

Solving referential problems in German as the target language: The role of the language learning environment

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1. Introduction

Solving referential problems requires a speaker to devise appropriate communication strategies. Drawing on Searle's speech act theory (1969), the dynamic communication process occurring between speaker and hearer may be conceptualized in this manner: A speaker encodes a message containing a certain intention and transmits it to a hearer who, in turn, decodes the message and its underlying intention. In encoding and decoding messages, speaker and hearer refer to their respective knowledge of the world, which they must share to at least some degree.

The process of referring to world knowledge is part of what has been labeled "referential communication". (Glucksberg, Kraus and Higgins 1975) Let us imagine, for example, a speaker meeting up with his or her friend Peter. As the first step in constructing a message referring to Peter, the speaker tries to think of Peter's name. (Peter is the "referent".) Next, the speaker endeavors to think of the names of other friends among whom he (or she) must distinguish Peter. In other words, the speaker constructs a reference phrase, in this case 'Peter', compares the referent to a non-referent (for example, 'Mary') and verifies that the constructed message is sufficiently distinctive. In addition, the speaker checks different attributes of the referent. For instance, 'Peter' may be referred to as 'he', 'you' or 'Peter'; the speaker chooses the attribute according to the context of the message. Subsequently, the reference to Peter is constructed and encoded in a message. The process of encoding the referent by the speaker is affected by "his goals: the immediate social, physical and linguistic context, his perception of the listener, and the set of non-referents from which the referent is to be distinguished" (Glucksberg and Kraus 1967: 310).

In second or foreign language learning and acquisition, encoding a referent may pose difficulties for the learner because references are often language- and culture-specific. In particular, research on expressions of space and time has shown a conceptual link between language and culture (Gumperz and Levinson 1996; Bowerman and Levinson 2001). The innumerable aspects of a culture form a network of subcultures which, when brought into contact with other cultures, interact on many levels. Geertz (1973) examined this issue further by inquiring who constructs the beliefs that are considered to be representative of a culture. He argued that it is through human activity and behavior that different variations of one culture are constructed in a community. Consequently, the dynamic process of human interaction with its environment constantly changes culture. This view has been expanded by Gumperz (1993) and Kramsch (1993) who emphasize the significance of personal experience in that process. Gumperz holds that "culture is revealed in the way we react to, evaluate and talk about experience" (1993, 207). In the context of acquiring a second or foreign language, Kramsch views culture as the difference between the native speaker's intended meaning and the foreign language students' "personal voice" (1993, 233). She posits that the creation of culture is a process in which the language learner acquires literacy in the L2 by "expressing personal meanings that may put in question those of the speech community. The language that is being learned can be used both to maintain traditional social practices and to bring about change in the very practices that brought about this learning." (1993, 233).

Taking these considerations into account, it becomes apparent that the environment in which a second language has been learned very likely plays a substantial role in referential communication. Two research questions arise:

1. At which stage in his or her learning can a learner construct comprehensible messages when solving referential problems?
2. How does success in doing so depend on his (her) learning environment and the method in which he (she) had acquired the target language?

2. Methodology

A research program was designed to test the interaction between a. the language environment, b. length of exposure to the language and c. the method of learning/acquiring a second language and the subjects' ability to solve a referential problem, namely to describe an abstract shape.

Similar research was carried out in the Netherlands where researchers examined the interaction between one language learning environment and one learning method, namely students at high school and university who had learned English as a foreign language (Bongaerts and Poulisse 1989). The participants in the study spoke Dutch as their native language and were learning English at a Dutch high school or university, resp., for two years (Level One), four or five years (Level Two), or seven years and more (Level Three). Bongaerts and Poulisse reported that the subjects on all three levels solved the referential problems successfully and in similar ways; they chose similar types and numbers of strategies, and they used a similar number of words and required a similar amount of time for their productions.

The present study uses some of the same methodology for purposes of comparison. However, here the focus is on testing the effectiveness of referential communication in two language learning environments and involving two approaches to learning German.

2.1 Subjects

The study was carried out at the University of British Columbia (UBC) and in Kiel and Hamburg, respectively, with native speakers of English who had learned German as a second language. The participants at UBC were students who had received classroom instruction for a varying number of years whereas the subjects in Kiel and Hamburg were working for German companies but were not receiving formal instruction.

In order to differentiate between the two language learning environments and approaches to learning German, two groups were set up. In Group C (Canada) were 30 students between 18 and 24 whose native language was English and who studied German at the University of British Columbia. They were selected on the basis of the results of a questionnaire (see Appendix B) to ensure that their main contact with German had been through classroom instruction. For example, students who had German relatives in either Canada or Germany were excluded from the study.

Group G (Germany) consisted of 30 participants whose native language was English and who worked for German companies in Kiel or Hamburg; they ranged in age between 22 and 34. They were chosen on the basis of another questionnaire (see Appendix C); care was taken to ensure that they had an extensive contact with German at their workplace, but had had only had a minimum of formal instruction.

Both groups were further divided into three subgroups each. The main criterion was the number of hours of classroom instruction received (Group C) or the number of years lived in Germany (Group G). In subgroups C1 to C3, participants had had approximately 208 hours, 336 to 442 hours, or 520 hours of classroom instruction, respectively.

Participants in Group G had received up to 104 hours of classroom instruction in Canada, the U.S. or Great Britain before they arrived in Germany. They lived in Germany for one year (subgroup G1), two years (subgroup G2) or three or four years (subgroup G3).

A cloze test was carried out to ensure that the members of the various subgroups did indeed display different levels of proficiency. It consisted of four text passages of approximately fifty words each, following examples from Hughes (1989). In each passage five lexical items had to be filled in on the basis of comprehension of the context of the passage; the highest possible score was 20. The accuracy of the cloze test had been pre-tested with native speakers of German in Germany before the research study at UBC and in Kiel/Hamburg began. Participants who were selected for Level Three in the present study had to score 17 points or higher; for Level Two they required 14 to 17 points, and for Level One 14 points or less.

Ten participants were selected for each level in both Groups C and G.

Factors such as motivation could not be determined, but all participants volunteered for the study, and so it may be assumed that they tried their best to solve the referential problems.

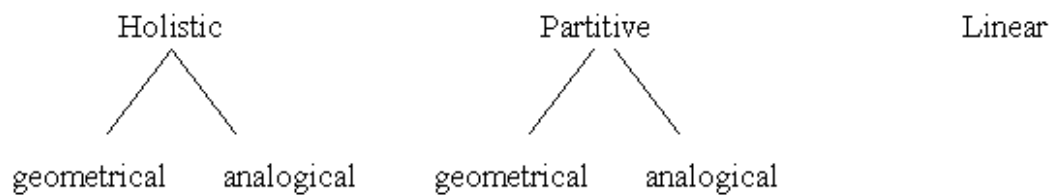
2.2 Procedure

All subjects carried out the same task, which was to describe six abstract shapes (see Appendix A). They were told that another person, who only understood and spoke German, would later have to identify the shapes from among a greater number of shapes, based on their descriptions. The participants were allowed to take as much time as they wanted to complete the task. Their descriptions were audio-taped and later transcribed, resulting in 360 transcription protocols (see below).

The shapes selected have been used extensively in research elsewhere. However, it has focused on first language acquisition (Kraus and Weinheimer 1964, 1966; Glucksberg and Kraus 1967; Kraus and Glucksberg 1969; Clark and Wilkes-Gibbs 1986), or - when applied to second language acquisition - with only one language environment, namely learning English as a Foreign Language in the Netherlands (Bongaerts and Poullisse 1989). Research related to referential communication has been concerned mostly with theoretical issues (de Bot 1992; Schreuder and Weltens 1993; Kellerman and Bialystok 1997).

When describing the abstract shapes, participants had to do the following: First, they had to find referents, and then they had to construct a comprehensible message containing these references.

The first part of the analysis determined the number and type of strategies used to solve the referential problem as well as the accuracy of the descriptions. For this purpose, the following taxonomy - developed and used by Bongaerts and Poullisse in their 1989 study - was applied in the categorization of referential strategies:



This is an example of the six shapes that had to be described by each of the participants:



Figure 1: Shape Three

The subjects described this shape in a variety of ways:

- 'eine schematische Repräsentation der Krone' ('a schematic representation of the crown') represents the holistic analogical strategy;
- 'ein verlängerter Kreis ohne die beiden Enden' ('an extended circle without the two ends') is an example of a holistic geometrical strategy;
- 'in der Mitte sieht es wie Pfosten aus' ('in the middle it looks like a post/posts') represents the partitive analogical strategy;
- 'Beide Seite hat gekrümmt Linie und Punkte' ('both sides have bent lines and points') the partitive geometrical strategy; and
- 'zwischen diesen Spitzen geht eine Linie' ('between those points is a line') embodies a linear strategy.

2.3 Analysis

The author and another investigator used this taxonomy to determine the number and type of strategies used by the participants based on the 360 transcription protocols. They also determined the accuracy of the descriptions. In case of disagreement, they re-examined the transcription protocols; this was required in eight of the 360 protocols.

The second part of the analysis quantified the subjects' efficiency in referential communication. A word count was carried out by the author using a word processor that was double-checked with a hand count. The time used by the subjects was established with the audio recordings, and the number of words spoken per second was computed. A paired sample t-test was employed to determine the significance of differences between subgroups at the same proficiency level in a comparison between UBC students and the Kiel/Hamburg participants.

3. Results

3.1 Type and number of strategies used and accuracy of description

The results show that constructing a comprehensible message in another language was indeed a difficult task for the subjects. Comparing the descriptions of Group C and G, there are differences in the performances of the six subgroups. Table 1 displays the frequency of strategies used by type, the total number of strategies used and the number of shapes described accurately by all six subgroups. At each level, the holistic strategy was used more frequently than any other strategy. The total number of strategies used by each subgroup of Group C was higher than the total number of strategies used by each subgroup of Group G although the differences were not substantial. At each level, participants of Group C described fewer shapes accurately than participants of Group G.

Table 1: Number and type of strategies used, comparing Group C with Group G

	HA	HG	PA	PG	L	T	N
Level One	48/48	7/7	5/4	14/2	4/2	78/63	42/46
Level Two	55/52	9/16	20/5	11/7	5/3	100/83	48/53
Level Three	62/61	12/16	41/21	31/29	5/16	151/143	54/58

Legend: The abbreviations used are HA (holistic analogical), HG (holistic geometrical), PA (partitive analogical), PG (partitive geometrical), L (linear), T (total number of strategies used), and N (number of shapes described accurately). The numbers on the left in each column refer to the descriptions provided by Group C and the numbers on the right to the descriptions produced by the members of Group G.

Level 1. Members of both subgroups C1 and G1 experienced difficulty in describing the six shapes accurately, and they did not use many different strategies. A good example is that of a participant of subgroup C1 describing Shape Two:

{*Holistic analogical*} 'Sieht aus wie ein Boot [h] ... [h] mit einem Unterteil.'

(Translation: {*Holistic analogical*} Looks like a boat [h] ... [h] with a bottom part.)

This rather short description cannot identify the shape described because it lacks detail. The participant did not attempt to use another strategy to solve the referential problem, and he (or she) did not process a sufficient number of lexical items that would express the referent successfully.

Level Two. The results on Level Two were most interesting. For example, a member of subgroup C2 described Shape Two in German translating the English word 'hour-glass' into 'Stundenglas' - a word which does not exist in German. In addition, this translation is inappropriate because Shape Two does not resemble an hour-glass (see Appendix A). A reference to an hour-glass in the description of Shape Two is only accurate if it is mentioned that the bottom half of the hour-glass is missing. Therefore the description is incorrect. This subject used the holistic analogical strategy to describe the shape:

{*Holistic analogical*} '<4> Es sieht aus wie [h] eine (sic!) [h] Glas [h] wie eine (sic!) Glas <5> eine (sic!) Stundenglas.'

(Translation: {*Holistic analogical*} It looks like [h] a [h] glass [h] like a glass <5> an hour-glass.)

The description of Shape Two by a member of subgroup G2, however, included a second reference to two antennas. It is accurate:

{*Holistic analogical*} '[h] <4> das sieht wie eine (sic!) Stundenglas (sic!) aus mit [h] ... zwei Antennen ... Antenne (sic!), ja.'

(Translation: {*Holistic analogical*} [h] <4> it looks like an hour-glass with [h] ... two antennas ... antenna, yes.)

The description by this participant also contained fewer pauses. All in all, the members of subgroup G2 described more shapes accurately than the subjects in subgroup C2. They did so by using less variety and a smaller number of strategies. For example, a member of subgroup C2 described Shape Six using two strategies:

{*Holistic analogical*} 'Aussieht (sic!) wie [h] [h] wie ein <8> [h] <4> musikalische (sic!) Instrument. Ja, ein Instrument. {*Change of strategy: Partitive analogical*} Oben dick und unten spitz.'

(Translation: {*Holistic analogical*} It looks like [h] [h] like a <8> [h] <4> musical instrument. Yes, an instrument. {*Change of strategy: Partitive analogical*}. Thick on top and thin at the bottom.)

In comparison, a member of subgroup G2 described Shape Six using one strategy:

{*Holistic analogical*} 'Sieht aus wie ein UFO [h] mit einer Leiter.'

(Translation: {*Holistic analogical*} Looks like a U.F.O. [h] with a ladder.

Both descriptions are accurate.

The results at Level Two indicate that some members of subgroup C2 did not find the referents that they needed to describe a shape, or it took more effort to do so when compared to the members of subgroup G2.

Level Three. On Level Three, the members of both subgroups C3 and G3 described most shapes accurately. They used a variety of strategies; however, in both subgroups the subjects still used the holistic analogical strategy most frequently. Lexical items expressing referents were processed successfully. For example, a member of subgroup C3 described Shape Two as:

{*Holistic analogical*} 'Diese Forme (sic!) hier ist ein umgedrehter Trichter [h] aber die Ecken sind ein bisschen glatter u=nd ist (sic!) nicht genau symmetrisch.'

(Translation: {*Holistic analogical*} This shape is an upside down funnel [h] but the corners are a bit smoother a=nd it is not symmetrical.)

Conclusions. Using different strategies requires the speaker to replace one semantic-conceptual framework with another (Levelt 1989). On Level One, some members of both subgroups were not able to carry out that process. On Level Two, the subjects of subgroup G2 seemed to have more referents at their disposal compared to speakers of subgroup C2, and the speakers in subgroup G2 processed lexical items expressing those referents to describe the shapes accurately. On Level Three, speakers of both subgroups performed their tasks successfully.

Bongaerts and Poulisse (1989) reported that participants at each of their three levels used the holistic analogical strategy most often. They also reported that the number and type of strategies used by the respective subgroups was similar, and their use was accurate. The language learning environment in the Dutch study is comparable to the one experienced by Group G in the present study. The way in which students had learned the target language in the Dutch study is comparable to the one experienced by Group C in the present study. The results indicate that a combination of treatments as represented by Group G and Group C - that is, participants have a great deal of contact with the target language *and* receive formal instruction - is most helpful for speakers when solving problems in referential communication.

3.2 Communication efficiency

A computation of the word-to-time ratio reflects the speakers' efficiency while performing their communication tasks. Table 2 displays the mean of the number of words and amount of time used by participants to describe all six shapes. On Levels One and Two, the members of Group C used more time and more words than the members of Group G. On Level Three, however, the subjects in Group C used more time and fewer words than Group G members.

Table 2: Number of words and amount of time used, comparing Group C with Group G

	Mean time Subgroups C (in seconds)	Mean words Subgroups C	Mean time Subgroups G (in seconds)	Mean words Subgroups G
Level One	38.21	22.56	19.50	16.52
Level Two	44.66	34.42	27.62	29.34
Level Three	59.43	51.13	51.97	67.26

On Level One, members of both subgroups had difficulties processing lexical items. The subjects in subgroup C1 used more lexical items and therefore needed more time than the subjects in subgroup G1, indicating a sustained effort required by the members of subgroup C1. On Level Two, subgroup G2 processed more lexical items successfully than subgroup C2. They accomplished this by using fewer words and less time than the individuals in subgroup C2, indicating a greater number of linguistic resources available to them which gave them the opportunity to select those lexical items that described the shapes accurately as well as quickly. On Level Three, the subjects in both subgroups processed lexical items successfully although subgroup G3 was more efficient than subgroup C3.

Table 3 shows the word-to-time ratios. The results reveal that differences between the subgroups at both Level Two and Level Three were significant between the participants at UBC and in Kiel/Hamburg. On Level One, however, the differences were not significant.

Table 3: Paired-samples t-test for the word-to-time ratios, comparing Group C with Group G

	Mean Subgroups C (words per second)	SD Subgroups C (standard deviation)	Mean Subgroups G (words per second)	SD Subgroups G (standard deviation)	t-value	Sig. (p)
Level One	0.72	0.33	0.85	0.18	-1.186	.266
Level Two	0.78	0.21	1.14	0.42	-2.648	.027*
Level Three	0.89	0.17	1.27	0.16	-7.421	.000*

* The difference between the two populations is significant ($p < .05$)

On Level One, the members of subgroup C1 required a sustained effort to solve the referential problems. However, they were not more efficient and in fact described fewer shapes accurately than members of subgroup G1. In both subgroups, some participants gave up on the task altogether.

On Level Two and Level Three the subjects in Group G were more efficient than those in Group C, and they described more shapes accurately.

Clearly, processing and expressing abstract concepts is a difficult task for a speaker to be carried out in the target language. The results show that a great deal of contact with the target language and culture is most helpful to the learner to process lexical items efficiently and accurately.

The Dutch study had also determined the number of words and the time used by participants to describe the shapes (however, the word-to-time ratio was not calculated). Bongaerts and Poullisse (1989) reported that their subjects on the three levels used a similar number of words and amount of time to describe the shapes. The results obtained by the present study differ from these findings. The difference can likely be attributed to the different language learning environments and learning methods tested in the present study. The type of language learning environment and learning method does not seem to have a significant impact on the speakers' ability to solve referential problems at the lowest level, but it does so on Levels Two and Three.

4. Discussion

This study tested the interaction between two language learning environments and ways of learning another language and the characteristics and success of referential communication. The strategy analysis showed that members of Group G - who had had a high amount of contact with the target language but had not received much classroom instruction - solved the referential problems more successfully than the subjects in Group C who did not experience extensive contact with the target language, but had received a great deal of classroom instruction. However, results of the Dutch study showed that participants with high exposure to the target language and a great deal of classroom instruction solved the referential problems successfully. The strategy analysis in the present study concluded that classroom instruction does indeed play a role in referential communication. However, the results of the efficiency analysis carried out in the present study did not confirm this finding. Unfortunately, the results cannot be compared to the Dutch study because it did not compute communicative efficiency.

The results of the present study of communicative efficiency showed that on Levels Two and Three high exposure to the target language is helpful for the speakers to solve referential

problems even if they had not received much classroom instruction. Therefore it is possible that in referential communication a key factor is to have had an extensive contact with the target language. In an environment that provides the language learner with a great deal of exposure to the target language the learner is more likely to succeed in finding referents and constructing comprehensible messages expressing them. Interestingly enough, the lack of formal instruction in that environment did not seem to have an effect on the success rate.

Limitations. It must be kept in mind that the two language learning environments in the current study were "constructed." Learners who were chosen for this study were selected according to a number of criteria, e.g., having had only a minimum amount of instruction (Group G) versus having little contact with the target language outside the classroom (Group C). In everyday language use, it can be expected that someone who lives in Germany is more fluent and able to communicate than someone who does not have much contact with the German language and culture. However, referential communication involves a different kind of language in that it requires the speaker to solve problems and make use of many structures to construct a comprehensible message: They have to use lexical concepts, bind them to syntactic nodes and articulate them on an abstract level (Levelt, Roelofs and Meyer 1999).

Recommendations. Applying these results to the teaching of German as a foreign language in Canada suggests the creation of new types of German courses. Ideally, students will spend some time in Germany, but this is not always feasible. Other approaches need to be employed; one example is to use new technologies. There are computer interfaces that allow students of German enrolled at a university course to have direct contact with native speakers of German enrolled at a German university (Schuetze and Wieland 2003). As a result, the dynamics of classroom interactions change: The instructor becomes an advisor while the learner works on assignments cooperatively with other students, including native speakers.

Much research needs to be done on these type of courses, in particular on the student-student exchange. However, it appears that the type of learning environment provided in such a course might be helpful for the learner when he or she is faced with the task of solving language- and culture-specific referential problems.

Appendix AThe six shapes used in the task

Shape One



Shape Two



Shape Three



Shape Four



Shape Five



Shape Six

Appendix B

Background Information

Type One

Name:

Age:

Please indicate for all languages you learned the following information:

Age (how old you were when you started learning it, e.g. L1: birth)

Number of years learned

Name and Number of courses taken/Number of hours per week per course (L2/L3 only)

Country you learned it (e.g. L2: German. Learned in Canada)

How you learned it (at home, high-school, university)

L1 (English):

L2 (German or other language):

L3 (German or other language):

Please indicate in what language(s) you are able to communicate at this moment:

- (A) with great difficulties (B) with difficulties (C) with minor difficulties
 (D) with fluent, near native ability (E) with native proficiency

L1 (English):

L2 (German or other language):

L3 (German or other language):

Please indicate where you speak L1, L2, L3 now (at home/going out in the city/doing leisure activities, e.g. sport/at the university/nowhere) and with whom you speak L1, L2, L3 (parents/other family/friends/other people/not at all).

Please also indicate your contact with German institutions in Vancouver, e.g. German stores, church service, Goethe-Institut, etc.

L1 (English):

L2 (German or other language):

L3 (German or other language):

Appendix C

Background Information

Type Two

Name:

Age:

1. Please indicate for all languages you learned the following information:

Age (how old you were when you started learning it, e.g. L1: birth)

Number of years learned

Name and Number of courses taken/Number of hours per week per course (L2/L3 only)

Country you learned it (e.g. L2: German. Learned in Germany)

How you learned it (at home, high-school, university, living in Germany)

L1 (English):

L2 (German or other language):

L3 (German or other language):

2. Please indicate where, when and how you started learning German.

3. Please indicate in what language(s) you are able to communicate at this moment:

(A) with great difficulties (B) with difficulties (C) with minor difficulties

(D) with fluent, near native ability (E) with native proficiency

L1 (English):

L2 (German or other language):

L3 (German or other language):

Please indicate where you speak L1, L2, L3 now (at home/going out in the city/doing leisure activities, e.g. sport/at the university/nowhere) and with whom you speak L1, L2, L3 (parents/other family/friends/other people/not at all).

L1 (English):

L2 (German or other language):

L3 (German or other language):

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