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PROMOTING PERFORMANCE FLUENCY IN A PERSON WITH PROFOUND INTELLECTUAL DISABILITY AND BLINDNESS

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Abstract. A combination of synchronous reinforcement and verbal prompts (automatically delivered through portable technology) was used to promote performance fluency in a person with profound intellectual disability and blindness. Performance fluency was measured on indoor walking and task engagement. Data indicated that the combination of reinforcement (favourite songs) and prompts was quite effective; it increased the distance covered per minute and the number of objects disassembled per minute. Implications of the findings are discussed.

Keywords: Synchronous reinforcement, verbal prompts, portable technology, performance fluency, intellectual disability, blindness.

Introduction

An important goal of programmes for persons with severe and profound intellectual or multiple disabilities is to promote performance fluency, that is, to enable the persons to carry out familiar responses without serious breaks in performance or slowdowns (Davis, Brady, Williams, & Burta, 1992; Lancioni, Campodonico, & Mantini, 1998). This goal can be quite difficult to achieve and special strategies, such as staff supervision/guidance, peer support (tutoring), automatic prompting or synchronous reinforcement, may be required (Davis et al., 1992; Duker & Schaapveld, 1996; Dunlap & Johnson, 1985; Lancioni et al., 1991).

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Staff supervision is the most common, but probably also the most expensive strategy in terms of time investment. Moreover, prolonged use of staff supervision would emphasize the person's dependence, with negative consequences for his or her social status (Lancioni et al., 1991; Duker & Schaapveld, 1996). Peer support may not necessarily be easy to arrange in centres for persons with severe multiple disabilities where only a few clients might possess the required skills (Lancioni et al., 1991).

Automatic prompting and synchronous reinforcement could be practically advantageous since they could be delivered through forms of portable technology, largely independent of staff (cf. Davis et al., 1992). In spite of the potential advantages, very little evidence exists to date about the possibility of using these strategies, with the help of portable technology, with persons with profound and multiple disabilities (Lancioni et al., 1998).

The present study assessed a combination of synchronous reinforcement and verbal prompts (automatically delivered through portable technology) to promote performance fluency in a person with profound intellectual disability and blindness. Performance fluency was measured on indoor walking and task engagement. The decision to combine prompts with reinforcement was taken since the person had breaks in performance that could limit the occurrence and impact of reinforcement.

Method

Participant

John was 19 years old, was totally blind and had normal hearing. He was nonverbal, but could understand some simple verbal commands. Although no formal IQ scores were available, he was considered to function in the profound range of intellectual disability and displayed stereotyped behaviours such as head weaving. The age equivalent for his daily living skills on the Vineland Adaptive Behavior Scales was about 3 years. He was largely independent in eating, toileting and dressing. He could reach activity destinations within the rehabilitation centre he attended (with the help of acoustic orientation cues), and could also carry out simple tasks. However, his performance tended to be discontinuous and staff wanted to help him reduce this problem, which was thought to have a negative impact on his occupational opportunities and social status. This study was designed in response to staff request for assistance in helping John.

Setting, recording, and reliability

The setting was the rehabilitation centre that John attended. Recording concerned the duration of each move to a destination (the length of these moves was known); and the duration of each task session in which a preset number of two-component objects was disassembled. This form of task engagement (separating the components of vocationally relevant objects such as electric plugs) was part of John's prevocational activity programme. The walking and task data were daily transformed into ratios (i.e., metres covered per minute and objects disassembled per minute) so that they could be compared across days and phases of the study. Interrater agreement, checked on 14% of the moves and 20% of the task sessions, allowed discrepancies of 30 seconds. The percentages of agreement, computed (over all

moves and task sessions used for reliability) by dividing agreements by agreements plus disagreements and multiplying by 100%, were 94 and 100.

System for synchronous reinforcement and prompting

The system included two portable tape players; one was connected to electronic circuitry with timers, a mercury or an electromagnetic switch, and ear-pieces and served for synchronous reinforcement. The other was connected to the same ear-pieces as the former and served for prompting. The first tape player was fitted with cassettes containing favourite songs; the other tape player with cassettes containing various encouraging/prompting statements spoken by different familiar people. The statements occurred at intervals of about 30 and 20 seconds during walking and task engagement, respectively. During walking, closures of the mercury switch (at John's ankle) activated the tape player with songs for 3 seconds. During task engagement, taking an object from or putting it into a container (i.e., passing the electromagnetic switch, a bracelet at John's wrist, over the edge of the container) activated the tape player with songs for 5–6 seconds.

Experimental conditions

The study was carried out using a multiple probe design across behaviours (Crawford & Schuster, 1993). After the initial baseline probes, the intervention (synchronous reinforcement and prompting) began on walking. Subsequently, new baseline probes and intervention occurred on task engagement. Finally, follow-up checks were conducted. John had daily averages of about eight moves (of 42–69 metres) and 1.2 task sessions. Task sessions included averages of 36 objects. Numbers of daily moves and objects in task sessions were lower during baseline.

Baseline. Prior to walking to a destination, John was provided with an object related to that destination. Sound cues were available to help him take the correct direction at critical points of the route (see Participant section). At the destination, he was praised and occasionally given a small drink. During the task engagement sessions, John had three familiar categories of objects to disassemble and was given praise after each category and a small drink at the end.

Intervention. John would wear the system for synchronous reinforcement and prompting that worked as described above. Other conditions were comparable to those applying during baseline.

Follow-up. Follow-up checks of 2 days were carried out after 3 weeks and 3 months from the end of the intervention phase.

Results and discussion

John's baseline, intervention, and follow-up data are summarized in Figure 1. During the initial baseline probes, he walked a mean of about 6 metres per minute and disassembled a mean of about 1.8 objects per minute. Intervention on walking promoted an increase in the number of metres per minute ratio. This reached an average of about 13 metres during the

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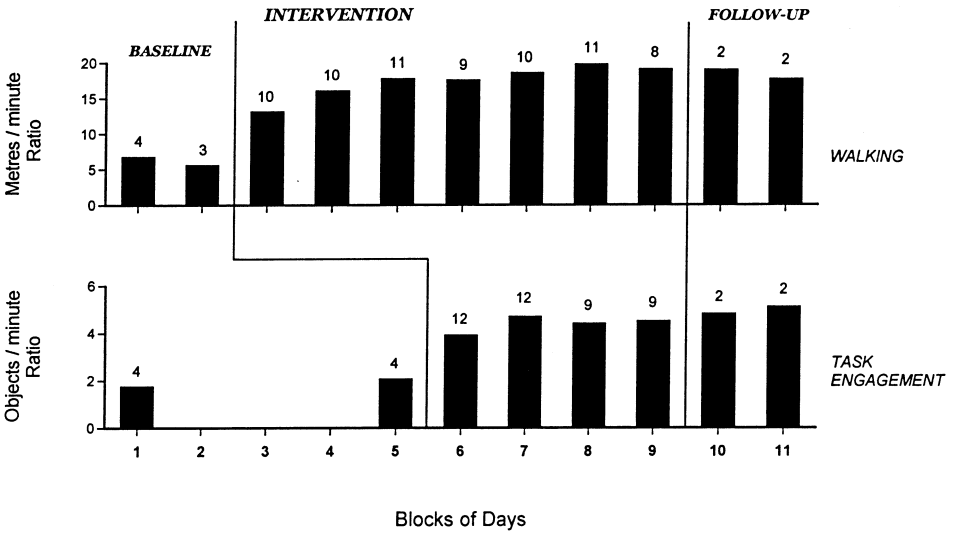

Figure 1. The figure shows the walking and task engagement data during baseline, intervention, and follow-up. Bars indicate mean ratios (metres per minute or objects per minute) over blocks of days. The blocks include 3 or 4 days during baseline, 8 to 12 days during intervention, and 2 days during follow-up. The number of days is indicated by the numerals above the bars.

first block of days and increased to approximately 19 metres per minute by the last blocks. On task engagement, the second set of baseline probes provided data similar to those obtained initially. During the four blocks of intervention days, the mean number of objects disassembled per minute ranged from 3.9 to 4.7. Follow-up at 3 weeks and 3 months after the end of the intervention showed performance levels comparable with those obtained during the intervention (see Figure 1).

In sum, automatically-delivered synchronous reinforcement and prompts were effective in promoting fluency of performance with a person with profound intellectual disability and blindness. Such fluency may be considered occupationally relevant; and may also help the person acquire a more positive and socially-acceptable image and a more satisfactory interaction with staff (staff have more occasions to witness, appreciate and reinforce the person's positive performance) (cf. Davis et al., 1992; Demchak, 1990). No efforts were made to assess whether one of the two components of the intervention package would have been sufficient to produce the same results. In support of the package, one may argue that (a) the prompts increased the chances of intervention effectiveness (by helping to cut breaks in performance); and (b) the prompts, used together with reinforcement, probably served as positive discriminative stimuli (without undermining the friendliness of the programme). Another important question left unanswered in this study is whether the intervention package (or one of its components) would continue to be needed indefinitely, or whether the person would eventually achieve some level of independence.

New research may focus on three objectives: (a) replicating the present study with other persons with profound intellectual or multiple disabilities; (b) comparing the effects and general acceptability of the package applied in this study with the effects and acceptability

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of its single components; and (c) determining long-term requirements for maintaining performance fluency.

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