Chapter 8
Assistive Technology-Based Programs to Support Adaptive Behaviors by Children with Autism Spectrum Disorders: A Literature Overview

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ABSTRACT
This chapter provides readers with an overview regarding empirical evidences available in the literature within the last decade (i.e., 2005-2015) concerning the use of assistive technology for children with autism spectrum disorders. According to the including and excluding criteria, 36 studies were retained and grouped in four main categories, namely: (a) communication skills, (b) adaptive and/or social skills, (c) life skills, and (d) challenge behaviors. The first aim of the chapter was to outline strengths and weaknesses of the aforementioned studies. The second objective of the chapter was to emphasize practical applications of assistive technology-based programs. Finally, the third purpose was to discuss the findings pointing out some useful guidelines for future research. Results were fairly positive, although some failures occurred. Clinical, educational, psychological and rehabilitative implications were also discussed.

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INTRODUCTION

Children with autism spectrum disorders (ASD) usually present communication, intellectual, emotional and motor impairments, with isolation, passivity, withdrawal, which may seriously hamper their social image, desirability and status with negative consequences on their quality of life (Felce & Perry, 1995; Koegel, Matos-Freden, Lang, & Koegel, 2012; Matson & Sturmey, 2011; Palmen, Didden, & Lang, 2012). Moreover, they may exhibit repetitive and stereotyped behaviors, self-injuries, aggression (Farmet et al., 2015; Matson & Jang, 2014). Additionally, they are frequently described with intellectual disabilities (ID) and attention deficits hyperactivity disorders (Newman, Leader, Chen, & Mannion, 2015; Stratis & Lecavalier, 2015). In fact, they may pose serious problems concerning their management within daily contexts such as home, school and rehabilitative or medical settings (Feldman, Blum, Gahman, & Shults, 2015). Accordingly, the aforementioned clinical conditions could be a threat to conventional programs (e.g., sensorial stimulation), increasing caregivers’ burden (Lin, 2015). One way to overcome this issue is the use of assistive technology (AT) (Barnard-Brak, Thomson, Wei, & Richman, 2014).

For instance, a participant with ASD and ID, exposed to a microswitch-based program (i.e., a basic form of AT intervention), may access autonomously to a short period of stimulation (e.g., 5-10 seconds) by manipulating a wobble microswitch (i.e., a ball) set in front of him/her. Subsequently, the participant may learn to decrease hand mouthing through a cluster-microswitch with an optic sensor embedded in an adaptive frame properly fixed under the lips (Stasolla et al., 2014c). Furthermore, a second participant with ASD and high functioning (e.g., Asperger syndrome) may increase his/her constructive engagement and/or positive participation by behavioral interventions through the use of an AT-based program (Stasolla, Perilli, & Caffò, 2014). Finally, a participant may use an IPAD to communicate his/her needs to a caregiver (Kagohara et al., 2013). All the aforementioned interventions may: (a) have beneficial effects on participants’ mood, (b) reduce significantly caregivers’ s burden, and (c) be favorably endorsed by experts in the field through social validation assessments (e.g., parents of children with developmental disabilities, psychologists, practitioners) (Lancioni, O’Reilly, et al., 2006; Lancioni, Singh, et al., 2006; Stasolla, Caffò, et al., 2015).

Accordingly, the first aim of this chapter is to provide the reader with an overview of the empirical evidences available between 2005-2015, on the electronic database such as SCOPUS, PUBMED, ERIC, PSYCHINFO, regarding AT-based programs for individuals with ASD. Microswitch-based programs, computer-based programs, speech generating devices-based programs, vocal output communication aid-based programs aimed at increasing adaptive responding and reducing challenge behaviors by ASD individuals with different levels of functioning will be systematically reviewed. The second objective of the chapter will be to point out the effects of such AT-based programs on participants’ mood (i.e., indices of happiness), constructive engagement (i.e., positive participation) and staff or caregivers/parents assessment (i.e., social validation). The third purpose of the chapter will be to emphasize strengths and weakness of the reviewed studies. Finally, the chapter will discuss the educational, practical and psychological implications of the overview, underlining some useful guidelines for the future research perspectives in this topic area.