Shared information in dialogues with *Amazon Alexa*

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Human-human communication (HHC) is expectation-driven in terms of perception and production. In dialogue, speakers understand how to communicate with their interlocutor based on the interlocutors' answers and communication flow in general. There is a perceived coherence of utterance within a discourse segment which is achieved by marking shared information, and information which was previously mentioned in the conversation as less prominent. This can be seen at various linguistic levels, e.g. the speakers tend to use low accessibility markers when mentioning shared information (Ariel 2001), given information comes before new (Gundel 1988), and it is mostly new or unexpected information that receives intonational prominence of the utterance (Heusinger 1999).

There are, however, communicative situations, where the speakers cannot rely on linguistic cues in the interlocutor's responses. For instance, the situation of human computer interaction (HCI). In dialogues with well-known automatic voice-based assistants like Amazon Alexa or Siri, the information which was mentioned in the dialogue does not automatically enter the common ground or shared knowledge of the interlocutors. Therefore, users cannot be sure that the system "remembers" what the topic of the previous utterance was. While Amazon Alexa Echo is able to interpret the utterances containing pronouns referring to the previously mentioned topic, e.g. Alexa, wie alt ist Leonardo diCaprio? Alexa, wann hat er Geburtstag? (Alexa, how old is Leonardo DiCaprio? Alexa, when is his birthday?, the system rarely responds using pronouns, elliptical constructions or other higher accessibility markers to label certain pieces of information as shared knowledge. Does the lack of linguistic marking of shared knowledge in Alexa's responses have influence on information structure in the users' utterances?

I hypothesise that, in contrast to HHC, given information will stay in focus of the utterance, e.g. Alexa-directed utterances may contain intonational stress both at given and new information, and given information may be marked as low accessible, e.g. full names are used instead of pronouns during the course of interaction.

In order to test this hypothesis, I asked 20 German speaking participants to request some specific information with the help of Alexa. The information is to be requested based on the following research instrument: I provide three general themes with five specific questions in each. The questions are given in the form of keywords so that participants can formulate questions without being syntactically primed by the research instrument, e.g. Leonardo DiCaprio is the main topic and there are five questions to it (Alter (Age), Familienstand (Marital status), Filmpartnerin in Titanic (Film partner in Titanic)). Such research instrument design allows me to look into how the information structure changes in the course of interaction around a certain topic. For the baseline condition, which is HHC, I ask the same participants to request some specific

information from a confederate speaker who is ready to search for these pieces of information online. I am using a similarly designed research instrument to create a comparable data set and the same participants to distil individual linguistic choices from specific features of HCI.

In the data set collected for the pilot study which followed the previously described procedure and included HHC and HCI data for two participants, in HCI, one can observe that the speakers do mark the information which was already mentioned in the dialogue as low accessible (see 1). The example shows that though the participant has already asked questions about the theme "Leonardo DiCaprio" and even specifically about Titanic, Alexa-directed question still included a full name to refer to the subject and "Titanic" was extra defined as "Film" to avoid ambiguity.

1) Third question to the theme "Leonardo DiCaprio" directed to Amazon Alexa:

Mit	wem	hat	Leonardo diCaprio	im Film	Titanic	gespielt?
With	whom	did	Leonardo diCaprio	in Film	Titanic	play?

In HHC, in contrast, the theme "Louvre" was omitted after it was introduced in the conversation (see 2).

2) Third question to the theme "Louvre" directed to a confederate speaker:

Was	ist	der Eintrittspreis	für	ein Ticket	für	Kinder?
What	is	the entrance price	for	a Ticket	for	children?

These preliminary findings suggest that there is a lack of accumulated shared knowledge in interaction with Alexa which influences the information packaging in users' utterances, e.g. lower accessibility markers for the information previously mentioned prevail in HCI when compared to HHC. The poster presents findings for information accessibility markers and intonation prominence on given information in dialogue based on the complete data set.

References

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