more complex nonaligned utterance. It is of course reasonable that alignment is broken under such circumstances, because it simply would not work. One important point this raises is that the tendency toward alignment is likely to be stronger under conditions where two interlocutors are placed in comparable environments. Presumably this reflects nonlinguistic contributions to linguistic alignment (see also the discussion of **Dominey** in sect. R11).

Nevertheless, we certainly agree with the general point that when communicators share a physical situation they take situational awareness into account in formulating utterances. But is this evidence for listener modeling? In the "side-by-side" situation described by Kraut et al. (2003, communicators use direction of gaze to establish joint attention, but the effect of one partner's point of gaze on the

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

other partner's focus of attention reflects low-level mechanisms which do not depend on inferences about the partner's mental state (see Schuller & Rossion 2001). And, because in this situation what is accessible to the speaker will usually be equally accessible to the partner (see sect. 4.1), an essentially egocentric approach will generally support successful communication without requiring speakers to model their listeners.

Schober suggests that current evidence cannot distinguish two possibilities: that interlocutors only model each other's mental states under exceptional circumstances, and that interlocutors normally model each other's mental states and only fail to do so when under great cognitive load or when circumstances weigh heavily against doing so. We accept that current evidence does not distinguish between these two positions. However, our account assumes the use of fewer resources and is parsimonious (obviously, an account containing two mental models is harder to falsify than an account limited to one, just as a parallel account is harder to falsify than a serial account). Moreover, Schober's proposal cannot hold for multiparty dialogues containing more than a small number of people, because it must become impossible to retain and regularly update a different mental model for each person. In general, cognitive psychology teaches us that constructing mental models is hard and holding onto different models at the same time is especially hard (e.g., Johnson-Laird 1983). We suggest that the paradox of how one can know when to model one's partner is easy to accommodate: Contributions to the dialogue will make it clear that alignment is breaking down, and if interactive repair does not solve the problem, the interlocutor is forced to assume that what his partner knows is likely to be different from what he knows. Even in such cases, it may be that interlocutors only model those differences between themselves and their partners that need to be modeled in order to allow the recovery of alignment.

Brennan & Metzing also criticize our assumption that interlocutors do not routinely employ full common ground. A fast-growing body of literature suggests that interlocutors sometimes do pay attention to each others' knowledge in comprehension and production (e.g., Hanna et al. 2003; Lockridge & Brennan 2002; Nadig & Sedivy, 2002) and sometimes do not (e.g., Brown & Dell 1987; Ferreira & Dell 2000; Keysar et al. 2003). It is too early to say precisely when such knowledge can affect processes of production and comprehension, but current evidence suggests both that interlocutors can immediately draw upon knowledge about differences between their own knowledge and their beliefs about their partner's knowledge, and that interlocutors can make egocentric decisions about production and comprehension. Most of these studies involve a fairly artificial situation in which the experimental subject is informed that his interlocutor may have knowledge about the situation that differs from his in quite specific ways. Experiments like that of Hanna et al. (2003) show that it can be straightforward to add *one fact* about your interlocutor – namely, that he does not have access to a particular piece of information that you have. Even in such cases, some egocentric behavior remains, as Hanna et al. acknowledge and Keysar et al. (2003) demonstrate. But adding one fact about your interlocutor's knowledge is quite different from maintaining a full representation of the interlocutor's situation model, and performing reasoning based on that model. Available resources do not normally allow interlocutors to constantly update models of each others' mental states. However, this does not lead to communicative breakdown because aligned interlocutors develop the same situation models.

In response to **Brennan & Metzing**, we stress that it was not our intention to commit to a two-stage account (e.g., Horton & Keysar 1996), in which other modeling occurs during revision but not during initial processing (whether production or comprehension). We note that **Krauss & Pardo** and **Brown-Schmidt & Tanenhaus** also interpret us as making this proposal, and accept that we did not make this very clear. Rather, we claim that "performing inferences about common ground is an optional strategy that interlocutors employ only when resources allow" (target article, sect. 4.2, para. 4).

We do not regard Metzing and Brennan's (2003) demonstration of partner-specific effects as problematic, and assume they can be explained in similar ways to Branigan et al.'s (2003) demonstration that syntactic alignment is sensitive to participant status (see sect. 2.3 of the target article). As we have pointed out in section R4 of this response, we assume that alignment is automatic at a postconscious level (Bargh 1989) and, hence, can be affected by a range of social factors from stereotype activation to participant status. A particular speaker is associated with a particular form, and breaking that association causes disruption. There is no need for other modeling to occur in this process of partner-specific lexical entrainment. The term *conceptual pact* appears to suggest that other modeling is used in lexical entrainment. If so, we would question whether it is generally appropriate.

R8. Routines

Schiller & de Ruiter propose that interactive alignment necessarily involves selecting stored fragments from previous utterances. This corresponds to our notion of routinization (see sect. 5 of the target article). We suspect that routinization comes about as a result of a longer lasting alignment mechanism based on memory retrieval rather than transient activation. This is because routines reflect multiple links between different levels of representation (e.g., they fix the relation between a word and its meaning, its syntactic form, and even its interpretation within a situation model) and it is difficult to imagine how this could be captured and routinized through purely transient activation. Rather than assume that routinization is the sole explanation of alignment, we suggest that it is a consequence of implicit learning but that transient activation also promotes alignment (see sect. R3). It may of course be that routines emerge from a resonance process, as **Goldinger & Azuma** suggest. In addition, because routinization works by linking levels of representation, it may explain how alignment percolates up from lower to higher levels (cf. issues raised by **Warren & Rayner** and **Branigan**, as discussed in sect. R3).

Within the interactive-alignment account, we regard routines as an extreme case of alignment, involving a fixed form and interpretation. It may be best to think of routinization as falling on a continuum, with expressions that contain some fixed elements (as in many of Kuiper's 1996 examples) being more or less "semi-routinized." Assuming that it is correct to regard alignment as a mixture of tran-

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

sient activation and implicit learning, we propose that the more routinized an expression is, the more it is best explained in terms of implicit learning – for the purposes of the conversation at least, the expression and its interpretation are stored and retrieved. Of course, if an expression becomes sufficiently entrenched, it may survive that conversation. Although other frameworks are no doubt possible, we regard Jackendoff's (2002) account of fixed and semi-fixed expressions as an appropriate representational scheme for semi- and completely routinized expressions (see Pickering & Garrod, in press, for discussion).

R9. Self-monitoring

Schiller & de Ruiter question our claim that self-monitoring can occur at any level of linguistic representation that can be aligned. We did not claim that there is conclusive evidence for this hypothesis and we believe that careful empirical work is needed to distinguish our proposal from the proposal that monitoring works externally on sound and internally on phonological representations alone. However, we would query whether the reported evidence provides strong support for this alternative proposal. First, the comparative slowness of selecting a gender label in comparison to selecting the indefinite article in French may have many explanations, perhaps most likely that selecting between genders is a more abstract and difficult task than selecting between (very common) words. Second, the strong evidence for monitoring of various aspects of phonological representations is completely compatible with monitoring of other linguistic representations. Although some or all gender-congruency effects in picture-word interference tasks may really be determiner congruency effects (Schiller & Caramazza 2003), there is also considerable evidence that grammatical gender can be accessed when phonological form is not available (Badecker et al. 1995; Vigliocco et al. 1997). Therefore, it is at least plausible that people can directly monitor for errors of grammatical gender and indeed for other aspects of syntactic representations. If an utterance is ill-formed at different levels of representation simultaneously, we suspect that there may be a race between monitoring processes at these different levels, in which case it might not always be possible to detect monitoring that takes place at the "slower" level.

R10. On the difference between dialogue and monologue

A number of commentators argue that language processing in dialogue is not fundamentally different from that in monologue. For example, both **Barr & Keysar** and **Glucksberg** point out that the same basic language processes operate in monologue and dialogue so there is no principled difference between the two. We agree in the sense that the actual production and comprehension mechanisms are the same (at what we might term a "microlevel"). However, the radically different contexts in which they operate lead to very different results. For example, a speaker's utterances are dramatically affected by the presence of the interlocutor – the speaker aligns with the interlocutor's utterances via the mechanisms we have described. In this respect we argue that the language processing system is designed for dialogue rather than monologue. As a result, speakers have to learn special strategies to deal with monologue which are not required during dialogue processing.

We agree with **Glucksberg** that dialogue is not necessarily easier than monologue, and accept that contextual effects can be very strong in monologue. We propose that the priming mechanisms are ideally suited for dialogue. Presumably they have developed from imitation (Arbib, in press) and it may be that the organization of dialogue (e.g., time between turns) is optimal for the mechanisms of priming. Therefore, dialogue does not need to rely on nonautomatic inference. In contrast, monologue cannot use priming between interlocutors (by definition) and therefore has to rely on inference, other-modeling, and so on. Priming is of course present in monologue, but we contend that it is far less useful than in dialogue (e.g., repetition is much rarer in monologue than in dialogue; see sect. 5.1 of the target article). So we concur that there is not a principled distinction between dialogue and monologue, but at the same time maintain that dialogue will usually but not always be easier than monologue.

Barr & Keysar appear to disagree with us more than we think they actually do. They are mistaken in assuming that we propose a categorical distinction between monologue and dialogue. In section 8 of the target article, we refer to a "dialogic continuum" with monologue at one end, and fully interactive dialogue at the other. We assume that the same mechanisms are present in dialogue and monologue (i.e., people do not set some processing "switch"). In true monologue, the speaker has no interlocutor to align with. He can of course align with himself and certainly does so (e.g., re-using the same word with the same meaning). We completely agree that dialogues go through various stages, with some involving rapid turn-taking (e.g., question answering) and some involving much more limited feedback (e.g., during narratives). Boden (1994) distinguishes between conversational phases and presentational phases in group discussion. These presentational phases are *not* monologues, as even minimal feedback affects them considerably (Bavelas et al. 2000).

Hence, we stress that monologue and dialogue lie on a continuum, and we predict that the degree of alignment will be affected by the position on the continuum. One important area for research is to consider the effects of dialogue genre on alignment (in which context we can regard monologue as particular genre). For example, **Schegloff** points to the importance of different speech-exchange systems (conversation, interview, giving a speech, etc.) in affecting the characteristics of the dialogue (e.g., turn-taking behavior, routinization). We predict that the rate and characteristics of alignment are not constant for all forms of dialogue, but will depend on the speech-exchange system. For example, forms of interaction that do not allow unconstrained feedback and where turn-taking is externally managed (e.g., interviews) will fail to employ the interactive repair mechanism to the extent that is possible in casual conversation.

R11. Extensions and discussion

Schegloff argues that our mechanistic account fails to consider the richness of the interaction afforded by dialogue. Although Schegloff's sociological starting point (i.e., in terms of organizational practice and interaction contingen-

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

cies) is somewhat different from ours, we certainly agree that there are additional specific details of dialogue organization that must enter into any complete mechanistic account. We also recognize the considerable contribution that Schegloff and colleagues have made in mapping out the details of these organizational practices and the contingencies they afford. However, our mechanistic aspiration goes beyond mapping out such practices and contingencies. Like **Brown-Schmidt & Tanenhaus** we believe that a mechanistic account should make it possible to formulate a computational model of the processes involved in the comprehension and production of dialogue and how these take advantage of the interactional nature of dialogue. We also recognize that any complete model will have to take account of both self and other commitments in dialogue processing (see our response to **Ginzburg** in sect. R5). We stress that our paper is entitled "*Toward* a mechanistic psychology of dialogue"!

Two commentators argue for a broadening of the interactive alignment account to include other interactive situations. **Mazur** proposes that interactive alignment needs to be embedded in a broader theory of communication that pays attention to a range of social conventions. We agree that a full theory of interactive alignment will make reference to nonlinguistic as well as linguistic information, and believe that our suggestions about the relations between our account and implicit social cognition is a step in this direction.

Dominey draws interesting parallels between the interactive alignment process in adult dialogue and certain features of language acquisition. Language learning depends upon extralinguistic or prelinguistic alignment mechanisms (e.g., establishing joint attention on intended referents through gaze direction or postural orientation). Also, there is evidence that routinization of utterances associated with repeated action scenarios (feeding, bathing, etc.) may play an important role in the acquisition of syntax (Tomasello 2003). These suggestions help reinforce the claim that nonlinguistic alignment may lead to linguistic alignment, just as linguistic alignment at one level leads to linguistic alignment at other levels (see our discussion of **Fussell & Kraut** in sect. R7). In fact, Dominey suggests that such linguistic/nonlinguistic links are necessary to explain the process of language acquisition, where one partner (the infant) does not initially have linguistic abilities. A full theory of how interactive alignment might explain acquisition would be fascinating. In particular, we are intrigued by the suggestion that learning by alignment might avoid the enlistment of generative grammar mechanisms, perhaps in a way similar to that envisaged by Tomasello.

Language acquisition is a good example of how it may be possible to extend our account into new domains. Other areas that we have highlighted at various points in the target article and this response include social psychology and human-computer interaction. A recurring theme is that it may be sensible to include nonlinguistic alignment into developments of our model; interlocutors who are aligned in nonlinguistic (e.g., body posture) or paralinguistic (e.g., tone of voice) ways may be more likely to align linguistically.

We emphasize that our use of the term "priming" is at a fairly abstract functional level, as our notion of automaticity makes clear (sect. R4). It allows nonconscious mediation by factors that may originate in distinctions that interlocutors are aware of (e.g., participant status, social status, cooperativeness). We also note that "priming" may employ transient activation or implicit learning or both. To be more speculative, we suspect that interactive alignment may work by two distinct mechanisms: a brief activation-based process that may not be affected by intentional distinctions, and a longer-lasting memory-based process that is intentionally mediated. The effects of these two processes will depend on precise timing, and will therefore be differentially affected by aspects of the conversation that affect timing. For example, a high-engagement face-to-face dialogue between intimate friends may result in timing that is precisely attuned to increasing alignment, whereas a dialogue between strangers that depend on external factors such as rules of engagement (e.g., in an interview) or technology (e.g., walkie-talkies) may not. We suspect that the longer-lasting process will not be affected but the activation process might be impaired in low-involvement dialogue. These speculative comments could inform an extensive program of empirical research concerned with the conditions that lead to alignment in dialogue (e.g., its time course).

The other obvious area for development is explicit computational modeling, as highlighted by **Brown-Schmidt & Tanenhaus** in particular. To perform such modeling, it would of course be necessary to explicate many assumptions of our account that are currently vague or implicit, for instance by developing interactive alignment, interactive repair, and other-modeling components. It would be necessary to model the process whereby alignment at one level leads to alignment at other levels, and to understand how conflicts of alignment are resolved (see **Warren & Rayner**). We need to know whether transient activation and implicit learning should be distinguished, and if so, how they interact. Finally, any such account should explain the process of routinization and describe its effects on alignment.

NOTE

1. Note that the uses of "interactive" in *interactive alignment* and *interactive activation* are unrelated.

References

Letters "a" and "r" appearing before authors' initials refer to target article and response respectively.

Ades, A. & Steedman, M. J. (1982) On the order of words. *Linguistics and Philosophy* 4:517–58. [aMJP]

Aijmer, K. (1996) *Conversational routines in English: Convention and creativity.* Longman. [aMJP]

Allen, J. F., Byron, D. K., Dzikovska, M., Ferguson, G., Galescu, L. & Stent, A. (2001) Towards conversational human-computer interaction. *AI Magazine* 22:27–35. [SB-S]

Altenberg, B. (1990) Speech as linear composition. In: *Proceedings from the Fourth Nordic Conference for English Studies,* ed. G. Caie, K. Haastrup, A. L. Jakobsen, J. E. Nielsen, J. Sevaldsen, H. Specht & A. Zettersten, pp. 133–43. University of Copenhagen. [aMJP]

Altmann, G. T. & Steedman, M. J. (1988) Interaction with context during human sentence processing. *Cognition* 30:191–238. [aMJP]

Amis, K. (1997) *The King's English: A guide to modern English usage.* Harper Collins. [aMJP]

Anderson, A. H. & Boyle, E. (1994) Forms of introduction in dialogues: Their discourse contexts and communicative consequences. *Language and Cognitive Processes* 9:101–22. [aMJP]

Arbib, M. A. (in press) From monkey-like action recognition to human language: An evolutionary framework for neurolinguistics. *Behavioral and Brain Sciences.* [rMJP]

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

Badecker, W., Miozzo, M. & Zanuttini, R. (1995) The dissociation of form-based lexical retrieval from access to word-specific aspects of grammar: Evidence for two-stage lexical processing. *Cognition* 57:193–216. [rMJP]

Balota, D. A. (1990) The role of meaning in word recognition. In: *Comprehension processes in reading,* ed. D. A. Balota, G. B. Flores d'Arcais & K. Rayner. Erlbaum. [JCC]

Balota, D. A., Paul, S. T. & Spieler, D. H. (1999) Attentional control of lexical processing pathways during word recognition and reading. In: *Language processing,* ed. S. Garrod & M. Pickering. Psychology Press. [aMJP]

Bard, E. G., Anderson, A. H., Sotillo, C., Aylett, M., Doherty-Sneddon, G. & Newlands, A. (2000) Controlling the intelligibility of referring expressions in dialogue. *Journal of Memory and Language* 42:1–22. [aMJP]

Bargh, J. A. (1989) Conditional automaticity: Varieties of automatic influence in social perception and cognition. In: *Unintended thoughts,* ed. J. S. Uleman & J. A. Bargh, pp. 3–51. Guilford Press. [rMJP, HS]

Bargh, J. A. & Chartrand, T. L. (1999) The unbearable automaticity of being. *American Psychologist* 54:462–79. [aMJP]

Bargh, J. A., Chen, M. & Burrows, L. (1996) Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology* 71:230–44. [aMJP]

Baron-Cohen, S., Tager-Flusberg, H. & Cohen, D. (2000) *Understanding other minds: Perspectives from developmental neuroscience.* Oxford University Press. [aMJP]

Barr, D. J. & Keysar, B. (2002) Anchoring comprehension in linguistic precedents. *Journal of Memory and Language* 46:391–418. [DJB]

(in press) Making sense of how we make sense: The paradox of egocentrism in language use. In: *Figurative language comprehension: Social and cultural influences,* ed. H. L. Colston & A. N. Katz. Erlbaum. [DJB]

Barton, S. & Sanford, A. J. (1993) A case-study of pragmatic anomaly-detection: Relevance-driven cohesion patterns. *Memory and Cognition* 21:477–87. [rMJP]

Barwise, J. (1989) Three views of common knowledge. In: *The situation in logic,* ed. J. Barwise. CSLI. [aMJP]

Bates, E. & MacWhinney, B. (1987) Competition, variation and language learning. In: *Mechanisms of language acquisition,* ed. B. MacWhinney & E. Bates. Erlbaum. [PFD]

Bavelas, J. B., Coates, L. & Johnson, T. (2000) Listeners as co-narrators. *Journal of Personality and Social Psychology* 79:941–52. [arMJP]

Binder, K. S. & Rayner, K. (1998) Context strength does not modulate the subordinate bias effect: Evidence from eye fixations and self-paced reading. *Psychonomic Bulletin and Review* 5:271–76. [aMJP]

Bock, J. K. (1986a) Meaning, sound, and syntax: Lexical priming in sentence production. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 12:575–86. [aMJP]

(1986b) Syntactic persistence in language production. *Cognitive Psychology* 18:355–87. [aMJP]

(1989) Closed class immanence in sentence production. *Cognition* 31:163–86. [aMJP]

(1996) Language production: Methods and methodologies. *Psychonomic Bulletin and Review* 3:395–421. [JCC, aMJP]

Bock, J. K. & Griffin, Z. M. (2000) The persistent of structural priming: Transient activation or implicit learning? *Journal of Experimental Psychology: General* 129:177–92. [JCC, MK, rMJP]

Bock, J. K. & Huitema, J. (1999) Language production. In: *Language processing,* ed. S. Garrod & M. Pickering. Psychology Press. [aMJP]

Bock, J. K. & Levelt, W. J. M. (1994) Language production: Grammatical encoding. In: *Handbook of psycholinguistics,* ed. M. A. Gernsbacher, pp. 945–84. Elsevier/Academic Press. [JCC, aMJP]

Bock, J. K. & Loebell, H. (1990) Framing sentences. *Cognition* 35:1–39. [aMJP]

Bock, J. K., Loebell, H. & Morey, R. (1992) From conceptual roles to structural relations: Bridging the syntactic cleft. *Psychological Review* 99:150–71. [aMJP]

Boden, D. (1994) *The business of talk.* Polity Press. [rMJP]

Boroditsky, L. (2000) Metaphorical structuring: Understanding time through spatial metaphors. *Cognition* 75:1–28. [aMJP]

Bourhis, R. Y. & Giles, H. (1977) The language of intergroup distinctiveness. In: *Language, ethnicity and intergroup relations,* ed. H. Giles, pp. 119–35. Academic Press. [RMK]

Branigan, H. P., Pickering, M. J. & Cleland, A. A. (1999) Syntactic priming in written production: Evidence for rapid decay. *Psychonomic Bulletin and Review* 6:635–40. [rMJP]

(2000) Syntactic coordination in dialogue. *Cognition* 75:B13–B25. [arMJP]

(submitted) Syntactic alignment and participant status in dialogue. [arMJP]

Brennan, S. E. & Clark, H. H. (1996) Conceptual pacts and lexical choice in conversation. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 22:1482–93. [arMJP]

Brennan, S. E. & Schober, M. F. (2001) How listeners compensate for dysfluencies in spontaneous speech. *Journal of Memory and Language* 44:274–96. [aMJP]

Brooks, P. & Tomasello, M. (1999) Young children learn to produce passives with nonce verbs. *Developmental Psychology* 35:29–44. [aMJP]

Brown, P. M. & Dell, G. S. (1987) Adapting production to comprehension: The explicit mention of instruments. *Cognitive Psychology* 19:441–72. [SEB, arMJP]

Brown-Schmidt, S., Campana, E. & Tanenhaus, M. K. (2002) Reference resolution in the wild: How addresses circumscribe referential domains in a natural, interactive problem-solving task. Paper presented at the Annual Meeting of the Cognitive Science Society, Fairfax, VA, August 2002. [SB-S]

(in press) Real-time reference resolution by naïve participants during a task-based unscripted conversation. In: *Approaches to studying world-situated language use: Bridging the language-as-product and language-as-action traditions,* ed. J. C. Trueswell & M. K. Tanenhaus. MIT Press. [SB-S, aMJP]

Burnard, L. (2000) *Reference guide for the British National Corpus (World Edition).* Oxford University Computing Services. [aMJP]

Calvert, G. A., Bullmore, E. T., Brammer, M. J., Campbell, R., Williams, S. C. R., McGuire, P. K., Woodruff, P. W. R., Iversen, S. D. & David, A. S. (1997) Activation of auditory cortex during silent lipreading. *Science* 276:593–96. [aMJP]

Capella, J. (1981) Mutual influence in expressive behavior: Adult-adult and infant-adult dyadic interaction. *Psychological Bulletin* 89:101–32. [SDG]

Caramazza, A. (1991) *Issues in reading, writing, and speaking. A neuropsychological perspective.* Kluwer Academic. [JCC]

(1997) How many levels of processing are there in lexical access? *Cognitive Neuropsychology* 14:177–208. [aMJP]

Carlson, K. (2001) The effects of parallelism and prosody in the processing of gapping structures. *Language and Speech* 44:1–26. [aMJP]

Carlson-Radvansky, L. A. & Jiang, Y. (1998) Inhibition accompanies reference frame selection. *Psychological Science* 9:386–91. [aMJP]

Carpenter, G. & Grossberg, S. (1987) A massively parallel architecture for a self-organizing neural recognition machine. *Computer Vision, Graphics, and Image Processing* 37:54–115. [SDG]

Carpenter, G. & Grossberg, S., eds. (1991) *Pattern recognition by self-organizing neural networks.* MIT Press. [SDG]

Chambers, C. G., Tanenhaus, M. K., Eberhard, K. M., Filip, H. & Carlson, G. N. (2002) Circumscribing referential domains in real-time sentence comprehension. *Journal of Memory and Language* 47:30–49. [aMJP]

Chang, F., Dell, G. S., Bock, J. K. & Griffin, Z. M. (2000) Structural priming as implicit learning: A comparison of models of sentence production. *Journal of Psycholinguistic Research* 29:217–29. [rMJP]

Charniak, E. (1993) *Statistical language learning.* MIT Press. [aMJP]

Chartrand, T. L. & Bargh, J. A. (1999) The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology* 76:893–910. [arMJP]

Cherry, E. C. (1956) *On human communication.* MIT Press. [aMJP]

Chomsky, N. (1965) *Aspects of the theory of syntax.* MIT Press. [HPB, aMJP]

(1973) Conditions on transformations. In: *A Festschrift for Mossis Halle,* ed. S. R. Anderson & R. Kiparsky, pp. 232–86. Holt, Rinehart and Winston. [FF]

(1981) *Lectures on government and binding.* Foris. [aMJP]

(1995) *The minimalist program.* MIT Press. [aMJP]

Christiansen, M. H. & Chater, N. (2001) Connectionist psycholinguistics: Capturing the empirical data. *Trends in Cognitive Sciences* 5:82–8. [SB-S]

Clark, E. V. (1993) *The lexicon in acquisition.* Cambridge University Press. [aMJP]

Clark, H. H. (1979) Responding to indirect speech acts. *Cognitive Psychology* 11:430–77. [aMJP]

(1985) Language and language users. In: *The handbook of social psychology, 3rd edition,* ed. G. Lindzey & E. Aronson. Harper Row. [aMJP]

(1992) *Arenas of language use.* University of Chicago Press. [aMJP]

(1996) *Using language.* Cambridge University Press. [JG, SG, RMK, ABM, aMJP]

(1998) Communal lexicons. In: *Context in language learning and language understanding,* ed. K. Malmkjoer & J. Williams. Cambridge University Press. [aMJP]

Clark, H. H. & Marshall, C. R. (1981) Definite reference and mutual knowledge. In: *Elements of discourse understanding,* ed. A. K. Joshi, I. A. Sag & B. L. Webber. Cambridge University Press. [DJB, SRF, JG, aMJP]

Clark, H. H. & Murphy, G. L. (1982) Audience design in meaning and reference. In: *Language and comprehension,* ed. J. F. Le Ny & W. Kintsch. North-Holland. [RMK, aMJP]

Clark, H. H. & Schaefer, E. F. (1987) Concealing one's meaning from overhearers. *Journal of Memory and Language* 26:209–25. [aMJP]

Clark, H. H. & Schober, M. F. (1991) Asking questions and influencing answers. In: *Questions about questions: Inquiries into the cognitive bases of surveys,* ed. J. M. Tanur, pp. 15–48. Russell Sage Foundation. [MFS]

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

Clark, H. H. & Wilkes-Gibbs, D. (1986) Referring as a collaborative process. *Cognition* 22:1–39. [arMJP, MFS]

Cleland, A. A. & Pickering, M. J. (2003) The use of lexical and syntactic information in language production: Evidence from the priming of noun-phrase structure. *Journal of Memory and Language* 49:214–30. [arMJP]

Clement, C. A. & Gentner, D. (1991) Systematicity as a selection constraint in analogical mapping. *Cognitive Science* 15:89–132. [ABM]

Coates, J. (1990) Modal meaning: The semantic-pragmatic interface. *Journal of Semantics* 7:53–64. [aMJP]

Conrad, F. G. & Schober, M. F. (2000) Clarifying question meaning in a household telephone survey. *Public Opinion Quarterly* 64:1–28. [MFS]

Consortium, T. T. (2000) *The TRINDI Book.* University of Gothenburg. Available at: http://www.ling.gu.se/research/projects/trindi. [JG]

Cooper, R., Larsson, S., Hieronymus, J., Ericsson, S., Engdahl, E. & Ljunglof, P. (2000) GODIS and questions under discussion. In: *The TRINDI Book.* University of Gothenburg. Available at: http://www.ling.gu.se/research/projects/trindi. [JG]

Creswell, C. (2002) Resumptive pronouns, wh-island violations, and sentence production. In: *Proceedings of the Sixth International Workshop on Tree Adjoining Grammar and Related Frameworks (TAG+6)*, pp. 101–109. Universita di Venezia. [FF]

Cutting, J. C. (1998) The production and comprehension lexicons: What is shared and what is not. Doctoral dissertation, University of Illinois, 1997. *Dissertation Abstracts International: Section B: The Sciences and Engineering* 58:10–B. [JCC]

Cutting, J. C. & Bock, J. K. (1997) That's the way the cookie bounces: Syntactic and semantic components of experimentally elicited idiom blends. *Memory and Cognition* 25:57–71. [JCC, aMJP]

de Boer, B. (2000) Self-organization in vowel systems. *Journal of Phonetics* 28:441–65. [SDG]

Dell, G. S. (1986) A spreading-activation theory of retrieval in sentence production. *Psychological Review* 93:283–321. [SDG, aMJP]

Dell, G. S, Chang, F. & Griffin, Z. M. (1999) Connectionist models of language production: Lexical access and grammatical encoding. *Cognitive Science* 23:517–42. [JCC]

Desrochers, A. & Paivio, A. (1990) Le phonem initial des noms inanimes et son effet sur l'identification du genre grammatical [The initial phoneme of inanimate nouns and its effect for the identification of grammatical gender]. *Canadian Journal of Psychology* 44:44–57. [NOS]

Desrochers, A., Paivio, A. & Desrochers, S. (1989) L'effet de la frequence d'usage des noms inanimes et de la valeur predictive de leur terminaison sur l'identification du genre grammatical [The effect of frequency of usage of inanimate nouns and of the predictive value of their endings on the identification of grammatical gender]. *Canadian Journal of Psychology* 43:62–73. [NOS]

Dijksterhuis, A. & Bargh, J. A. (2001) The perception-behavior expressway: Automatic effects of social perception on social behavior. In: *Advances in experimental social psychology, vol. 33*, ed. M. P. Zanna, pp. 1–40. Academic Press. [arMJP]

Dijksterhuis, A. & van Knippenberg, A. (1998) The relation between perception and behavior or how to win a game of Trivial Pursuit. *Journal of Personality and Social Psychology* 74:865–77. [aMJP]

Doherty-Sneddon, G., Anderson, A. H., O'Malley, C., Langton, S., Garrod, S. & Bruce, V. (1997) Face-to-face and video-mediated communication: A comparison of dialogue structure and task performance. *Journal of Experimental Psychology: Applied* 3:105–25. [aMJP]

Dominey, P. F. (2000) Conceptual grounding in simulation studies of language acquisition. *Evolution of Communication* 4(1):57–85. [PFD]

(2003a) Learning grammatical constructions in a miniature language from narrated video events. In: *Proceedings of the 25th Annual Meeting of the Cognitive Science Society.* (in press). Available at: http://www.isc.cnrs.fr/wp/DomineyISC-WP0.pdf. [PFD]

(2003b) Learning grammatical constructions from narrated video events for human-robot interaction. In: *Proceedings of the 2003 IEEE Humanoid Robot Conference, Karlsruhe, Germany.* [PFD]

Drew, P. (1997) "Open" class repair initiators in response to sequential sources of troubles in conversation. *Journal of Pragmatics* 28:69–101. [EAS]

Duffy, S. A., Morris, R. K. & Rayner, K. (1988) Lexical ambiguity and fixation times in reading. *Journal of Memory and Language* 27:429–46. [aMJP]

Epley, N. & Gilovich, T. (1999) Just going along: Nonconscious priming and conformity to social pressure. *Journal of Experimental Social Psychology* 35:578–89. [rMJP]

Fay, N., Garrod, S. & Carletta, J. (2000) Group discussion as interactive dialogue or as serial monologue: The influence of group size. *Psychological Science* 11:481–86. [aMJP]

Fernández, R. & Ginzburg, J. (2002) Non-sentential utterances: Grammar and dialogue dynamics in corpus annotation. In: *Proceedings of the 19th International Conference on Computational Linguistics (CoLing),* pp. 253–59. Morgan Kaufman. [aMJP]

Ferreira, F. & Swets, B. (2003) The production and comprehension of resumptive pronouns in relative clause "island" contexts. Paper presented at the Max Planck Institute's Four Corners Workshop Series. Workshop 2: The relationship between language comprehension and language production. Nijmegen, the Netherlands, April 5, 2003. [FF]

Ferreira, V. S. & Dell, G. S. (2000) Effect of ambiguity and lexical availability on syntactic and lexical production. *Cognitive Psychology* 40:296–340. [SEB, arMJP]

Ferreira, V. S. & Griffin, Z. M. (2003) Phonological influences on lexical (mis)selection. *Psychological Science* 14:86–90. [SG]

Fodor, J. A., Bever, T. G. & Garrett, M. F. (1974) *The psychology of language.* McGraw Hill. [aMJP]

Fowler, C. A., Brown, J. M., Sabadini, L. & Weihing, J. (2003) Rapid access to speech gestures in perception: Evidence from choice and simple response-time tasks. *Journal of Memory and Language* 49:396–413. [rMJP]

Fowler, C. & Housum, J. (1987) Talkers' signaling "new" and "old" words in speech and listeners' perception and use of the distinction. *Journal of Memory and Language* 26:489–504. [aMJP]

Frazier, L. & Rayner, K. (1990) Taking on semantic commitments: Processing multiple meanings vs. multiple senses. *Journal of Memory and Language* 29:181–200. [rMJP]

Frisson, S. & Pickering, M. J. (1999) The processing of metonymy: Evidence from eye-movements. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 25:1366–83. [rMJP]

(2001) Obtaining a figurative interpretation of a word: Support for underspecification. *Metaphor and Symbol* 16:149–71. [rMJP]

Fussell, S. R. & Krauss, R. M. (1989) Understanding friends and strangers: The effects of audience design on message comprehension. *Journal of Experimental Social Psychology* 19:509–26. [RMK]

(1992) Coordination of knowledge in communication: Effects of speakers' assumptions about what others know. *Journal of Personality and Social Psychology* 62:378–91. [SG, RMK, aMJP]

Fussell, S. R., Kraut, R. E. & Siegel, J. (2000) Coordination of communication: Effects of shared visual context on collaborative work. In: *Proceedings of the CSCW 2000 Conference on Computer-Supported Cooperative Work.* ACM Press. [SRF]

Fussell, S. R., Setlock, L. D. & Kraut, R. E. (2003) Effects of head-mounted and scene-oriented video systems on remote collaboration on physical tasks. In: *Proceedings of the CHI 2003 Conference on Human Factors in Computing Systems.* ACM Press [SRF]

Gagné, C. L. (2001) Relation and lexical priming during the interpretation of noun-noun combinations. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 27:236–54. [aMJP]

Gagné, C. L. & Shoben, E. J. (2002) Priming relations in ambiguous noun-noun combinations. *Memory and Cognition* 30:637–46. [aMJP]

Garrett, M. (1980) Levels of processing in speech production. In: *Language production, vol. 1*, ed. B. Butterworth. Academic Press. [aMJP]

Garrod, S. (1999) The challenge of dialogue for theories of language processing. In: *Language processing*, ed. S. Garrod & M. Pickering. Psychology Press. [aMJP]

Garrod, S. & Anderson, A. (1987) Saying what you mean in dialogue: A study in conceptual and semantic co-ordination. *Cognition* 27:181–218. [SRF, PGTH, arMJP, TW]

Garrod, S. & Clark, A. (1993) The development of dialogue co-ordination skills in schoolchildren. *Language and Cognitive Processes* 8:101–26. [HPB, aMJP]

Garrod, S. & Doherty, G. (1994) Conversation, co-ordination and convention: An empirical investigation of how groups establish linguistic conventions. *Cognition* 53:181–215. [PGTH, aMJP]

Garrod, S. & Pickering, M. J. (2004) Why is conversation so easy? *Trends in Cognitive Sciences* 8:8–11. [rMJP]

Garrod, S. & Sanford, A. J. (1977) Interpreting anaphoric relations: The integration of semantic information while reading. *Journal of Verbal Learning and Verbal Behavior* 16:77–90. [aMJP]

Gaskell, M. G. & Marslen-Wilson, W. D. (1997) Integrating form and meaning: A distributed model of speech perception. *Language and Cognitive Processes* 12:613–56. [SDG]

Gazdar, G., Klein, E., Pullum, G. & Sag, I. A. (1985) *Generalized phrase structure grammar.* Blackwell. [aMJP]

Gentner, D. (1983) Structure-mapping: A theoretical framework for analogy. *Cognitive Science* 7:155–70. [ABM]

Gentner, D. & Markman, A. B. (1997) Structural alignment in analogy and similarity. *American Psychologist* 52(1):45–56. [ABM,arMJP]

Gerrig, R. J. & Bortfeld, H. (1999) Sense creation in and out of discourse contexts. *Journal of Memory and Language* 41:457–68. [aMJP]

Giles, H., Coupland, N. & Coupland, J. (1991) Accommodation theory: Communication, context, and consequence. In: *Contexts of accommodation:*

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

Developments in applied sociolinguistics, ed. H. Giles, J. Coupland, & N. Coupland, pp. 1–68. Cambridge University Press. [SDG, RMK, arMJP]
Giles, H. & Powesland, P. F. (1975) *Speech styles and social evaluation.* Academic Press. [aMJP]
Ginzburg, J. (1996) Interrogatives: Questions, facts, and dialogue. In: *Handbook of contemporary semantic theory,* ed. S. Lappin. Blackwell. [JG]
(1997a) On some semantic consequences of turn taking. In: *Proceedings of the 11th Amsterdam Colloquium on Formal Semantics and Logic,* ed. P. Dekker, M. Stokhof & Y. Venema, pp. 145–50. Institute for Logic, Language, and Computation (ILLC). Available at: http://www.dcs.kcl.ac.uk/staff/ginzburg. [JG]
(1997b) Structural mismatch in dialogue. In: *Proceedings of MunDial 97* (Technical Report 97–106), ed. G. Jaeger & A. Benz, pp. 59–80. Universität München Centrum für Informations- und Sprachverarbeitung. Available at: http://www.dcs.kcl.ac.uk/staff/ginzburg. [JG]
(1999) Ellipsis resolution with syntactic presuppositions. In: *Computing meaning 1: Current issues in computational semantics,* ed. H. Bunt & R. Muskens. Kluwer. [aMJP]
(2001) Fragmenting meaning: Clarification ellipsis and nominal anaphora. In: *Computing meaning 2: Current issues in computational semantics,* ed. H. Bunt. Kluwer. [aMJP]
(2003) Disentangling public from private meaning. In: *Current and new directions in discourse and dialogue,* ed. J. van Kuppevelt & R. Smith, pp. 183–212. Kluwer. Available at: http://www.dcs.kcl.ac.uk/staff/ginzburg. [JG]
(forthcoming) *Semantics and interaction in dialogue.* CSLI Publications and University of Chicago Press. Draft chapters available at: http://www.dcs.kcl.ac.uk/staff/ginzburg. [JG]
Ginzburg, J. & Cooper, R. (2004) Clarification, ellipsis, and the nature of contextual updates. *Linguistics and Philosophy* 27(3):297–365. Available at: http://www.dcs.kcl.ac.uk/staff/ginzburg. [JG]
Ginzburg, J. & Sag, I. A. (2001) *Interrogative investigations.* CSLI. [aMJP]
Goldberg, A. (1995) *Constructions.* University of Chicago Press. [PFD]
Goldinger, S. D. (1998) Echoes of echoes? An episodic theory of lexical access. *Psychological Review* 105:251–79. [SDG, MK, RMK, arMJP]
Goldinger, S. D. & Azuma, T. (in press) Puzzle-solving science: The quixotic quest for units in speech perception. *Journal of Phonetics.* [SDG]
Goodwin, C. (1979) The interactive construction of a sentence in natural conversation. In: *Everyday language: Studies in ethnomethodology,* ed. G. Psathas, pp. 97–121. Irvington. [EAS]
Graesser, A. C., Weimer-Hastings, P. & Weimer-Hastings, K. (2001) Constructing inferences and relations during text comprehension. In: *Text representation: Linguistic and psycholinguistic aspects,* ed. T. Sanders, J. Schilperoord & W. Spooren, pp. 249–72. Benjamins. [ABM]
Gregory, S. W & Webster, S. (1996) A nonverbal signal in voices of interview partners effectively predicts communication accommodation and social status. *Journal of Personality and Social Psychology* 70:1231–40. [RMK]
Grossberg, S. (1980) How does a brain build a cognitive code? *Psychological Review* 87:1–51. [SDG, rMJP]
(1999) The link between brain learning, attention, and consciousness. *Consciousness and Cognition* 8:1–44. [SDG]
Grossberg, S., Boardman, I. & Cohen, M. (1997) Neural dynamics of variable-rate speech categorization. *Journal of Experimental Psychology: Human Perception and Performance* 23:483–503. [SDG]
Grossberg, S. & Myers, C. W. (2000) The resonant dynamics of speech perception: Interword integration and duration-dependent backward effects. *Psychological Review* 107:735–67. [SDG]
Grossberg, S. & Stone, G. O. (1986) Neural dynamics of word recognition and recall: Priming, learning, and resonance. *Psychological Review* 93:46–74. [SDG]
Gunlogson, C. (2003) *True to form: Rising and falling declaratives as questions in English.* Routledge. [SB-S]
Halpern, Y. & Moses, Y. (1990) Knowledge and common knowledge in a distributed environment. *Journal of the ACM* 37:549–87. [aMJP]
Hamblin, C. L. (1970) *Fallacies.* Methuen. [JG]
Hanna, J. E. & Tanenhaus, M. K. (2004) Pragmatic effects on reference resolution in a collaborative task: Evidence from eye movements. *Cognitive Science* 28:105–15. [SEB]
Hanna, J. E., Tanenhaus, M. K. & Trueswell, J. C. (2003) The effects of common ground and perspective on domains of referential interpretation. *Journal of Memory and Language* 49(1):43–61. [SEB, arMJP, SB-S]
Hartsuiker, R. J. & Kolk, H. H. J. (2001) Error monitoring in speech production: A computational test of the perceptual loop theory. *Cognitive Psychology* 42:113–57. [aMJP]
Hartsuiker, R. J. & Westenberg, C. (2000) Persistence of word order in written and spoken sentence production. *Cognition* 75:B27–39. [arMJP]
Hartsuiker, R. J., Pickering, M. J. & Veltkamp, E. (2004) Is syntax separate or shared between languages? Cross-linguistic syntactic priming in Spanish/English bilinguals. *Psychological Science* 15:409–14. [rMJP]
Haviland, S. E. & Clark, H. H. (1974) What's new? Acquiring new information as a process in comprehension. *Journal of Verbal Learning and Verbal Behavior* 13:512–21. [aMJP]
Healey, P. G. T. (1997) Expertise or expertese?: The emergence of task-oriented sub-languages. In: *Proceedings of the 19th Annual Conference of the Cognitive Science Society, 7th–10th August, Stanford University, California,* ed. M. G. Shafto & P. Langley, pp. 301–306. Erlbaum. [PGTH]
(in preparation) Semantic co-ordination in dialogue: Communication as a special case of misunderstanding. Unpublished manuscript. [PGTH]
Heyes, C. M. (2001) Causes and consequences of imitation. *Trends in Cognitive Sciences* 5:253–61. [aMJP]
Hintzman, D. L. (1986) "Schema-abstraction" in a multiple trace model. *Psychological Review* 93:411–28. [MK]
Holtgraves, T. (1994) Communication in context: Effects of speaker status on the comprehension of indirect requests. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 20:1205–18. [HS]
Hommel, B., Müsseler, J., Aschersleben, G. & Prinz, W. (2001) The theory of event coding (TEC): A framework for perception and action planning. *Behavioral and Brain Sciences* 24:849–937. [JCC, arMJP]
Horton, W. S. & Keysar, B. (1996) When do speakers take into account common ground? *Cognition* 59:91–117. [SEB, arMJP]
Hurley, S. & Chater, N., eds. (in press) *Perspectives on imitation: From mirror neurons to memes, vols. 1 & 2.* MIT Press. [arMJP]
Iacoboni, M., Woods, R. P., Brass, M., Bekkering, H., Mazziotta, J. C. & Rizzolatti, G. (1999) Cortical mechanisms of human imitation. *Science* 286:2526–28. [aMJP]
Isaacs, E. A. & Clark, H. H. (1987) References in conversations between experts and novices. *Journal of Experimental Psychology: General* 116:26–37. [rMJP]
Jackendoff, R. (1997) *The architecture of the language faculty.* MIT Press. [aMJP]
(1999) Parallel constraint-based generative theories of language. *Trends in Cognitive Sciences* 3:393–400. [aMJP]
(2002) *Foundations of language.* Oxford University Press. [arMJP]
Jansma, B. M. & Schiller, N. O. (2004) Monitoring syllable boundaries during speech production. *Brain and Language* 90:311–17. [NOS]
Jefferson, G. (1974) Error correction as an interactional resource. *Language in Society* 2:181–99. [EAS]
(1980) On "trouble-premonitory" response to inquiry. *Sociological Inquiry* 50(3–4):153–85. [EAS]
(1986) Notes on "latency" in overlap onset. *Human Studies* 9:153–83. [EAS]
(1987) On exposed and embedded corrections in conversation. In: *Talk and social organization,* ed. G. Button & J. R. E. Lee. Multilingual Matters. [aMJP, EAS]
Johnson, K., Strand, E. A. & D'Imperio, M. (1999) Auditory-visual integration of talker gender in vowel perception. *Journal of Phonetics* 27(4):359–84. [HS]
Johnson-Laird, P. N. (1983) *Mental models: Toward a cognitive science of language, inference and consciousness.* Harvard University Press. [RK, arMJP]
Just, M. A. & Carpenter, P. A. (1980) A theory of reading: From eye fixations to comprehension. *Psychological Review* 87:329–54. [aMJP]
Kaplan, R. & Bresnan, J. (1982) Lexical-functional grammar: A formal system for grammatical representation. In: *The mental representation of grammatical relations,* ed. J. Bresnan. MIT Press. [aMJP]
Kaschak, M. P. (2003) This syntax needs learned: Adult acquisition of novel syntactic constructions. Unpublished doctoral dissertation, University of Wisconsin–Madison. [MK]
Kellas, G. & Vu, H. (1999) Strength of context does modulate the subordinate bias effect: A reply to Binder and Rayner. *Psychonomic Bulletin and Review* 6:511–17. [aMJP]
Kempen, G. & Huijbers, P. (1983) The lexicalization process in sentence production and naming: Indirect election of words. *Cognition* 14:824–43. [aMJP]
Kempson, R., Meyer-Viol, W. & Gabbay, D. (2001) *Dynamic syntax.* Blackwell. [RK, aMJP]
Keysar, B. (1994) The illusory transparency of intention: Linguistic perspective taking in text. *Cognitive Psychology* 26:165–208. [ABM]
(1997) Unconfounding common ground. *Discourse Processes* 24:253–70. [DJB, SEB]
Keysar, B., Barr, D. J. & Balin, J. A. (1998) Definite reference and mutual knowledge: Process models of common ground in comprehension. *Journal of Memory and Language* 39:1–20. [aMJP, ABM]
Keysar, B., Barr, D. J., Balin, J. A. & Brauner, J. S. (2000) Taking perspective in conversation: The role of mutual knowledge in comprehension. *Psychological Science* 11:32–38. [aMJP]
Keysar, B., Lin, S. H. & Barr, D. J. (2003) Limits on theory of mind use in adults. *Cognition* 89:25–41. [rMJP]
Kingsbury, D. (1968) Manipulating the amount of information obtained from a person giving directions. Unpublished honors thesis, Department of Social Relations, Harvard University. [RMK, rMJP]

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

Krauss, R. M. & Fussell, S. R. (1996) Social psychological models of interpersonal communication. In: *Social psychology: A handbook of basic principles,* ed. E. T. Higgins & A. Kruglanski, pp. 655–701. Guilford. [RMK]

Kraut, R. E., Fussell, S. R. & Siegel, J. (2003) Visual information as a conversational resource in collaborative physical tasks. *Human-computer interaction* 18:13–49. [SRF, rMJP]

Kraut, R. E., Gergle, D. & Fussell, S. R. (2002) The use of visual information in shared visual spaces: Informing the development of virtual co-presence. In: *Proceedings of the CSCW 2002 Conference on Computer-Supported Cooperative Work.* ACM Press. [SRF]

Kuiper, K. (1996) *Smooth talkers: The linguistic performance of auctioneers and sportscasters.* Erlbaum. [arMJP]

Lakin, J. L. & Chartrand, T. L. (2003) Using nonconscious behavioral mimicry to create affiliation and rapport. *Psychological Science* 14:334–39. [rMJP]

Larsson, S. (2002) *Issue based dialogue management.* Doctoral dissertation, Gothenburg University. [JG]

Lee, B. P. H. (2001) Mutual knowledge, background knowledge and shared beliefs: Their roles in establishing common ground. *Journal of Pragmatics* 33:21–44. [DJB]

Lerner, G. H. (1991) On the syntax of sentences-in-progress. *Language in Society* 20:441–58. [EAS]

(1996) On the "semi-permeable" character of grammatical units in conversation: Conditional entry into the turn space of another speaker. In: *Interaction and grammar,* ed. E. Ochs, E. A. Schegloff & S. A. Thompson, pp. 238–76. Cambridge University Press. [EAS]

Levelt, W. J. M. (1983) Monitoring and self-repair in speech. *Cognition* 14:41–104. [aMJP]

(1989) *Speaking: From intention to articulation.* MIT Press. [DJB,JCC,SG,aMJP,NOS]

Levelt, W. J. M. & Kelter, S. (1982) Surface form and memory in question answering. *Cognitive Psychology* 14:78–106. [arMJP]

Levelt, W. J. M. & Maassen, B. (1981) Lexical search and order of mention in sentence production. In: *Crossing the boundaries in linguistics: Studies presented to Manfred Bierwisch,* ed. W. Klein & W. J. M. Levelt. Riedel. [aMJP]

Levelt, W. J. M., Roelofs, A. & Meyer, A. S. (1999) A theory of lexical access in speech production. *Behavioral and Brain Sciences* 22:1–75. [JCC,SDG,aMJP,NOS]

Lewis, D. K. (1969) *Convention: A philosophical study.* Basil Blackwell/Harvard University Press. [PGTH,aMJP]

(1979) Score keeping in a language game. In: *Semantics from different points of view,* ed. R. Bauerle, pp. 172–87. Springer. [JG]

Liberman, A. M., Cooper, F. S., Shankweiler, D. P. & Studdert-Kennedy, M. (1967) Perception of the speech code. *Psychological Review* 74:431–61. [HS]

Liberman, A. M. & Whalen, D. H. (2000) On the relation of speech to language. *Trends in Cognitive Sciences* 4:187–96. [aMJP]

Lindblom, B. (1990) Explaining variation: A sketch of the H and H theory. In: *Speech production and speech modeling,* ed. W. Hardcastle & A. Marchal. Kluwer. [aMJP]

Linnell, P. (1998) *Approaching dialogue: Talk, interaction, and contexts in a dialogical perspective.* Benjamins. [aMJP]

Lockridge, C. B. & Brennan, S. E. (2002) Addressees' needs influence speakers' early syntactic choices. *Psychonomic Bulletin and Review* 9:550–57. [SEB,arMJP]

Lombardi, L. & Potter, M. C. (1992) The regeneration of syntax in short term memory. *Journal of Memory and Language* 31:713–33. [aMJP]

MacDonald, M. C., Pearlmutter, N. J. & Seidenberg, M. S. (1994) Lexical nature of syntactic ambiguity resolution. *Psychological Review* 101:676–703. [MK]

MacKay, D. (1987) *The organization of perception and action.* Springer. [aMJP]

Magnuson, J. & Nusbaum, H. C. (1994) Some acoustic and nonacoustic conditions that produce talker normalization. In: *Proceedings of the Spring Meeting of the Acoustical Society of Japan, Tokyo, March 1994,* pp. 637–38. Acoustical Society of Japan. [HS]

Markman, A. B. (1997) Constraints on analogical inference. *Cognitive Science* 21(4):373–418. [ABM]

Markman, A. B. & Gentner, D. (1993) Structural alignment during similarity comparisons. *Cognitive Psychology* 25:431–67. [aMJP]

(2000) Structure mapping in the comparison process. *American Journal of Psychology* 113(4):501–38. [ABM]

Markman, A. B. & Makin, V. S. (1998) Referential communication and category acquisition. *Journal of Experimental Psychology: General* 127:331–54. [aMJP]

Marslen-Wilson, W. D. (1973) Linguistic structure and speech shadowing at very short latencies. *Nature* 244:522–23. [aMJP]

Martin, R. C., Lesch, M. F. & Bartha, M. C. (1999) Independence of input and output phonology in word processing and short-term memory. *Journal of Memory and Language* 41:3–29. [JCC]

Mattingly, I. G. & Liberman, A. M. (1988) Specialized perceiving systems for speech and other biologically significant sounds. In: *Auditory function,* ed. G. M. Edelman. Wiley. [aMJP]

Mazur, A. (1985) A biosocial model of status in face-to-face primate groups. *Social Forces* 64:377–402. [AM]

McCarthy, J. (1990) Formalization of two puzzles involving knowledge. In: *Formalizing common sense: Papers by John McCarthy,* ed. V. Lifschitz. Ablex. [aMJP]

McClelland, J. L. & Elman, J. L. (1986) The TRACE model of speech perception. *Cognitive Psychology* 18:1–86. [SDG]

McClelland, J. L., St. John, M. & Taraban, R. (1989) Sentence comprehension: A parallel distributed processing approach. *Language and Cognitive Processes* 4:287–336. [SDG]

McDaniel, D. & Cowart, W. (1999) Experimental evidence for a minimalist account of English resumptive pronouns. *Cognition* 70:B15–B24. [FF]

McKoon, G. & Ratcliff, R. (1992) Inference during reading. *Psychological Review* 99:440–66. [ABM]

Meltzoff, A. N. & Decety, J. (2003) What imitation tells us about social cognition: A rapprochement between developmental psychology and cognitive neuroscience. *Philosophical Transactions of the Royal Society of London* 358:491–500. [rMJP]

Metzing, C. & Brennan, S. E. (2001) When conceptual pacts are broken: Partner effects in the comprehension of referring expressions. In: *Abstracts of the Psychonomic Society, 42nd Annual Meeting, Orlando, FL, November 2001,* p. 29. Psychonomic Society. [SEB]

(2003) When conceptual pacts are broken: Partner-specific effects on the comprehension of referring expressions. *Journal of Memory and Language* 49:201–13. [SEB, rMJP]

Meyer, A. S. (1996) Lexical access in phrase and sentence production: Results from picture-word interference experiments. *Journal of Memory and Language* 35:477–96. [aMJP]

Moore, J. (1995) *Participating in explanatory dialogues.* Bradford Books/MIT Press. [JG]

Morales, M., Mundy, P., Delgado, C. E. F., Yale, M., Messinger, D., Neal, R. & Schwartz, H. K. (2000) Responding to joint attention across the 6- through 24-month age period and early language acquisition. *Journal of Applied Developmental Psychology* 21(3):283–98. [PFD]

Morgan, J. L. (1973) Sentence fragments and the notion "sentence". In: *Issues in linguistics: Papers in honor of Henry and Renée Kahane,* ed. B. B. Kachru, R. B. Lees, Y. Malkiel, A. Pietrangeli & S. Saporta. University of Illinois Press. [aMJP]

Morgan, J. L. & Wheeldon, L. R. (2003) Syllable monitoring in internally and externally generated English words. *Journal of Psycholinguistic Research* 32:269–96. [NOS]

Morton, J. (1969) Interaction of information in word recognition. *Psychological Review* 76:165–78. [aMJP]

Moss, H. E. & Gaskell, G. M. (1999) Lexical semantic processing during speech. In: *Language processing,* ed. S. Garrod & M. Pickering. Psychology Press. [aMJP]

Mullennix, J. W. & Pisoni, D. B. (1990) Stimulus variability and processing dependencies in speech perception. *Perception and Psychophysics* 47(4):379–90. [HS]

Müller, O. & Hagoort, P. (2001) Semantic and syntactic properties of a word – which are first in reading? In: *Abstracts of the Annual Meeting of the Cognitive Neuroscience Society,* p. 124. Cognitive Neuroscience Society. [NOS]

Muller-Gass, A., Gonthier, I., Desrochers, A. & Campbell, K. B. (2000) Multiple P3 evidence of a two-stage process in word gender decision. *NeuroReport* 16:3527–31. [NOS]

Murphy, G. L. (1988) Comprehending complex concepts. *Cognitive Science* 12:529–62. [aMJP]

Myers, J. L. & O'Brien, E. J. (1998) Accessing the discourse representation during reading. *Discourse Processes* 26:131–57. [MK]

Nadig, J. S. & Sedivy, J. C. (2002) Evidence of perspective-taking constraints in children's on-line reference resolution. *Psychological Science* 13:329–36. [SEB, arMJP]

Natale, M. (1975a) Convergence of mean vocal intensity in dyadic communication as a function of social desirability. *Journal of Personality and Social Psychology* 32:790–804. [RMK]

(1975b) Social desirability as related to convergence of temporal speech patterns. *Perceptual and Motor Skills* 40:827–39. [RMK]

Nearey, T. M. (1989) Static, dynamic, and relational properties in vowel perception. *Journal of the Acoustical Society of America* 85(5):2088–113. [HS]

Newtson, D. (1994) The perception and coupling of behavior waves. In: *Dynamical systems in social psychology,* ed. R. Vallacher & A. Nowak, pp. 139–67. Academic Press. [SDG]

Niedzielski, N. (1999) The effect of social information on the perception of

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

sociolinguistic variables. *Journal of Language and Social Psychology* 18(1):62–85. [HS]
Nunberg, G., Sag, I. A. & Wasow, T. (1994) Idioms. *Language* 70:491–538. [aMJP]
Nusbaum, H. C. & Henly, A. S. (1989) Understanding speech from the perspective of cognitive psychology. Paper presented at the Workshop on Spoken Language Understanding, Department of Psychology, State University of New York at Buffalo, 1989. [HS]
Nusbaum, H. C. & Magnuson, J. (1997) Talker normalization. In: *Talker variability in speech processing,* ed. K. Johnson & J. W. Mullennix. Academic Press. [HS]
Nusbaum, H. C. & Morin, T. M. (1992) Paying attention to differences among talkers. In: *Speech production, perception, and linguistic structure,* ed. Y. Tohkura, Y. Sagisaka & E. Vatikiotis-Bateson, pp. 113–34. Ohmasha Publishing. [HS]
Nusbaum, H. C. & Schwab, E. C. (1986) The role of attention and active processing in speech perception. In: *Pattern recognition by humans and machines: Speech perception, vol. 1,* ed. H. C. Nusbaum & E. C. Schwab, pp. 113–57. Academic Press. [HS]
Oomen, C. C. E. & Postma, A. (2002) Limitations in processing resources and speech monitoring. *Language and Cognitive Processes* 17:163–84. [aMJP]
Peterson, G. & Barney, H. (1952) Control methods used in the study of vowels. *Journal of the Acoustical Society of America* 24:175–84. [HS]
Phillips, C. (1996) Order and structure. Unpublished doctoral dissertation, MIT. [RK]
(2003) Linear order and constituency. *Linguistic Inquiry* 34:37–90. [aMJP]
Pickering, M. & Barry, G. (1991) Sentence processing without empty categories. *Language and Cognitive Processes* 6:229–59. [aMJP]
(1993) Dependency categorial grammar and coordination. *Linguistics* 31:855–902. [aMJP]
Pickering, M. J. & Branigan, H. P. (1998) The representation of verbs: Evidence from syntactic priming in language production. *Journal of Memory and Language* 39:633–51. [MK, arMJP, NOS]
(1999) Syntactic priming in language production. *Trends in Cognitive Sciences* 3:136–41. [aMJP]
Pickering, M., Clifton, C. & Crocker, M. W. (2000) Architectures and mechanisms in sentence comprehension. In: *Architectures and mechanisms for language processing,* ed. M. W. Crocker & M. Pickering. Cambridge University Press. [JCC]
Pickering, M. J. & Garrod, S. (in press) Routinization in the interactive-alignment model of dialogue. In: *Twenty-first century psycholinguistics: Four cornerstones,* ed. A. Cutler. Erlbaum. [rMJP]
Pinker, S. (1989) *Learnability and cognition: The acquisition of argument structure.* MIT Press/Bradford Books. [HPB]
Pinker, S. & Birdsong, D. (1979) Speakers' sensitivity to rules of frozen word order. *Journal of Verbal Learning and Verbal Behavior* 18:497–508. [aMJP]
Poesio, M. & Traum, D. R. (1997) Conversational actions and discourse situations. *Computational Intelligence* 13:309–47. [aMJP]
Pollard, C. & Sag, I. A. (1994) *Head-driven phrase structure grammar.* University of Chicago Press and CSLI. [aMJP]
Postma, A. (2000) Detection of errors during speech production: A review of speech monitoring models. *Cognition* 77:97–131. [aMJP]
Potter, M. C. & Lombardi, L. (1990) Regeneration in the short-term recall of sentences. *Journal of Memory and Language* 29:633–54. [aMJP]
(1998) Syntactic priming in immediate recall of sentences. *Journal of Memory and Language* 38:265–82. [aMJP]
Prat-Sala, M. & Branigan, H. P. (2000) Discourse constraints on syntactic processing in language production: A cross-linguistic study in English and Spanish. *Journal of Memory and Language* 42:168–82. [aMJP]
Prince, E. F. (1990) Syntax and discourse: A look at resumptive pronouns. In: *Proceedings of the Sixteenth Annual Meeting of the Berkeley Linguistics Society,* ed. University of California at Berkeley Press, pp. 482–97. [FF]
Purver, M., Ginzburg, J. & Healey, P. (2002) On the means for clarification in dialogue. In: *Advances in discourse and dialogue,* ed. J. van Kuppevelt & R. Smith. Kluwer. Available at: http://www.dcs.kcl.ac.uk/pg/purver/publications.html. [JG]
Purver, M., Healey, P. G. T., King, J., Ginzburg, J. & Mills, G. J. (2003) Answering clarification questions. In: *Proceedings of the 4th SIGdial Workshop on Discourse and Dialogue.* Sapporo. Available at: http://www.dcs.kcl.ac.uk/pg/purver/publications.html. [JG]
Purver, M. & Otsuka, M. (2003) Incremental generation by incremental parsing: Tactical generation in Dynamic Syntax. In: *Proceedings of 9th EACL (European Association for Computational Linguistics) Workshop in Natural Language Generation, Budapest, April 2003,* ed. E. Reiter, H. Horecek & K. van Deemter, pp. 79–86. Association for Computational Linguistics. [RK]
Rayner, K., Pacht, J. M. & Duffy, S. A. (1994) Effects of prior encounter and discourse bias on the processing of lexically ambiguous words. *Journal of Memory and Language* 33:527–44. [aMJP]
Reeves, B. & Nass, C. (1996) *The media equation: How people treat computers, television, and new media like real people and places.* Cambridge University Press. [aMJP]
Rizzolatti, G. & Arbib, M. A. (1998) Language within our grasp. *Trends in Neurosciences* 21:188–94. [aMJP]
Ross, J. R. (1969) Guess who? In: *Papers from the Fifth Regional Meeting of the Chicago Linguistics Society,* ed. R. I. Binnick, A. Davison, G. M. Green & J. L. Morgan. University of Chicago. [aMJP]
Russell, A. W. & Schober, M. F. (1999) How beliefs about a partner's goals affect referring in goal-discrepant conversations. *Discourse Processes* 27(1):1–33. [MFS]
Sacks, H. (1972a) An initial investigation of the usability of conversational data for doing sociology. In: *Studies in social interaction,* ed. D. N. Sudnow, pp. 31–74. Free Press. [EAS]
(1972b) On the analyzability of stories by children. In: *Directions in sociolinguistics: The ethnography of communication,* ed. J. J. Gumperz & D. Hymes, pp. 325–55. Holt, Rinehart and Winston. [EAS]
(1975) Everyone has to lie. In: *Sociocultural dimensions of language use,* ed. M. Sanches & B. G. Blount, pp. 57–80. Academic Press. [EAS]
(1987) On the preferences for agreement and contiguity in sequences in conversation. In: *Talk and social organization,* ed. G. Button & J. R. E. Lee. Multilingual Matters. [aMJP]
(1992) *Lectures on conversation,* ed. G. Jefferson, introduction by E. A. Schegloff (2 vols.). Blackwell. [EAS]
Sacks, H. & Schegloff, E. A. (1979) Two preferences in the organization of reference to persons and their interaction. In: *Everyday language: Studies in ethnomethodology,* ed. G. Psathas, pp. 15–21. Irvington. [EAS]
Sacks, H., Schegloff, A. E. & Jefferson, G. (1974) A simplest systematics for the organization of turn-taking for conversation. *Language* 50:696–735. [DJB, aMJP, EAS]
Sancier, M. & Fowler, C. A. (1997) Gestural drift in a bilingual speaker of Brazilian Portuguese and English. *Journal of Phonetics* 25:421–36. [RMK]
Sanford, A. J. & Garrod, S. C. (1981) *Understanding written language.* Wiley. [aMJP]
Sanford, A. J. & Sturt, P. (2002) Depth of processing in language comprehension: Not noticing the evidence. *Trends in Cognitive Sciences* 6:382–86. [rMJP]
Schegloff, E. A. (1972) Notes on a conversational practice: Formulating place. In: *Studies in social interaction,* ed. D. N. Sudnow, pp. 75–119. Free Press. [EAS]
(1979) The relevance of repair for syntax-for-conversation. In: *Syntax and semantics 12: Discourse and syntax,* ed. T. Givon, pp. 261–88. Academic Press. [EAS]
(1986) The routine as achievement. *Human Studies* 9:111–51. [EAS]
(1987a) Recycled turn beginnings: A precise repair mechanism in conversation's turn-taking organisation. In: *Talk and social organisation,* ed. G. Button & J. R. E. Lee, pp. 70–85. Multilingual Matters. [EAS]
(1987b) Some sources of misunderstanding in talk-in-interaction. *Linguistics* 25:201–18. [EAS]
(1989) Reflections on language, development, and the interactional character of talk-in-interaction. In: *Interaction in human development,* ed. M. Bornstein & J. S. Bruner, pp. 139–53. Erlbaum. [EAS]
(1990) On the organization of sequences as a source of "coherence" in talk-in-interaction. In: *Conversational organization and its development,* ed. B. Dorval, pp. 51–77. Ablex. [EAS]
(1991) Conversation analysis and socially shared cognition. In: *Perspectives on socially shared cognition,* ed. L. Resnick, J. Levine & S. Teasley, pp. 151–71. American Psychological Association. [EAS]
(1992) Repair after next turn: The last structurally provided place for the defence of intersubjectivity in conversation. *American Journal of Sociology* 95(5):1295–345. [EAS]
(1995) Sequence organization. Unpublished manuscript, Department of Sociology, University of California at Los Angeles. [EAS]
(1996a) Turn organization: One intersection of grammar and interaction. In: *Interaction and grammar,* ed. E. Ochs, E. A. Schegloff & S. A. Thompson, pp. 52–133. Cambridge University Press. [EAS]
(1996b) Some practices for referring to persons in talk-in-interaction: A partial sketch of a systematics. In: *Studies in anaphora,* ed. B. A. Fox, pp. 437–85. John Benjamins. [EAS]
(1997a) Practices and actions: Boundary cases of other-initiated repair. *Discourse Processes* 23:499–545. [EAS]
(1997b) Third turn repair. In: *Towards a social science of language: Papers in honor of William Labov, vol. 2: Social interaction and discourse structures,* ed. G. R. Guy, C. Feagin, D. Schiffrin & J. Baugh, pp. 31–40. John Benjamins. [EAS]
(2000a) Overlapping talk and the organization of turn-taking for conversation. *Language in Society* 29(1):1–63. [EAS]
(2000b) When "others" initiate repair. *Applied Linguistics* 21(2):205–43. [EAS]
(2001) Accounts of conduct in interaction: Interruption, overlap and turn-taking.

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press

In: *Handbook of sociological theory,* ed. J. H. Turner, pp. 287–321. Plenum Press. [EAS]
(forthcoming) *A primer in conversation analysis: Sequence organization.* Cambridge University Press. [EAS]
Schegloff, E. A., Jefferson, G. & Sacks, H. (1977) The preference for self-correction in the organization of repair in conversation. *Language* 53(2):361–82. [EAS]
Schegloff, E. A. & Sacks, H. (1973) Opening up closings. *Semiotica* 8:289–327. [aMJP, EAS]
Schenkein, J. (1980) A taxonomy of repeating action sequences in natural conversation. In: *Language production, vol. 1,* ed. B. Butterworth, pp. 21–47. Academic Press. [aMJP]
Schiffer, S. R. (1972) *Meaning.* Oxford University Press. [aMJP]
Schiller, N. O. (2001) Metrical encoding during speech production. *Abstracts of the Psychonomic Society* 6:29. [NOS]
(in press) Verbal self-monitoring. In: *Twenty-first century psycholinguistics: Four cornerstones,* ed. A. Cutler. Erlbaum. [NOS]
Schiller, N. O. & Caramazza, A. (2003) Grammatical feature selection in noun phrase production: Evidence from German and Dutch. *Journal of Memory and Language* 48:169–94. [rMJP, NOS]
Schiller, N. O., Jansma, B. M., Peters, J. & Levelt, W. J. M. (in press) Monitoring metrical stress in polysyllabic words. *Language and Cognitive Processes.* [NOS]
Schiller, N. O., Münte, T., Horemans, I. & Jansma, B. M. (2003) Semantic and phonological factors in syntactic decisions. *Psychophysiology* 40:869–77. [NOS]
Schmitt, B. M., Rodriguez-Fornells, A., Kutas, M. & Münte, T. F. (2001a) Electrophysiological estimates of semantic and syntactic information access during tacit picture naming and listening to words. *Neuroscience Research* 41:293–98. [NOS]
Schmitt, B. M., Schiltz, K., Zaake, W., Kutas, M. & Münte, T. F. (2001b) An electrophysiological analysis of the time course of conceptual and syntactic encoding during tacit picture naming. *Journal of Cognitive Neuroscience* 13:510–22. [NOS]
Schober, M. F. (1993) Spatial perspective-taking in conversation. *Cognition* 47:1–24. [aMJP]
(1995) Speakers, addressees, and frames of reference: Whose effort is minimized in conversations about location? *Discourse Processes* 20(2):219–47. [MFS]
(1998a) Different kinds of conversational perspective-taking. In: *Social and cognitive psychological approaches to interpersonal communication,* ed. S. R. Fussell & R. J. Kreuz, pp. 145–74. Erlbaum. [MFS]
(1998b) How partners with high and low spatial ability choose perspectives in conversation. *Abstracts of the 39th Annual Meeting of the Psychonomic Society,* No. 39. [MFS]
Schober, M. F. & Brennan, S. E. (2003) Processes of interactive spoken discourse: The role of the partner. In: *Handbook of discourse processes,* ed. A. C. Graesser, M. A. Gernsbacher & S. R. Goldman, pp. 123–64. Erlbaum. [SEB, aMJP, MFS]
Schober, M. F. & Clark, H. H. (1989) Understanding by addressees and overhearers. *Cognitive Psychology* 21:211–32. [DJB, aMJP]
Schober, M. F. & Conrad, F. G. (1997) Does conversational interviewing reduce survey measurement error? *Public Opinion Quarterly* 61:576–602. Reprinted in: *Interviewing, vol. 1,* ed. N. G. Fielding. SAGE Benchmarks in Social Science Research Series, 2003. Sage Publications. [MFS]
Schober, M. F., Conrad, F. G. & Fricker, S. S. (2004) Misunderstanding standardized language in research interviews. *Applied Cognitive Psychology* 18:169–88. [MFS]
Schriefers, H., Meyer, A. S. & Levelt, W. J. M. (1990) Exploring the time course of lexical access in language production: Picture-word interference studies. *Journal of Memory and Language* 29:86–102. [aMJP]
Schuller, A. M. & Rossion, B. (2001) Spatial attention triggered by eye gaze increases and speeds up early visual acuity. *NeuroReport* 12:2381–86. [rMJP]
Searle, J. (1969) *Speech acts.* Cambridge University Press. [JG]
Sereno, S. C., Brewer, C. & O'Donnell, P. J. (2003) Context effects in word recognition: Evidence for early interactive processing. *Psychological Science* 14:328–33. [SG]
Sheldon, A. (1974) The role of parallel function in the acquisition of relative clauses in English. *Journal of Verbal Learning and Verbal Behavior* 13:272–81. [aMJP]
Shiffrin, R. M. & Schneider, W. (1977) Controlled and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. *Psychological Review* 84(2):127–90. [HS]
Shockley, K., Santana, M-V. & Fowler, C. A. (2003) Mutual interpersonal postural constraints are involved in cooperative conversation. *Journal of Experimental Psychology: Human Perception and Performance* 29:326–32. [SDG]
Skinner, B. F. (1953) *Science and human behavior.* Macmillan. [JJP]
(1957) *Verbal behavior.* Appleton-Century-Crofts. [JJP, rMJP]
Smith, M. & Wheeldon, L. (2001) Syntactic priming in spoken sentence production – an online study. *Cognition* 78:123–64. [aMJP]
Smyth, R. (1994) Grammatical determinants of ambiguous pronoun resolution. *Journal of Psycholinguistic Research* 23:197–229. [aMJP]
Sperber, D. & Wilson, D. (1986) *Relevance.* Blackwell. [ABM]
Stalnaker, R. C. (1978) Assertion. In: *Syntax and semantics, vol. 9: Pragmatics,* ed. P. Cole, pp. 315–32. Academic Press. [JG, aMJP]
Steedman, M. (2000) *The syntactic process.* MIT Press. [aMJP]
Suessbrick, A. L., Schober, M. F. & Conrad, F. G. (2000) Different respondents interpret ordinary questions quite differently. In: *Proceedings of the American Statistical Association* (Section on *Survey Research Methods*). American Statistical Association. [MFS]
Swinney, D. A. (1979) Lexical access during sentence comprehension. *Journal of Verbal Learning and Verbal Behavior* 18:645–59. [aMJP]
Tanenhaus, M. K., Chambers, C. C. & Hanna, J. E. (2004) Referential domains in spoken language comprehension: Using eye movements to bridge the product and action traditions. In: *The interface of language, vision, and action: Eye movements and the visual world,* ed. J. M. Henderson & F. Ferreira. Psychology Press. [SB-S]
Tanenhaus, M. K., Spivey-Knowlton, M. J., Eberhard, K. M. & Sedivy, J. C. (1995) Integration of visual and linguistic information in spoken language comprehension. *Science* 268(5217):632–34. [aMJP, HS]
Tannen, D. (1989) *Talking voices: Repetition, dialogue, and imagery in conversational discourse.* Cambridge University Press. [aMJP]
Thakerar, J. N., Giles, H. & Chesire, J. (1982) Psychological and linguistic parameters of speech accommodation theory. In: *Advances in the social psychology of language,* ed. C. Fraser & K. R. Scherer, pp. 205–255. Cambridge University Press. [HS]
Tomasello, M. (2000) Do young children have adult syntactic competence? *Cognition* 74:209–53. [HPB, aMJP]
(2003) *Constructing a language: A usage-based theory of language acquisition.* Harvard University Press. [PFD, rMJP]
Traxler, M. J. & Gernsbacher, M. A. (1992) Improving written communication through minimal feedback. *Language and Cognitive Processes* 7:1–22. [aMJP]
(1993) Improving written communication through perspective-taking. *Language and Cognitive Processes* 8:311–36. [aMJP]
Tucker, G. R., Lambert, W. E. & Rigault, A. A. (1977) *The French speaker's skill with grammatical gender: An example of rule-governed behavior.* Mouton. [NOS]
van Dijk, T. A. & Kintsch, W. (1983) *Strategies in discourse comprehension.* Academic Press. [aMJP]
van Gelder, T. & Port, R. F. (1995) It's about time: An overview of the dynamical approach to cognition. In: *Mind as motion,* ed. R. F. Port & T. van Gelder, pp. 1–44. MIT Press. [SDG]
van Turennout, M., Hagoort, P. & Brown, C. M. (1998) Brain activity during speaking: From syntax to phonology in 40 milliseconds. *Science* 280:572–74. [aMJP, NOS]
Vigliocco, G., Antonini, T. & Garrett, M. F. (1997) Grammatical gender is on the tip of Italian tongues. *Psychological Science* 8:314–17. [arMJP]
Vitevitch, M. S. & Luce, P. A. (1999) Probabilistic phonotactics and neighborhood activation in spoken word recognition. *Journal of Memory and Language* 40:374–408. [SDG]
Wheeldon, L. & Levelt, W. J. M. (1995) Monitoring the time course of phonological encoding. *Journal of Memory and Language* 34:311–34. [aMJP, NOS]
Wheeldon, L. & Morgan, J. L. (2002) Phoneme monitoring in internal and external speech. *Language and Cognitive Processes* 17:503–35. [NOS]
Wheeldon, L. R. & Smith, M. C. (2003) Phrase structure priming: A short-lived effect. *Language and Cognitive Processes* 18:431–42. [rMJP]
Wilkes-Gibbs, D. & Clark, H. H. (1992) Coordinating beliefs in conversation. *Journal of Memory and Language* 31:183–94. [DJB, aMJP]
Williams, J. H. G., Whiten, A., Suddendorf, T. & Perrett, D. I. (2001) Imitation, mirror neurons, and autism. *Neuroscience and Biobehavioral Reviews* 25:287–95. [aMJP]
Wisniewski, E. L. (1996) Construal and similarity in conceptual combination. *Journal of Memory and Language* 35:434–53. [aMJP]
Wray, A. & Perkins, M. R. (2001) The functions of formulaic language: An integrated model. *Language and Communication* 20:1–28. [aMJP]
Zwaan, R. A. & Radvansky, G. A. (1998) Situation models in language comprehension and memory. *Psychological Bulletin* 123:162–85. [aMJP]
Zwitserlood, P. (1994) Access to phonological-form representations in language comprehension and production. In: *Perspectives on sentence processing,* ed. C. Clifton, L. Frazier & K. Rayner, pp. 83–106. Erlbaum. [JCC]

https://doi.org/10.1017/S0140525X04450055 Published online by Cambridge University Press