Investigating The Extent Of Interfering Behaviors And Termination Of Sessions While Executing Discrete Trial Training Program For Developing Coordinated Eye Contact With Wait To Verbal Respond

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Abstract
The study focused to investigate the extent of interfering behaviors and termination of sessions while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond. Enrolled children with autism spectrum disorder in govt. special education centers across the Punjab province of Pakistan was taken as the population of the study. An adolescent girl with 15 years and 8 months was taken as the participant of the study. She was diagnosed as minimal verbal adolescent girl with autism spectrum disorder and required support (level 1 of severity) observed on DSM-5 by the psychologist. She was admitted at govt. special education centre, Gojra, Toba Tek Singh district of the province of Punjab, Pakistan. Single subject study design consistent with A-B-C-D-E-A and two follow up periods was taken as the research design of the study (Seah, 1997). Semi logarithmic chart and descriptive statistics were used as analysis techniques for the current study. It was concluded that coordinated eye contact with wait to verbal respond was developed with highest percentage during phase C of experiment. Minimum occurrence of interfering behavior was found 0.3% during phase B. No discrete trial training session was terminated across phases.

Keywords: discrete trial training, autism spectrum disorder, coordinated, eye contact, verbal respond, interfering behaviors, termination of sessions
Introduction
Children with autism spectrum disorder (ASD) are often recognized first by their social ineptness and communication failure. In fact, these children are lacking social communication skills needed when using language to: 1) communicate with others; 2) and engage in conversations with others. It is because they do not know: 1) how to use language in a structured way for a range of functions, for example: a) to provide information to others; b) to question; c) to negotiate with others; d) to suggest to others; and e) to clarify to others; 2) how to conversant, for example: a) starting conversations; b) finishing conversations; c) maintaining a topic of conversation; and d) taking turns in a conversation; 3) how to understand shared and/or assumed knowledge, for example; a) how much piece of information the listener needs to understand; 4) how to understand and use non-verbal communication skills, for example; a) eye contact; b) facial expressions; c) gestures; d) proximity; and e) distance; and 5) how to understand implied meanings. These social communication lacks can be dealt with various tools of behavioral interventions.

Previous research studies addressed different aspects of above mentioned social skills deficits under the umbrella of DTT. Garfinkle and Schwartz (2002) increased social interactions. Shabani et al. (2002) increased social initiations successfully with tactile prompts in children with ASD. Gena et al. (2005) taught socially affective behavior (s). Likewise, social interactions were increased in children with ASD (Garfinkle& Schwartz, 2002), eye contact was built up (Jones et al., 2006), and imitation skills were developed (De Quinzio et al., 2007). DTT was used by using prompt to promote joint attention in children with autism (Pollard et al. 2012). Verbal responses to social greetings were increased by using audio script fading and multiple-exemplar training in children with autism (Garcia-Albea et al., 2014). Groskreutz et al. (2015) also increased initiations skills and social responses in children with ASD using novel script-frame. Harris et al. (1990) and Reeve et al. (2007) conducted a study on how to offer help to others and established a range of helping behaviors for others. Likewise, perspective taking skills were taught (LeBlanc et al., 2003), increased joint attention skills and taught smile models (Kasari et al. 2006; Jones et al. 2006; Krstovska-Guerrero & Jones, 2013), empathy skills were developed through modeling (Schrandt et al., 2009), and sharing skills were taught (Marzullo-Kerth et al., 2011). Likewise, Simpson et al., (2004) embedded computer based instructions and video to develop social skills among children with autism spectrum disorder. In this research, the researchers investigated the extent of interfering behaviors and termination of sessions while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond. Hence, the objectives of the study were to:
1. investigate the extent across developing coordinated eye contact with wait to verbal respond
2. investigate the extent of interfering behaviors while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond
3. investigate the percentage of terminated sessions while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond
The researchers formulated three research questions on the basis of the above objectives of the study:

1. What is the extent of developing coordinated eye contact with wait to verbal respond while executing discrete trial training program?
2. What is the extent of interfering behaviors while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond?
3. What is the percentage of terminated sessions while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond?

Materials and Methods

Population
Enrolled children with autism spectrum disorder in govt. special education centers across the Punjab province of Pakistan was taken as the population of the study.

Participant
An adolescent girl with 15 years and 8 months was taken as the participant of the study. She was diagnosed as minimal verbal adolescent girl with autism spectrum disorder and required support (level 1 of severity) observed on DSM-5 by the psychologist. She was admitted at govt. special education centre, Gojra, Toba Tek Singh district of the province of Punjab, Pakistan.

Nature of Study
Quantitative nature of study was comprised of one independent variable such as discrete trial training and two dependent variable such as 1) coordinated eye contact with wait to verbal respond; and 2) interfering behaviors.

Research Design
Single subject study design consistent with A-B-C-D-E-A and two follow up periods was taken as the research design of the study (Seah, 1997). A phase was the baseline (no treatment). B phase was first treatment phase: a) administered treatment inside the classroom context; b) participant with researchers and no error correction. C phase was second treatment phase: a) administering treatment inside the classroom context; b) participant with researchers and error correction. D phase was third treatment phase: a) administered treatment inside the autism friendly training room (temporarily designed); b) participant with researchers and no error correction. E phase was fourth treatment phase: a) administered treatment inside the autism friendly training room (temporarily designed); b) participant with researchers and error correction. Second A phase was return to baseline (withdrawing treatment procedures). During F1 phase, the researchers investigated appropriateness of the skill of coordinated eye contact with verbal respond under novel stimuli (participant with researchers). During F2 phase, the researchers generalized the skill of coordinated eye contact with verbal respond (participant with class teacher).
Procedures
The researchers accomplished this study by following eleven steps of the procedure.

1. Protection and Privacy

2. Task Objective
   The child will be able to develop coordinated eye contact with wait to verbal respond (yes, I am) to communicator partner following by finished speak with most to least prompt ending at 90% correct responding across 3 consecutive DTT sessions was set as task objective at first step.

3. Mastery Criteria
   Mastery for each step was set at 90% correct independent responses during three consecutive teaching periods was set as mastery criteria at second step.

4. Steps of Task Analysis
   Steps of task analysis for lesson progression for developing coordinated eye contact with wait to verbal respond were designed as steps of task analysis at third step:
   - Step 1 of Task Analysis: Maintain eye contact for 5 seconds with the communicator partner during 90% correct responding across 3 consecutive DTT sessions
   - Step 2 of Task Analysis: Wait to verbally respond until the communicator partner finishes speaking during 90% correct responding across 3 consecutive DTT sessions
   - Step 3 of Task Analysis: Giving eye contact and verbally respond to name (yes, I am) to communicator partner following by finished speak during 90% correct responding across 3 consecutive DTT sessions

5. Identified prior item such as candies, chocolates and toys were chosen as reinforcements.

6. Light touch/raise finger, manual guidance at hand and manual guidance at wrist were chosen as prompts to alert the child for further steps of the DTT program to be executed.

7. Execution of Discrete Trial Training Sessions
   The researchers planned to use a structured series of learning trials to develop social communication skills among children with ASD with the following steps: 1) an instruction; 2) a prompt; 3) a response; 4) a consequence; and 5) an inter-trial interval under the format of DTT. This sequence will then be repeated to provide maximum opportunities to practice and strengthening the formulated skill on providing immediate positive reinforcement, hence, to reach the desired outcome of the current study (Smith, 2001). The researchers designed three experimental sessions each day. Duration of training program was spreading over fifteen days. There were ten baseline sessions. Each session was spreading over two minutes of duration. The
researchers conducted two baseline sessions each day. In this way, there were five days to set the baseline. On other hand, discrete trial training session was terminated for occurring interfering behavior consistently at three consecutive discrete trials.

8. Break-up of Session and Discrete Trial
Break-up of session and discrete trial followed the below mentioned formulation of time at fifth step:

Table 1 Break-up of sessions and discrete trials

<table>
<thead>
<tr>
<th>Break-Up of Sessions</th>
<th>Break-Up of Discrete Trial (Twice in a Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Session</td>
<td>1:00 Hour</td>
</tr>
<tr>
<td>Total Number of DTT Sessions</td>
<td>12</td>
</tr>
<tr>
<td>Each DTT Session</td>
<td>4 Minutes</td>
</tr>
<tr>
<td>Break After Each DTT Session</td>
<td>1 Minute</td>
</tr>
<tr>
<td>Total Time of Each DTT Session</td>
<td>5 Minutes</td>
</tr>
<tr>
<td></td>
<td>10 Seconds (excluding 5 seconds of response)</td>
</tr>
<tr>
<td></td>
<td>Prompt</td>
</tr>
<tr>
<td></td>
<td>5 Seconds (excluding 10 seconds of cue and 5 seconds of response)</td>
</tr>
<tr>
<td></td>
<td>Response</td>
</tr>
<tr>
<td></td>
<td>5 Seconds (excluding intra-trial time of 3 seconds up-to 5 seconds)</td>
</tr>
<tr>
<td></td>
<td>Consequence</td>
</tr>
<tr>
<td></td>
<td>5 Seconds</td>
</tr>
</tbody>
</table>

Note. This table shows break-up of session and discrete trials

9. Treatment Integrity
Treatment integrity was observed at sixth step.

10. Inter-Rater Reliability
Inter-rater reliability was measured over 50% randomly chosen sessions by the speech therapist of adolescent girl of the study at seventh step.

11. Analysis of Results
Finally, he researchers employed semi logarithmic charts and descriptive statistics to reach the results of the study at eighth step.

Analysis Techniques
Semi logarithmic chart and descriptive statistics were used as analysis techniques for the current study.

Data Analysis and Results
The number of correct responding over developing coordinated eye contact with wait to verbal respond in each experimental session spreading over 24 minutes of duration is presented in figure 5. In this research, the researcher used semi logarithmic charts. Semi logarithmic chart (Lindsley, 1964) enabled the researcher for displaying the graphs of the PA’s correct responding over developing coordinated eye contact with wait to verbal respond. Basically, these charts reflect the rate of change rather than the amount of change. Therefore, may more accurately reflect the effort involved in administrating treatment and then developing a skill.

2.1 Semi Logarithmic Chart

Figure 1 Number of Correct Responding of Coordinated Eye Contact with Wait to Verbal Respond across Experimental Sessions

Note. This figure illustrates development of coordinated eye contact with wait to verbal respond across four treatment conditions within the format of DTT program spreading over three months of period. Coordinated eye contact with wait to verbal respond was developed across three formulated steps of task analysis with varying degree of mastery achievement for each core area of deficit in each experimental phase of the study which provides a comparative analysis of the particular contexts designed to investigate the efficacy of DTT program in Pakistani society.

2.2 Descriptive Statistics of Results
Table 2 Skill Development of Coordinated Eye Contact with Verbal Respond across Four Treatment Conditions

<table>
<thead>
<tr>
<th>Treatment Conditions</th>
<th>Skill Development</th>
<th>Occurrence of Interfering Behaviors</th>
<th>Terminated Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase B</td>
<td>54.4444%</td>
<td>0.3%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Phase C</td>
<td>56.4102%</td>
<td>3.7%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Phase D</td>
<td>53.0303%</td>
<td>6.48%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Phase E</td>
<td>55.4166%</td>
<td>5.46%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Note. This table shows skill development in percentage across four treatment conditions.

Treatment Integrity
The researcher calculated 100% extent of treatment integrity in which the treatment sessions were implemented as it were designed. These results assured that no step was missing while implementing treatment sessions across phases.

Inter-Observer Reliability
The researcher calculated inter-observer reliability for 50% of each phase including the follow-up phases for dependent variable by measuring number of correct responding over discrete trials. The speech therapist recorded and measured the dependent variable through viewing the data sheets. 50% sessions were randomly chosen from each phase and each follow-up phase. For the number of correct responding over target skill, the percentage of agreement between the researchers and the speech therapist was 84.4%.

Discussion
Three research questions were formulated to answer in the current research. Each question is discussed below:

Question 1: What is the extent of developing coordinated eye contact with wait to verbal respond while executing discrete trial training program?

The extent of developing coordinated eye contact with wait to verbal respond while executing discrete trial training program during phase B, phase C, phase D, and phase E was found 54.4444%, 56.4102%, 53.0303%, and 55.4166% respectively. The researchers found no research study supporting this phenomenon.

Question 2: What is the extent of interfering behaviors while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond?

Interfering behavior was occurred 0.00%, 0.00%, and 1.90% at step 1, step 2, and step 3 of task analysis respectively during phase B of experiment. Overall percentage across 3 steps was
measured 1.90%. Consequently upon that, overall percentage across this objective was measured 0.3%.

Interfering behavior was occurred 2.22%, 3.88%, and 5.00% at step 1, step 2, and step 3 of task analysis respectively during phase C of experiment. Overall percentage across 3 steps was measured 11.1%. Consequently upon that, overall percentage across this objective was measured 3.7%.

Interfering behavior was occurred 7.5%, 7.5%, and 4.44% at step 1, step 2, and step 3 of task analysis respectively during phase D of experiment. Overall percentage across 3 steps was measured 19.44%. Consequently upon that, overall percentage across this objective was measured 6.48%.

Interfering behavior was occurred 7.5%, 8.88%, and 0.00% at step 1, step 2, and step 3 of task analysis respectively during phase E of experiment. Overall percentage across 3 steps was measured 16.38%. Consequently upon that, overall percentage across this objective was measured 5.46%. In this way, total percentage of interfering behavior across phases was measured 15.95%.

This was the major gap of reviewed literature to investigate the extent of interfering behavior during targeting persistent deficits within the framework of DTT program. The researchers found no research study supporting this phenomenon.

At the end of the study, the researchers found that interfering behavior occurs during targeting persistent deficits within the framework of DTT program with highest percentage in PB.

Question 3: What is the percentage of terminated sessions while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond?

Percentage of terminated sessions was measured 0.00% across phases while executing discrete trial training program for developing coordinated eye contact with wait to verbal respond

This was the major gap of reviewed literature to investigate the extent of interfering behavior during targeting persistent deficits within the framework of DTT program. The researchers found no research study supporting this phenomenon.

At the end of the study, the researcher found that interfering behavior occurs during targeting persistent deficits within the framework of DTT program with highest percentage in PB.

**Implications**

This study will help the special educationists, practitioners, trainers and parents to make the most of child’s learning through one-on-one structured teaching technique. It will reduce the need for specialized instructional support during a child’s school years and later in his/her future life. It will occur where the child is most comfortable and will become part of his/her routine. Training program can be provided at no cost to families. No known risk is associated with DTT. However, sudden danger may arise which will be dealt calmly. Hence, concerned safety measures can be provided on spot. There is no cost for delivering discrete trials based on identified social communication skills to develop for each of the chosen subjects of the study will be purchased or not by the researchers. Consequently, it will empower families to help their child reach their true potential.
Limitations
Limitations of the study were as the following:
1. Sample of the study was comprised of solo enrolled adolescent at the Govt. Special Education Centers of Toba Tek Singh District.
2. Results were generalized on the basis of solo enrolled adolescent with autism spectrum disorder.

Future Recommendations
The study recommends the following:
1. Prompt level should be recorded by the interventionists/special educationists during execution of DTT program.
2. Level of acceptance for hierarchy of reinforces should be recorded by the interventionist/special educationist during executing DTT program.
3. Type of interfering behavior should be recorded by the interventionist/special educationist during executing DTT program.

Conclusion
Coordinated eye contact with wait to verbal respond was developed with highest percentage during phase C of experiment. Minimum occurrence of interfering behavior was found 0.3% during phase B. No discrete trial training session was terminated across phases. Therefore, it was concluded that, discrete trial training program may be successfully executed to develop coordinated eye contact with wait to verbal respond inside the premises of govt. special education centers across the Punjab province.

Definition of Terms
Discrete Trial Training: Discrete trial training is defined as structured one-on-one teaching strategy.

Autism Spectrum Disorder: Autism spectrum disorder is defined as neuro-developmental disorder.

Interfering Behaviors: Interfering behaviors are defined as occurrence of self-stimulated and/or self-injurious behavior.

Reinforcement: Reinforcement is defined as identified prior item such as candies, chocolates and toys.

Prompt: Prompt is defined as to alert the child for further steps of the DTT program to be executed such as light touch/raise finger, manual guidance at hand and manual guidance at wrist.

References


