



## Background

In Clark's ladder of mutual understanding, communicative problems can apparently arise at every step. One mechanism to deal with such problems are clarification requests (CRs).

Grounding hierarchy for speaker A and listener B (adapted from Clark (1996))

Level	Joint Action	Ex. Clarification
1 contact	A and B pay attention to another.	<i>Are you talking to me?</i>
2 perception	A produces a signal; B perceives it.	<i>What did you say?</i>
3 understanding	A conveys a meaning; B recognizes it.	<i>What did you mean?</i>
4 uptake	A proposes a project; B accepts/considers it.	<i>What do you want?</i>

Recent interest in CRs has mainly dealt with levels 2 and 3; however, the annotation scheme of Rodríguez and Schlangen (2004) includes level 4 under the label *recognizing or evaluating speaker intention*. The following two examples are (translated) from their corpus:

### Uptake CRs

- |   |  |
|---|--|
| <p>(1) I: you have to put these in between there<br/>K: <b>in between how?</b><br/>I: in between the well you have the wings on top</p> | <p>(2) K: for me that is in fact below this, but well, doesn't matter<br/>I: <b>why below?</b><br/>K: yes, it belongs there, all okay.</p> |
|---|--|

Other work has related level 4 CRs to planning (Benotti, 2009); Schlangen's (2004) scheme has been amended with *contradicting belief* and *ambiguity refinement* (Rieser and Moore, 2005).

We relate level 4 CRs to preparatory conditions of joint purposes. Clark has postulated the following conditions for two people to adopt a *joint purpose*:

Conditions for Joint Purposes (Clark, 1996)

- Identification** A and B know about *p*;
- Ability** A and B are able to do the participatory actions in *p*;
- Willingness** A and B must be willing to engage in *p*;
- Mutual Belief** The previous three are common ground for A and B.

## Examples

We investigate questions that indicate purely semantic understanding, *i.e.*, grounding on level 3. Such questions can ask for *refined* understanding, *e.g.*, specifying the pragmatic force of an utterance, or elaborating on an ambiguity.

### Understanding or Refinement

- |   |   |
|---|---|
| <p>(3) A: we're going to discuss [...] who's gonna do what<br/>B: <b>Are you asking me whether I wanna be in there?</b></p> | <p>(4) A: [...] that is fifty one dollars.<br/>B: <b>Per day?</b></p> |
|---|---|

If there are circumstances precluding an acceptance move, but the addressee is seemingly unwilling to make a rejection move, he may ask a question instead.

### Contradicting Belief or Assumed Uncooperativeness

- |  |  |
|--|--|
| <p>(5) A: Manto is before Monaco.<br/>B: <b>But isn't Manto near the Italian border?</b></p> | <p>(6) A: No.<br/>B: <b>No? Why not?</b><br/>A: I can't open the door.</p> |
|--|--|

Before committing to acceptance or rejection, addressees can evaluate reason or motivation. This includes both speaker's and addressee's motivations.

### Reason or Motivation

- |  |   |
|--|---|
| <p>(7) A: I'm not going to sleep.<br/>B: <b>Why not?</b></p> | <p>(8) A: Daddy can we swop places now?<br/>B: <b>Why?</b><br/>A: Cos I wanna sit next to you [...]</p> |
|--|---|

Similarly, knowledge or ability can be evaluated.

### Ability, Knowledge or Planning

- |   |   |
|---|---|
| <p>(9) A: I know Vic has cream in his [food]<br/>B: <b>How do you know?</b></p> | <p>(10) A: Turn it on.<br/>B: <b>By pushing the red button?</b></p> |
|---|---|

Example (10) is due to Benotti (2009); (4) is due to Rieser and Moore (2005); the rest is taken from the BNC corpus (Burnard, 2000) and retrieved with SCoRE (Purver, 2001).

## Analysis

We relate the types of CRs we observed to Clark's conditions for joint purposes. Our idea is that a *CR is triggered by a defect* (perceived or actual) of a *precondition* of the utterance's purpose.

CRs related to Joint Purpose Conditions

- Clarification Requests related to *Pragmatic Understanding* or *Ambiguity Refinement* are related to the *Identification Condition*.
- CRs triggered by a *Contradicting Belief* are due to the *Willingness* condition: A contradicting belief makes an addressee unwilling to grounding an assertion.
- CRs related to *Planning* are related to the *Ability* condition.
- Generally, *Motivation* and *Ability/Knowledge* CRs can relate to the *Willingness* or *Ability* condition for *either speaker*.

We propose an asymmetry in the *Willingness* condition in cooperative dialogue: The initiator of a joint purpose must have a *positive reason* to take the initiative, while the addressee should *not* have an *adverse reason* to take part in a project. A reasonable cooperative assumption is that addressees adopt joint purposes they are indifferent towards.

Willingness in Cooperative Dialogue

- Proposer Reason** The proposer has sufficient reason to propose the project.
- Addressee Reason** The addressee does not have reason not to take part in the project.

This asymmetry can be observed in the following example:

- (11) A: Oh, oh you can pop in and get your fishing magazines [...]  
B: **Why?**  
A: **Well why not?**

Here, A proposes something to do for B, but B asks a clarification question towards *addressee reason*: B asks for a reason to adopt A's purpose. This CR is itself uncooperative if B is indifferent. Accordingly, in her response, A does not provide B with a reason. Instead, A asks B for his reasons to ask this CR, or, equivalently, for his reasons not to take up the initial request.

An interesting case are CRs relating to a rejecting utterance. Apparently, a rejection is successful/cooperative if the purpose of the *rejected* utterance is defective.

- (12) A: **No? Why not?**  
B: (unclear) I can't cos I can't open the door.  
A: That's alright.

## Conclusion & Further Work

We have surveyed the extant work on clarification requests on uptake level, and explained them in terms of general preconditions that apply to both speakers identifying and willingly adopting a joint purpose. We have presented further examples on how these preconditions interact in dialogue and give rise to CRs.

Furthermore, we have refined Clark's original statement of such preconditions and proposed that they determine the uptake *clarification potential* and explain the range of CRs on level 4.

The preconditions are related to *disagreement relevance* of an utterance in the sense of Jackson and Jacobs (1980). Investigating these conditions might help to explain argumentative dialogue, *cf.* Schlöder (2014). Consider the following excerpt of an argumentation (due to Jackson and Jacobs (1980)):

- (13) A: Food prices will be going down soon  
B: What makes you say that? ((CR: proposer knowledge))  
A: We had a bumper crop this year.  
B: So? ((CR: proposer reason))  
A: Well, prices just go down when there's a big crop.

These considerations are part of our investigation into the notion uptake; our immediate next goal is a systematic corpus study of these CRs. At this point in our research, we cannot say with certainty whether the categories we described are exhaustive.

### References

- Luciana Benotti. Clarification potential of instructions. In *Proceedings of SIGDIAL '09*, 2009.
- Lou Burnard. *Reference Guide for the British National Corpus*. Oxford University Computing Services, 2000.
- Herbert H. Clark. *Using language*. Cambridge University Press, 1996.
- Sally Jackson and Scott Jacobs. Structure of conversational argument: Pragmatic bases for the enthymeme. *The Quarterly Journal of Speech*, 1980.
- Matthew Purver. SCoRE: A tool for searching the BNC. Technical report, King's College London, 2001.
- Verena Rieser and Johanna D. Moore. Implications for generating clarification requests in task-oriented dialogues. In *Proceedings of ACL '05*, 2005.
- Kepa Joseba Rodríguez and David Schlangen. Form, intonation and function of clarification requests in german task-oriented spoken dialogues. In *Proceedings of SemDial '04*, 2004.
- David Schlangen. Causes and strategies for requesting clarification in dialogue. In *Proceedings SIGDIAL '04*, 2004.
- Julian J. Schlöder. Uptake, clarification and argumentation. Master's thesis, University of Amsterdam, 2014.