

*REDUCING RAPID EATING IN TEENAGERS WITH AUTISM:
USE OF A PAGER PROMPT*

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This study assessed the effects of a vibrating pager for increasing the duration of meal consumption in 3 teenagers with autism who were observed to eat too quickly. Participants were taught to take a bite only when the pager vibrated at predetermined intervals. A reversal design indicated that the vibrating pager successfully increased the total duration of mealtime, thereby slowing the pace of consumption for all 3 participants.

DESCRIPTORS: autism, pager prompts, rapid eating, stimulus control

Rapid eating is a common problem observed in individuals with developmental disabilities (McGimsey, 1977). This behavior can lead to serious health problems, such as vomiting and aspiration (Kedesky & Budd, 1998), and may be socially stigmatizing. Rapid eating is difficult to treat because the reinforcer (i.e., food) is accessed at a faster rate when an individual consumes food quickly, thereby shaping rapid consumption (Lennox, Miltenberger, & Donnelly, 1987). Lennox et al. used differential reinforcement of low responding (DRL) and prompting to reduce the rate of eating in participants with mental retardation. Wright and Vollmer (2002) extended the findings of the Lennox et al. study by implementing an adjusting DRL schedule. Both schedules were effective at reducing the rate of eating, but both relied on the continued presence of a person to implement the schedule.

Advances in technology have allowed the successful use of vibrating pagers to cue individuals with autism to engage in important behavior, such as verbal and nonverbal initiations (e.g., Taylor & Levin, 1998; Taylor, Hughes, Richard, Hoch, & Rodriguez-Coello, 2004; Shabani et al., 2002). Vibrating pagers provide

unobtrusive prompts (i.e., others are not aware that students are being cued to engage in target behavior) and do not require that a person provides the prompting. Therefore, the purpose of the current study was to determine if a similar vibrating pager could be used to cue consumption at fixed intervals in teenagers with autism, thereby slowing the pace of consumption.

METHOD

Participants and Setting

Three teenage boys with autism, Mark (19 years old), Jack (15 years old), and John (15 years old), participated. All demonstrated independent eating skills (e.g., used utensils appropriately) and had a history of rapid food consumption. Mark and Jack also had a history of rumination and gastroesophageal reflux. All attended a school that served persons with autism. The participants' teachers conducted training sessions at each participant's desk in his classroom. Probe sessions were conducted at a large table in the classroom where the participants ate lunch along with their classroom peers.

Materials

The target probe food for each participant was one that he ate regularly during lunch (i.e., one slice of pizza for Mark, 6 oz of yogurt for Jack, and 10 slices of a clementine for John). These food items were not available to the participants at school outside the probe sessions.

Special thanks to Mark, Jack, John and their parents for participation in this study. Thank you also to the Alpine Learning Group teachers who assisted with data collection.

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doi: 10.1901/jaba.2008.41-107

Separate snack foods (e.g., pretzels, chips, popcorn, cheese crackers) were selected as training foods, and these varied across training sessions. The participants used one of two types of vibrating pagers—the MotivAider and the Invisible Clock—depending on which was available in his classroom. The time of vibration could be preset to the second on both devices. The repeat feature allowed the pagers to repeat vibration at the designated time intervals (e.g., if the pager was set to vibrate at 20 s on the repeat feature, it vibrated every 20 s until it was turned off). The MotivAider vibrated for 3 consecutive seconds and then stopped vibrating. The Invisible Clock vibrated continuously until the teacher or participant pressed any button on the device. The vibration interval was reset as soon as the pager began to vibrate, and the duration of vibration (i.e., time until the participant pressed a button) did not affect the designated vibration interval.

The first author timed a typical adult man eating one of the target probe foods to calculate the vibration interval. The vibration interval for each food was calculated by dividing the duration of eating time of the adult by the number of bites the participant took during baseline. For example, the adult consumed 6 oz of yogurt in 212 s. Mean consumption of the same amount of yogurt by Jack was 16 bites in a mean of 63 s when the pager was not activated. Based on these data, Jack would have to take one bite approximately every 13 s (212 s divided by 16 bites is approximately 13 s between bites) to consume the yogurt with the same number of bites (16) in nearly the same amount of time as the typically developing adult (i.e., 212 s). We used the same procedure to determine the intervals for the other two target foods (i.e., a 25-s pager vibration interval was set for Mark for pizza by dividing 162 s by six bites, and a 10-s pager vibration interval was set for John for clementines by dividing 93 s by 10 bites).

Data Collection and Design

The primary dependent measure in this study was the total number of seconds of eating time

to consume the target food. The data collector scored eating time from the second the teacher presented the food until the participant swallowed the last bite. The teacher measured eating time using a digital timer, which he or she started when the food was presented and stopped when the participant swallowed the last bite. The teacher also used paper and pencil to record the total number of bites taken to consume the food. A reversal design was used to assess the effects of the vibrating pager on the total number of seconds of eating time to consume the target foods.

Interobserver Agreement

A trained independent observer was present for 17% of the sessions and recorded the total seconds of eating time and the number of bites. Agreement was calculated by dividing the shorter time or smaller number of bites by the longer time or greater number of bites, multiplied by 100%. Interobserver agreement was 100% for the total number of bites and was 99% (range, 98% to 100%) for mean total seconds of eating time for all participants.

Procedure

Pager prompt inactivated. The teacher conducted sessions during lunchtime. Each participant wore an inactivated vibrating pager on the waistband of his pants (the teacher turned the pager off or removed the battery). The teacher presented the target food and the rest of the participant's lunch when the participant had consumed the entire target food. The teacher remained within 2 to 4 m of the participant throughout the session. The teacher did not provide prompts or reinforcement related to consumption. Beverages such as water or juice were available throughout the session, and the student could consume these as he wished. The teacher never asked the participant to drink during this condition.

Training sessions. The teacher conducted training sessions outside of lunchtime to teach the participant to consume various snack foods

only when the pager vibrated. The teacher set the pager to vibrate at varied intervals (range, 10 to 30 s) across training sessions to decrease the likelihood that the participant would begin to respond to a specific time-based schedule and to increase the likelihood that the pager would cue responding. During the first training session, the teacher physically guided the participant to place his hand on the pager and to wait until the pager vibrated before consuming a piece of the snack (Taylor & Levin, 1998). The participant was no longer required to keep his hand on the pager between vibrations as he learned to respond to the vibration across training sessions. The teacher blocked attempts to take bites before the pager vibrated, and then guided the participant's hand back to the pager. The teacher guided the participant to pick up a piece of the snack item when the pager vibrated. All participants consumed their food independently.

The participant's hand was guided back to the pager immediately after the bite entered his mouth. The teacher provided verbal praise (e.g., "I liked the way you waited until the pager vibrated.") if the participant waited to take a bite until the pager vibrated. The teacher physically prompted the participants who were using the Invisible Clock to press a button on the device to turn off the vibration before picking up the snack food. Physical prompts for responding to the pager were faded to gestural prompts (no other prompt types were needed). There were 10 trials conducted in each training session, and sessions lasted 100 to 300 s. All participants took bites only when the pager vibrated on 100% of trials for two consecutive training sessions within five sessions and never received additional training.

Pager prompt activated. Once training was completed, the teachers conducted sessions to evaluate the effects of the pagers during probe sessions at lunch with the target food item. These sessions were identical to the pager prompt inactivated condition, with the excep-

tion that the pagers were set to vibrate at the designated interval.

RESULTS AND DISCUSSION

Results (Figure 1) indicated that the total number of seconds of eating time for the target foods increased when and only when the participants used the vibrating pager, thereby slowing consumption for all 3 participants to a duration comparable to that of a typical adult. The mean total seconds of eating time for target foods was relatively short, with 93 s, 63 s, and 29 s for Mark, Jack, and John, respectively, when the pager prompt was not activated. Total number of seconds of eating time increased to 159 s, 200 s, and 84 s for Mark, Jack, and John, respectively, when the pager was activated. Further, the number of bites taken did not differ substantially with or without the pager, indicating that the participants did not simply take larger bites when the pager vibrated (to consume the food item faster). Specifically, the mean total number of bites were 6, 16, and 10 with the vibrating pager inactivated and 5, 14, and 10 when the pager was activated for Mark, Jack, and John, respectively.

These results are promising and indicate that individuals with autism can be taught to respond to a vibrating pager to cue consumption of food. An advantage of using this technology is that it is unobtrusive and portable and may be used easily in community settings. In addition, the participants were, in effect, independently monitoring consumption (e.g., they waited independently to be cued by the pager), thus requiring less immediate supervision and prompts from teachers. In fact, a probe for Jack revealed that consumption remained at a comparable pace when the adult left the room and observed through a one-way mirror, indicating that pager prompts may allow adults to fade supervision of mealtime altogether. No further assessments were conducted to determine if the participants continued to respond to the pager in the absence of their teachers. Thus,

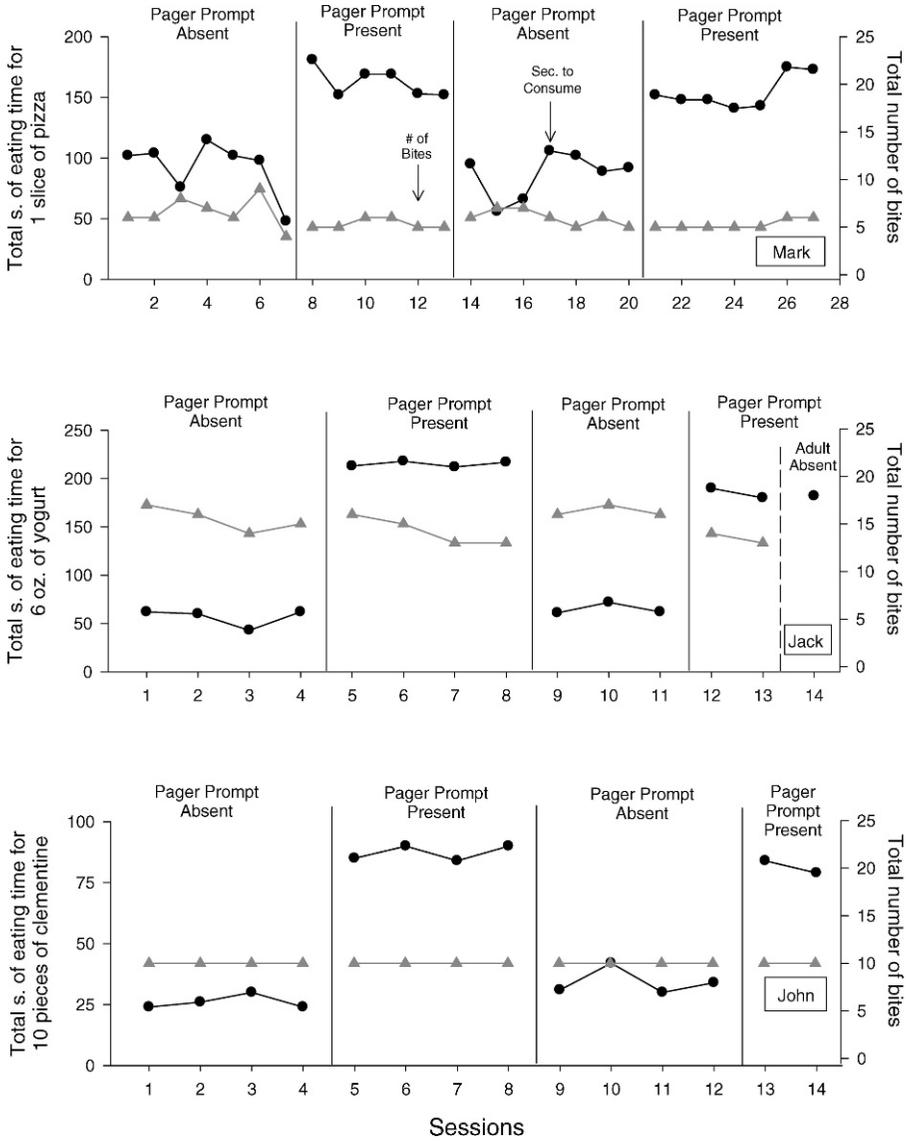


Figure 1. Total eating time in seconds and number of bites to consume target foods across sessions for Mark, Jack, and John.

we cannot determine whether the pager alone was responsible for the change in behavior, or whether the teachers also exerted some control over eating rate. It appeared, however, that the vibration of the pager was controlling responding, because all of the participants ate one bite of the food immediately upon vibration of the pager on 100% of opportunities during all probe sessions. Future researchers may consider using a more precise measurement system for determin-

ing the extent of stimulus control exerted by the pager prompts. Additional research also is needed to investigate means to fade or remove the pager prompts so that the individual learns to pace consumption without being cued (e.g., slowly decreasing the intensity of the vibration until the pager no longer vibrates).

A limitation to the generality of the results is that probe sessions were conducted with only one food during lunchtime for each participant

following training with a variety of foods. The applicability of the pager prompts with other foods, during other mealtimes, and in natural settings also should be examined. In addition, this study did not evaluate the qualitative changes in participants' mealtime behavior as a result of using the pager. In other words, it is uncertain if independent observers would have judged the participants' manner of eating as more socially acceptable with the pager than without. Future researchers should consider obtaining social validity measures from independent observers to determine the qualitative benefits of using the pagers. Despite these limitations, this study is the first to offer evidence that pager prompts can be used to slow an individual's meal consumption to approximate durations observed in typical adults without continued adult supervision and prompting.

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Received October 4, 2006
 Final acceptance March 16, 2007
 Action Editor, Gregory Hanley