

B. Advances in Research Methodology and Assessment

We have developed single-subject designs that show change over time as a result of intervention.

Example: Several research designs have emerged at Juniper Gardens that are now part of the standard collection of single-subject research designs (Baer, Wolf, & Risley, 1968). For example, the changing criterion design (Hartmann & Hall, 1976) is one such design widely used today, and it is described in all basic texts on single-subject design (e.g., Hersen & Barlow, 1977). This design has made extensive contributions to research concerning the education and treatment of persons with retardation (e.g., Rusch, Rose, & Greenwood, 1988).

We have developed naturalistic observational assessment instruments that support molar- and molecular-level analyses of natural patterns of interaction.

Example: Research on environment-behavior interaction has been supported by observational instruments that have assessed ecological as well as behavioral events in close temporal relationship (Greenwood, Carta, Kamps, & Arreaga-Mayer, 1990). This development has provided a molecular-level analysis of individual behavior where previously only a molar-level analysis was possible. This advance has provided an important impetus and empirical support base for the investigation of environment-behavior transaction, and ecobehavioral analysis in particular (Greenwood, Carta, & Atwater, 1991). The ecobehavioral instruments developed at the JGCP are in use by other investigators around the country (e.g. CISSAR: Cooper & Speece, 1990, ESCAPE; Odom, Peterson, McConnell, & Ostrosky, 1990).

Example: We have increased the number and type of ecobehavioral strategies to other settings, populations, and problem conditions. Work has been completed in the area of bilingual education and analysis of bilingual special education resulting in an ecobehavioral instrument with language features (e.g., ESCRIBE: Arreaga-Mayer, Carta, & Tapia, 1994). Work has also been completed incorporating digital audio-recording on notebook computers with ecobehavioral instrument taxonomies in order to improve the efficiency and accuracy of environment, behavioral, and language sample recording (Walker, Hart, Greenwood, Carta, & Hou, 1994).

We have developed computer-based management and analytical strategies for handling large, complex data bases containing multi-measure, multi-content data.

Example: Two longitudinal data bases have been created that contain observational and developmental outcome data that span a twelve-year period and represent thousands of units of information (e.g., Hart & Risley, 1989; 1995; Kamps, Carta et al., 1989). Software systems were developed beginning in 1982 to manage the accumulation of these data, enable access to it, and use of various analytical strategies. One such strategy is the ecobehavioral process-product design (Carta & Greenwood, 1987; Greenwood, Delquadri, Stanley, Terry, & Hall, 1985) which combines sequential analyses of molecular-level interaction with molar-level measures of engagement and change in developmental outcome (Greenwood, Arreaga-Mayer, & Carta, 1994; Greenwood, Carta, & Atwater, 1991). These strategies have been employed by Cooper and Speece at the University of Maryland, McConnell and Ysseldyke at the University of Minnesota, Kaiser and Odom at Vanderbilt University, and Goldstein at the University of Pittsburgh.

Example: A longitudinal data base has been developed by the Early Childhood Research Institute on Substance Abuse at Juniper Gardens that includes 270 children in three age cohorts (Birth, 18 mos., and 36 mos.) most of whom were prenatally exposed to alcohol or illicit drugs. Ecobehavioral observation data collected in the homes and schools for these children have been compiled in data bases also containing demographic, developmental, play, and social indices (Carta, McConnell, McEvoy, & Rokusek, 1992). This ongoing project is examining the impact of prenatal exposure as one of multiple risk factors affecting the performance and developmental progress of these children (Carta, Sideridis, et al., 1994).

Example: A longitudinal study of the generalization and maintenance of the behavior of students with autism has incorporated validated ecobehavioral assessment in monitoring educational programs (Kamps,

Greenwood, & Leonard, 1991). The current sample includes 40 children with autism served in integrated settings in a 5-year longitudinal study (Kamps, 1992).

We have conducted, and have in progress, comprehensive, longitudinal studies of development now covering more than 12 years of life span across multiple settings (e.g., home, school).

Example: Results from a longitudinal, controlled field trial after ten years have revealed that at-risk elementary students who systematically increased their engagement through their teachers' use of Classwide Peer Tutoring, also significantly increased their performance on standardized tests of reading, arithmetic, spelling, and language compared to (a) control group students and to (b) a non-risk comparison group (Greenwood, Delquadri, & Hall, 1989; Greenwood, 1991a; 1991b). By middle school, the group of students whose teachers had used Classwide Peer Tutoring had significantly fewer members who had received Special Education Placements and for those who were placed, their services were less restrictive (Greenwood & Delquadri, 1995; Greenwood, Terry, Utley, Montagna, & Walker, 1994).

Example: Another ten-year line of research has been the longitudinal description of the development of language and social interaction in the home (Hart & Risley, 1989; 1995) and subsequently in the elementary school (Walker, Carta, & Hart, 1990). In addition to revealing environmental processes of language development (e.g., Hart 1991), the predictive validity of the rate of spoken language at 36 months of age assessed in the home has been established in terms of standardized measures of IQ and vocabulary at kindergarten, first, second, and third grades (Walker, Greenwood, Hart, & Carta, 1994).

Example: We have validated Individual Indicators of Growth and Development (IGDIs) for use by home-visitors and other caregivers for monitoring the progress of infants and toddlers toward outcomes in early language, movement, problem solving and social skills. One of these indicators, the Early Communication Indicator is used by 13 Early Head Start Programs in Kansas (<http://www.lsi.ku.edu/jgprojects/igdi/>) via a web-based internet site devoted to this purpose.