"Ordinary Gingerbread":
Pragmatic Constraints on Fragments in Dialogue

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Abstract

The paper presents a corpus study of constraints on fragments in dialogue. The work is part of a larger corpus study where dialogues from seven different corpora in three languages are qualitatively analysed. A fragment is characterised using information structure as containing either just a focus or a focus together with a partial ground. Two types of constraints are then presented and discussed. The first type concerns constraints on what parts of the context the fragments is connected to. These constraints involve recency, parallelism with alternatives, and relevance. The second type of constraints concerns the choice between fragments and non-fragment utterances in dialogue, where fragments are found to be the default choice in dialogue, and several different constraints requiring a non-fragment utterance are considered.

Introduction

As part of natural and flexible dialogue, human speakers as well as machine dialogue participants need to make a principled choice between whether to use a fragment or a non-fragment at any given point, such as whether to say "A quarter past two" or "The train leaves at a quarter past two". Using a characterisation of utterances in terms of information structure, I will here discuss two types of constraints on fragments in dialogue. The first set of constraints involves constraints on information structure regarding how the information structure of an utterance is determined in relation to a potentially large and complex dialogue context. The second set of constraints concerns pragmatic and extra-linguistic constraints on when to use a fragment and when no to do so. The work presented here concentrates on the pragmatics of fragments, and morphosyntactic and phonological aspects, although clearly relevant to fragments, will not be considered.

I begin by giving a view of the corpus material used in the study, and I then introduce the particular information structural framework that is used here. The analysis then consists of, first of all, constraints on information structure, and secondly, pragmatic and extra-linguistic constraints on when a fragment is used and not.

Corpus material

The work presented here is part of a larger study on fragments that I have carried out, see Ericsson (2005), using dialogues from seven corpora of human-human dialogue, including a number of different activities and the three languages English, Swedish, and French. The examples given below are taken from the HCRC Map Task corpus (Anderson *et al.*, 1991); a Route Explanation corpus (Prévot, 2004); the Göteborg Spoken Language Corpus (Allwood *et al.*, 2000); The Office du Tourisme de Grenoble corpus (Nicolas *et al.*, 2002); a corpus of dialogues for the control of an mp3 player collected as part of the TALK[1] project; and SRI's Amex Travel Data, e.g., Shriberg (1994).

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[1] http://www.talk-project.org/

The dialogues were all manually and qualitatively analysed to give a full view of fragments and their contexts, mainly using transcriptions, but also through audio data as needed. The whole study includes 420 dialogues from the different corpora. Of these, the 315 dialogues from the OTG corpus typically consist of just a few utterances, whereas the remaining 105 dialogues are of varying lengths.

Information structural framework

Something made relevant by all fragments in dialogue is the distinction between what is informative and what is not. This distinction is precisely one of the dimensions analysed by theories of information structure. The information structural framework I use here is influenced by, although not identical with, that of Vallduví (1992). The *focus* of an utterance is the informative part, that which is to update the hearer's information state. The *ground* is that part of an utterance that the speaker presents to the hearer as either already part of the hearer's information state or that the speaker believes can be uncontentiously accommodated. With a slight modification of Vallduví (2001), the *base* of an utterance is that part of the context that the ground of a non-fragment utterance reflects, or, in the case of fragments, that acts as the ground for the fragment's focus. In addition I also distinguish between contrastive foci, which here have an explicitly mentioned alternative in the context, and non-contrastive foci, which have no such explicitly mentioned alternative. I also make a distinction between the (pragmatic) focus and the (syntactic) focus phrase of an utterance, see Drubig (1994), allowing a fragment to consist of less than a full phrase, which my analysis will show to be necessary for the treatment of fragments in dialogue. In my information structural framework, a fragment can either consist of just a focus or a focus together with a partial ground.

Example (1) illustrates the notions introduced so far (where $F3$ is taken from the actual dialogue, and $F3'$ and $F3''$ are constructed utterances):

(1)   [HCRC Map Task, dialogue q2nc3]
         G1: Where are you in relation to the top of the page just now?
         F1: About four <u>inches</u>
         ...
         G3: Where <u>are you from the left-hand side</u>?
         F3: **About two**
         F3': **About two** *inches*
         F3'': *I am* **about two** *inches from the left-hand side*

Utterance $F3$ is a fragment consisting of only a focus, shown using boldface. The base for this utterance comes partly from $G3$ and partly from $F1$. The base is underlined. Utterance $F3'$ is also a fragment, consisting of the focus, and a partial ground shown in italics. "About two inches" constitutes the focus phrase for this example, showing that $F3$ consists of less than the focus phrase. As $F3$ is the utterance that occurred in the original dialogue, rather than $F3'$ or $F3''$, this example illustrates how for fragments in dialogue, a focus can correspond to less than a full syntactic phrase.[2] Utterance $F3''$, finally, is a non-fragment consisting of a full ground and focus. In all three variants of $F3$ the focus is a contrastive focus, since "two" contrasts with "four" in $F1$.

Having characterised the utterance in terms of ground, contrastive or non-contrastive focus, and the focus phrase, I now turn to the issue of constraints on fragments.

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[2]This also relies on a requirement that all of the focus must be explicitly realised in a fragment.

Information structural constraints

The first set of constraints concerning fragments to be considered here concerns information structure, that is, constraints on the determination of how a fragment relates to the context. More specifically, the question to be investigated is what material in the context can act as the base for a given fragment.

The first constraint here is a constraint on recency: when the base for a fragment comes from a preceding utterance, this utterance must be a recent one in the dialogue history.

Analysing dialogue as structured around questions under discussion in a way similar to Roberts (1996) and Ginzburg (1996), the corpus material shows that the base of a fragment can come from a question under discussion if this question occurs in the immediately preceding turn, or if the question is distanced by at most a brief exchange concerning clarification or grounding more generally. An example of the former is $G1 - F1$ in example (1) above, where $G1$ is the question under discussion when the fragment $F1$ is uttered. An example of the latter is (2):

(2)   [Route Explanation, dialogue 2.3]

      F1: <u>Tu viens d'où?</u>

         Eng. Where <u>do you come</u> *or* <u>are you coming</u> <u>from</u>?

      R1: Tout de suite là?

         Eng. Just now?

      F2: Ben oui

         Eng. Yeah

      R2: **La Chartreuse**   *Eng.* (the name of a hotel)

In example (2), $R2$ is a fragment where the base comes from the question under discussion given by $F1$. The two turns in between $F1$ and $R2$ clarify the interpretation of $F1$.

Utterances where the base comes from a preceding utterance that is not a question under discussion also comply with a recency constraint. For instance, short intervening sequences concerning grounding often seem possible. For a fragment that is a question itself, and whose base comes from a question no longer under discussion, recency appears to constrain the fragment and the base to be separated by at most an answer to the question no longer under discussion and possibly a short exchange concerning grounding. Consider the following example, where the fragment is the question $TA2$:

(3)   [GSLC, dialogue A8207051]

      TA1: <u>Hur mår</u> din lilla Josefin?

         Eng. <u>How is</u> your little Josefin?

      C1: Hon mår hyfsat

         Eng. She's okay

      TA2: Och **Gabriella**?

         Eng. And **Gabriella**?

The base for the question fragment $TA2$ in example (3) comes from $TA1$, a question that is no longer under discussion when $TA2$ is being posed. A short sequence concerning the clarification, or other grounding, of $C1$ can presumably be inserted before $TA2$ without changing the form of $TA2$, but other material does not seem possible in the corpus dialogues.

The recency constraint appears to be very strong, and shows an opposing view to Ginzburg (1996) where it is maintained that answer ellipses can "occur arbitrarily far away from the question they relate to". However, I argue that Ginzburg's example does not involve a fragment on its own, but rather a fragment supplemented with additional material that performs the function of reraising, see Cooper *et al.* (2000). Ginzburg's corpus example concerns a discussion between three people of the ages of their fathers. At the start of the example, one speaker raises the question

of whether the father of one of the other speakers is a generation younger than the other father. This issue and the ages of the fathers are discussed during 13 consecutive turns, after which one of the speakers concludes, "a half generation then". The focus in this utterance corresponds to "a half generation", but rather than being a fragment consisting of just this material, the fragment also crucially contains the word "then". Although "a half generation" seems perfectly possible immediately following the question several turns earlier, it does not seem possible on its own after 13 turns, indicating that something more than just answering a question by a fragment is going on here.

Fragments with a contrastive focus have a base that can be analysed as coming from lambda abstraction over a contrastive element in a preceding utterance. For such fragments, parallelism – in the sense of Pulman (1997) – between the fragment and the utterance from which the base is construed, is a constraint which also involves the contrasting elements being construable as alternatives to each other. For instance, "four" and "two" in example (1) are contrastive in part through being, say, alternative integers. Another example is (4):

(4)   [HCRC Map Task, dialogue q2nc3]
         G: <u>Have you got</u> stones <u>at the top left-hand point of your page</u>?
         F: **Rock fall**

In (4) F's fragment and G's utterance can be construed as parallel through "stones" being an alternative to "rock fall", both being landmarks in the map task activity.

Another constraint on fragments is also illustrated by (4). First of all, the base can be formulated as a *wh*-question. For instance, in (2) above the base for $R2$ formulated as a question is equal to the explicitly asked question under discussion in $F1$. However, in (4) the base question is not identical with the question explicitly asked by G, but rather with the question obtained by lambda abstracting over "stones", giving "What have you got at the top left-hand point of your page?". The constraint illustrated here is a constraint on relevance: the base question must be a relevant question at the given point in the context in order to act as the base of a fragment.

The relevance constraint is naturally of importance to all fragments, but it is particularly visible for examples like (4) where a question other than the one explicitly posed contributes the base material. In order for F to utter "Rock fall" here, and for G to be able to make sense of this utterance, the question of what, if not stones, F has at a particular point on the map, must be construable as a relevant question at that point in the dialogue. A similar example is the following:

(5)   [OTG, dialogue 1AP0133]
         C: Est-ce que vous avez le plan du bus et du TAG?
             Eng. Do you have a map of buses and the TAG?
         H: **En face**
             Eng. **Just opposite**

H's fragment in (5) does not explicitly answer the question of whether she has the map in question, but instead answers the question of where it can be found, which she presumably considers a relevant question here. Note that both of H's answer in (5) and F's answer in (4) not only give information in relation to another relevant question, but also imply an answer to the question explicitly raised and under discussion.

Pragmatic and extra-linguistic constraints

I now turn to the second set of constraints on fragments to be considered here. These constraints concern the determination of when a fragment can be used, and when it should not be used, given that in both cases a base is contextually available. There are a number of such constraints evident in the corpus examples, and I will discuss some of them here.

The first thing to note is that using a fragment appears to be the rule; whenever a base is contextually available and there are no other constraints discouraging a fragment, a fragment is produced. Examples are $F1$ and $F3$ (1), $R2$ in (2), and F's utterance in (4), and these kinds of example are numerous in all corpora considered here. What then are the constraints discouraging the use of fragments, or, to put it slightly differently, what are the constraints requiring the presence of ground material in an utterance?

One such constraint concerns communication difficulties, either anticipated or already having occurred. For instance, a fragment overlapped by the speech of another dialogue participant or by background noise, may be repeated as a full ground-focus utterance to ensure understanding. Similarly, ground may be included to make an utterance fully explicit, which may be a way of avoiding future misunderstanding.

Ground may also be included for reasons of own communication management, in the sense of Allwood (2000) and Allwood *et al.* (1990), such as the planning of one's utterance while talking. For instance, there are dialogue examples where a speaker produces ground material, typically together with various markers of hesitation, while deliberating just what focus information to give (three dots here indicate a short pause):

(6)   [GSLC, dialogue V8202041]

TA: När <u>kan du tidigast åka</u>?

    Eng. When <u>can you the-earliest leave</u>? – When's the earliest you can leave?

C: Öh *tidigast* ... öm jag är ganska flexibel ... men eh ... *tidigast* ... vad ska jag säga ... eh öh **nittonde**

    Eng. Eh *the earliest* ... eh I'm quite flexible ... but eh ... *the earliest* ... what should I say ... eh eh **the nineteenth**

In (6) a fragment answer consisting of just the focus would have been "The nineteenth", but as C is presumably not sure of which date to give when she starts speaking, she includes part of the ground, "tidigast" ("the earliest"), and this even twice, together with pauses, hesitation markers, and other material, before the focus.

Ground material may also be part of the utterance in what seems to be an optional fashion. Such optional grounds are semantically and phonologically "light", including little material and typically involving a pronoun. For example, utterances such as "Me" and "It's me" – the former a fragment and the latter a non-fragment with a light ground – occur interchangeably in the dialogues. The pronoun in a light ground either refers to an antecedent introduced through a more complex expression in the base utterance, or is an identical repetition of a pronoun in the base whose antecedent was introduced somewhere earlier in the dialogue. An example of the latter is the following:

(7)   [MP3, dialogue 1.2]

A: Vad <u>heter den</u>?

    Eng. What <u>is it called</u>?

B: *Den heter* **Time dance**

    Eng. It's called **Time dance**

The ground material in B's utterance in (7) is identical to the base in A's utterance, ignoring word order.

Utterances may also be constrained to include ground when the ground involves a reformulation. This reformulation may either be for purely stylistic reasons, and the ground is then typically also quite light, or with more of a semantic import. An example of the latter is the following:

(8)   [SRI's Amex Travel Data, tape 16 call 1]

TA: What was it <u>you needed to have changed</u>?

C: *He wants to change* **United to US Air**

The "you" in the travel agent's question is changed to a "he" in the ground of the customer's answer, clearly giving a semantic differernce between the two utterances. The reason for considering this to be ground and not focus is that the speaker makes no attempt at drawing attention to the change of pronouns, neither phonologically nor through a rephrasing of the utterance. Additionally, the question of who wants to change something is not under discussion at this point in the dialogue, and who wants to do the changing is, at least at this stage, irrelevant to the task at hand.

By including ground material in example (8) speaker C thus introduces a slight change to the content of the question under discussion as introduced by the travel agent. It can also be noted that TA's utterance contains the verb "need" whereas C makes use of "want". The reason for this is slightly less clear. It could be for purely stylistic reasons, introducing variation in what is being said, or it could be used to indicate that it is not a matter of needing but of wanting. Either way, the travel agent gets the information that she asked for in the form of "United to US Air"..

Let us finally consider examples of fragments consisting of the focus together with a partial ground, where these together constitute the focus phrase. An example would be $F3'$ in example (1) above, "About two inches". Another example is the following:

(9)   [GSLC, dialogue A3212011]
         A: Man kan ta, <u>när man bakar</u> mjuk <u>pepparkaka man tar i</u> bikarbonat

             Eng. You can take, <u>when you bake</u> soft <u>gingerbread</u>[3] <u>you put in</u> bicarbonate.
         B: **Vanliga** *pepparkakor* då?

             Eng. **Ordinary** *gingerbread*[4] then? – What about **ordinary** *gingerbread*?

The fragment here is B's utterance, consisting of the focus phrase "vanliga pepparkakor" ("ordinary gingerbread"), where "vanliga" is the pragmatic focus and "pepparkakor" is part of the pragmatic ground.

A common reason for the inclusion of a partial ground, although not discussed any further here, is syntactic in nature: a syntactically complete phrase may be required by the language in question for a particular example. This is not the case for example (9), however, as it would have been syntactically perfectly fine for B to utter the following in Swedish:

(10)   [GSLC, dialogue A3212011]
          B′: **Vanliga** då?

              Eng. **Ordinary** then? – What about **ordinary**?

Another reason for the inclusion of a partial ground giving a fragment that consists of a full focus phrase, has to do with such material typically being light, in the sense introduced above. Thus, a partial ground that is part of the focus phrase may be included more or less optionally.

A partial ground may also be included to facilitate the hearer's comprehension task. The full context for B's utterance in (9) is obviously much larger than is shown in the extract here, with several issues being discussed. The explicit realisation of "pepparkakor" can help A construct just what it is that B is asking about, as just "vanliga" on its own could potentially modify other items in the context, giving other questions.[5]

Conclusion

I have here presented a corpus study of constraints in dialogue as part of a larger body of work on fragments. I have based my analysis on a theory of information structure, where I argue that at

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[3]'Soft gingerbread' is a literal translation of 'mjuk pepparkaka'. 'Mjuk pepparkaka' is a form of gingerbread cake.
[4]'Pepparkakor' ('gingerbread') here refers to gingerbread as gingerbread biscuits, which is the "ordinary" kind of gingerbread.
[5]See also the more general discussion of *interference* by Ericsson (2005).

least the notions of (contrastive and non-contrastive) focus, ground, and focus phrase are needed for the treatment of fragments.

Two sets of constraints on fragments have been considered. In terms of information structure – in the sense of what parts of the preceding dialogue can act as the base for a fragment – I have argued for the existence of at least the following three constraints: recency, parallelism and alternatives for contrastive foci, and relevance. When it comes to constraints on whether a fragment is used at all or if a full ground-focus utterance is rather to be used, empirical data seem to show that the default is to produce a fragment when a base is contextually available. Different constraints may then require the presence of a full or a partial ground in different contexts. Ground material may be included to prevent communication difficulties, or as part of own communication management, or optionally if it is a matter of a light ground. It may also be included to introduce a slight meaning difference, or to make the intended interpretation of the utterance clear.

Although not further investigated here, light grounds that are identical to their base, such as in example (7) above, may perhaps be even more common than fragments consisting of only the focus in such contexts. I leave this question to future investigations.

Several of the constraints discussed above may be conflicting in relation to each other. This is perhaps most obvious for the default constraint requiring the absence of ground and the different constraints requiring the presence of ground material. Ericsson (2004, 2005) has explored Optimality Theory for such constraint conflicts in relation to fragments.

Constraints on fragments based on the corpus study that I have now discussed, are currently being implemented in the dialogue system GoDiS (Larsson, 2002). The generation component of this system is being made to handle the determination of information structure, and, based on this, the determination of whether a fragment or not is to be produced.

References

Allwood, J. (2000). An activity based approach to pragmatics. In H. Bunt and W. Black, editors, *Abduction, Belief and Context in Dialogue: Studies in Computational Pragmatics*, pages 47–80. John Benjamins.

Allwood, J., Nivre, J., and Ahlsén, E. (1990). Speech management: On the non-written life of speech. *Nordic Journal of Linguistics*, **13**(1).

Allwood, J., Björnberg, M., Grönqvist, L., Ahlsén, E., and Ottesjö, C. (2000). The spoken language corpus at the Linguistics Department, Göteborg University. *Forum Qualitative Social Research*, **1**(3).

Anderson, A., Bader, M., Bard, E., Boyle, E., Doherty, G., Garrod, S., Isard, S., Kowtko, J., McAllister, J., Miller, J., Sotillo, C., Thompson, H., and Weinert, R. (1991). The HCRC map task corpus. *Language and Speech*, **34**, 351–366.

Cooper, R., Engdahl, E., Larsson, S., and Ericsson, S. (2000). Accommodating questions and the nature of QUD. In *Proceedings of Götalog'00*, pages 57–61.

Drubig, H. B. (1994). Island constraints and the syntactic nature of focus and association with focus. *Arbeitspapiere des Sonderforschungsbereichs 340: Sprachteoretische Grundlagen für die Computerlinguistik*. Nr. 51.

Ericsson, S. (2004). Dynamic optimisation of information enrichment in dialogue. In *Proceedings of the 8th International Workshop on Formal Semantics and Pragmatics of Dialogue, Catalog*, Barcelona, Spain.

Ericsson, S. (2005). *Information Enriched Constituents in Dialogue*. Ph.D. thesis, Göteborg University.

Ginzburg, J. (1996). Interrogatives: Questions, facts and dialogue. In S. Lappin, editor, *The Handbook of Contemporary Semantic Theory*, pages 385–422. Blackwell, Oxford.

Larsson, S. (2002). *Issue-based Dialogue Management*. Ph.D. thesis, Göteborg University.

Nicolas, P., Letellier-Zarshenas, S., Schadle, I., Antoine, J.-Y., and Caelen, J. (2002). Towards a large corpus of spoken dialogue in French that will be freely available: The "parole publique" project and its first realisations. In *Proceedings of LREC'02*.

Prévot, L. (2004). *Structures sémantiques et pragmatiques pour la modélisation de la cohérence dans des dialogues finalisés*. Ph.D. thesis, Université Paul Sabatier, Toulouse.

Pulman, S. (1997). Higher order unification and the interpretation of focus. *Linguistics and Philosophy*, **20**, 73–115.

Roberts, C. (1996). Information structure in discourse: Towards an integrated formal theory of pragmatics. In J.-H. Yoon and A. Kathol, editors, *OSU Working Papers in Linguistics, Vol 49: Papers in Semantics*.

Shriberg, E. E. (1994). *Preliminaries to a Theory of Speech Disfluencies*. Ph.D. thesis, University of California at Berkeley.

Vallduví, E. (1992). *The Informational Component*. Garland.

Vallduví, E. (2001). Fragments in information packaging. Talk at the ESSLLI'01 workshop on Information Structure, Discourse Structure and Discourse Semantics.