COMMENTS ON STAATS' BEHAVIORIST' THEORY OF INTELLIGENCE

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In order to comment STAATS' paper entilted «Paradigmatic behaviorism's theory of intelligence: A third-generation approach to cognition», I will first present briefly the application I made of (I am quoting STAATS' paper) «the theory and methods of paradigmatic behaviorism's analysis of intelligence in treating the lack of intellectual development in a child whose abusive and deficit environment has left her functioning on the level of a feral child». Then, I will comment STAATS' theory of intelligence.

THE TREATMENT OF A «WILD» CHILD

Dominique (this is a fictive name) was born on March 20th 1976 in a small town of the Province of Quebec. When she was six years old, an agency responsible for the protection of youth was informed about her. The little girl had been restrained in a cage built around her bed for major periods of time. She slept on an old mattress without a pilow and without blankets. In evenings, her mother often left her alone in her cage to go out to a bar.

The child was ill fed. The psychologist who made the inquiry about this case went to the home at noon time. No meal had been prepared. The mother told him that the child ate only sweet food and drank softs drinks and milk and that she did not like meat, fruits and vegetables.

The child was also ill clothed. According to the psychologist who visited the home, the little girl was in the kitchen playing with dirty water; her clothing were dirty and torn. She was barefoot; her mother said: «she does not like to put her shoes on but it is true that they are a little bit too small for her».

The mother is a borderline retardate, a prostitute and an alcoolic. The father was in the navy when he met her; he spent a few days in the town and never reappeared. When the psychologist suggested to the mother to place the child, she asked: «will I still receive the same amount of money from welfare?». She did agree to place her child for one year.

The child was also ill-trained. She was not toilet trainet; she ate with her hands. She did not know how to play. She talked with simple words only. She understood a few simple commands if given precisely one at a time. She had temper tantrums. She self-mutilated by tearing her hair off.

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The child was developmentally retarded. When she was 7 years and 2 months old, on the WISC-R, her full scale IQ was 54, her verbal IQ, 52 and her performance IQ 69. On the *Peabody Picture Vocabulary Test* at a chronogical age of 8 years and 2 moths, her mental age was 4 years and 8 months. On the *Vineland Social Maturity Scale*, when she was 8 years old, her social age was 3.1 when the attendants of the Day Care Center were the informants and 3.6 when the mother of the foster family was the informant.

Up to now, Dominique has lived in five different milieus: an institution for retarded children, a home for children who are waiting to be placed in a foster family and three different foster families. Since September 1982, she attends the Day Care Center of the regional psychiatric hospital where there are 15 children most of them being diagnosed as autistic.

The research project was concerned primarily with cognitive training as described by STAATS in his paper. STAATS' theory of intelligence was the theoretical framework along with his theory of abnormal behavior. The child was trained on concepts, reading, writing and numbers. Although the staff of the Day Care Center did not believe that Dominique could learn cognitive skills, we were allowed to work with her up to a limit of 45 minutes a day.

Cognitive skills training included the use of STAATS' learning apparatus and token reinforcer system. The number and length of the training sessions incrased progressively as suggested by STAATS. The trainers were attendants of the Day Care Center who had never worked with the learning apparatus or the token reinforcer system. They received a one day training session. The supervision was carried out by the research team through monthly visits; the analysis of the data collected by the attendants and of the video cassettes of some of the learning sessions were done before the visits. A few phone calls were added when needed.

In October 1983, Dominique had one training session a day in concept learning. Her results on the WISK-R revealed that she had no basic behavioral repertoire of concepts; this was the basis of the decision to train her in concepts. In January 1984, a second training session was added; she was trained on the names of the letters of the alphabet. In April 1984, a third training session was added on number abilities; she did not know how to discriminate between one and two objects. In September 1984, Dominique started to be trained to write the letters of the alphabet. She had a training session on writing four days a week and, one day a week, she was trained on concepts.

For each type of cognitive skills, the material had three components: the learning material itself, the instructions to the trainers and the recording procedures. The training procedures are those suggested by STAATS.

The first objective of the research is to examine the notion that en adequate teaching programme can help to overcome cognitive and other deficits resulting from severe isolation.

The research includes seven experimental longitudinal studies: one on concepts, three on reading, two on numbers and one on writing. There has been 350 hours of individual training on these basic behavioral repertoires over a period of three years and a half.

The child learned 120 concepts. Her performance on reading was at the level of the ,.66 grade as measured by the SRA; the percentage of comprehension was 79,1. Dominique learned to discriminate numbers up to 5. She learned to count up to 100, to label ordinal numbers up to 10. She learned the addition tables 1, 2 and 3. She writes numbers from 1 to 39. She tells the time, reads the calendar and the thermometer. She writes the lower case letters of the alphabet and some syllables and simple words in cursive writing. She is always using her rigth hand to write.

Before Dominique learned a basic behavioral repertoire of concepts, on the similitude sub-test of the WISK-R, the child succeded no items which gave her a scaled score of 2. After 101,4 minutes of training

on a basic behavioral repertoire of concepts, she succeded seven consecutive items of that sub-test which gave her a scaled score of 8. When she was administered that sub-test later on, she maintained her performance.

Dominique also learned a basid behavioral repertoire of attention. Before she started to learn concepts, her percentage of attention was 41,4 as measured by FORGET and OTIS' grid (1984). After a few hours of concept and reading learning, her percentage of attention became 83.3.

In April 1984, on the *Peabody Picture Vocabulary Test*, the child mental age was 4 years and 9 months while her chronological age was 7 years and 11 months. On May 1st 1985, she was 9 years and 1 month old and her mental age was 8 years and 6 months. This test measures, according to STAATS (1968), the labeling repertoire which was developed by the training on concepts. On the WISK-R, the global IQ did not change; Dominique's performance changed only on the items measuring the basic behavioral repertoires she was taught.

The second objective of the research was to explore generalization to other children with similar deficits. The analysis of the data obtained with the experimental longitudinal methods revealed that, as in STAATS' studies, the number of trials decreased as the child was learning as well as the number of reinforcers; that indicates the presentce of the learning acceleration phenomenon. In the first learning situations, the time to learn a unit also decreased. Later on, this phenomenon was not regular.

These results suggest that, with only 350 hours of training, Dominique became more intelligent and that the results of the research which are similar to those obtained by STAATS and his colleagues with other types of children are, at least partly, generalizable.

PARADIGMATIC BEHAVIORISM'S THEORY OF INTELLIGENCE

In his paper on paradigmatic behaviorism's theory of intelligence, STAATS suggest that intelligence is composed of basic behavioral repertoires which are mainly of a verbal nature; these repertoires are learned according to the basic principles of conditioning and the principle of cumulative hierarchical learning. Adding to the principle of classical and instrumental conditioning the principle of cumulative hierarchical learning, paradigmatic behaviorism offers an important contribution to the explanation of complex human learning and to the rapprochement between the first and second generation of behaviorists and the traditional personality theorists.

The concept of repertoires of responses which are an effect of learning principles and which are described in detail takes its roots in the first and second generation of behaviorists in using the basic principles of conditioning. There is then continuity with the work accomplished within the framework of behaviorism since the beginning of the 20th century. It adds to it a concept of human learning, the concept of basic behavioral repertoires, which is a step further to describe in detail the nature of what is to be learned by humans in order to adjust to a complex society. This concept also makes it possible to identify the principles of learning involved in each of these repertoires of responses and then, to elaborate procedures to train them. STAATS' studies as well as my study with Dominique is a good example of the importance of this concept of basic behavioral repertoire.

The principle of cumulative hierarchical learning makes a rapprochement with the traditional personality theories which consider personality as a cause. According to this principle, complex human learning takes place over long periods of time; the acquisition of one skill which is an effect of learning is also a cause of furher learning. It is «the training [that] makes the child a good learned, a rapid worker». Individual differences in learning or in intelligence depend upon the place the child occupies on the cumulative hierarchical learning process; the child who is advanced in this pro-

cess is a better learner than the child who is retarded.

STAATS' studies as well as my own study with Dominique support this principle. As different types of children learned to read, to count and to write, they took fewer trials and received less reinforcers. There are some differences in STAATS' studies and the research on Dominique. In STAATS' studies, as they learned, the children took less and less time to learn a new unit of the repertoire. Dominique did not display this characteristic regularly. When she was spontaneously trying to find words starting by a letter she was requested to write, she took more time to write that letter. In 1986, Dominique was hospitalized in a pedopsychiatric unit for 4 1/2 months and she received heavy doses of drugs. At that time, the learning process was still normal but the rate of responses was much slower.

STAATS predicts that traditional psychological tests that measure basic behavioral repertoires will be sensitive to the training given on those repertoires. For example, in his studies, the children who were given training on cognitive skills obtained better results on the *Metropolitan Readiness* and on the *Stanford Binet*. Dominique, after being trained on cognitive skills, obtained better results on the *Peabody Picture Vocabulary Test* but, on the *WISC-R*, her global IQ her verbal and performance IQ did not change. But the analysis of the items succeeded and failed reveal that the child succeeds the items measuring units of the basic behavioral repertoires on which she had received training. This is also what STAATS suggests in his paper.

STAATS' theory of intelligence is very powerful to work with children who have cognitive deficits. With such an extreme case as Dominique, it has been possible to develop many basic behavioral repertoires of cognitive skills in a relatively short period of time in spite of many conditions which did not facilitated learning. Moroever, paradigmatic behaviorism's theory of intelligence offered the possibility to develop training procedures on various repertoires of cognitive skills; this indicates also its unifying power as it utilizes various types of knowledge accumulated by the behavioral sciencies.