# Whose turn is it anyway?
# Same- and cross-person compound contributions in dialogue

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### Abstract

In natural conversation people sometimes build larger grammatical, semantic and pragmatic units out of multiple turns or installments. The incremental and collaborative character of these 'compound contributions' presents challenges for theories of natural language processing. Compounds produced over successive turns by one person have often been analysed in essentially the same way as compounds produced by multiple people. In some recent accounts this putative equivalence has been taken as evidence for the claim that within- and cross-person language processing are fundamentally interchangeable. However, in this paper we present an analysis of compound contributions in a corpus of ordinary dialogues which shows that same- and cross-person compound contributions are constructed in different ways and have different semantic and pragmatic effects on the organisation of dialogue. In particular, we show that they differ in the pragmatic environments in which they occur and that they have different consequences for subsequent turn-taking and interpretation. This asymmetry highlights the need for models of dialogue that account for not just the inherent incrementality of dialogue, but the different status of each contributor towards a turn-in-progress.

**Keywords:** Dialogue; compound contributions.

## Introduction

*Compound contributions* (*CCs*) – dialogue contributions that continue or complete an earlier contribution, see e.g. (1) – are the paradigm case of coordination in dialogue and constitute a critical test case for theories of *natural* language processing.

(1)    **Daughter:**    Oh here dad, a good way to get those corners out
          **Dad:**    is to stick yer finger inside.
          **Daughter:**    well, that's one way.
          *[from Lerner (1991)]*

CCs are of interest to dialogue theorists because they provide evidence about how contributions can cohere with each other at multiple levels – syntactic, semantic and pragmatic (though of course they are not the only way). They also indicate the radical context-dependency of conversational contributions, which can, in general, be highly elliptical without disrupting the flow of the dialogue. CCs are a dramatic illustration of this: speakers must rely on the dynamics of the unfolding context (linguistic and extra-linguistic) in order to guarantee successful processing and production.

Much of the work on CCs has studied cross-person cases, in different disciplines and under a variety of different names, including *collaborative completions* (Clark, 1996; Poesio and Rieser, 2010), *co-constructions* (Sacks, 1992), *joint productions* (Helasvuo, 2004), and *split utterances* (Purver et al., 2006).

Linguistic studies show that grammatical constraints are respected across speaker and hearer (see e.g. Gregoromichelaki et al., 2009). In Finnish (which has rich inflectional morphology), and Japanese (a verb-final language), cross-person CCs within a single clause conform to the strict syntactic constraints of the language, despite the change in speaker (Helasvuo, 2004; Hayashi, 1999).

From a psycholinguistic point of view, the phenomenon of CCs seems compatible with mechanistic approaches as exemplified by the Interactive Alignment model of Pickering and Garrod (2004), which claims that, all things being equal, it should be as easy to complete another's sentence as one's own. According to this model, speaker and listener ought to be interchangeable at any point. A similar stance is taken by the grammatical framework of Dynamic Syntax (DS: Cann et al., 2005). In DS, parsing and production are taken to employ the same mechanisms, leading to a prediction that CCs ought to be strikingly natural (Purver et al., 2006).

From an organisational point of view, it has been claimed that turn-taking operates not on individual conversational participants, but on 'parties' (Schegloff, 1995). For example, a couple talking to a third person may organise their turns as if they are one 'party', rather than two separate individuals. Lerner (1991) speculates, following Sacks (1992), that cross-person compound contributions can clarify the formation of such parties, as they reveal a relationship between syntactic mechanisms and social organisation. He claims that this provides evidence of one way in which syntax can be used to organise participants into "groups".

Because a sentence is obviously a prototypical instance of that thing which is done by a unit. Normally, some single person. That then permits it – for those who have the wit to do it – to be a way that some non-apparent unit may be demonstrated to exist.

We get, then, a kind of extraordinary tie between syntactic possibilities and phenomena like social organization. That is, an extremely strong way that these kids go about demonstrating that, for one, there is a group here, is their getting together to put this sentence together, collaboratively. (Sacks, 1992, p145)

These different approaches all treat cross-person compound contributions as being in some sense equivalent to turns produced by a single participant, in syntactic, semantic or pragmatic terms. However, there are few studies of same-person CCs, and those that there are (e.g. Goodwin, 1979; Walker, 2004) focus on the subset of *expansions*, which add material to an already potentially complete contribution (2), excluding *completions*, which involve the addition of syntactic material which is required to make the whole compound contribution (syntactically) complete (3).

(2) **T:** It'll be an E sharp.
    **G:** Which will of course just be played as an F.
                                         *[BNC G3V 262-263]*

(3) **D:** Well I do know last week thet=uh Al was certainly very ⟨pause 0.5s⟩
    **R:** pissed off             *[Lerner (1996), p260]*

Like cross-person expansions, same-person ones are viewed as a highly productive way of utilising grammatical constraints for interactional purposes. Walker (2004) notes "it would seem that increments can be added to almost any possibly complete turn at talk, placing the practice alongside other generic conversational practices such as self- and other-initiated repair" (p167).

This type of treatment again suggests that there should be no differences to supplying a continuation to a prior turn, regardless of who produced the initial contribution. However, none of these studies have directly compared same- and cross-person CCs. We here present a corpus study to bridge this gap.

## Hypotheses

We examine two basic questions. First, whether the internal construction of CCs i.e., the syntactic and pragmatic ways in which the component parts are tied together, is the same in the same- and cross-person cases. Second, the external organisation of CCs; whether CCs as a whole are integrated into conversational organisation in the same way as as a conventional turn.

Following the existing literature we analyse the internal structure of the CC in terms of; a) the syntactic relationship between the components i.e. whether they are expansions or completions (as described above), b) repair i.e. whether the continuation of the CC is used to perform an edit or amendment on the antecedent and c) separation i.e. how closely together the antecedent

and continuation parts of a CC are normally placed. For the external organisation of CCs we examine the pragmatic organisation of the sequences in which CCs occur. Specifically, the patterns of turn-taking (who will speak next) and ratification (who acknowledges or responds to the CC). We also consider the placement of CCs with respect to backchannels. Backchannels are short acknowledgements like 'aha' or 'mmm', often produced in overlap with a speakers turn, which provide feedback to a speaker but don't typically lead to a change of speaker.

If there is no fundamental syntactic or cognitive difference between same- and cross-person CCs (e.g. Pickering and Garrod, 2004; Cann et al., 2005) then, all things being equal, we would expect that they should have the same distribution of expansions/completions, repairs and antecedent-continuation separations.

**Hypothesis 1** *Same-person and cross-person CCs have the same patterns of internal construction.*

In addition, if a CC functions as a single turn that just happens to have been produced in two (or more) parts (potentially by more than one person), rather than being a distinctive form of contribution, then they should be integrated into the conversation as a whole in the same way as non-compound turns. This would predict that the patterns of backchannels, turn-taking and ratification should, all things being equal, be the same for CC and non-CC turns. Moreover, this external organisation should be the same for both same-person and cross-person CCs. In a typical conversational sequence once a speaker has finished someone else will usually – although not always– speak next. Similarly, people do not normally acknowledge or ratify their own turns.

**Hypothesis 2** *The people who produce a CC should be less likely than other participants to speak next. They should also be less likely than other participants to ratify or acknowledge the CC.*

## Method

To investigate similarities and differences between same- and cross-person CCs, a corpus analysis of CCs in the spoken portion of the British National Corpus (BNC: Burnard, 2000) was carried out. This part of the corpus contains a large number of genuine spoken dialogues across a wide range of people and situations, allowing us to examine the prevalence of CCs in a variety of dialogues not restricted to the task-based dialogues which previous corpus studies tend to have analysed.

### Materials and procedure

For this exercise, the portion of the BNC annotated by Fernández and Ginzburg (2002), chosen to maintain a balance between what the BNC defines as *context-governed* (drawn from a particular domain e.g. business meetings, school classes, radio interviews) and *demographic* (recorded by volunteers during their daily lives)

dialogue, was used. This portion comprises 11,469 *s-units* – roughly equivalent to sentences[1] – taken from 200-turn sections of 53 separate dialogues.

**Annotation scheme** The dialogues were annotated according to the protocol outlined in Purver et al. (2009), and summarised in table 1, below.

| Tag | Value | Explanation |
|---|---|---|
| end-complete | y/n | For all s-units: does this s-unit end in such a way as to yield a complete proposition or speech act? |
| continues | s-unit ID | For all s-units: does this s-unit continue the proposition or speech act of a previous s-unit? If so, which? |
| repairs | number of words | For continuations: does the start of this continuation explicitly repair words from the end of the antecedent? If so, how many? |
| start-complete | y/n | For continuations: does this continuation start in such a way as to be able to stand alone as a complete proposition or speech act? |

Table 1: Annotation tags

## Results

| person: | Same- | | | | Cross- | |
|---|---|---|---|---|---|---|
| | all | | across- | | (all) | |
| | N | % | N | % | N | % |
| overlapping | 0 | *0* | 0 | *0* | 18 | *5* |
| adjacent | 840 | *44* | 0 | *0* | 262 | *80* |
| sep. by overlap | 320 | *17* | 0 | *0* | 10 | *3* |
| sep. by backchnl | 460 | *24* | 456 | *63* | 17 | *5* |
| sep. by 1 s-unit | 239 | *13* | 229 | *32* | 16 | *5* |
| sep. by 2 s-units | 31 | *2* | 31 | *4* | 4 | *1* |
| sep. by 3 s-units | 5 | *0* | 3 | *0* | 1 | *0* |
| sep. by 4 s-units | 4 | *0* | 4 | *1* | 0 | *0* |
| sep. by 5 s-units | 1 | *0* | 1 | *0* | 0 | *0* |
| sep. by 6 s-units | 2 | *0* | 2 | *0* | 1 | *0* |
| Total | 1902 | | 726 | | 329 | |

Table 2: BNC antecedent/continuation separation

As discussed in Howes et al. (2011), the transcription conventions used when compiling the corpus can affect the raw results; in particular, the BNC convention of dividing contributions into "sentence-like units", and in transcribing overlapping interruptions by interlocutors in linear time order, may result in an over-estimate of the number of same-speaker within-turn CCs. However, even excluding such within-turn and overlapping cases, and looking only at across-turn cases, there are over

[1] *S-units* are defined as "sentence-like divisions of a text", and *utterances* are defined as "stretches of speech usually preceded and followed by silence or by a change of speaker". Utterances may consist of many s-units; s-units may not extend across utterance boundaries. While s-units are therefore often equivalent to complete syntactic sentences, or complete functional units such as bare fragments or one-word utterances, they need not be: they may be divided by interrupting or overlapping material from another speaker.

twice as many same-person CCs (726) as cross-person CCs (329) – see table 2.

Many CCs have at least one s-unit intervening between the antecedent and continuation. In same-person cases, once we have excluded the within-turn CCs, this must always be the case; the intervening material is usually a backchannel (63%) or single other s-unit (32%, often e.g. a clarification question), but two intervening s-units are possible (4%) with up to six being seen. In cross-person cases, 88% are adjacent or separated only by overlapping material, but again up to six intervening s-units were seen, with a single s-unit most common.

## Completeness

As can be seen from table 3, the end- and start-completeness figures for same- and cross-person CCs are strikingly similar. The majority of both same- and cross-person continuations (71% to 72%) continue an already complete antecedent, with only 28-29% therefore being *completions*.

| person: | | Same- | | | | Cross- | |
|---|---|---|---|---|---|---|---|
| | | all | | across- | | (all) | |
| | | N | % | N | % | N | % |
| Antecedent | Y | 1367 | *72* | 513 | *71* | 236 | *72* |
| end-complete | N | 535 | *28* | 213 | *29* | 93 | *28* |
| Continuation | Y | 224 | *12* | 99 | *14* | 45 | *14* |
| start-complete | N | 1678 | *88* | 627 | *86* | 284 | *86* |
| Repair | Y | 77 | *4* | 34 | *5* | 32 | *10* |
| | N | 1825 | *96* | 692 | *95* | 297 | *90* |
| Total | | 1902 | | 726 | | 329 | |

Table 3: BNC completeness and repair

These figures are even more striking when we consider the placement of arbitrary split points. In the experiment reported in Howes et al. (2011), artificial CCs were created in text chat dialogues, resulting in only 37% of fake CCs having a split point at a point where the antecedent could be considered end-complete (i.e. expansions) with 63% therefore appearing to be continuations.

This can be taken as evidence that participants in dialogue tend to wait for syntactic cues that suggest a possible opportunity for speaker change (referred to by conversation analysts as 'transition relevance places') before taking the floor – even where they construct their contribution as a continuation to a prior utterance.

## Repair

Although we are using only limited notion of `repair`, which only takes into account the amount of repetition or reformulation of words from the end of the antecedent at the start of the continuation, we believe that repair, as formulated, can be taken as an index of the difficulty of integrating the continuation to the syntactic material offered in the antecedent. This being the case, then under a model in which speakers and hearers are interchangeable (such as the interactive alignment model) the

proportion of repairs should be the same in same-person CCs as cross-person CCs, as there should be no increased difficulty in integrating one's continuation to another's antecedent as there would be to one's own. There should also not be any effects of where the split point occurs on the prevalence of repair.

However, cross-person continuations are significantly more likely to repair their antecedents than same-person cases (32/329, 10% vs. 34/726, 5%; $\chi^2_{(1)} = 9.82, p = 0.002$), showing that there are differences between distributions of same- and cross-person CCs. In other words, although the distributions regarding completeness were equivalent and supported Hypothesis 1, it isn't this simple, and there appear to be additional constraints associated with continuing another's prior contribution that do not necessarily apply when continuing one's own.

## Backchannels

Similarly, there are different distributions of CCs in which the continuation follows a backchannel between same- and cross-person CCs. Same-person cases are more often produced as a response to a backchannel (63% of across-turn cases follow a backchannel, whilst even discounting adjacent cases only 40% of cross-person CCs do) suggesting that shaping one's next turn as a response to feedback is a common strategy in dialogue. Note also that 13% of all s-units in the corpus sample were backchannels[2] so there are actually a greater proportion of same-person cases following a backchannel than would be expected by chance, suggesting that backchannels may be used as a cue for participants to perform a `continue` grounding act (Traum, 1994).

## CA categories

In terms of specific types of CCs, the most common of the CA categories are Lerner's (1996) hesitation-related *opportunistic* cases, which make up 3-5% of same- and 10% of cross-person CCs, meaning cross-person opportunistic cases are more common than same-person ones (same, across-turn 36/726, 5% vs. other 32/329, 10%; $\chi^2_{(1)} = 8.53, p = 0.003$). Interestingly, the breakdown of cases into those where the antecedent ends with an unfilled versus a filled pause also shows a difference between same- and cross-person cases: an other person is more likely to offer a continuation after an unfilled pause, than after a filled pause (antecedents ending in '*er(m)*' 35 continued by same, 13 by other; ending in '`<pause>`' 19 continued by same, 19 by other; $\chi^2_{(1)} = 4.77, p = 0.03$). This finding backs up claims by Clark and Fox Tree (2002) that filled pauses can be used to indicate that the current speaker's turn is not yet finished and thus have the effect of holding the floor.

Lerner's compound TCU cases (*instead of*, *said/thought* etc, *if-then* and *when-then*) account for 2-3% of same-person and 1% of cross-person CCs, though note that these could be underestimates, as his non-syntactic cues (e.g. contrast stress and prefaced disagreements) could not be extracted. Rühlemann's (2007) *sentence relative* cases come next with 1-2%.

In contrast, the most common pattern (for same- and cross-person CCs) is the addition of an extending clause, either a conjunction introduced by '*and/but/or/nor*' (36-42%), or other clause types with '*so/whereas/nevertheless/because*', and the (other) category.

## Next speaker

To see if there are any effects on turn-taking or apparent party-membership, the 329 cross-person CCs were further annotated according to who spoke after the continuation and whether the conversation was dyadic or multiparty. Of the 53 dialogues, 34 were dyadic and 19 multiparty (though as observed in Eshghi (2009), many segments of multiparty dialogue are also dyadic in nature, we leave this to one side). This equates to 4919 turns in dyadic dialogues, in which there were 204 cross-person CCs (4.15%) and 2961 turns in multiparty dialogues with 125 cross-person CCs (4.22%). These proportions are not different (204/4919, 4% vs. 125/2961, 4%; $\chi^2_{(1)} = 0.03, p = 0.87$), which is surprising – if cross-person CCs are used to indicate party-membership we might expect a greater proportion in the multiparty dialogues. This could be taken to suggest that parties are not common in these annotated dialogues.

There is no difference in the proportion of occasions in which the participant who contributed the continuation also provides the next contribution, thus holding the floor (50/204, 25% vs. 26/125, 21%; $\chi^2_{(1)} = 0.600, p = 0.44$, in line with the figure of 3/15, 20% reported in Szczepek, 2000a). However, in all dialogues the proportion in which the supplier of the continuation retains the floor is lower than in general. For all annotated s-units in the dialogues there is no change of speaker in 41% of cases, compared to 23% of cases following a cross-person CC (4791/11469, 41% vs. 76/329, 23%; $\chi^2_{(1)} = 44.424, p < 0.001$), suggesting that the continuation is treated as a separate turn and that interlocutors supplying a continuation do not assume they have a right to retain the floor.

## Ratification

Supporting the idea that ratifications ought to be more common in dyadic dialogues, if only appropriate when addressed to the original speaker, cross-person CCs are ratified or rejected by the initial speaker in (marginally) more cases in dyadic than multiparty cases (82/204, 40% vs. 37/125, 30%; $\chi^2_{(1)} = 3.769, p = 0.052$). This does suggest that in dyadic dialogues cross-person CCs are

more often interpreted by the antecedent owner as addressed towards them, potentially as a form of repair which requires acknowledgement or ratification, and not interpreted as simply the mechanistic articulation of predictable material by another.

Cross-person CCs are also more likely to be ratified or rejected in completions than expansions (59/93, 63% vs. 79/236, 34%; $\chi^2_{(1)} = 24.600, p < 0.001$). This is surprising if completions are merely the vocalisation of already predicted material (as in the interactive alignment model, for example), or if they are taken to be explicit acknowledgements (in a grounding model) as they should not then need either explicit evaluation or additional completion by the contributor of the antecedent.

In total, 138/329 (42%) of cross-person CCs are ratified; which is not rare, suggesting that cross-person continuations are often treated as not part of the same single unit as the antecedent. In a grounding model this suggests that these cases are those which are taken to be repairs, or new discourse units though note that we cannot distinguish between these possibilities. However, if they are treated as repairs then they are not treated as within-party repairs analogously to self-repairs, because these should also not require ratification.

## Discussion

Contrary to the predictions of Hypothesis 1, although there are similarities between same- and cross-person CCs, for example in the distributions of expansions versus completions, there are also significant differences. Cross-person continuations are more likely to start with explicit repair/reformulation of the antecedent. This suggests that people use CCs to do different things in the same and cross-person cases. Repairs are interesting in this context because they are not predictable continuations of the preceding contribution and therefore provide a counter-example to the idea that CCs are appropriately analysed as essentially the same turn but with a switch of producers. Perhaps more interestingly, they also suggest the operation of a more strategic process. It is generally observed that people avoid repairing other people's turns (known in Conversation Analysis as the preference for self repair; Schegloff et al., 1977). The observed pattern might be one that we would expect if cross-person CCs, in virtue of being constructed as a continuation of the speakers utterance, provide a device that enables a less exposed or 'face-threatening' form of other repair (as Lerner (1993) hypothesised). This works as a repair strategy to the extent that the completed CC is understood as 'belonging' to the producer of the antecedent of the CC. However, as we go on to discuss, our observations about patterns of turn-taking suggest that this is not straightforwardly the case.

Opportunistic CCs (after a '<pause>' or 'erm') are in general more likely to be cross-person cases; however there are again pragmatic constraints – cross-person CCs are more likely where the antecedent ends in an unfilled rather than a filled pause. This suggests participants are aware of turn-taking or sequential expectations, and that speaker and hearer roles carry different responsibilities.

There also seem to be different places when same- and cross-person continuations are offered; the majority of cross-person continuations are adjacent to their antecedents, whilst even considering within-turn cases this is not so for same-person continuations. Same-person continuations are far more likely to follow a backchannel or single other s-unit than cross-person cases, suggesting that it may be the feedback from one's interlocutor(s) that leads to producing something syntactically tied to one's own prior contribution.

Contrary to Hypothesis 2, ratifications are offered following a cross-person CC; something which should be rare if the speaker of the antecedent were treating the continuation as if they themselves had just finished their turn. The assumption that cross-person CCs operate as a single turn that just happens to have been produced by more than one interlocutor, is perhaps an artefact of syntactic analyses that idealise away from the key organisational features of conversation. The evidence from CCs suggests that they might be better characterised as separate contributions that build parasitically on prior contributions, meaning that syntax is not an organising structure in the production of dialogue, but a resource that can be flexibly exploited by participants.

That ratifications were also more likely to be offered following a completion rather than an expansion, suggests that completions can also not be taken to be solely grounding devices, but must also be being treated by the antecedent owner as at least potentially repairing the incomplete antecedent (in which case an acknowledgement is appropriate).

This means that although one can unproblematically finish or continue another's utterance, this does not give it the same status as if they had completed or continued it themselves and has consequences for how we model CCs in particular and dialogue in general. There are several ways in which this might be approached. Either continuations by another are generally treated as repairs (and not exclusively as particularly strong forms of acknowledgement) or they are not taken to be acknowledgements at all. Given that continuations tend to be offered when common ground is presumed to be shared it could be the case that it is the presumption of shared common ground which requires acknowledging, or rejecting. Alternatively, it might be the fact that the incoming participant is aligning themselves with the initial speaker that requires acknowledgement, and not the content itself.

From a dialogue modelling perspective, we would want to be able to tell when a human agent's contribution con-

tinues some prior contribution -either their own or the system's- in order to correctly analyse the semantics of the discourse, which is non-trivial given that antecedents do not have to be (and often are not) incomplete, or adjacent to the continuation.

The system should also be able to produce naturalistic continuations, and respond appropriately (e.g. by acknowledging a continuation from the user) including in terms of turn-taking. One example is the use of expansions – the system need not compute a complete sentence, but could use previously parsed input as a starting point. As dialogue models are very often in highly constrained contexts in which the system seeks information from the user, appropriate strategies involving CCs could be using incomplete antecedents to invite a user completion (for example, the travel agent system might ask "You want to go to...?") and appendor questions ("...by bus?") – see Hough (2011), for a preliminary outline of such a system.

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