Introduction

Many researchers have stressed the lack of linguistic indicators of the development of family interaction and have cast doubts on the validity of the behavioural measures applied in family interaction studies: for a review, see Jacob (1975). The combination of linguistic (mainly syntactic) with other behavioural (paralinguistic and nonverbal) indicators in studying family interaction during therapeutic sessions has been claimed by Silvestri et al. (1980) to be an important heuristic tool for the assessment of the effectiveness of family treatment. The package of automatic linguistic analysis (ALA) described below forms part of a wider research, planned by the Psychiatric Clinic of Bari and the Institutes of Informatics and Psychology of the Trento University, whose purpose is to integrate the study of pragmatic functions and communicative strategies in family interaction during therapeutic sessions with linguistic indicators of the cognitive processes operating in speech planning during those sessions. Thereby it is hoped to assess the validity of linguistic indicators as providers of insight into developmental aspects of treatment by family therapy.

Linguistic and Paralinguistic Analysis

The ALA package is based on axioms of syntagmatic and transformational grammars, which guide the parsing of sentences in a sequence of linked nodes, corresponding to elementary linguistic units (called kernel sentences, KS according to Chomsky's theory; 1957). Transcriptions of complete therapy sessions are analyzed in five sets of operations, of which the first and the second have to be partially performed by the researcher.

1) Each turn is labeled by a digit marker identifying the speaker. The turns of the psychiatrist(s) are not considered, since they are not particularly pertinent for understanding the cognitive and emotional processes of family members.

2) All the words transcribed are substituted with digit markers reproducing traditional morphosyntactic categories. Sentence boundaries and infrasentential punctuation are also expressed (after a matched classification of two or more judges) through digit markers (see Table 1).
The sentence is defined (following Lyons, 1968) as a verbal sequence which has a) a meaning by itself; b) an interruptive pause before the sentence to follow; c) a quite regular syntactic form. To define c), every verbal sequence which satisfied conditions a) and b) is analyzed according to the main criteria of transformational grammars, which allow the identification of the acceptable patterns of surface constituents linkable to possible kernel strings. The acceptable patterns of surface constituents are classed as complete KS ("I would like to explain this problem") or incomplete KS ("I would like to explain ...") according to whether the surface form of the sentence contains all the constituents present in the (deep) kernel string (regardless of order). The two groups of complete and incomplete KS are the following (see table 2).

**TABLE 2**

<table>
<thead>
<tr>
<th>COMPLETE KS</th>
<th>INCOMPLETE KS</th>
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<tbody>
<tr>
<td>5 -- 3 -- 3-</td>
<td>4 2 8</td>
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</table>

In each combination the 7 can occur in any position, and may be repeated.