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Drug Effects on Human Social Behavior: Changes in Talking Activities Induced by CGP 361/A, a Beta-blocking Agent

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Introduction

Drugs can modify social behavior of patients, and the social context within which a patient is treated can influence a drug's action. Although there is much support for this statement from psychiatric experiences, its scientific basis is small (cf. *Stitzer* et al., 1981) and urgently requires further research. Up to now, rather isolated groups have tried to evaluate the effects of drugs on social behavior, and these groups are mainly concerned with the social consequences of drug addiction. To give an example, the Baltimore group (e.g. *Stitzer* et al., 1980) described enhancing effects of drugs like d-amphetamine, secobarbital, and alcohol on human conversation. Nevertheless, regarding most of our (psycho-) pharmacotherapeutic drugs, there is little systematic knowledge about their influences on the social behavior of drug-treated patients or subjects (cf. *McGuire* et al., 1982).

Research in this area is hindered especially by the two basic problems of either creating suitable experimental models of social behavior (lab experiments, e.g. *Krüger* and *Kohnen*, 1982) or finding valid methods for evaluating social activities in everyday-life settings (field studies). Regarding field studies, in this paper a new instrument called the LOGOPORT will be introduced for evaluating drug-induced changes in talking activities in everyday-life conversations.

Method

The LOGOPORT is a portable microcomputer. It is connected by a cable to a throat microphone which is adhered to the neck of a patient or subject. This device enables the researcher to register (and computerize) whether a person is speaking or not in a fixed interval (say, 5 seconds) within a considerable space of time (say, 12 hours). The LOGOPORT data makes it possible to reconstruct all talking activities of a person during registration time, especially allowing the researcher to identify characteristic parameters of a person's conversations. According to *Heidenfelder* (1985), valid LOGOPORT-indicators for interactional social behavior are the following: (a) the duration of a single talk; (b) a person's involvement in a talk (i.e., the time he or she is speaking within a conversation either alone or at the same time as a partner); (c) the pause-interval between two consecutive conversations. These parameters proved to be suitable for evaluating drug effects on human speech (cf. *Stitzer* et al., 1984). The advantage of the LOGOPORT device, compared e.g. to the quite similar procedure of the Baltimore group (*Griffiths* et al., 1977), is that the patient or subject does not have to stay in the laboratory but can move away into his or her field of everyday life. So, highly naturalistic speech activities are registered by the LOGOPORT (for more details regarding the LOGOPORT, see *Krüger* (1985), or write to the authors).

In a field study, the effects of a new compound, CGP 361/A, on talking activity were examined using the LOGOPORT. CGP 361/A is an experimental drug (Ciba-Geigy, Basel) exerting β-receptor blocking properties in animal studies comparable to those of propranolol. Very small dosages (0.3 mg and 0.6 mg per kg p.o.) of this drug in monkeys produced enhancing of affiliative behavior: the drug increased grooming contacts, at strongest in animals with normally low grooming rates (alpha, omega position in the group; *Jaekel*, 1986). Based on this observation, it was hypothesized that the drug will influence (improve) interactive social behavior in man, particularly in socially handicapped people.

Using the symptomatic volunteer approach (*Goldstein* and *Brauzer*, 1971), $n_1 = 18$ subjects were engaged who described themselves as socially handicapped (stressed, with social deficits, etc.), and $n_2 = 18$ subjects were hired who assessed themselves as socially successful. Psychometric validation of the subjects' self-evaluations yielded statistically significant differences ($p < 0.001\%$) in measures of assertiveness. The subjects were paid for their participation. Half of the subjects in each group were males, the age-range was 20 to 30 years with a median of 23 years. In a randomized-group design, two dosages of CGP 361/A (10 mg and 20 mg p.o.) and placebo were given in a double-blind manner to the subjects twice a day (8 a.m. and 6 p.m.) for 4 days. Every morning, the subjects were connected with the LOGOPORT and left the lab for their normal (campus) activities. In the evening (at 6 p.m.), the subjects returned to bring back the LOGOPORT. To minimize interindividual differences in social activities, the late evening was excluded from investigation in this study. After termination of the 4-days-period, the LOGOPORT parameters were calculated as mean values over 4 days.

Results

The LOGOPORT parameters are not normally distributed; therefore the data were evaluated statistically by the Kruskal-Wallis-Test separately for both groups. There were no significant drug – placebo differences in the socially successful subjects; however, in the socially handicapped group clear distinctions could be made between drug and placebo treatment. To clarify the action of CGP 361/A, its effects in the socially handicapped people were compared to the effects of placebo treatment in the socially successful subjects.

The two groups differed significantly in their involvement in talking under placebo (Figure 1; $p < 0.01$, Wilcoxon-Test). As could be expected, socially successful subjects were more engaged than socially handicapped: the latter spent about 47% of the total time speaking and the successful subjects 63%. Drug treatment brings involvement-in-talking measures of the socially handicapped subjects to the placebo level of the socially successful subjects: the involvement in talking is about 58% under 10 mg CGP 361/A, and is about 63% under 20 mg CGP 361/A. The drug-placebo difference is highly significant ($p < 0.001$) in the socially handicapped group.

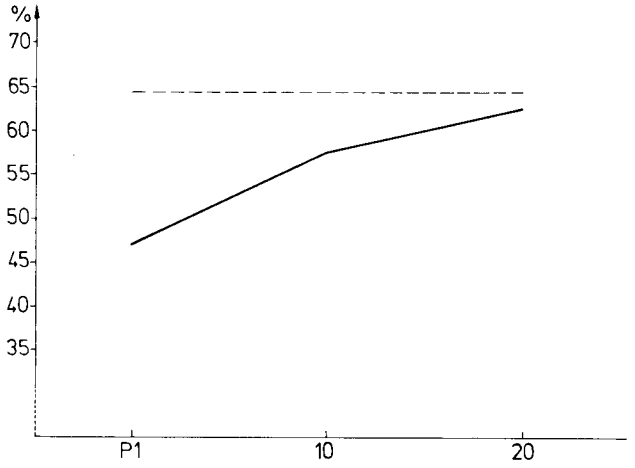

Fig. 1 Involvement in talking as percentage of the speech time related to the total time of a conversation.
----: involvement-in-talking level of socially successful subjects under placebo treatment;
———: involvement-in-talking of socially handicapped subjects under placebo (PL) and CGP 361/A (10 = 10 mg, 20 = 20 mg)

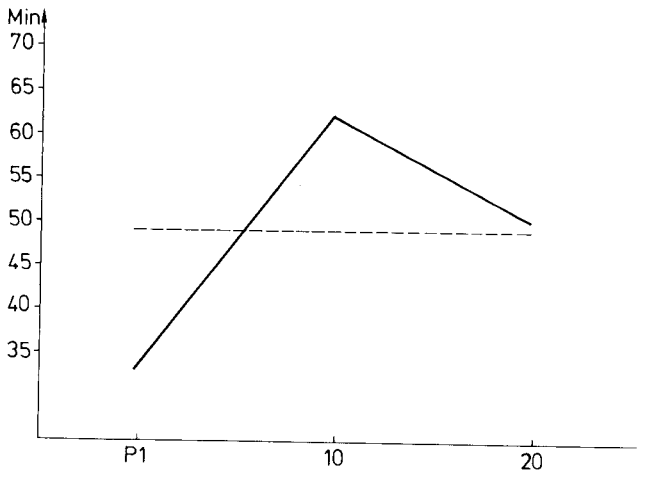

Fig. 2 Mean duration of all conversations.
----: duration of conversations of socially successful subjects under placebo treatment;
———: duration of conversations of socially handicapped subjects under placebo (PL) and CGP 361/A (10 = 10 mg, 20 = 20 mg)

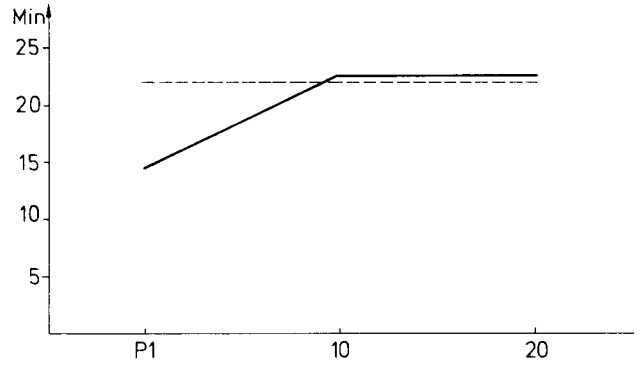

Fig. 3 Mean pause-interval between two consecutive talks.
----: pause-interval of socially successful subjects under placebo treatment;
———: pause-interval of socially handicapped subjects under placebo (PL) and CGP 361/A (10=10 mg, 20=20 mg)

In Figures 2 and 3, quite similar effects of CGP 361/A on the (mean) duration of talks (Fig. 2) and the (mean) interval between two consecutive talks (Fig. 3) are shown. Differences between the two groups under placebo ($p < 0.05$, Wilcoxon-Test) are whiped out by the drug. The mean duration of the talk is lengthened in the socially handicapped subjects by both dosages of CGP 361/A (from 14 minutes under placebo to 23 minutes under both dosages, $p < 0.05$) to the level of the socially successful people (22 minutes). The pause-interval between each of two talks increases from 33 minutes under placebo to 62 minutes under 10 mg and to 50 minutes under 20 mg CGP 361/A ($p < 0.10$), while placebo-treated, successful subjects have pauses between two talks of 49 minutes.

Summarizing the drug-induced changes in LOGOPORT parameters, it can be stated that differences in initial level of talking activites between socially handicapped and socially successful subjects diminish under verum condition. The drug effect already appears under the lower dosage of 10 mg CGP 361/A. However, in socially successful people, the drug hardly affected talking activities at all.

Discussion

Socially handicapped subjects are described by the LOGOPORT measures as rather hectic people. Compared to the behavior of socially successful subjects, their conversations are rather short, they are less involved in talking, but they start up the next conversation very quickly. These observations indicate that most conversations are not satisfying for the handicapped people and/or their partners, and so are finished rather early by one or the other (cf. *Krüger*, 1985). CGP 361/A induces a considerable change in these aspects of social behavior. No differences between socially successful and socially handicapped subjects appear any longer in behavioral measures of talking activities. These changes could tentatively be interpreted, according to *Jaekel* (1986), as enhancement of affiliative behavior. Such effects may be characterized as "sociotropic" drug effects. The mechanism by which CGP 361/A acts on talking activities remains unclear.

The LOGOPORT is a suitable instrument to evaluate nonverbal characteristics of verbal behavior which is an important dimension of human socialness. The LOGOPORT can easily be applied in the field of everyday-life withtout any considerable problems.

References available from the authors on request.

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