Increasing Eye Contact in Children with Autism
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Introduction
A lack of eye contact in infants diagnosed with autism may hinder their ability to acquire later nonverbal and verbal skills (Risley, 1986). Hamlet, Axelrod, and Kuerschner (1984) found that increased eye contact more than doubled comprehension levels, validated the claim that eye contact is an important skill to be taught before teaching other skills. Koegel and Frey (1993) found that increased eye contact resulted in an increase of other social behaviors, such as nonverbal mannerisms and perseveration of topic of conversation. These findings support that eye contact may be part of a response class for other social behaviors, which strengthens the argument that it is necessary to teach eye contact before attempting to teach other social behaviors.

The use of verbal instructions, such as “look at me,” as well as environmental cues, as the end of a task have been utilized to prompt participants to look at the instructor (Hamlet et al., 1984; Blake & Moss, 1987). One limitation of using verbal prompts is that the participant may become dependent on the verbal instruction in order to perform, the child is likely to look only when the verbal instruction is given. In order to avoid prompt dependence, researchers began identifying environmental cues that signaled when typical individuals were likely to look at the instructor (Phillips, Baron-Cohen, & Rutter, 1992).

One procedure that has been implemented to increase eye contact in children with autism is showing (Blake & Moss, 1987; Brooks, Morrow, & Gray 1968; Risley, 1968). Studies that have utilized shaping procedures have typically had the child look at an item and then had the instructor bring the item to their eyes to prompt the child to make eye contact. Once eye contact occurs, the child was then given verbal praise or a tangible reward.

Morrison (1999) used a shaping procedure that was shown to teach children diagnosed with autism to look at cues. Morrison attempted to increase both the frequency of eye contact as well as independent eye contact to specific environmental cues. Treatment 1 lasted for the first two minutes of a typical therapy session for one day, and consisted of continuous reinforcement for all eye contact. Treatment 2 began the following day of therapy during two one-minute intervals where eye contact was reinforced for a specific percentage of instances, while the remaining instances were followed by a task. Morrison found that this procedure was successful at increasing the participant’s eye contact. The present study is a replication of the procedure used by Morrison.

Method
Definitions
Eye contact. Eye contact was defined as the child looking in the experimenter’s eyes for at least two seconds.

Environmental Cues. Environmental cues included: the timer beep that signaled the beginning of a one-minute period, as soon as the edible consequence was swallowed, as soon as a praise statement ended, and when the child’s tangible item was covered.

Participants
Three children diagnosed with autism participated in this study. Mary was four years old, received four hours of behavioral therapy per week, and had a moderate level of vocal skills. Ben was four years old, received 40 hours of behavioral therapy per week both in-home and at a university based autism program and had a low level of vocal skills. Emily was two years old, received four hours of behavioral therapy per week, and had little to no vocal skills.

Baseline
All research sessions took place during the normal therapy session. Data were collected during two-minute time intervals across several days (ranging from 3 to 10 days). The authors collected data on the frequency of eye contact and the percentage of eye contact per minute. The authors collected data on the frequency of eye contact as well as the number of times eye contact occurred per cue.

Treatment 1
Treatment 1 consisted of the first two minutes of a one-hour therapy session during which any occurrence of the child looking at the instructor was reinforced. If the child did not look at the instructor’s eyes, the instructor prompted the child by bringing the edible or tangible consequence near her eyes. No instructions were given once the child made eye contact with the instructor; instead the child received an edible or tangible consequence.

Treatment 2
Treatment 2 consisted of two one-minute intervals during a one-hour therapy session. Each child began Treatment 2 in phase one, receiving edible or tangible consequences following 80% of eye contacts to cues and receiving a task-related instruction following each phase shift consisted of a 10% increase of task-related instruction following eye contacts to cues and a 10% decrease of the edible and tangible consequences.

Interobserver agreement was assessed by having a second observer simultaneously and independently record data during baseline and treatment.

Table 1: Description of the Independent Variables and Measured Outcome Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Contacts</td>
<td>Number of times eye contact occurred</td>
</tr>
<tr>
<td>Percentage of Eye Contact</td>
<td>Percentage of eye contact per minute</td>
</tr>
</tbody>
</table>

Table 2: Data Collection Schedule

<table>
<thead>
<tr>
<th>Phase</th>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Eye Contacts</td>
<td>80% reinforced</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Eye Contacts</td>
<td>90% reinforced</td>
</tr>
</tbody>
</table>

Results
Figure 1 illustrates the rate per minute of independent eye contact across all three participants. Rate per minute was determined by the total number of independent instances of eye contact divided by the total time in minutes. Mary’s mean rate per minute of eye contact was 2.6 during baseline and 6.6 times per minute during treatment. Ben’s mean rate per minute of eye contact was 1.4 times in baseline and 1 time per minute during treatment. Emily did not independently make eye contact during or after treatment conditions.

Figure 2 shows the percentage of trials each participant independently made eye contact following a cue. A percentage of eye contact to cues were calculated by taking the total number of instances of eye contact to cues divided by the total number of cues. Mary independently made eye contact in response to a mean of 11% during baseline, and a mean of 34% during treatment. Ben made eye contact in response to 15% of the cues during baseline, and a mean of 6.5%. Emily never independently made eye contact following a cue. The instructor needed to prompt her every time.

Discussion
The results indicate that the procedure used increased eye contact for one participant but did not increase the amount of eye contact in the other two subjects. Those results did not replicate the results found in Morrison (1999). Morrison found that for all three participants an increase in frequency of eye contact as well as independent eye contact to cues occurred during treatment. The skill levels of the participants included in the present study ranged from Emily who only had little vocal skills to Mary who had a moderate level of vocal skills. Mary had the highest skill level and was the only participant who showed an increase in independent eye contact at the end of treatment. The current treatment may be better suited to assist in increasing eye contact in higher functioning children diagnosed with autism. Future replications of the procedure used in the Morrison (1999) study should include participants with a wide range of skills to clarify whether the procedure is better suited for specific skill levels.

Another limitation present in the current study was the brief time available for data collection. Both Emily and Ben had only six or seven days of treatment compared to Mary who had 13 days of treatment. The duration of treatment may have been insufficient for an increase in independent eye contact to occur for both Emily and Ben. Future research in this area should explore the effects of varying the number of sessions and individual session time length.

The limitation of only having Treatment 1 for one session prevented therapeutic decisions based on each participant’s individual data. Treatment 1 only lasted for one day because Morrison (1999) only had Treatment 1 run for one day. If this limitation had not been present, participants would have remained in Treatment 1 until a significant increase of eye contact took place. Future replications of this treatment plan should allow therapeutic decisions based on the present data and not previous procedural timelines.

References

Author Note
The authors of this research would like to thank the Office of Research and Sponsored Programs for their support. We would also like to thank Bobbi Gunderson, Cierra Micke, Lauren Novak, Tasha Reid, and Cassidy Drees for their assistance in data collection.

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Figure 1: Line graph displaying the rate per minute of independent eye contacts of all three participants.

Figure 2: Line graph displaying the percentage of independent eye contacts to cues.