

Communicating routes to older and younger addressees

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Abstract

Our study addressed the extent to which route descriptions reflect different concepts of addressees as a function of age, with respect to route choice, semantic elaboration, politeness forms and syntactic complexity. 55 native speakers of German wrote route descriptions for imagined addressees supposed to be either 25 or 75 years old. Results reveal that participants' consideration of their addressee is reflected in their differentiated use of politeness forms, degree of syntactic complexity, and in the ways in which routes were selected for younger vs. elderly people. However, route descriptions for elderly addressees did not reflect increased semantic elaboration (here: providing more details about the route).

1 Introduction

Speakers are known to be sensitive to their interaction partners' knowledge and ability. Route descriptions are particularly suitable for investigating the extent to which the abilities presumed on the part of the addressee are taken into account, since they relate to a predefined spatial environment as well as a clear discourse goal: to enable the addressee to reach their destination. Here we address speakers' strategies when asked to write a route description for an addressee about whom they know nothing except age and gender. Our aim is to contribute to research on age-related talk, in particular with respect to the extent to which speakers intuitively adhere to a principle found to be useful for elderly addressees, namely, semantic elaboration – explaining a particular piece of information in more than one way (Kemper et al., 1995). This idea is in the present scenario represented by distinct levels of granularity as defined by Tenbrink and Winter (2009). This framework distinguishes between crucial spatial units (segments of the route) and those that are not always mentioned explicitly in route instructions, and differentiates the types

and amount of detail about each spatial unit that is provided by route givers. We hypothesized that speakers may provide different amounts of detail as a function of age of addressee.

Interaction style and language use differ systematically with elderly addressees to such an extent that *elderspeak* has been identified as a special speech register. In *elderspeak*, speakers appear to adapt to the communicative and cognitive needs of their interlocutors guided by assumptions about their limited language, cognitive, and/or physical ability. In a route drawing task involving dialogues between older and younger speakers, Kemper et al. (1995) found that younger speakers simplified their speech for elderly addressees by talking more slowly, using shorter sentences and fewer subordinate clauses. At the same time, they provided more information about the routes to be drawn by repeating utterances and using more varied vocabulary, as well as providing more location checks per map. Addressing comprehension of route instructions, Kemper & Harden (1999) found that increasing semantic elaborations and reducing use of subordinate and embedded clauses improved performance although reduced length did not.

While earlier studies such as these provide a number of relevant insights about the types of adjustments made for elderly addressees, they do not build on research in spatial cognition that highlights how speakers' concepts of routes are represented in language. Previous research has revealed a range of spatial aspects that speakers typically refer to when describing a route to a wayfinder, such as the route's start and end points, landmarks, directions, paths, actions, regions, and distances (Denis, 1997; Tversky and Lee, 1998). Routes are sometimes described at a finer grained level than that dictated by the decisions to be taken along the way. Landmarks are mentioned not only at decision points but also in between decision points (Herrmann et al., 1998). Also, additional path information may be provided even without a change of direction (Habel,

1988). Such information keeps the traveler confident particularly in cases of potential sources of uncertainty (Tversky and Lee 1998).

The perception of what kind of supportive information may be required by a wayfinder can differ widely across individuals and task situations. Since speakers are known to adapt their language to the listener (Clark and Krych, 2004), any aspects known about the addressee could have an impact on the spatial descriptions formulated for them (Herrmann and Grabowski, 1994). For example, the choice of reference frames and perspectives is affected by interactive alignment, adaptation, and interlocutor priming processes as well as by the addressee's perceived abilities (Schober, 1993, 2009; Watson et al., 2004).

For route descriptions, it has been established that levels of granularity or complexity may differ according to the situation, for instance in relation to problematic segments or decision points (Tenbrink and Winter, 2009). However, only little is known about speakers' flexibility in relation to different addressees with respect to the communication of route-related details. While the studies by Kemper and colleagues above point to a positive effect of semantic elaboration on elderly listeners' comprehension that might be used to enhance the efficiency of automatic dialogue systems providing route instructions (Thomas, 2010), it is unknown to date what kinds of spatial concepts should be enhanced semantically. Also, the extent to which a schematic map scenario might transfer to a real-world scenario involving multimodal travel (i.e., public transport in addition to walking) remains unclear. A schematic map offers only a limited amount of information that could be verbalized; in contrast, the real world consists of an almost infinite number of features that might in theory be referred to in a route description. Furthermore, in natural environments there is typically more than one option for traveling. A recent study set in a complex city environment established that routes are chosen differently for one's own future navigation than for somebody who is not familiar with the environment (Hölscher et al., *subm.*). It stands to reason that route choice might systematically be affected by the age of the intended addressee because of general assumptions of such an addressee's physical, cognitive or communicative constraints.

In our study we set out to investigate how speakers confronted with a route instruction task involving their own natural everyday surroundings react to the requirement of providing route

information to either younger or older addressees. We hypothesized that the amount of detail conveyed about a route segment, which is influenced by features of the spatial environment, may be further mediated by the concept of an addressee of a particular age. Furthermore, route givers may select different kinds of routes for their addressees depending on age.

2 Route Description Study

2.1 Method

55 native speakers of German who were familiar with the Bremen university campus were recruited via an email call and participated in the study by email (20 were male and 35 female; 4 between 30–49 and 51 between 18–29 years old). Their task was to describe the route from the train station in Bremen to one of two buildings on campus (the library or the Cartesium building). The intended addressee of the route description was either male or female and either 25 or 75 years old. Participants were assigned to conditions randomly. Thus, the design of the study was 2 (addressee's age: 25 vs. 75 years old) x 2 (addressee's gender: male vs. female) x 2 (destination: the Cartesium or the library).

2.2 Analysis

The route descriptions were annotated by coders blind to the purpose of the study and the design conditions. Since the majority of the participants chose the same routes for the library and the Cartesium destinations, respectively, we focused on these two "standard" routes and identified others as exceptions (alternatives to these routes). We addressed the distribution of spatial details by first identifying the *spatial units* (Tenbrink & Winter, 2009) constituting the two standard routes: segments along the route that were described in a particular order by participants (the temporal order of route travelling). Next, we identified the number of *detail units* (pieces of information given in no particular order within a description) within each spatial unit that were mentioned more than once (i.e., by different participants). Spatial units that were explicitly mentioned by all participants were identified as *crucial*. This analysis yielded a semantically based hierarchical measure of *crucial spatial units* at the highest level of granularity, followed by the number of *spatial units* referred to in a description, and then by the number of (non-idiosyncratic) *detail units*.

We identified those parts of each description that referred to spatial units of the same two standard routes, and normalized the measures by participant by calculating the ratio of occurrence of each category for each participant. Our hypothesis was that, while the *crucial spatial units* and the *mention of a particular spatial unit* should be independent of age, the amount of *detail* should differ if people consider the requirement of semantic elaboration for elderly addressees.

Apart from this semantic analysis of spatial information provided along the route, we also calculated the average number of words per (shared) spatial unit, capturing in this way also the idiosyncratic cases in which further details were mentioned by individuals for a particular spatial unit shared across descriptions, and we looked at the following features of (complete) descriptions:

- mean length of a sentence (the number of words divided by the number of sentences),
- relative frequency of syntactically simple vs. subordinate (complex) sentences (leaving aside co-ordinate sentences, which may be judged as intermediate concerning syntactic complexity),
- form of address: informal "du" vs. formal "Sie"; further alternatives found were neutral infinitives, and third person singular.

2.3 Results

Route choices differed for younger and older addressees, and descriptions differed with respect to politeness forms and syntactic complexity as a function of age of addressee. We ran a series of 2 (age: younger vs. older) x 2 (gender: male vs. female) analyses of variance on the variables of interest. We found robust main effects of addressee age on the use of "Du", $F(1,51)=21.84$, $p<.001$, as well as on the use of the polite "Sie", $F(1,51)=30.56$, $p<.001$, and a two-way interaction between age and gender of addressee on the use of "Sie", $F(1,51)=7.32$, $p<.01$. We also found a marginally significant effect of age, $F(1,51)=3.96$, $p=.052$, on the simple/subordinate sentence ratio. Elderly people (particularly men) were addressed consistently by "Sie" and descriptions tended to be syntactically simpler; whereas young people (particularly men) were addressed informally by "du" (or in a neutral form), and descriptions tended to be syntactically more complex (particularly for young women).

Standard routes were preferred for elderly addressees; younger addressees received alternative, more challenging but possibly shorter routes more often. Altogether, 11 descriptions for 25-

year-olds and 5 for 75-year-olds used an alternative route. A 2 (younger vs. older addressee) x 2 (standard vs. alternative route) chi-square analysis showed a marginally significant association between these variables ($\chi^2=3.49$, $p=.062$). Alternative routes for 25-year-olds consistently concerned either walking diagonally across a parking lot towards the Cartesium building, or following the tramline on a narrower path rather than walking directly from the tram into the main university entrance in order to reach the library. Both of these were only suggested in one description each for a 75-year-old; the remaining three alternative routes chosen for elderly addressees concerned variations of public transport that were never offered to younger people.

In contrast to these consistent differences in route descriptions as a function of age of addressee, the analysis of spatial units and density of details did not reveal any systematic differences with respect to semantic elaboration. As expected, the spatial semantics contained in the route descriptions were hierarchically structured, independent of age of addressee. Neither the number of spatial units mentioned for the standard route, nor the mean number of words per shared spatial unit differed as a function of age of addressee. Descriptions for 25-year-olds contained on average 7.74 spatial units with an average of 16.40 words per unit. Descriptions for 75-year-olds contained on average 8.07 spatial units with an average of 15.50 words per unit.

Across all shared spatial units, the mean number of details mentioned per unit was 2.09 for 25-year-olds and 2.11 for 75-year-olds. The number of details varied across spatial units, the highest number was 4.48 details on average towards 25-year-olds and 4.11 towards 75-year olds for one particular spatial unit; the lowest number (for a different spatial unit) was 0.89 details towards 25-year-olds and 0.93 towards 75-year-olds. For each single spatial unit, average numbers were similarly close, i.e., independent of age of addressee, as in these examples. In other words, participants did not provide an enhanced level of detail for any spatial unit for elderly addressees.

2.4 Discussion

In our study, route givers wrote descriptions in different ways as a function of age of addressee. They not only adapted their route descriptions with respect to politeness forms and syntactic complexity, but also carefully considered which route their addressee should take. This yielded systematic differences in route choices in spite of

the fact that the spatial environment apparently supported one feasible "standard" route per destination which was used far more often across all descriptions than any other choice.

However, our analysis of semantic elaboration in terms of spatial granularity revealed no systematic differences as a function of age. This result stands in contrast to earlier findings by Kemper et al. (1995), who found that speakers used semantic elaboration when addressing elderly addressees. One reason for this difference may concern the fact that written descriptions provide a permanent medium of communication to aid the recipient's memory. A further enhancement of already mentioned material, which is easily accessible upon re-reading, would then appear redundant. As a result, semantic elaboration effects may be particularly present in the spoken modality as a way of facilitating memory and (semantic) integration of information. Another reason for the differences found between our analysis and Kemper's work may concern the analytical measures used. While Kemper and colleagues focused on formal measures such as repetition and variability in word forms, our analysis was concerned with the conveyance of facts, i.e., particular details about the environment that may support the traveler in finding the correct route in addition to the communication of essential spatial segments and decision points.

Our analysis revealed that, similar to earlier research (Tenbrink and Winter, 2009), route descriptions exhibited a hierarchical structure in that some of the spatial elements were considered so necessary as to be mentioned by every single route giver and some (more complex ones) were elaborated by many details, while others were left implicit in some descriptions and/or enhanced by fewer details on average. These patterns appeared to reflect solely the features of the spatial environment rather than any specific requirements attributed to the addressee. Thus, while route descriptions systematically varied the levels of granularity in relation to the nature of segments, route givers apparently did not expect elderly wayfinders to require more details about problematic spatial segments than younger ones. Instead, if they judged a particular spatial segment to be too problematic for an elderly addressee, they rather suggested a different route.

Acknowledgements

Funding by the DFG (SFB/TR 8 Spatial Cognition) is gratefully acknowledged. We thank Kavita Thomas and our assistants for their support.

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