

Chapter 97

Technological Solutions for Helping Adaptive Responding of Children with Severe to Profound Developmental Disabilities: A Literature Overview

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ABSTRACT

This article provides the reader with a literature overview of the newest empirical evidences available on the use of assistive technology-based programs for teaching and improving adaptive responding of children with severe to profound developmental disabilities. Four main categories of studies were selected, regarding (a) the technology for promoting independent access to positive stimulation, (b) the combination between microswitch and VOCA aimed at asking for social contact with a caregiver, (c) the cluster technology for increasing an adaptive response, and simultaneously reducing a challenging behavior, (d) the technology for requesting and choosing desired item or the access to the literacy. Overall, 26 studies were reviewed, and 75 participants were involved. The outcomes were largely positive, although few failures occurred. Psychological and Rehabilitative implications of the findings for both research and clinical practices were critically discussed

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INTRODUCTION

Assistive technology (AT) is an umbrella term which includes a relevant range of electronic options aimed at helping children with developmental disabilities and special needs to play an active role towards the social environment and to minimize their isolation and passivity. Accordingly, AT may have positive outcomes enhancing constructive engagement and improving quality of life (Borg, Larson, & Ostegren, 2011). To design an effective AT rehabilitative program is mandatory create an individualized solution for the targeted users, and keep in mind the targeted behaviors, tasks, both human and financial resources in which programs are implemented (Reichle, 2011). The growing availability of such technologies may be viewed a critical consequence of the effectiveness of AT-based intervention programs (De Pace & Stasolla, 2014).

Two basic groups of users have been selected for the aforementioned programs: (a) participants with extensive motor disabilities and normal intellectual functioning, and (b) individuals with severe to profound developmental and multiple disabilities (i.e., a combination of intellectual, motor and sensorial impairments). The AT for the first group, implemented for educational and/or rehabilitative goals, may be helpful to improve literacy process, instead the interventions for the second group are focused on the independent access to preferred stimuli or on constructive engagement (Saunders et al., 2003).

A crucial form of AT are the microswitches, that are electronic tools planned to ensuring individuals with developmental delays to manage autonomously their environment through the exhibition of small and simple behavioral responses. For instance, through an optic sensor (i.e., a photocell activated by an eye blinking), a child may receive a short listen (e.g., 8 sec) of preferred song, rather than directly switching on the computer or the CD player, inaccessible to him/her, considering his/her clinical conditions or accessible only through the help of caregivers (Lancioni, Singh, et al., 2006). Consequently, they may be viewed as a great educational and rehabilitative resources (Stasolla & Perilli, 2015).

Some useful guidelines are needed for the effectiveness, and the suitability of a microswitch-based program. First, a plausible behavioral response, naturally available in the person's repertoire and exhibited without excessive effort, should be retained. Second, a microswitch for monitoring the aforementioned response should be adapted. Third, a set of positive stimulation for motivating the exhibition of such response, and preventing sensorial saturation should be retained. Thus, the response cost (i.e. the effort produced to performing the behavioral response) should be highly compensated by the preferred stimuli.

A second relevant objective of AT-based program is constituted by the improving of quality of life (Borg et al., 2011). The main construct of quality of life is happiness, which encompasses well-being, pleasure, fulfillment and satisfaction, particularly difficult to detect among people with severe to profound developmental disabilities (Lancioni, Singh, O'Reilly, Oliva, & Basili, 2005). To overcome this issue, professionals and researchers refer to behavioral signs of happiness such as smiling, laughing and energized body movements, labeling them indices of happiness (Lancioni et al., 2005) which may represent an outcome measure of positive mood. Thus, by interacting independently with the environment, a person with developmental disabilities should increase positive mood with beneficial consequences on the quality of life, based upon learning principles (i.e., causal association between the adaptive responding and the environmental consequences).

The objectives of the current contribution were to provide the reader with a literature overview of microswitches, described their use and provided some illustrative examples concerning their applications to persons with severe to profound developmental and/or intellectual delays. Specifically, the article argued on: (a) the independent access to positive stimulation (i.e., through the use of a simple behavioral

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