

The Effects of Constant Time Delay Embedded Into Teaching Activities for Teaching the Names of Clothes for Preschool Children with Developmental Disabilities

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Abstract

The general purpose of this study was to examine the effectiveness of constant time delay embedded in activities for teaching clothes name for preschool children with developmental disabilities. This study included four participants having Down syndrome with an age range of 43-46 months. All experimental sessions were conducted in one to one teaching style. All sessions were conducted in a classroom of the university unit where the participants are every day. A multiple probe design across behaviors and replicated across subjects was used. The dependent variable of the study was teaching the names of clothes name and the independent variable of the study was constant time delay procedure. There were, full probe, intervention, generalization and maintenance sessions in the study. The results concerning effectiveness revealed that all three participants acquired the target skills at criterion level. Furthermore, participants maintained acquired skills at criterion level and generalized acquired skills to another person at criterion level.

Key Words

Developmental Disabilities, Embedded Instruction, Constant Time Delay, Single Subject Design.

Learning occurs more rapidly in the early childhood period, which covers the most important part of learning. That is why the early childhood years are quite important for all children, but of more importance for children with developmental disabilities (Barnett, 1995; Gombi, Lerner, Stevenson, Lewit, & Behrman, 1995; Lerner, Lowenthal, & Egan 1998; Odlyurt & Batu, 2009; Yoshikawa, 1995).

Skills which children are expected to display in adult-driven and traditional teaching arrangements are taught in a structured way isolated from

the natural environment. Although this is effective in the skills acquisition stage, this method cannot facilitate the generalization the acquired skills at the desired level of accuracy (Bricker, Pretti-Frontczak, & McComas, 1998; Kurt & Tekin-İftar 2008; Pretti-Frontczak & Bricker, 2004; Swell, Collins, Hemmeter, & Schuster, 1998).

Embedded instruction is widely used in early childhood education with children who have developmental disabilities or who are at risk (Bricker et al., 1998; Daugherty, Grisham-Brown, & Hemmeter 2001; McDonnell, Johnson, & McQuivey, 2008; McDonnell, Johnson, Polychronis, & Risen, 2003). The embedded instruction process refers to placing responses expected to be shown by the child into planned daily activities which are directed by the child (Pretti-Frontczak & Bricker, 2004).

Embedded instruction practices include systematic teaching arrangements such as response prompting and the stimulus modification procedure which are errorless teaching practices (Grisham-

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Brown, Schuster, Hemmeter, & Collins, 2000; Kurt, 2008; Venn et al., 1993). McDonnell et al. (2008) reported that the use of response prompting and stimulus modification procedure during embedded instruction process increases the efficacy of instruction. Constant time delay (CTD) used in this study is one of the effective teaching methods employed in different instructional arrangements for children and adults with moderate or severe mental retardation and for children and adults with autism (Kleinert & Gast, 1982; Rogers, Hemmeter, & Wolery, 2010; Schoen & Sivil, 1989; Schuster et al., 1998; Tekin-İftar & Kırcaali-İftar 2004; Wolery, Ault, & Doyle 1992).

The CTD process must be undertaken with variety of tools in order to support more generalization. In accordance with this need, the aim of the present study is to determine the effectiveness of CTD delivered within embedded instruction for teaching of single skills in preschool period to children with developmental disabilities. To this end, responses to the following questions were sought:

1. Is CTD delivered within embedded instruction effective for teaching the names of clothes to students with developmental disabilities via two separate tool sets comprising pictures and photos?
2. If names of clothes can be taught to students with developmental disabilities via CTD delivered within embedded instruction, will the acquisition of the names of clothes be permanent when assessed one week or three weeks later following the teaching?
3. If names of clothes can be taught to students with developmental disabilities via CTD delivered within embedded instruction, can the names of clothes be generalized to different people?

Method

Participants and Settings

The study was conducted with three children with developmental disabilities in the Research Institute for the Handicapped Unit of Developmental Disabilities in Anadolu University, Turkey. All the subjects having Down syndrome are between 43 and 46 months old.

The participant children were taught names of clothes by the constant time delay delivered within embedded instruction method. Pictures with the dimensions 15 cm x 15 cm of the items of clothing to be taught were prepared. In addition, pho-

tos of the same clothes were taken in the same dimensions. A video camera was used to record the teaching sessions in order to obtain reliability data. The "Teaching Sessions Data Collection Form" and "Full Probe Sessions Data Collection Form" were used to record the data collected.

Experimental Design

In this study, multiple baseline design across behaviors was employed to determine the effectiveness of the CTD delivered within embedded instruction method in teaching of names of clothes.

Dependent and Independent Variables

The dependent variable of the study is the subjects' skill in naming the clothes when asked. This skill is among the objectives of students in individualized education programs prepared for that period of their education. The independent variable of the study is the CTD delivered within embedded instruction.

General Procedures

This study involves screening session, full probe session, teaching, generalization and maintenance session. First, the screening sessions were arranged and the names of 24 items of clothing that the students did not know were determined. Then, instruction sets were formed from the determined names of clothes. There were 8 names of clothes in each instruction set. After instruction sets were prepared, the probe data were collected until obtaining stable data for three consecutive sessions. As soon as stable data were obtained during probe session, the instruction involving CTD delivered within embedded instruction was introduced for the first instructional set. After criterion was met for the first instructional set, the second probe session was administered in such a way that it would involve all three instruction sets. This process was conducted in a similar way for the remaining instructional sets. Maintenance sessions were collected one and three weeks after the instruction had terminated. The same procedure was replicated in a similar way with all the subjects. Generalization across materials was tested in pre- and post-test measures. While pre-test sessions were conducted after the first probe session, post-test sessions were conducted after the fourth probe session.

All the sessions were arranged in the form of one to one teaching arrangement in the Research Insti-

tute for the Handicapped where students come for group training five days a week between 09.00 a.m. and 12.00 a.m. All the full probe sessions and teaching sessions were planned and included in the daily plan by the researcher who has also the instruction in this study beforehand (e.g. hanging pictures of clothes on the panel, picking up the pictures and putting them in the basket, picking up clothes from the clothes line, touching the pictures, picking up the pictures and putting them in the bucket). Prior to the sessions, the necessary arrangements were made in the classroom for the tools and video recording. All the sessions were observed by the implementer and the data were recorded in the data collection forms. The following section presents the explanations about the sessions of the study.

Reliability

Two types of reliability data were collected in the study: (a) inter-observer reliability data and (b) treatment integrity data. The inter-observer reliability data and treatment integrity data were collected in 20% of all experimental sessions the study.

The inter-observer reliability data showed with an average of 99 % (range 99 %-100 %) agreement across subjects and sessions (instruction and probe sessions). In addition, treatment integrity data showed the instructor delivered full probe and maintenance probe sessions with a mean of 99 % integrity (range: 97 %-100 %), and delivered instructional sessions a mean of 95 % treatment integrity (range: 79 %-100 %) across subjects.

Results

Looking at the effectiveness of the study findings, it was found that on completion of a total of 27 sessions with CTD delivered within embedded instruction, Ayşe acquired her instructional sets with 100% accuracy. In teaching sessions, she showed accurate responses to the instruction set comprising of photos approximately at a rate of 87 % and showed accurate responses to the instruction set containing pictures approximately at an average rate of 86 %.

On the completion of a total of 24 sessions of the CTD delivered within embedded instruction, Sezen acquired her instructional sets with 100% accuracy. In the teaching sessions, she showed accurate responses to the instruction set comprising of photos at an approximate rate of 84 % and showed accurate responses to the instruction set containing pictures at an approximate rate of 89 %.

On completion of 26 sessions of CTD delivered within embedded instruction, Ali acquired his in-

structional sets with 100% accuracy. In the teaching sessions, he showed accurate responses to the instruction set comprising of photos at a rate of approximate 86 % and showed accurate responses to the instruction set containing pictures at an approximate rate of 87 %.

Discussion

This study aimed to determine the effectiveness of CTD delivered within embedded instruction for teaching children in preschool period with developmental disabilities the skill of naming items of clothing to. The findings of this study were consistent with those of earlier studies in which CTD delivered within embedded instruction had been conducted (Chiara, Schuster, Bell, & Wolery, 1995; Caldwell, Wolery, Werts, & Caldwell, 1996; Wolery, Anthony, Snyder, Werts, & Katzenmeyer, 1997; Wolery, Anthony, Caldwell, Snyder, & Morgante, 2002). The CTD conducted in this study by means of instrument set comprising of clothes and pictures was effective for teaching names of clothes to children with developmental disabilities in the pre-school period. In addition, the present study shows consistency with findings of a limited number of studies which were conducted on children with developmental disabilities in the pre-school period and in which CTD delivered within embedded instruction was employed (Chiara et al., 1995; Wolery et al., 2002).

In this study, the acquisition, by the three children, of the names of items of clothing were studied within different activities, in different periods and under different conditions in accordance with the CTD delivered within embedded instruction method. The fact that subjects achieved these skills under different conditions in the accuracy level of approximately 90%-96% indicates that they may be able to generalize skills, even at the stage of acquisition, to different activities, different periods and different tools.

Reviewing the literature, it is seen that certain programs allow children with Down Syndrome to enter pre-school inclusive settings from 30 months old. As from 36 months, they are included in inclusive settings (Klein, Cook, & Richardson-Gibson, 2001; Odlyurt & Batu, 2009; Pueschel, 2001). In this study, names of clothes existing in Individualized Education Programs (IEPs) of children with developmental disabilities were taught within daily activities. Accordingly, the teaching skills and concepts appropriate for developmental level of children in natural environments will make it easier for children with developmental disabilities to gener-

alize the skills they learn in the inclusive settings to which they will be transferred.

Some suggestions can be made for future studies in the light of the research findings. In this study, the constant time delay delivered within embedded instruction method was used in teaching of discrete skills. The impact and effectiveness of different response prompting methods on teaching of chain and discrete skills can be compared by embedding them within the activities. The present study was conducted on three pre-school children with Down Syndrome, however, it is possible to investigate the impact and effectiveness of embedded instruction with other children having different disabilities, e.g. children with autism. In this study, one to one teaching arrangement was used. Further research could examine impact of embedded instruction and additionally, that of learning by observing in small group arrangement or pull in strategy in inclusive settings can be examined.

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