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Two boys with multiple disabilities increasing adaptive responding and curbing dystonic/spastic behavior via a microswitch-based program

Giulio E. Lancioni [a,*], Nirbhay N. Singh [b], Mark F. O'Reilly [c], Jeff Sigafoos [d], Robert Didden [e], Doretta Oliva [f]

[a] Department of Psychology, University of Bari, Via Quintino Sella 268, 70100 Bari, Italy
[b] ONE Research Institute, Midlothian, VA, USA
[c] University of Texas at Austin, Austin, TX, USA
[d] Victoria University of Wellington, Wellington, New Zealand
[e] Radboud University Nijmegen, Nijmegen, The Netherlands
[f] Lega F. D'Oro Research Center, Osimo (AN), Italy

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ABSTRACT

A recent study has shown that microswitch clusters (i.e., combinations of microswitches) and contingent stimulation could be used to increase adaptive responding and reduce dystonic/spastic behavior in two children with multiple disabilities [Lancioni, G. E., Singh, N. N., Oliva, D., Scalini, L., & Groeneweg, J. (2003). Microswitch clusters to enhance non-spastic response schemes with students with multiple disabilities. *Disability and Rehabilitation, 25*, 301–304]. The present study was an attempt to replicate the aforementioned study with two boys with multiple disabilities. The adaptive responses selected for the boys consisted of pushing an object with the hand or the back. The dystonic/spastic behavior consisted of body arching (i.e., pushing belly and stomach forward) and leg stretching for the two boys, respectively. Initially, the boys received preferred stimulation for all hand- and back-pushing responses. Subsequently, the stimulation followed only the responses that occurred free from the dystonic/spastic behavior. The results showed that both boys increased the frequency of adaptive responses, learned to perform these responses free from the dystonic/spastic behavior, and maintained this improved performance during a 2-month post-intervention check.

* Corresponding author.
E-mail address: g.lancioni@psico.uniba.it (G.E. Lancioni).

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1. Introduction

Persons with profound and multiple disabilities may have very low levels of adaptive responding with limited opportunities of advancing in their development and increasing their control over the environment (Gutowski, 1996; Holburn, Nguyen, & Vietze, 2004; Mechling, 2006; Murphy, Saunders, Saunders, & Olswang, 2004). Frequently, they may also present with forms of problem behavior, such as (a) inadequate body postures (e.g., forward head tilting), (b) stereotypies (e.g., hand mouthing and eye poking), and (c) dystonic/spastic behavior (e.g., back arching or leg stretching), occurring concomitant with adaptive responses and independent of them (Lancioni, Singh, Oliva, Scalini, & Groeneweg, 2003; Lancioni et al., 2008b,c; Luiselli, 1998; Saloviita & Pennanen, 2003).

Educational intervention with these persons needs to encompass the dual goal of promoting adaptive responding and reducing problem behavior in order to advance their situation in a meaningful and harmonious manner (Lancioni et al., 2007a, 2008b). A form of educational intervention recently put forward to pursue such a dual goal relies on programs involving microswitch clusters (i.e., combinations of microswitches) that concurrently monitor adaptive responding and problem behavior (Lancioni et al., 2006, 2008a). Initially, these programs provide preferred stimulation for all adaptive responses irrespective of whether they occur free or in combination with the problem behavior. Once adaptive responding has increased, the programs provide preferred stimulation only for the adaptive responses that occur free from the problem behavior (Lancioni et al., 2006). For example, a microswitch cluster monitoring adaptive vocalization responses and eye poking may ensure that (a) initially, all vocalization responses are followed by positive stimulation and (b) subsequently, only vocalization responses performed in the absence of eye poking are followed by positive stimulation (Lancioni et al., 2007b).

Programs with microswitch clusters have been mainly addressed to increase adaptive hand and foot responses and reduce inappropriate head position or hand/finger mouthing and eye poking (Lancioni et al., 2008a). Only one study has been reported in which microswitch clusters were used to increase adaptive responses and reduce dystonic/spastic behavior (Lancioni et al., 2003). The positive results of this study with the two participants of 9 and 14 years of age seem to indicate (a) the possibility of supplementing traditional, therapist-directed physiotherapy with the exercise of self-directed motor control, and thus (b) the availability of an additional, personalized strategy to improve and sustain the participant's motor condition.

In light of the apparent relevance of this last type of program and the limited evidence available about it, replication efforts would seem to be warranted. The purpose of the present study was to carry out such a replication with two boys with multiple disabilities. The adaptive responses selected for the boys consisted of pushing an object with the hand or the back. The dystonic/spastic behavior consisted of body arching (i.e., pushing belly and stomach forward) and leg stretching.

2. Method

2.1. Participants

The participants, Clint and Gene, were 4.1 and 13.4 years of age, respectively, and were rated in the severe/profound range of intellectual disability, although no IQ scores were available. They had congenital encephalopathy, spastic tetraparesis with dystonic movements, scoliosis, minimal residual vision or total blindness, and lack of speech. Clint, who was born prematurely with very low birth weight and suffered from perinatal hypoxia, was also diagnosed with epilepsy. This was largely controlled through medication. Gene had been involved in microswitch programs aimed at increasing adaptive responding. Those programs were partially active when this study started. Both participants spent their time in a wheelchair or in bed. They lived at home with their parents and attended daily educational programs focusing almost exclusively on physiotherapy and general stimulation. Parents and teachers had provided informed consent for this study.