Effects of Differential Reinforcement of Short Latencies on Response Latency, Task Completion, and Accuracy of an Adolescent with Autism

Melanie M. Donohue, Laura Baylot Casey, David F. Bicard, and Sara E. Bicard
The University of Memphis

Abstract: Children with Autism Spectrum Disorder (ASD) are faced with many challenging behaviors that could impede their learning. One commonly reported problem behavior is noncompliance, which is often defined as a delay in response (latency), decrease in rate of responding (fluency), or failure to complete a task. This failure to comply in an appropriate amount of time has been noted as a primary factor for a child’s exclusion from the community, poor social interactions, as well as limited instructional opportunities. This study examined the response latency, task completion, and accuracy in responding of an adolescent with ASD utilizing a changing criterion design. Reinforcement was provided only when the student answered a question or complied with an instruction accurately and within the preset criterion which was successively and gradually reduced. Results indicated that response latency decreased from an average of 4.6 seconds down to an average of 2.4 seconds and that there was a significant decrease in no responses. Findings show that differential reinforcement of short latencies resulted in a decrease in response latency and an increase in compliance. Thus, the study yielded positive results and paved the way for future research.

Autism Spectrum Disorder (ASD) is a developmental disability that affects a large number of children to varying degrees. According to the Centers for Disease Control and Prevention (CDC), ASD has risen to 1 in every 150 American children (CDC, 2007). This statistic means that approximately 1.5 million Americans have some form of ASD. These numbers indicate that ASD is growing at an alarming rate of 10% to 17% per year, meaning that 4 million Americans could be affected in the next decade (ASA, 2008).

Children with ASD exhibit a number of challenging behaviors that often interfere with learning. Some of these behaviors may be aberrant and/or maladaptive; one common reported maladaptive behavior is noncompliance. Noncompliance is defined as a delay in response (latency), decrease in rate of responding (fluency), or failure to complete a task. Numerous studies have evaluated procedures to increase compliance or reduce latency using both antecedent- and consequent-based interventions, such as differential reinforcement and guidance prompting; results have been mixed as to their effectiveness.

The failure to respond to requests or instructions is found among many children throughout childhood; however, with ASD this is a classic symptom. This response can be as simple as not following an instruction given by a parent or teacher or ignoring instructions or appearing to ignore them. In a school, the failure to respond or comply with instruction could cause disruption and impede learning for the child as well as other classmates. Children may fail to respond to instructional demands in the classroom because the demand functions as aversive stimuli (Carr & Durand, 1985). This failure to respond may present in varied forms from simply not responding to a request or as complex as engaging in aggressive, self-injurious, or stereotypic behavior to escape the demand (Carr & Durand, 1985). This aberrant behavior can cause children to stand out among their peers and, as a result, may negatively influence the interaction or relationship that adults may have with these...
children. Failure to respond has been noted as a primary factor for a child’s exclusion from the community, social interactions, and instructional opportunities (Davis, Brady, Williams, & Hamilton, 1992). If the adult working with the child with ASD is able to increase the child’s ability to respond, then often the next struggle for the adult is to decrease the latency between the question posed and the child’s response. Response latency is defined by Cooper, Heron, and Heward (2007) as the elapsed time from the onset of a stimulus (e.g., task direction, cue) to the initiation of a response.

Reducing Response Latency

Over the past 20 years, the empirical research on reducing response latency and increasing compliance points to several effective interventions, both antecedent- and consequent-based, for challenging behaviors in children. However, the participants in these studies were primarily children diagnosed with developmental disabilities such as Mental Retardation (MR), Down syndrome, specific learning disabilities, and behavior disorders. Only a small number of articles focused on compliance or latency involved with ASD (Bouxsein, Tiger, & Fisher, 2008; Davis et al., 1992; Matson & Nebel-Schwalm, 2007; Piazza, Moes, & Fisher, 1996; Tarbox, Wallace, Penrod, & Tarbox, 2007; Tiger, Bouxsein, & Fisher, 2007).

Rationale for Current Study

The current study was based on the success of the Tiger et al. (2007) study that used reinforcement of short response latencies (DR-short) with a young man with Asperger syndrome to decrease his latency to comply with instruction (question answering and math problems). In the Tiger et al., study, the researchers used a changing criterion design with an added contingency to teach him which problems could be answered quickly and those that required more time to get correct. The established reinforcement criterion was stated before each session and a token, exchangeable for a preferred activity, paired with praise was given anytime the latency to respond fell below the pre-established criterion. Corrective feedback was given for any response that exceeded this criterion.

Throughout the study, the criterion for reinforcement decreased each session by 10% from the mean latency in the previous session.

Initially, the participant was asked questions pertaining to personal information (e.g., “What is your sister’s name?”) using the above-stated methods. As a result, the participant’s response latency decreased from an average of 19.9 seconds to below 5 seconds, increased to 23.9 seconds during DR-long and returned to 3 seconds upon replication of the DR-short condition. Next, the procedure was implemented with math problems with differing difficulty to assess for generalization. DR-short resulted in generalization; however, it also resulted in rapid responding “I don’t know” to math problems of medium difficulty. Thus, a DR-correct was implemented and correct responding increased. Response latencies for these problems also increased during this contingency but remained below initial baseline levels. Based on the success of this study, the current research sought to replicate with procedures with minor adjustments made to fit the participant.

The primary aim of the current study was to systematically replicate research by Tiger et al. (2007) using differential reinforcement of short latencies utilizing a changing criterion design to determine the effect on reducing response latency and compliance. The participant in Tiger et al.’s research was a higher functioning adolescent who was able to respond “I don’t know” to unknown questions; thus, the researchers allowed a substantial amount of time for the individual to respond. The current study was unable to completely replicate the methods outlined in the Tiger et al. due to participant characteristics not being a direct match to the participant in the initial study. For example, the current participant has a history of simply not responding regardless of task difficulty; so enabling him to have a substantial amount of time to respond was not a viable option. Furthermore, based on anecdotal information from the participant’s teacher, the student has the potential not to respond for up to thirty minutes if unprompted. The student also had a history of self-injurious behavior if, after questioning, prompting was not implemented immediately. Thus, to reduce the probability of extended wait times or self-injurious behavior,
the current study set time parameters and focused on task completion with accuracy within a maximum of 10 seconds to information presented. Another variation from Tiger et al. was the utilization of a forced-choice preference assessment to identify preferred stimuli as opposed to using the token system because the participant was unaccustomed to token exchange. A secondary aim of the study was to reduce response latency in an effort to increase learning opportunities. A third aim, concurrent with research, was to investigate the notion that increasing academic performance would reduce other aberrant and maladaptive behaviors.

In summary, the current study sought to show that a child with ASD could decrease response latency, increase fluency and accuracy, and reduce the less desirable and maladaptive behaviors by having the researcher differentially reinforcing short latencies. The research questions were: (a) What are the effects of differential reinforcement of short latencies on response latency?; (b) What are the effects of differential reinforcement of short latencies on task completion?; and (c) What are the effects of differential reinforcement of short latencies on accuracy of responses?

Method

Participant

The participant was a 17-year-old male diagnosed with profound autism and severely limited verbal skills. He attended an autism day treatment center full time (Monday–Friday, 8:00–4:30) that targeted to improve his academic learning, social skills, independent living skills, while decreasing his maladaptive behaviors such as self-injurious behavior, physical aggression, noncompliance, disruptive behavior, and perseveration. This participant had a history of not responding to questions/instructions asked/given, even those which were indicated as having been mastered.

Setting

For the first part of the study, the sessions were conducted in the participant’s regular classroom at the Autism day treatment center, which consisted of two other students ranging from 12 to 17 years of age. Sessions were conducted at an individual work table with the researcher sitting next to the student. All sessions were conducted on a one-to-one, individualized manner. The setting changed during the study to an in-home setting due to the school closing. The room still consisted of two other students and the sessions continued to be conducted at the student’s work table with the researcher sitting next to the participant. One noticeable change was that the table was placed in front of the window as opposed to facing the wall without a window as in the school setting.

Materials

Materials utilized were data sheets with 25 questions or instructions familiar to the participant that were also used to record data, items needed for the participant to perform instructions (shapes, colors, letters, words, etc.), pen, a timer with a visual indicating the seconds expiring, an additional timer for the researcher, and preferred stimuli as determined by a preference assessment.

Dependent Variables and Measurement

The study used three dependent variables: (a) response latency, (b) task completion, and (c) accuracy. Response latency was the number of seconds between the end of the instruction given until the participant’s correct or incorrect response to the question (i.e., the latency to task completion). Task completion was the number of correctly answered questions or instructions complied with or the lack of a response. Accuracy was defined as the correct response to the question or instruction as measured by frequency. In addition, the number of occurrences of concomitant behaviors during the sessions, specifically physical aggression, perseveration, disruptive behavior, and self-injurious, were measured.

Procedure

Pre-baseline. Prior to beginning the study, a preference assessment using forced-choice as outlined by Berg, Wacker, and Steege (1995) was conducted to determine preferred stimuli for reinforcement. From a list of 12 suggested
items, sets of two reinforcer choices were presented to the student until all choices had been paired with one another. Reinforcer choices were presented so that the same item was not offered consecutively. The participant was given 5–10 seconds to choose. If a choice was not made, they were presented again later. The items were then rank ordered according to preference. Following the rank ordering, another forced-choice assessment was conducted only utilizing the six most preferred items to better identify the top choices for the participant. This assessment resulted in the identification of the top four preferred stimuli.

**Baseline.** Two sessions a day were conducted three times per week during baseline. Before a session began, the participant was allowed to choose between two stimuli to be used as reinforcement for that session only. Each stimulus for selection was shown to the participant to assist in the decision-making process. Before each question/instruction was given, the researcher explained to the participant that he needed to answer before the timer beeped in order to obtain the chosen item which was then re-shown to the participant. The decision to provide reinforcement during baseline was to maintain similarity to his current discrete trial training sessions and to establish a functional relationship between correctly responding within a time frame and receiving the desired item for reinforcement.

To begin each trial, the timer with the visual was then set for 10 seconds. The 10-second criterion was selected for baseline due to the participant’s history of self-injurious behavior and the propensity for him to wait for extended amounts of time. If the researcher had enabled the participant to wait until he was ready to respond, this delay could have potentially resulted in a loss of academic instruction time. It was deemed not ethical to deprive the student of learning opportunities if even for a limited amount of time during baseline. Therefore, the decision was made to use a time limit in baseline too.

After the timer was set, the researcher then asked/gave the participant a familiar question/instruction one at a time. A familiar question, for the purposes of this study, was defined as a question that was already part of his curriculum and that he had previously responded to correctly but not consistently (e.g., “What is your name?” or “Point to shirt.”). The visual timer was started immediately after the question was asked. The researcher waited a maximum of 10 seconds for his response. Reinforcement was provided for correct responses only given within the 10-second time frame. Incorrect or no responses resulted in corrective feedback (e.g., “Good try, but try to answer a bit faster next time, the correct answer was . . .”). The response within the scheduled time or after 10 seconds elapsed signified the end of the trial and resulted in the presentation of the next question/instruction. Baseline sessions ended after all 25 questions/instructions were presented.

**Intervention.** Treatment sessions were similar to baseline conditions; however, these sessions used differential reinforcement of short latencies by using praise and a preferred stimuli for reinforcement following any trial in which the response latency fell at or below the preset criterion with an accurate response. Thus, a response within 10 seconds was now no longer accepted. The initial criterion was set based on the mean response latency established in baseline. When the set criterion was reached for three consecutive sessions, the criterion for reinforcement was decreased by 1 second from the mean response latency in the previous session. The criterion was further decreased by 1 second again after reaching criterion for three consecutive sessions and so on until all responses were falling within the desired time frame of under 3 seconds. The sessions followed a similar pattern consisting of the following steps: (a) Prior to the beginning of the treatment sessions, the researcher had the participant choose between two of the preferred stimuli to be used as reinforcement for that session (and that choice was not offered again that day); (b) the researcher explained to the participant that he needed to answer each question before the timer beeped for him to get the preferred stimuli which was shown to the participant; (c) a timer with a visual was set for the established criterion each time a question/instruction was presented; and (d) another timer was set for 10 seconds as this was the maximum time allowed to respond before a “No Response” was recorded. Only accurate responses that fell within the
criterion resulted in praise and the preferred stimuli. A response that exceeded the set criterion on the visual timer or that was incorrect resulted in corrective feedback (e.g., “Good, but try to go faster next time or the correct answer was . . .”). Concomitant behaviors were also tracked during each session. Treatment sessions ended after all 25 questions/instructions were presented.

Research Design

The research design used in this study was changing criterion. Cooper et al. (2007) defined this as an experimental design in which the initial baseline is followed by the treatment phase consisting of successive and gradually changing the criteria for reinforcement. Experimental control is shown by the extent to which the level of responding is changing to meet each new criterion. The criterion for response latency was established from the mean response latency during baseline and was subsequently decreased in the following treatment sessions.

Observation and Recording

Data was collected through direct observation beginning with the preference assessment as described by Berg et al. (1995). Latency in seconds was obtained for each question asked or instruction given. A timer with a visual depicting seconds expiring was used to indicate the criterion (10 seconds during baseline and the average latency from the previous session during treatment) to receive reinforcement and to measure latency. An additional timer was used during the treatment phase and set for 10 seconds as the maximum time allowed to score a “no response.” The response was recorded as a “C” for correct if the participant answered the question accurately (as outlined on the data sheet) and within the preset criterion of time allowed; and “I” for incorrect if he answered incorrectly and within the preset criterion. “N” for no response was recorded if the participant did not answer after the 10 seconds had expired. In addition, concomitant behaviors were tallied as they occurred during each session. A session ended after all 25 questions/instructions were presented.

Reliability

Procedural integrity was collected by a trained observer during 30% of the sessions. Observations were compared on a trial-by-trial basis. An agreement was scored if there was an exact match as outlined on the treatment integrity checklist. The checklist was based on the required steps needed to accurately conduct each trial and was designed as a script that involved indicating, by circling yes or no, if the step had or had not been completed in the appropriate order. Procedural integrity was scored as 100%.

Interobserver agreement (IOA) was measured by a second trained observer who scored response latency and task completion as either correct, incorrect, or no response during 30% of the sessions. IOA for latency was calculated using the formula to compute mean latency-per-response IOA. First the latency per occurrence IOA was determined by dividing the shorter latency by the longer latency for each trial within each session. Then the individual IOA percentages for each occurrence were added together. Next the sum of the individual IOAs per occurrence was divided by the total number of responses for that session and multiplied by 100 to obtain the IOA percentage for that session (Cooper et al., 2007). IOA for response latency was 98% with a range of 92 to 100%. For task completion, observers were compared on a trial-by-trial basis and were scored as an agreement only if there was an exact match, meaning that both observers circled the same word (correct, incorrect, or no response). IOA was calculated by counting the number of agreements, dividing by the total number of agreements and disagreements, and then multiplying by 100. IOA for correct, incorrect, and no response for task completion was 99%, 97%, and 98% respectively.

Data Analysis

The mean response latency was calculated for all sessions and presented in the form of a line graph. Visual analysis of the level, trend, and variability during baseline and treatment was utilized to determine whether the use of differential reinforcement of short latencies was successful in reducing response latency. In
addition, a bar graph was used to depict the effect of this treatment on the frequency of task completion, specifically if the task was completed (correctly or incorrectly), or if there was no response. A fourth graph was used to determine whether there was a correlation between response latencies of correct and incorrect responses. The last graph shows the frequency of concomitant behaviors during the session.

**Results**

**Preference Assessment**

Results were gathered from the initial forced-choice preference assessment. After all items had been paired with each other, the items were rank ordered according to preference. The top six items most preferred were chips, Skittles, cookies, Coke, taking a 3-minute break, and a visit to the sensory room. After the second preference assessment was re-administered, the top four most preferred stimuli used for potential reinforcement were small amounts of chips, Skittles, cookies, and Coke.

**Response Latency**

Results of the mean response latency are depicted in Figure 1. During baseline, the mean response latency was 4.6 seconds. The data was at a mid-level, fairly stable with a range from 5.8 seconds to 3.4 seconds. For intervention, the initial criterion was set at 4 seconds with mean response latency during this phase at 3.4 seconds. The data was at a low to mid-level, with the start of a descending trend and a range of 5.0 seconds to 1.6 seconds. For the second phase of the intervention, which was set at 3 seconds, the mean response latency was 2.9 seconds, at a low to mid-level, variable, and had a range of 4.3 seconds to 2.1 seconds. During the 2-second criterion, the mean response latency was 2.4 seconds. The data was at a low level, stable, and had a range of 3.4 seconds to 1.6 seconds. Although two data points fell below the criterion of 2 seconds, time expired before the participant reached three consecutive sessions of meeting this criterion. Overall, response latency decreased from an average of 4.6 seconds during baseline to an overall average response latency of 2.9 seconds during intervention.

**Task Completion**

Correct responses. Results of task completion are depicted in Figure 2. During baseline, the correct responses were at a mid-level, on a descending trend, and had a range of 8 to 14 correct tasks completed. During the 4-second criterion, the responses were at a mid-level, stable, and ranged from 10 to 13 tasks. During the 3-second criterion, the data was at a mid-level, variable, and ranged from 9 to 15 tasks. Lastly, during the 2-second criterion the data
for correct tasks completed were at mid-level, stable, and ranged from 11 to 15 tasks. The average frequency of responding is shown in Figure 3. Overall, for correct tasks completed, the average during baseline was 11.3 tasks and in intervention, 11.2, 12.8, and 13.0 tasks, respectively.

No responses. During baseline, the no responses were at a low to mid-level, stable, and ranged from 4 to 9. During the 4-second criterion, the data was at a low to mid-level, varying from a descending to ascending trend, and ranged from 0 to 8 no responses. During the 3-second criterion, the data was at a lower
level, variable, and ranged from 1 to 8. During the last criterion of 2 seconds, no responses were at a low level, stable, and ranged from 0 to 3 (see Figure 2). Overall, the average of no responses during baseline was 6.5 and in intervention was 4.8, 3.6, and 1.9 no responses, respectively. To summarize, based on dichotomies of all responses and no responses, the average frequency of all responding is represented in Figure 3.

Incorrect responses. Results of accuracy are also indicated in Figure 2. During baseline, incorrect responses were at low to mid-level, on an increasing trend, and ranged from 4 to 9 responses. During the first phase of intervention at the 4-second criterion, the data was at a mid-level, with a fairly ascending trend, and ranged from 7 to 12 incorrect responses. During the 3-second criterion, the data was mid-level, stable, and ranged from 7 to 11. During the last phase, incorrect responses were at a mid-level, stable, and ranged from 9 to 10. Overall, the average of incorrect responses went from 7.2 in baseline to 9.0, 8.8, and 9.8 incorrect responses, respectively. While the average number of correct responses increased from 11.3 in baseline to 11.2, 12.8, and 13.0 during the intervention phases, the incorrect responses also increased from an average of 7.2 in baseline to 9.0, 8.8, and 9.8 during intervention.

Average Latencies of Correct and Incorrect Responses

Results of the average latencies of correct and incorrect responses are depicted in Figure 4. The average response latency to respond correctly during baseline was 2.9 seconds and decreased to an overall average latency of 1.7 seconds during the intervention phases. The average response latency to respond incorrectly during baseline was 2.6 seconds and decreased to an overall average of 2.0 seconds during intervention. Thus, as the average response latency to respond correctly decreased, so did the average response latency for incorrect responses.

Concomitant Behaviors

The frequency of concomitant behaviors is depicted in Figure 5. During baseline, with the exception of one outlier when the first secondary observer was present, the data was at a very low level, stable, and ranging from 0 to 14 occurrences of concomitant behaviors. During intervention, the behaviors remained
at a low level, steady, ranging from 0 to 26 occurrences of behavior with the exception of perseverative behavior. Perseverative behavior showed an increase during the intervention phases on the second day after the setting change and remained at a higher level and variable. With the exception of perseveration, the overall average of all the concomitant behaviors decreased from baseline to intervention, and remained at a low level and fairly stable.

**Discussion**

Research Question 1

Differential reinforcement of short latencies was effective for decreasing response latency. These results were obtained with a participant who regularly would not respond to any known questions or instructions or would only answer after a long period of time with additional prompting. Even though the decrease in response latency may not appear significant, the participant was only given a maximum of 10 seconds to respond as suggested by Wilder, Atwell, and Wine (2006) and Davis et al. (1992), thus making his mean response latency during baseline no higher than 10 seconds. This decision to set the 10-second maximum was also based on the participant’s history of not responding for extended amounts of time and then engaging in self-injurious behavior; thus, the researchers wanted to maximize gains and opportunities to learn. Reducing the latency to respond down to around 2 seconds would have a socially significant impact. When asked a question such as “What is your name?,” it would be important not to delay but to respond immediately. In addition, the cumulative effect of even such a small decrease in latency over the years adds up to a substantial amount of instructional opportunity. During both baseline and intervention, a visual timer with a sound indicating the expiration of time, the discriminative stimuli “You must answer before the timer goes off to get reinforcement” which was shown to the participant, and the choice of a preferred stimuli for reinforcement as identified by a preference assessment were all available. The only different contingency placed on the student during the intervention phases was meeting the specific criterion set forth during each phase in order to obtain reinforcement. The student had to meet the contingency three consecutive times in order to move to the next phase; thus, his behavior
was gradually shaped to responding at a faster rate. The sound of the timer was familiar to the participant as a signal that a break was over; however, the use of a visual timer had not been previously used. In the initial phases in some sessions he would watch the timer and wait for it to expire before responding, which would have increased his latency. In accordance with Tiger et al. (2007) and Fjellstedt and Sulzer-Azaroff (1973), differential reinforcement of short latencies was successful in reducing response latency and decreasing maladaptive behaviors.

**Research Question 2**

Differential reinforcement of short latencies was effective in increasing the number of correct responses while decreasing the number of no responses. This change was socially significant. The participant increased his opportunity to respond. Failure to respond has been identified as a primary factor for a child’s exclusion from community, social interactions and instructional opportunities. By increasing his rate of responding, he has increased his opportunity to participate in normal activities (Davis et al., 1992). The edibles seemed to be very reinforcing in increasing his actual responding since the sessions were usually conducted before snack and before lunch. Thus completing tasks was gradually shaped over time. The response latency was related to his responding in that as his no responses decreased, so did his response latency. A pattern evolved in that he typically responded correctly to the same questions, suggesting fluency, and that he had actually mastered those concepts even though all the 25 questions had been identified as “known” before the study began. However, sometimes he did not respond (no response) to those same questions, suggesting that his full attention may not have been obtained or because of his history of relying on prompts of which none were given. However, the effectiveness of reducing latency and increasing task completion is relevant with accuracy.

**Research Question 3**

Although the number of correct responses increased, the number of incorrect responses also increased, suggesting that differential reinforcement was not entirely effective in increasing accuracy within the time frame with which this study was conducted. This result suggested that undesirable behavior was also shaped along with the increased rate of responding or decreased response latency. These results are consistent with Tiger et al. (2007) in which the contingency resulted in generalized rapid responding and with Fjellstedt and Sulzer-Azaroff (1973) when responding incorrectly with a different behavior was more reinforcing than the token received for reinforcement. While the average response latency for answering correctly decreased, so did the average response latency of responding incorrectly. This may have improved with more time as the participant began to differentiate the contingencies of giving the correct response as well as within the criterion allowed. Toward the end of the study, the participant showed signs of correctly responding to similar questions such as responding to touching the arm with touching the leg or answering “green” to “What shape?” which happened to be a green triangle. This suggested that he had not actually mastered this skill or reached fluency or that he was simply rapidly responding. In addition, within the last few sessions, some of what would have been no responses became correct or incorrect responses in that he did not answer quickly but did actually answer before reaching the maximum 10 seconds. Also, he began to correct his incorrect responses immediately, which showed promise.

**Tracking of Concomitant Behaviors**

Although the average number of behaviors did decrease from baseline to intervention, the intervention did not appear to have a direct effect on concomitant behaviors. Actually it appeared reversed. Typically the sessions with increased concomitant behaviors, such as self-injurious or physical aggression, would have a negative impact on latency, task completion, or accuracy. These two behaviors had been previously assessed as having multiple functions, thus possibly explaining why decreasing response latency did not appear to have a direct effect on these behaviors. The change in setting only affected one concomi-
tant behavior and that was the perseverative behavior. The participant was placed in front of the window and focused on the strings or cords of the blinds. This placement increased the time needed to obtain the participant’s attention to begin the session, but did not affect the other variables. Carr and Durand (1985) suggest that failure to respond could result in increased aberrant behaviors. The results from this study do not indicate that suggestion, but more research is needed to determine whether those findings apply.

Limitations

Results of the current study had some limitations. First, this intervention was evaluated with only one participant within one population and with a limited number of familiar tasks. Different results may be obtained if utilizing unfamiliar tasks. No generalization to novel tasks, other people, or long term follow-up was investigated in this study since the data was collected in a relatively short period of time. With regard to interpretation, response latency times may be deceiving due to the variability in responding. In addition, with this intervention strategy, it was unclear whether the participant’s increase in incorrect responses was due to a generalization of rapid responding to seek reinforcement or an inaccurate initial assessment of known concepts. A change in setting was required due to a change in locations of the treatment center. Finally, because of the nature of the study and inadequate space, bringing observers into the research setting could have skewed the results. Videotaping could have reduced this possible effect.

Future Research

This study should be replicated with more participants and among other populations. In addition, this research base could be extended to show the long-term effects of this intervention strategy especially with the fading out of edibles as reinforcement. Differential reinforcement of short latencies could be conducted without the use of a visual timer to alleviate any distractions utilizing only sound to indicate that time has expired. Generalization to a naturalistic setting and to novel questions or instructions could be examined as well as in a typical classroom, for example, to increase response rate for working math problems. Future studies could separate the components to further investigate the effects of this intervention on specific concomitant behaviors. Future research could focus solely on differential reinforcement of correct responses to control for the rapid responding of incorrect responses as well as the variability of correct responses. For example, future researchers should examine response prompting strategies, such as time delay, for the purpose of maximizing correct responses and minimizing errors (Walker, 2008). Finally, future research should compare the effectiveness of differential reinforcement of short latencies with other response-shaping procedures, e.g., behavior momentum (Davis et al., 1992; Wehby & Hollahan, 2000).

Applied Implications

Several applied implications may be gained from the current research study. First, the research highlights that differentially reinforcing short latencies decreases the failure to respond. This finding is critical since the failure to respond/comply and responding slowly can hinder other opportunities to interact in the community and to obtain necessary social skills and ultimately interfere with learning in a classroom setting, especially for individuals with disabilities. Thus, this study has implications of educational, community, and personal significance and supports literature that differential reinforcement of short latencies has promise for reducing response latency, thus shaping behavior to appropriate levels of compliance. Practitioners and teachers could utilize this methodology with struggling individuals or with the entire classroom by using group orientated contingencies. The decrease in noncompliant behavior is paramount as noncompliance substantially interferes with instruction and decreases opportunities to learn for the individual and the classroom as a whole. Therefore, once noncompliance is replaced with appropriate responding, more opportunities for learning result. In addition, increasing compliance and decreasing aberrant behaviors may change how the child is perceived and accepted by others. In other
words, opportunities to acquire both academic skills and social skills will increase. This increase will alter the individual’s current repertoire, maximize opportunities for short- and long-term reinforcers, and directly contribute to the individual’s overall level of habilitation.

References


Received: 8 November 2010
Initial Acceptance: 15 January 2011
Final Acceptance: 10 April 2011