First observations on a corpus of multi-modal trialogues

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Abstract

While there is a huge amount of work on duologues, trialogues are little investigated. We present first observations on a corpus which contains, *inter alia*, multi-modal trialogues. It turns out that we need new tools in order to do justice to the peculiarities of these forms of interactions.

1 Introduction

To communicate fluently and successfully requires humans to coordinate with each other. There are many proposals of how to analyze duologues (dialogues between two persons). Topics like turn-taking (e. g., Sacks et al. (1974)), joint project organization (e. g., Clark (1996)), and grounding (e. g., Clark and Brennan (1991), and Traum (1994)) are much discussed. But not many deal with communications beyond duologues. A notable exception is Ginzburg (2012), who, however, does not treat multi-modal utterances.

The Bielefeld Speech-and-Gesture-Alignment-corpus (short: SaGA-corpus, Lücking et al. (2013)) has been extended in order to fill this gap. The extended SaGA-corpus contains 90 duologues and 10 trialogues of participants engaged in route descriptions and/or comparisons. In the trialogues, two participants explain their routes and passed sights to a third participant, who should be able to identify both routes and the differences between them. Here, we present first observations on the essential differences between trialogues and duologues by using examples from the corpus.

2 An example for a trialogue

The two route givers (RGs) describe the beginning of the route to the so-called Follower (FO). Here, they are describing the route segment from a sculpture to another sight (the town hall). One of the RGs ("RG2") explains how to exit a roundabout (see Fig. 1).

RG2: Im Kreisel habe ich dann
In the roundabout have I then
die zweite Ausfahrt genommen
the second exit taken

FO: Also geradeaus durch
So straight ahead through,
sozusagen, oder?
so to say, right?

RG2: Genau
Exactly

RG1: Ja, das habe ich auch
Yes, that have I as well

Figure 1: Example conversation

This example is structured as follows (Fig. 2): The description by RG2 is followed by a clarification request by the FO. After that has been answered, RG1 comments by noticing that she encountered the same path at this point.

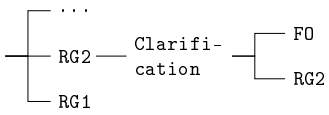

Figure 2: Structure of trialogue example

3 Essential differences between duologues and trialogues

Both duologues and trialogues require the participants to coordinate with each other to fulfill joint projects, and include a variety of communicative actions, including non-verbal actions (e.g., gestures and eye movements). However, there are crucial differences of trialogues to duologues.

3.1 Differences concerning joint projects

For our analyses of the conversations, we follow Clark's conception of a joint project (JP). "A joint project is a joint action projected by one of its participants and taken up by others" (Clark (1996): 191), whereas a joint action is an action carried out by more than one person (e. g., dancing a waltz). The overall joint-project of the trialogues in our corpus is the comparison of two routes and sights described by RG1 and RG2 to a FO. A big JP as this one is realized by several smaller JPs. Each JP is characterized by two actions: an action by one of the participants (e. g., a question) and the reaction/response of the others (e. g., an answer).

The main differences between duologues and trialogues concerning JPs lie in the responses. Firstly, the common *binary* adjacency pair organization is not applicable to most JPs. An example is a question requiring two answers by different participants. One also needs group acceptance in order to initiate and complete joint projects of the group. It would not suffice if only one or two participants agree. In our trialogues, especially the comparisons of route segments are acknowledged by all of the participants before the route description continues. In our example, both FO (after the clarification request) and RG1 acknowledge the description by RG2. This observation can be substantiated with numerous corpus examples.

Secondly, the scope of acknowledgements can differ. While in duologues it can be assumed that the scope of an acknowledgement extends over (parts of) the last contribution, the acknowledgements in trialogues can also extend over more than one contribution. Take one example: One of the RGs tells the FO "The fact by which you can recognize it [the townhall] easily is simply that there are two little trees next to the door". Next, the other RG claims "Ah, right. They were [there] as well", by which she presumably means that there were also two little trees on her ride through the town. Then, the FO says "Ah, trees", whereby she acknowledges *both* utterances.

Thirdly, the differences in responses are crucial for grounding. If you get acceptance in a duologe the resulting mutual belief of the agents can be based on individual beliefs in the manner of epistemic logics. However, in trialogues you can have different groupings of agents and then you need a notion of group belief which cannot be reduced to individual beliefs (see Rieser (2014) for a systematic overview on individual and group beliefs).

3.2 Differences concerning turn-taking

The current addressee in common duologues is the non-talking participant. There is usually no need for an explicit addressing. In trialogues one always has to explicitly address the addressee of one's contribution if it is not addressed to both participants in order to avoid confusion. If one does not use proper names to do that, one can achieve it by using eye contact or gesture, or by employing context information. In our example, the addressee of the question is RG2 because the clarification request is clearly related to his description.

This difference in addressing also has an influence on turn-taking regularities. The projection of the end of a turn and turn transition relevance points (Sacks et al., 1974) presumably works in the same way as in duologues. But the taking of a turn is organized differently, because in absence of explicit addressing there are two potential turn takers. In our trialogues, one influence on turn-taking is the kind of role of the respective participant. The FO is expected to ask questions about route segments and the sights (beyond clarification requests). Thus, it is easier for her to win the turn-taking competition. The turn-taking also depends on the overall organization of the joint project realization. Depending on the kind of structure used, there are certain expectations about who's turn is next. For instance, in consecutive Route-Sight(RS)-comparison (Fig. 3 in appendix) it is expected that RG2 takes the floor after RG1 has finished his/her description (including clarification requests). Similar rules can also be given for other kinds of RS-comparisons (Figures 4 & 5 in app.). Such an expectation does not apply to the comparison-phases. Since all are required to compare the descriptions, there is no one preferred.

4 Conclusion

Our first observations strongly suggest that there are peculiar features of trialogues which need to be modelled by extending the common tools for analyzing duologues. In our future research, we will provide fine-grained analyses of trialogues in the extended SaGA-corpus to gain a deeper understanding of the phenomenon. We also want to stress the role that gestures play in the organization of trialogues, and aim to build here on our work on discourse gestures (Hahn & Rieser, 2011).

Appendix

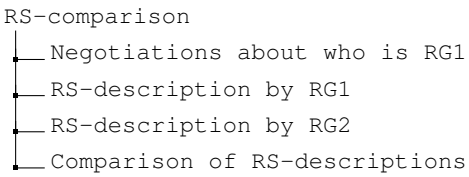

Figure 3: Consecutive RS-comparison

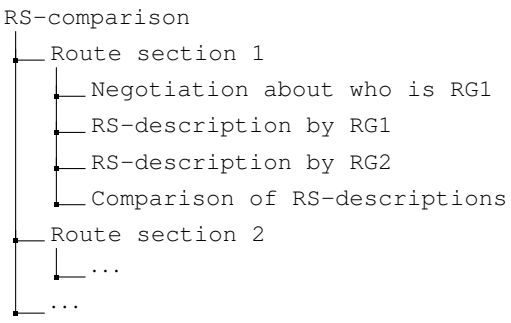

Figure 4: Consecutive RS-comparison step by step

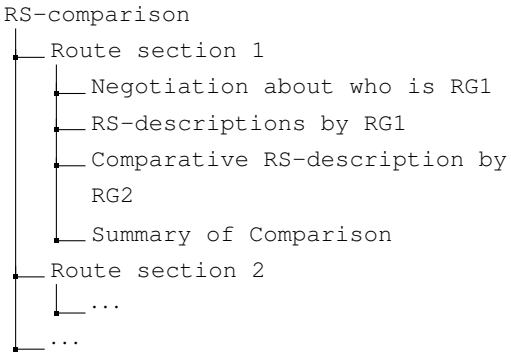

Figure 5: Immediate RS-comparison

Acknowledgements

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