

INTERLANGUAGE AND THE COMPUTER

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Abstract

Second language acquisition research has questioned the value of formal teaching of grammar and emphasized the importance of language use. Accordingly, proponents of computer-assisted language learning have argued that computer software is valuable for second language learning to the degree that it provides practice in using the language rather than merely manipulating it. Theory and research on interlanguage indicates that language acquisition will increase with the quantity and quality of comprehensible input that non-native speakers (NNSs) receive. Preliminary analysis of language interaction of intermediate NNSs suggests that the quantity and quality of interaction is lower in computer use than in conversation. This raises questions about the role of the computer in language development.

Introduction

This paper will describe the language interaction (interlanguage) between non-native speakers (NNSs) of English during computer use, a typical situation being where two people use a program on a microcomputer and talk with each other as they do so. Recent developments in second language acquisition theory and knowledge about computer-assisted language learning indicate that these language interactions are

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essential research data for assessing the value of the computer for language development.

While computer-assisted learning has existed as a field of inquiry for at least two decades, it has only been relatively recently that there has been a large amount of interest in computer-assisted language learning (CALL). There is now a journal devoted to CALL, *CALICO*, which maintains a large database of relevant journal articles, language learning journals have devoted special issues to CALL (e.g., *System* Vol. 11, No. 1, 1983; *Medium* Vol. 9, No. 3, 1984) and a number of books have been published (e.g., Higgins & Johns 1984; Underwood 1984). These publications are concerned with second language development, but anyone interested in the more advanced levels of second language acquisition, particularly in reading and writing, will find a great deal of value in contemporary work on first language learning at the computer (e.g., Mason, Blanchard & Daniel 1983; Daiute 1985). An important issue emerging from discussion about CALL is how far practices in CALL are consistent with current research and theory in second language acquisition: Many CALL programs embody assumptions about language development that have been discredited by recent research.

The well-known work of Krashen (Krashen 1982; Krashen & Terrell 1983) encapsulates a number of trends in second language acquisition research and draws conclusions for language teaching policy. Making a distinction between conscious learning and unconscious acquisition, Krashen argues that formal language learning is not nearly as important in developing communicative ability in second language as previously thought, and conscious grammar rules have only a limited function in second language use. Rather, the operative factor in second language acquisition is comprehensible input: "The central hypothesis of the theory is that language acquisition occurs in only one way: by understanding messages We acquire when language is used for communicating real ideas." (Krashen & Terrell 1983:1, 9)

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The immediate implication of this for language teaching programs is that "Language is best taught when it is being used to transmit messages, not when it is explicitly taught for conscious learning." (Krashen & Terrell 1983:55). This implies an essential distinction between what can be called *formal* language teaching, which aims for conscious learning of rules through explicit teaching of them, and therefore focusses on the forms of the message, and *communicative* language teaching, which aims for acquisition of communicative competency, and therefore focusses on what is being said rather than the form of the message. The Grammar-Translation, Audiolingual and Cognitive-Code methods are to varying degrees examples of formal language teaching and the Natural Approach is an example of communicative language teaching.

But there are much wider implications of this position which go beyond language classrooms. Since second language acquisition can occur in any environment of comprehensible communication, we must consider all contexts in schools and the wider community where the second language is the medium of communication as potential environments for second language acquisition. We should distinguish between language teaching (formal or communicative) and *communicative language use* across the curriculum and community. These wider implications are discussed in detail in Mohan (1979). They require us to take account of how discourse varies in different social contexts. Mohan (1986) provides a framework for the analysis of functional variation in discourse, particularly with respect to the language demands made, and language opportunities offered, by the teaching and learning of content (i.e., subject matter). To the theory of "comprehensible input", then, we must add theory and research with respect to functional variation in discourse. Functional variation in discourse affects both what language is comprehended and what language competencies may be acquired.

CALL and SLA

Krashen's perspective has been applied in a state-of-the-art survey of CALL (Underwood 1984). Underwood contrasts an older approach to CALL with a newer, emergent approach. These approaches can be labelled formal CALL and communicative CALL because they are parallel to formal language teaching and communicative language teaching.

Formal CALL programs aim to teach rules and items of the language and then test this knowledge through questions, exercises and drills. They thus reflect a traditional concept of language teaching and focus on the form of language. The large majority of CALL programs are of this type (Underwood 1984:45). As Underwood points out, formal CALL assumes that CALL is a computerised form of programmed instruction whereby language material is broken down into small discrete points of grammar and vocabulary; there are simple techniques for providing feedback; and the computer is to be "an evaluative taskmaster that asks all the questions and judges all the answers." (Underwood 1984:46). He criticises this type of program as not providing any semblance of communication or conversation.

Communicative CALL programs will aim to create a rich communicative environment for the learner. Learner activities will focus on communication rather than language form and result in original utterances rather than language manipulation. The intention will be to encourage the learner to use the target language naturally. To this end, correction of structural errors in language will be avoided, for successful communication should be sufficient reward for the learner (Underwood 1984: 52-4). Groupwork at the computer is a particularly important aid to Communicative CALL:

"An important source of comprehensible input that is often overlooked in the discussion of computer materials is the communication that takes place,

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not between computer and user, but between users. Programs tend to be used by small groups, often pairs, of students rather than by students working alone. Invariably, the students get involved in much healthy discussion centering on how you get the thing to work or the best way to solve the problem." (Underwood, 1984:54)

A different category from formal or communicative CALL is *communicative computer use*. Communicative computer use occurs when a program provides an environment of comprehensible communication for non-native speakers (NNSs). A program designed to teach music or mathematics might be very successful with NNSs if they found it understandable and interesting. Communicative CALL programs are designed to promote language acquisition, but programs not specifically designed for CALL may do this as well or better. The difference between communicative CALL and communicative computer use is like the difference between communicative language teaching and communicative language use across the curriculum and in the community.

Communicative computer use – a category overlooked by Underwood – implies a radically changed perspective. It extends enormously the range and quantity of computer programs that may be appropriate for second language development, for CALL programs are only a small proportion even of educational software. We do not have to wait for the development of better CALL software; we make the best use of all software available now. *All* programs must communicate with their users if they are to be used successfully at all. *Any* program may promote communication with NNSs; it is an empirical question whether it does so or not. Furthermore, communicative computer use raises new research questions. Instead of limiting ourselves to questions of whether CALL

software is communicative and how it might be programmed to be more so, we can raise questions of how far the normal use of any program gives rise to communicative language use and what conditions of computer use (e.g., groupwork vs. individual work) increase communicative interaction between NNSs. In other words, we should enquire into functional variation in discourse during computer use. Consistent with this line of thought, Barker and Canale (1984) have argued for a variety of uses of word processors with second language learners and Greene (1984) similarly suggests uses of spreadsheets and other program types.

How can we know whether a computer program is communicative or not? We could ask "Does the program provide practice in using the language instead of merely manipulating it?" (Underwood 1984:94). More exactly, if computer software is valuable for language learning to the degree that it results in quantities of comprehensible input, we need to know whether one type of computer software produces more comprehensible input than another. Does communicative CALL actually produce more than formal CALL, for instance?

Besides comparing one type of computer use with another we should also compare language interaction *with* the computer and language interaction *without* the computer. Suppose learners communicated less during computer use than they did during conversation. If so, we would have to radically reassess assumptions about the computer as an aid for language development. It would not compare well to other alternatives. In more general terms we should examine whether there is functional variation in discourse between computer use and other types of language interaction.

This new perspective on software for second language acquisition, therefore, revolves crucially around the question of comprehensible input during computer use. To my knowledge, there is little, if any, published research on this question.

Interlanguage and Groupwork

Investigation of language interaction at the computer will draw on theory and research about interaction between non-native speakers, i.e., interlanguage talk during groupwork. This area has been reviewed by Long and Porter (Long & Porter 1985). Adding to Krashen's position on the importance of comprehensible input, they point out that there is substantial agreement between researchers that "Learners must be put in a position of being able to *negotiate* the input, thereby ensuring that the language in which it is heard is modified to exactly the level of comprehensibility they can manage" (Long & Porter 1985:214). Accordingly, a current focus of research in studies of NNS/NNS conversations is not only the quantity of language practice learners engage in but also the quality of the talk they produce in terms of the negotiation process. Typical measures of the negotiation process are clarification requests, confirmation checks, comprehension checks, and self- and other- repetitions.

Long and Porter's survey of research studies of NNS/NNS interaction shows that, when compared with teacher-fronted lessons and with NS/NNS interactions, NNS/NNS interactions provide more language practice opportunities and result in more negotiation. In other words, NNS/NNS interactions provide both a greater quantity and quality of comprehensible input. Studies also between participants increase quantity of talk and negotiation compared to "one-way" tasks.

The implications of this work for the study of computer-based language interaction are clear. If we study the language interaction of pairs of NNSs at the computer we are studying NNS/NNS groupwork. The use of a computer program provides tasks for the learners and we might expect the information exchange characteristics of these tasks will affect language interaction. We should study both the quantity and negotiated quality of NNS/NNS interaction at the computer.

As noted above, communication at the computer divides into computer-user communication and user-user communication. User-user communication should have research priority because it allows for negotiation, which we have seen to be theoretically and empirically a crucial aspect of the quality of comprehensible input.

Research Study

I will present some preliminary findings from a study (in progress) of NNS/NNS computer-based interaction. Subjects were eight pairs of intermediate proficiency adult NNSs; four pairs were female, four pairs were male. No pair shared the same first language. Each pair interacted in four tasks: informal conversation without the computer (10 minutes) and the use of three different computer programs (20 minutes each). One was a grammar teaching program which reviewed conditionals and then tested the learner's knowledge of them. Another was word-processing program (Bank Street Writer): Learners followed a tutorial on the use of the word-processor and then used the program to write a statement of their opinion of corporal punishment in schools. The third was a business management program which simulated the establishment and operation of a business franchise. In all cases, subjects were asked to work together to use the program cooperatively. Order of presentation of the tasks was counter-balanced and interactions were video-taped and transcribed.

Table 1 gives the results for a measure of quantity of speech (words per minute) across all pairs for the four tasks. It can be seen that pairs produced much more speech in conversation than in computer use. The rank order of quantities for each pair was tested using Friedman's non-parametric 2-way analysis of variance (Siegel, 1956:166-172) and found to be significantly different from chance ($p < .001$). As a rank-order statistic this does not take into account the size of the difference between conversation and computer

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use: For every pair, quantity of speech in conversation was two to three times higher than any type of computer use.

	Conversation	Computer use		
		Grammar	Simulation	Word Processing
Words per min.	80	26	22	17
Comprehension checks (per minute).	1.01	.24	.26	.14

Table 1

Totals for interaction quality (words per minute) and quality (comprehension checks) across all pairs of subjects.

One measure of the quality of speech and the process of negotiation is the frequency of confirmation checks. Confirmation checks occur when one speaker tries to elicit confirmation that he or she has correctly heard or understood what was previously said by the other speaker. Table 1 reports the average frequency of comprehension checks per minute across the different tasks. On this measure conversation is again considerably higher than any type of computer use. Using Friedman's nonparametric 2-way ANOVA, the rank order of frequencies for each individual pair was found to be significantly different from chance ($p < .001$). Every pair produced more comprehension checks in conversation than in computer use.

This preliminary finding, that conversation was higher than computer-based interaction in both quantity and quality, is based on only two measures, but the large differences found suggest that other measures may arrive at the same result.

We cannot therefore assume that computer use will automatically produce the appropriate language environment desirable for second language acquisition, for it appears from these data that the quantity and quality of interaction may

actually *decrease* when NNSs engage in computer use. In fact, computer use may result in interactional discourse which is functionally different from conversation. If so, this difference is something which future research on NNS/NNS computer-based interaction will have to take into account.

Typical samples from one pair of NNSs will illustrate the nature of the data. J is a female Japanese speaker, S is a female Spanish speaker. Both had studied English at university in their home countries and were learning English in Canada.

Interpretation of Data

Simulation.

J: What do you think?"

S: I don't know.

J: I don't know. How much? I guess . .

S: Number 5.

J: Are you sure?

Grammar.

J: What is this thing?

S: "Would".

J: "You would have to"?

S: "you will have to reserve it. You want . ."

J: "Wanted". Yes. I am having some trouble with grammar.

Word processor.

J: Type in upper case letters.

S: You try?

J: You do it.

S: No, you do it. You have practice.

J: No, no.

S: Yes, you have practice and I haven't.

Conversation.

S: How long have you been here?

J: About five weeks.

S: Just five weeks?

J: Yes.

S: Your language is very good. I came here, I think, March or April, but it was very difficult for me because when I came here I couldn't say anything in English. Just my name and "I am from Honduras". My teacher tried to talk to me, but I couldn't speak well enough, but I make a lot of mistakes.

These samples suggest possible reasons for differences between conversation and computer use. In conversation, speakers tend to hold the floor longer than they do at the computer. Most of the sustained turns of speaking in these data appear to occur in the conversations. A further point is that the computer interactions seem to be more limited to the "here and now", while in conversation speakers talk about their previous experiences. A related issue is that the conversation is more easily interpretable to the reader than the computer interactions, where it is often difficult for an outsider to understand what is happening. It may be that in conversation the participants are creating their shared focus of attention through the conversation itself, so that meanings are made explicit. By contrast, in the computer interactions the screen, and the videotape provides the key to understanding what is said. This could be summed up by speculating that the computer interactions are highly dependent on the context created by the computer, whereas the conversations to a large extent create their own context of understanding.

It should be stressed that this paper is a preliminary study, part quantitative, part interpretive. Its conclusions should not be overgeneralised. The data have not been fully analysed; the results have appeared only with intermediate speakers and other proficiency levels should be examined as well. We should explore other kinds of computer programs and we should investigate other arrangements of learners and tasks at the computer. Only user-user communication has been analysed, and while there are good reasons for doing this, ultimately

computer-user communication should be addressed. To do otherwise would be to ignore the considerable amount of reading that occurs during many computer programs. We should also treat the assumptions of the input hypothesis with caution. Cummins (1984) has drawn attention to differences between conversational language proficiency and cognitive/academic language proficiency. Competence in one does not imply competence in the other. It may be that the computer is more appropriate to the development of cognitive/academic language rather than conversation.

Conclusion

Current theory and research on second language acquisition now emphasises the importance of communicative language use rather than formal teaching. Debate on the use of the computer in second language learning also stresses communicative language use, but there is a lack of research which examines communicative interaction at the computer. This paper has shown that it is possible to research computer-based language interaction using theory and measures developed in the study of NNS/NNS interaction.

Emerging findings give preliminary indications that the quantity and quality of NNS/NNS interaction at the computer is lower than in conversation between the same speakers. This is a disturbing result. However, it does not mean that the computer has no role in second language development. Rather, it means that conceptions of the role of the computer may have to be revised radically and that much further research is required to examine closely the nature of language use at the computer under a variety of conditions.

Such further research will be valuable in at least three ways. Firstly, at a practical level, it will provide objective data for the evaluation of computer software for language purposes. Secondly, it will provide empirical evidence needed to develop models of appropriate computer use by second language

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learners. Thirdly, and more generally, the study of language use at the computer is likely to increase our understanding of the role of context in language input and of the nature of functional variation in interlanguage.

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