1 INTRODUCTION

The idea of communicating with a computer in natural language has stimulated the imagination for quite some time and has given rise to a debate about the advantages and disadvantages this might have. Some of this discussion is carried out on a more philosophical plane, some of it is derived from experimentation with different kinds of simulated situations, but very little of it is based on experience with implemented natural language systems.

Given that the interaction language of a system is important for its human factors, it is easy for those who think that even restricted natural language is useful for data analysis, as we did and still do, to believe that a natural language interface to a relational data base will have good human factors by definition, and in proportion to the natural language syntax and semantics implemented in it. The system we built on these premises is User Specialty Languages (USL, cf. references under Lehmann, Ott, and Zoeppritz). Of course, we have found out in the meantime that even natural language systems must tell about errors politely, need some training, hence a legible manual, and can be just as frustrating as any other system when the diagnostics are not sufficiently clear.

On the other hand, our system has had several users who had data they wanted to analyze and who let us study how they used the system. At first, this was only intended to detect functional and linguistic errors, constructions that were needed and we had not thought about, interpretations that were inconsistent with other people's usage, etc., and to find out in general whether natural language was feasible with the restrictions imposed by our system. But the
studies with users also offered an opportunity to observe natural language communication with a computer, with respect to functional requirements (do they use pronouns and if so for what purpose?) and with respect to user attitudes and strategies (how do they formulate their questions and what happens if there is an error?).

There is not very much data about the use of natural language with implemented systems (but see Woods et al., 1972, Damerau, 1979, and Tennant, 1979). The purpose of this paper is to contribute to the discussion about the desirability of communicating with computers in natural language by comparing some of the statements for and against natural language with what we observed in our studies with users. The first section describes the features of the system which are relevant for the argument, leaving out technical detail. The second section gives an overview of the studies. Then, in the third section, some of the arguments for and against natural language are presented and discussed.

2 THE USER SPECIALTY LANGUAGES SYSTEM

2.1 PROPERTIES OF THE SYSTEM

The User Specialty Languages System (USL) is designed as an applications independent natural language interface to a relational data base for data query, analysis, and manipulation, including data entry. The underlying data base management system now is System R (Chamberlin et al., 1981), earlier versions of USL interfaced to the Peterlee Relational Test Vehicle (Todd, 1975). USL analyzes and interprets natural language sentences. From the interpretation, the system generates one or several expressions in the formal data base query language. This language was Information Systems Base Language (ISBL) for the Peterlee Relational Test Vehicle (PRTV), it now is Structured Query Language (SQL) for communication with System R.

The project started out as a joint effort to construct interfaces for several natural languages using the same technology. The basic concepts of the technology derive from the Rapidly Extensible Language (REL) System of Thompson et al. (1969). While both the present REL System (cf. Henisz-Thompson 1978) and the USL System