



Brief article

Syntactic co-ordination in dialogue

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Received 15 June 1999; received in revised form 28 September 1999; accepted 3 December 1999

Abstract

There is substantial evidence that speakers co-ordinate their contributions in dialogue. Until now, experimental studies of co-ordination have concentrated on the development of shared strategies for reference. We present an experiment that employed a novel confederate-scripting technique to investigate whether speakers also co-ordinate syntactic structure in dialogue. Pairs of speakers took it in turns to describe pictures to each other. One speaker was a confederate of the experimenter and produced scripted descriptions that systematically varied in syntactic structure. The syntactic structure of the confederate's description affected the syntactic structure of the other speaker's subsequent description. We suggest that these effects are instances of syntactic priming (Bock, 1986), and provide evidence for a shared level of representation in comprehension and production. We describe how these effects might be realized in a processing model of language production, and relate them to previous findings of linguistic co-ordination in dialogue. © 2000 Elsevier Science B.V. All rights reserved.

Keywords: Dialogue; Co-ordination; Language production; Syntax; Syntactic priming

1. Introduction

Research on dialogue has demonstrated that the processes of language production are sensitive to the communicative environment: Through the course of a dialogue or series of dialogues, pairs of speakers start to express themselves in similar ways. There is substantial evidence for such co-ordinated behaviour at the semantic and lexical levels (Brennan & Clark, 1996; Clark & Schaefer, 1989; Clark & Wilkes-Gibbs, 1986; Garrod & Anderson, 1987; Garrod & Clark, 1993; Garrod & Doherty,

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1994; Schober & Clark, 1989). It is not clear, however, whether participants in a dialogue also converge upon co-ordinated syntactic structures for their contributions. In this paper, we introduce a novel experimental technique, confederate scripting, which allows the study of syntactic structure in dialogue under controlled conditions. We employ it to examine whether speakers in a dialogue tend to co-ordinate the syntactic structures of their contributions, irrespective of lexical and semantic content.

Many studies of dialogue demonstrate co-ordination in the development of shared schemes for reference. Garrod and colleagues showed that participants describing abstract mazes tended to converge on particular types of description (e.g. describing positions in the maze in terms of paths between two points, or as column-row indices) (Garrod & Anderson, 1987; Garrod & Clark, 1993; Garrod & Doherty, 1994). The same experiments showed that participants also tended to converge on particular lexical expressions to refer to entities (e.g. 'box' or 'square' to refer to a node in the maze). As a result, the descriptions used in adjacent turns were 'locally consistent' (Garrod & Anderson, 1987). Clark and colleagues provided further evidence that participants form a temporary (tacit) agreement, or 'conceptual pact', about how to refer to an entity (Brennan & Clark, 1996; Clark & Schaefer, 1989; Clark & Wilkes-Gibbs, 1986; Schober & Clark, 1989). These results demonstrate co-ordination at two levels: semantic co-ordination, in terms of the mental models employed by the participants; and lexical co-ordination, in terms of the expressions they used to refer to entities in their models.

It is important to stress that such convergence in behaviour may be implicit; it need not involve any conscious or deliberate intent on the part of participants. For example, it is clear from Garrod and Anderson's (1987) examples that co-ordination can occur without explicit negotiation. Hence in keeping with Garrod and Anderson and Garrod and Clark (1993), we will use the term 'co-ordination' simply to describe an observable convergence in participants' linguistic behaviour, without any commitment to whether this convergence is in some sense intentional.

Both the speaker and the listener benefit from semantic and lexical co-ordination. The listener benefits because co-ordination increases the likelihood of correctly understanding the speaker's meaning. An expression or description scheme may have more than one possible interpretation. For example, in the context of a maze, 'square' could refer to a single node or to a configuration of several nodes, and 'two, three' could describe a column position followed by a row position, or vice versa. By producing co-ordinated descriptions, participants implicitly converge on a set of rules for interpretation. The speaker benefits because co-ordination reduces computational load: By previously interpreting an utterance in a particular way, the speaker has determined a set of semantic procedures (e.g. using 'square' to refer to a node, and 'two, three' to a row position followed by a column position) that can be re-used in production, and do not need to be computed from scratch.

These functional benefits also predict that speakers will tend to be semantically and lexically consistent with their own prior utterances. Listeners benefit from within-speaker consistency because, if the listener resolves ambiguities in the same way as in previous (successfully interpreted) utterances, this resolution is

likely to be correct. For speakers, the facilitation gained from reusing previous decisions holds irrespective of whether they were originally made by speaker or listener. Not surprisingly, dialogue studies show within-speaker consistency, at least once the referring expressions or description schemes have been established (e.g. Garrod & Anderson, 1987).

The same benefits should also hold with respect to other levels of linguistic structure. Hence, we might expect that participants should also co-ordinate their contributions at other linguistic levels. One such level is that of grammatical structure. Speakers normally have a choice of grammatical structures to convey a meaning. For example, speakers can describe a picture of a cowboy offering an apple to a burglar as ‘the cowboy offering the banana to the burglar’ or as ‘the cowboy offering the burglar the banana’. Thus the same mental model can map onto two distinct grammatical structures (cf. Levelt, 1989). We hypothesize that participants should display co-ordination of grammatical form during a dialogue. By co-ordinating grammatical form, speakers can reduce the computational load associated with the syntactic processing of their contributions. Thus when they have a choice between alternative grammatical structures to express a meaning, speakers should tend to use one or other form if the other speaker has just employed that form. In other words, participants’ adjacent utterances should show local syntactic consistency. For this to be interpreted as syntactic co-ordination, it must be shown that this consistency is a syntactic effect and does not arise from, for example, the repetition of particular words. As with semantic co-ordination, such syntactic co-ordination may well occur without conscious intent.

Corpus studies provide some evidence for local syntactic consistency between speakers in dialogue. For example, Schenkein (1980) reported a tendency for speakers to repeat the types of sentences used in conversations, as when one speaker said ‘But you can go to sleep tonight’ and the other responded ‘How am I going to sleep tonight?’ (cf. Tannen, 1989; see also Weiner and Labov, 1983, for evidence of within-speaker consistency). One experimental study supports these results: Levelt and Kelter (1982) found that shop assistants tended to reply to ‘What time do you close?’ and ‘At what time do you close?’ (in Dutch) with a syntactically congruent answer (e.g. ‘Five o’clock’ or ‘At five o’clock’). However, all of these results can be explained without reference to syntactic co-ordination. For example, Schenkein’s results could reflect both lexical repetition and repetition for rhetorical purposes. Levelt and Kelter’s results come from question-answer pairs, which are obviously related in meaning and bear an exceptionally close linguistic relationship (e.g. the answer can be within the linguistic scope of the question, as in: Q: ‘Who does John love?’ A: ‘Himself’).

Experimental studies have found within-speaker local syntactic consistency for single speakers producing isolated sentences outside a discourse context (Bock, 1986, 1989; Bock & Loebell, 1990; Bock, Loebell & Morey, 1992; Branigan, Pickering & Cleland, 1999; Hartsuiker & Kolk, 1998; Hartsuiker, Kolk & Huiskamp, 1999; Pickering & Branigan, 1998; Potter & Lombardi, 1998; see Pickering & Branigan, 1999 for a review). In Bock’s (1986) study, speakers alternately repeated sentences and described pictures. The syntactic form of their picture

descriptions tended to repeat the syntactic form of the immediately preceding sentence. Other studies have found similar effects using sentence completion (Pickering and Branigan, 1998) and sentence recall (Potter & Lombardi, 1998). Importantly, these experiments indicate that single speakers tend to repeat syntactic structure in ways that cannot be explained by non-syntactic (e.g. lexical, semantic, or prosodic) factors. This tendency has been called syntactic priming or syntactic persistence. Participants are in general completely unaware of the priming effect (e.g. Bock, 1986).

These experiments have demonstrated that syntactic priming exerts a relatively strong effect on individual speakers. In experiments in English examining Prepositional Object (PO) structures (e.g. 'the girl gave the book to the boy') and Double Object (DO) structures (e.g. 'the girl gave the boy the book'), priming increased the likelihood of producing a particular syntactic form by an average of 12% (Bock, 1986, 1990; Bock & Loebell, 1990; Pickering & Branigan, 1998; Potter & Lombardi, 1998). Priming has also been shown to occur for both these structures, relative to an unrelated baseline (Branigan, Pickering & Stewart, 1998). If such syntactic priming effects were also to occur in dialogue, such that comprehending a structure would prime its subsequent production, the result would be local syntactic consistency that could not be attributed to non-syntactic factors. In other words, syntactic priming between speakers in dialogue would result in syntactic co-ordination, with the functional benefits for the speaker that we have noted.

One influential account excludes any possibility of syntactic priming between speakers in dialogue. Bock and Loebell (1990) explained syntactic priming in terms of the activation of procedures that are associated with the production of particular syntactic structures. Activation of a procedure does not disappear immediately, and so subsequent production of that form is facilitated. Under this account, syntactic priming is predicted to occur from production of a syntactic form to its subsequent production, but not from comprehension of a form to its subsequent production (or vice versa), as Bock and Loebell noted. The procedure associated with comprehending a particular syntactic form and the procedure associated with producing that form must be different, because the operation is reversed. Certainly, current theories of production and comprehension make different assumptions about the nature of the underlying mechanisms; for example, syntactic processing in comprehension is usually assumed to take place on a word-by-word basis (e.g. Frazier, 1987; McRae, Spivey-Knowlton & Tanenhaus, 1998), whereas in syntactic processing in production, it is usually assumed that selection of a word that will appear later in an utterance can determine the selection of a preceding word, for example in the indirect election of closed class words (e.g. Kempen & Hoenkamp, 1987; Levelt, 1989).

However, the strength of co-ordination effects at other levels of linguistic structure, the functional benefits of syntactic co-ordination, the corpus evidence for local syntactic consistency, and the apparent strength of syntactic priming in individual speakers, all lead us to hypothesize that syntactic priming may indeed occur between speakers in dialogue. One way in which this might occur would be if syntactic priming arises not from residual activation of syntactic procedures, but instead

from residual activation of syntactic information (e.g. licensing rules) that is common to production and comprehension (Branigan, Pickering, Liversedge, Stewart & Urbach, 1995). In that case, priming is predicted to occur from comprehension to production, because the information associated with comprehending a structure is the same as that associated with producing it.

There is some evidence that silently reading a sentence with a particular syntactic form increases the likelihood of subsequently producing that form (Potter & Lombardi, 1998). However, Potter and Lombardi's experimental task (sentence recall) involved an explicit memory component. It is not possible to draw any conclusions about the existence of comprehension-to-production priming in spontaneous language production, still less whether such effects occur between speakers in spontaneous dialogue. Hence the existence of syntactic priming effects between speakers in dialogue, and more generally the existence of syntactic co-ordination in dialogue, remain unproven.

We report an experiment employing a novel technique called confederate scripting to investigate syntactic co-ordination in dialogue under controlled conditions. Pairs of participants played a dialogue game in which they alternated between describing a picture to their partners, and selecting a picture that matched their partners' description. In fact, only one participant was an experimental subject; unbeknownst to the subject, the other participant was a confederate of the experimenter.

Some of the pictures could be described using two different syntactic forms. We manipulated the form of the confederate's prime description and examined whether the subject subsequently produced a co-ordinated target description (i.e. a description with the same syntactic form). We also manipulated whether these two descriptions involved the same verb or different verbs. In a previous study of syntactic priming in single speakers, Pickering and Branigan (1998) found that although priming effects were not lexically specific, their magnitude was greater when the verb was repeated between prime and target. By manipulating the verb in the current experiment, we hoped to maximise the chance of detecting syntactic co-ordination effects and to explore whether any such effects in dialogue are affected by verb repetition.

2. Method

2.1. Subjects

Twenty-four members of the University of Glasgow community were paid to participate.

2.2. Materials

We prepared two sets of 48 cards depicting actions. Each set included 12 cards depicting ditransitive actions involving an agent, a patient and a beneficiary. The entities depicted were chosen to be easily recognisable and nameable. There were

two cards for each of six ditransitive verbs (give, hand, offer, sell, show, throw). These 12 cards comprised the experimental cards. The remaining 36 cards in each set depicted transitive actions involving an agent and a patient. There were two cards for each of 18 transitive verbs. These 36 cards comprised filler cards. The appropriate verb was printed under each picture. Each set of cards depicted the same range of entities and actions. However, the pairing of entities with actions was different.

We term one set the Subject's Description Set and the other set the Confederate's Description Set. We created ordered pairs of prime and target cards by pairing each experimental card from the Confederate's Description Set (the prime card) with an experimental card from the Subject's Description Set (the target card). There were two different pairings. In the same-verb pairing, the prime and the target cards involved the same verb; in the different-verb pairing, the two cards involved different verbs. In both pairings, the prime and target cards depicted actions involving different entities. We prepared four scripts, each containing a description for each of the prime cards. In each script, half of the prime cards were assigned PO descriptions of the form 'the X verbing the Y to the Z', and half were assigned DO descriptions of the form 'the X verbing the Z the Y'.

An experimental item was defined as the confederate's scripted description of a prime card plus the subject's target card paired with it. There were thus four versions of each item: same verb, PO confederate description; same verb, DO confederate description; different verb, PO confederate description; different verb, DO confederate description. We constructed four lists containing 12 experimental items and 36 fillers. Each list contained six experimental items with PO prime descriptions and six with DO prime descriptions. Two lists consisted entirely of same-verb items; two lists consisted entirely of different-verb items. Exactly one version of each item appeared in each list. Hence, Prime Type (PO vs. DO) was manipulated within subjects and items; Verb Identity (same vs. different verb) was manipulated between subjects but within items.

2.3. Procedure

The Subject's Description Set was arranged in a box on a table in front of the subject. The order of the cards was randomized for each subject, with at least two filler cards intervening between each target card. Each subject also had a Selection Set of cards to choose from arranged on the table. This set contained the same cards as the Confederate's Description Set, plus an additional 24 distracter cards. There was one distracter card for each verb. The Subject's Selection Set was arranged in alphabetical order by verb, in a four by six card matrix; all of the cards for a given verb were stacked together. Each subject also had an empty box in which to place the chosen cards.

The Confederate's Description Set was similarly arranged in a box, with the fillers randomized in the same way as the subject's. The prime cards were placed in the same ordinal positions as the target cards in the subject's box. The Confederate's Selection Set (identical to the Subject's Description Set, plus 24 distracter cards) was arranged on the table in the same way as the subject's. The confederate

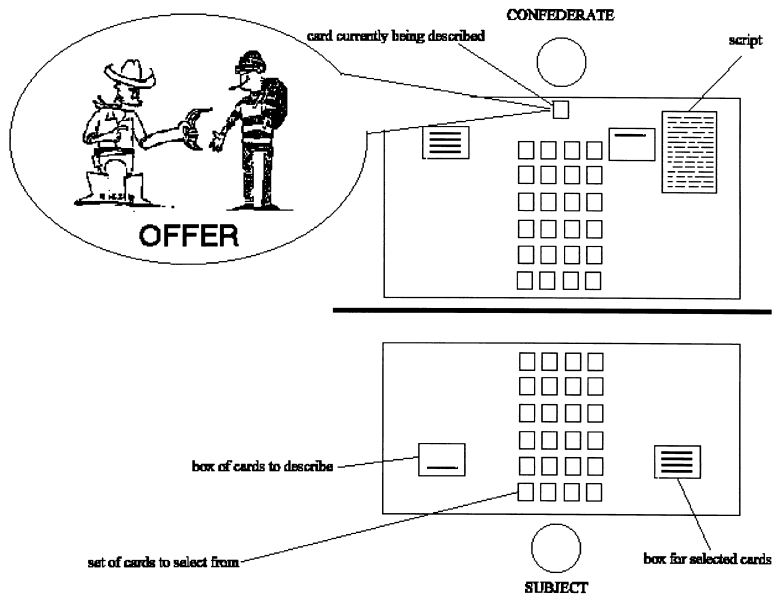


Fig. 1. Experimental set-up.

also had a script specifying the description (PO or DO) to use for each prime card. A divider prevented the subject from seeing the confederate or her cards (see Fig. 1).

The experimenter told the subject and the confederate that the experiment investigated how well people communicate when they cannot see each other. Their tasks were alternately to describe the pictures in their card-filled box to the other participant, and to choose the cards from the set on the table that matched the other participant's descriptions, placing these in the empty box. They were instructed that they could say "Please repeat" to request repetition of a description, but nothing else. Throughout the session, the experimenter and confederate acted as if the confederate was a genuine subject (e.g. the confederate asked the experimenter for clarifications about the method). Before the experiment, there was a practice session involving four cards. In both sessions, the confederate gave the first description. Hence the confederate's description of a prime card always immediately preceded the subject's description of a target card.

The experimental session was recorded on audio tape and subsequently transcribed. We coded the first response that the subject produced; 3 target responses that did not contain the appropriate verb were excluded. We coded the remaining 285 target responses as PO if the (inanimate) patient of the action immediately followed the verb and was followed by the preposition 'to' and the (animate) beneficiary of the action; and as DO if the (animate) beneficiary of the action immediately followed the verb, and was followed by the (inanimate) patient of the action.

3. Results

Proportions of target responses in the different conditions are reported in Table 1.

The two factors in our analyses were Verb Identity (same vs. different verb) and Prime Type (PO prime vs. DO prime). Because the proportions of PO and DO target responses in each condition were complementary, it is not meaningful to report analyses for PO and DO responses separately. We therefore report analyses for PO target responses only. We conducted analyses treating subjects ($F1$) and items ($F2$) as random factors. Two-way ANOVAs on the proportions of PO target responses produced in each condition revealed a main effect of Prime Type ($F1(1, 22) = 54.39$, $P < 0.01$, $MSe = 0.037$; $F2(1, 11) = 48.95$, $P < 0.01$, $MSe = 0.041$), and an interaction between Verb Identity and Prime Type ($F1(1, 22) = 6.71$, $P < 0.05$, $MSe = 0.037$; $F2(1, 11) = 7.40$, $P < 0.05$, $MSe = 0.034$). Separate analyses over each level of the Verb Identity factor revealed an effect of Prime Type for both the same-verb level ($F1(1, 11) = 44.90$, $P < 0.01$, $MSe = 0.041$; $F2(1, 11) = 42.31$, $P < 0.01$, $MSe = 0.044$) and the different-verb level ($F1(1, 11) = 13.75$, $P < 0.01$, $MSe = 0.034$; $F2(1, 11) = 13.67$, $P < 0.01$, $MSe = 0.031$). Table 1 shows that subjects tended to produce target descriptions of the same syntactic form as the prime, both when the verb stayed the same between prime and target, and when it differed. However, the effect was stronger when the verb remained the same.

4. Discussion

Our experiment provides a clear demonstration of syntactic co-ordination in dialogue, using the novel confederate-scripting technique. We found a dramatic tendency for speakers to produce a syntactic form that they had just heard the other participant use: When the verb remained the same, they produced 55% more syntactically co-ordinated responses than non-co-ordinated responses; when it differed, they produced 26% more co-ordinated than non-co-ordinated responses.

We can exclude non-syntactic explanations for our findings. The two alternative forms are not associated with different discourse registers, and use of one form or another could not be attributed to rhetorical effects. A lexical explanation seems

Table 1
Results^a

Verb type	Prime description	Target description	
		PO	DO
Same	PO	0.86	0.14
	DO	0.31	0.69
Different	PO	0.65	0.35
	DO	0.39	0.61

^a PO = prepositional object, DO = double object.

equally unlikely. The prime and target cards involved different entities, and repetition of the verb alone could not account for the tendency to repeatedly produce particular phrasal complements following the verb. The function word 'to' is found in PO but not DO forms in both prime and target, but an account based on lexical priming of 'to' cannot explain the variation in the magnitude of the effect in the same-verb and different-verb conditions.

These results differ from earlier demonstrations of co-ordination in dialogue. They cannot be explained in terms of the co-ordination of mental models, or the convergence on particular referring expressions and interpretations for them. The two alternative structures used to describe a target card described the same situation and contained the same referring expressions. In contrast, the prime and the target descriptions contained entirely different referring expressions. Hence our experiment demonstrates co-ordination based on form rather than meaning. Our results are particularly striking because, unlike meaning-based co-ordination, where failure to co-ordinate (e.g. using the word 'square' in different ways) can result in misunderstanding and communicative breakdown, form-based co-ordination was not necessary for communicative success in our experiment.

Our results provide further evidence that, during language production, speakers are sensitive to the characteristics of the communicative situation, and in particular to the linguistic behaviour of other participants. As such, our results support the view of dialogue as a collaborative process (Clark & Wilkes-Gibbs, 1986; Garrod & Anderson, 1987). Our finding of form-based co-ordination is also consistent with Garrod and Clark's (1993) proposal that co-ordination in dialogue is a default response, with young children displaying lexical repetition even when it interferes with communicative success.

We emphasise that in interpreting our results in these terms, we do not claim that participants were consciously aware of their partner's linguistic behaviour and were deliberately adjusting their own behaviour to converge with it. What we have identified as co-ordination of linguistic behaviour (i.e. convergence on a common pattern of behaviour) may arise without deliberate intent on the participants' part (Garrod & Anderson, 1987; Garrod & Clark, 1993). Certainly, the syntactic co-ordination that we found did not arise from explicit negotiation.

Our findings have methodological implications. They demonstrate that it is possible to study syntactic structure in natural dialogue under controlled experimental conditions by using confederate scripting in a picture-description and picture-matching task. Our study focused on syntactic co-ordination; but we suggest that confederate scripting could be used in future research to study other aspects of syntactic processing in dialogue.

We argue that syntactic co-ordination in dialogue may arise in the same way as the syntactic priming effects found for individual speakers. Prior processing of a particular structure can facilitate subsequent use of that structure. Specifically, speakers tended to produce the same structure as that produced by their partner in the immediately preceding turn. Note that over the experiment as a whole, experimental subjects encountered the PO and DO forms produced by the confederate equally frequently. Hence our effects cannot be interpreted as a response to the

statistically greater frequency of one structure within the experimental session. Any statistical account of our effects would instead require a mechanism that was sensitive to single occurrences of a structure. It is difficult to see how such a mechanism can be empirically distinguished from priming.

Thus, syntactic priming is not limited to experimental situations where the speaker has just produced a particular syntactic form; it also occurs in natural dialogue, when the speaker has heard that form produced by another participant. The pattern of effects in dialogue was the same as that found in previous experiments that investigated syntactic priming in the production of isolated PO and DO sentences by individual speakers: Effects were stronger when the verb was repeated between prime and target than when the verb differed (Pickering & Branigan, 1998). However, the magnitude of the effect found here was substantially greater in both conditions (55% versus 17.5% for the same-verb conditions; 26% versus 4.4% for the different-verb conditions). Other single-speaker priming experiments in English using the same structures that investigated only different-verb conditions also found consistently smaller effects than in this experiment, varying from 12% (Potter & Lombardi, 1998: Experiment 3, target-first conditions) to 23% (Bock, 1986: Experiment 1), with a mean of 16% (Bock, 1986; Bock & Loebell, 1990; Potter and Lombardi, 1998). It is not clear on the basis of this experiment whether the difference in magnitude reflects differences in the communicative situation (dialogue versus monologue), or differences in the experimental task (picture description in the context of a picture-matching task versus picture description in the context of a running memory task, or sentence completion).

Our finding of syntactic priming in dialogue is informative about the nature of the language processing system. It demonstrates that there are shared syntactic representations underlying comprehension and production, and moreover that these representations are activated during spontaneous dialogue. Such syntactic representations might be encoded as a component of lexical entries that are accessed during both production and comprehension. Levelt, Roelofs and Meyer (1999) proposed a model of lexical access in production that assumes the existence of a lemma stratum, common to production and comprehension, which encodes syntactic information. Their main evidence for the claim that the lemma stratum is shared between production and comprehension is the finding that the perception of a word can affect the production of a semantically related word (e.g. Schriefers, Meyer & Levelt, 1990). But since the lemma contains only syntactic information, our finding of syntactic priming between comprehension and production is actually much clearer evidence for their model.

These results argue strongly against Bock and Loebell's (1990) account of syntactic priming, in which priming reflects the residual activation of procedures associated with producing a particular syntactic form. Such an account would require the same procedures to be shared between production and comprehension. Instead, the results support an account in which priming arises from the residual activation of syntactic information (Branigan et al., 1995). Pickering and Branigan (1998) proposed such an account of syntactic priming in language production, in terms of a model of the lemma stratum that is consistent with Levelt et al. (1999) and Roelofs's (1992).

In this model, nodes representing verb lemmas (i.e. the base form of the verb) are linked to nodes representing grammatical features (e.g. present tense, plural number) and to nodes representing combinatorial possibilities. Producing a verb with the PO construction involves activation of one combinatorial node; producing a verb with the DO construction involves activating another combinatorial node. In this model, activation of a combinatorial node, and the link between it and the lemma node, does not decay immediately; hence subsequent use of that construction is facilitated. The model predicts stronger priming effects when the same verb appears in prime and target than when the verb differs, on the assumption that both the combinatorial node encoding a particular syntactic form, and the link between a particular verb and a particular combinatorial node, can be primed.

We can extend this model to explain syntactic co-ordination in dialogue by following Levelt et al. (1999) in assuming that both producing and understanding a sentence involve activating nodes within the lemma stratum. For example, understanding a PO sentence involves activating the relevant verb lemma node and the combinatorial node that is associated with the PO structure. If the listener then has to describe an event that can be described using a PO sentence or a DO sentence, the residual activation of the combinatorial node will favour production of a PO sentence. Under this model, then, syntactic co-ordination reduces the speaker's computational load by facilitating the ease with which a particular combinatorial node can be selected, and hence the ease with which the syntactic structure that is associated with that node can be constructed. This model is also compatible with Trueswell and Kim's (1998) findings for language comprehension. Trueswell and Kim showed that the masked presentation of a verb with a particular combinatorial potential affected the choice of syntactic analysis for a sentence containing a different verb. They interpreted their results as priming from comprehension to comprehension of verb argument structure, but did not consider in detail how such effects might arise. In our model, such effects could arise from residual activation of combinatorial nodes accessed during both production and comprehension, in exactly the same way as syntactic priming effects from production to production or from comprehension to production.

Syntactic co-ordination occurs when the speaker and the listener activate shared syntactic information, in the same way that semantic and lexical co-ordination require the activation of shared semantic and lexical information. In this sense, participants in a dialogue establish common syntactic ground in the same way as they establish common semantic ground (e.g. Clark, 1996). One difference between the common syntactic ground established in our experiment and the common semantic ground studied in previous experiments is that in our experiment, common syntactic ground was established for adjacent turns only, and not over longer stretches of dialogue, because the confederate produced equal numbers of each alternative syntactic structure in a randomized order. We hypothesize, however, that in an unscripted dialogue, common syntactic ground could be established for longer stretches of dialogue, in the same way as common semantic ground. This follows from our finding that speakers tend to syntactically co-ordinate their contributions in dialogue.

We have used a novel experimental method to demonstrate the existence of form-based co-ordination in dialogue, and have shown how such results might arise within a processing model of language production. Our results add to the existing evidence that linguistic co-ordination effects are pervasive in dialogue, and lend further support to the proposal that co-ordination plays an important role in facilitating human communication.

Acknowledgements

We thank Stuart Boutell and Simon Garrod. We also thank Gerry Altmann and two anonymous reviewers for comments on an earlier version of this paper. This research was supported by a British Academy Postdoctoral Fellowship and a British Academy grant (awarded to HB), and ESRC Grant R000237418.

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