

## SUMMARY OF THE RESEARCH OF IVAR LOVAAS

Since the early 1960's, Dr. Ivar Lovaas and his associates have conducted research on behavioral interventions for people with autism. In the beginning, in order to more objectively measure the effect of various environmental interventions, the syndrome of autism was broken down into separate behavioral components (Lovaas, Freitag, Gold, & Kassorls, 1965). Seven behavioral delays were identified: language, motivation, imitation, toy play, peer play, self-help skills, and cognitive functioning. Two behavioral excesses were also noted: self-injury and aggression against others, and ritualistic behaviors such as hand flapping. Delays and excesses were then examined separately with children diagnosed with autism by independent clinicians using then current nosological systems (presently DSM-IV). Environmental variables were selected from laboratory research in learning theory, especially work on reinforcement, shaping and discrimination learning. In most studies, a small number of children were studied intensively, and single-subject experimental designs (Barlow & Herson, 1984) were used to control for potential confounds.

This research contributed to a number of experimentally validated procedures for reducing certain behavioral excesses displayed by individuals with autism, as well as helping them to overcome behavioral delays (Schreibman, 1988). These procedures, and those developed by other investigators using similar methodologies, form the basis for the intensive behavioral treatment that is referred to as the Lovaas or ABA method.

Two important studies from the UCLA Clinic have become research classics (Lovaas, Berberich, Perloff, & Schaffer, 1966; Lovaas & Simmons, 1969). Most of this research has been replicated and extended by independent investigators (see, for example, a review by Lovaas, Koegel, and Schreibman, 1979). Many of the procedures have become standards in behavioral treatment programs for children with autism (Newsom & Rincover, 1989; Schreibman, 1988). In 1973, Lovaas, Koegel, Simmons and Long published the first long-term follow-up study on the behavioral treatment of children with autism. Positive findings showed that all children improved; the longer treatment lasted the more improvement was made; complex behaviors such as language could be acquired; and maladaptive behaviors, such as self-injury, could be decreased. Negative findings were that no child achieved normal functioning; no child developed social interactions or play with other children; children regressed after treatment ceased; and treatment gains did not generalize across environments, or across behaviors that were not a focus of treatment. The findings from the 1973 study were consistent with other experimental reports in the literature (DeMyer et al., 1981; Rutter, 1985, Smith, 1983).

The negative findings from the 1973 study strongly influenced the design of the next treatment program, the UCLA Young Autism Project, which ran from 1970 to 1984 (Lovaas, 1987). In an attempt to increase treatment effectiveness, four changes were made. First, treatment was concentrated on young children with autism (average age at intake was 34 months).



It was reasoned that younger children would need less time to catch up to their peers because their maladaptive behaviors might be less excessive and disruptive and the younger child's nervous system might be better able to assimilate new behaviors (Huttenlocher, 1984). Second, the 1987 study treated children in their homes, included training the parents, taught peer play, and helped mainstream children into normal preschool environments in an attempt to facilitate further growth. Third, the 1987 study treated the children for two or more years, with 40 hours or more per week of 1:1 behavioral intervention. This was done to more closely approximate the opportunities that are available to average children, who appear to learn from the environments, such as home, preschool, and neighborhood, to assist in generalizing skills.

The 1987 study employed an experimental-control group design. Children were assigned to either an experimental group, totaling 19 children, who received intensive treatment, or a control group, totaling 19 children who received much less intensive treatment. The assignment was based on availability of therapists to provide intensive treatment. If therapists were available, a child entered the experimental group; otherwise the child entered the control group. A matched pair random assignment procedure had initially been proposed, but parents objected to such a procedure, so the therapist availability model was adopted. Nineteen diverse pre-treatment variables showed the experimental and control groups to be comparable at intake. An additional control group of 21 children was also employed which consisted of children who were seen by an independent agency, rather than by Dr. Lovaas, and were matched on pre-treatment variables to the experimental group. After treatment, children in the experimental group had higher IQ scores, averaging 83 versus a pretreatment average of 60. They also required less restrictive school placements than children in the control groups. Nine experimental children, which Lovaas termed "best outcome" children (47%), attained scores within the average range of intellectual and educational functioning by 7 years of age. (IQ averaged 107 and all were in regular classes without help).

In contrast, only 1 of 40 in the two control groups (2.5%) achieved such a favorable outcome, a finding consistent with the results reported by others (Rutter, 1985). Follow-up assessment of these children when they averaged 11.5 years of age, by McEachin, Smith & Lovaas (1993), found that the experimental group had maintained their gains over the control group. Evidence of this consisted of less restrictive school placements, greater levels of adaptive behavior, and maintenance of IQ scores 30 points higher than the control group children. The nine best-outcome experimental children received particularly extensive evaluations using a double blind psychological interview. Eight of the nine best-outcome children were found to be indistinguishable from normal children on the tests employed.



The best outcome children from the 1987 study have been followed into early adulthood. Of the nine best outcome children, seven had been evaluated at an average age of 24 years. The evaluation included an intelligence test, personality test, and tests of abstract thinking. Results showed that they maintained their IQ gains so that the average IQ was 108 compared to 107 at age seven, and 109 at age 12. They showed superior performance on a concept formation task, they had normal personality profiles on the MMPI and Rorschach, and they were able to demonstrate abstract thinking in theory of mind tasks. In terms of their independent functioning, four had gone to college, one had graduated from high school, and one had not graduated. Three had regular jobs, one was self-employed, one was still in college and one was unemployed. Four lived independently, and two were still at home. These latter two were both college students. Five had driver's licenses and four managed their own finances.

The other two were the ones who were at home going to college. All said that they had close friends. In terms of problems with peers, two felt that they had problems with their temper, one felt that he had a problem of being shy, and three said they had no problems at all. In terms of intimate relationships, one was married, three had current boyfriends or girlfriends, one had a girlfriend or boyfriend in the past, two had no current boyfriend or girlfriend, and all of them wanted to get married. To summarize, the best outcome children seemed to have maintained their gains into adulthood, they had normal intellectual and neuro-psychological functioning, they did not display clinically significant abnormal behavior on assessments that were given, and all had considerable independence and close relationships. (Smith, Wynn, & Lovaas, 1996)



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