Chapter 3
Selecting Computer–Mediated Interventions to Support the Social and Emotional Development of Individuals with Autism Spectrum Disorder

Kristen Gillespie-Lynch
City University of New York, USA

Naomi Love Gaggi
City University of New York, USA

Patricia J. Brooks
City University of New York, USA

Deborah Sturm
City University of New York, USA

Christina Shane-Simpson
City University of New York, USA

Bertram O. Ploog
City University of New York, USA

ABSTRACT

This chapter is designed to provide parents, professionals, and individuals with Autism Spectrum Disorder (ASD) with tools to help them evaluate the effectiveness of computer-mediated interventions to support the social and emotional development of individuals with ASD. Starting with guidelines for selecting computer-mediated interventions, we highlight the importance of identifying target skills for intervention that match an individual's needs and interests. We describe how readers can assess the degree to which an intervention is evidence-based, and include an overview of different types of experiments and statistical methods. We examine a variety of computer-mediated interventions and the evidence base for each: computer-delivered instruction (including games), iPad-type apps, virtual environments, and robots. We describe websites that provide additional resources for finding educational games and apps. We conclude by emphasizing the uniqueness of each individual with ASD and the importance of selecting interventions that are well-matched to the specific needs of each individual.

SELECTING COMPUTER-MEDIATED INTERVENTIONS TO SUPPORT THE SOCIAL AND EMOTIONAL DEVELOPMENT OF INDIVIDUALS WITH AUTISM SPECTRUM DISORDER

An increasing number of computer-mediated applications are becoming available to support the development of individuals with Autism Spectrum Disorder or ASD (Ploog, Scharf, Nelson, & Brooks, 2013). These applications are often believed to be highly effective and thus are widely used (Fletcher-Watson, 2014; Joshi, 2011), but currently there is limited scientific evidence that they are beneficial to the user. Limitations due to the lack of scientific evidence for the effectiveness of computer-mediated applications (which is not to say that they are *not* effective) may be attributable to the fact that the rate at which computer-mediated interventions for ASD are being developed far exceeds the rate at which research is being conducted to evaluate their effectiveness. Unfortunately, it can be daunting to sift through the proliferation of applications, to evaluate the (often limited) evidence supporting the effectiveness of a given application, and to determine if that application is likely to be useful for an individual with ASD.

The purpose of this chapter is to provide guidelines that help parents, professionals, and people with ASD evaluate and select computer-mediated applications to support the social and emotional development of individuals with ASD. We will provide readers with suggestions for how to select a computer-mediated application for a given individual by presenting evidence for the effectiveness of applications on a variety of platforms, including personal computers, handheld devices, and robots. Throughout this chapter, we will use the terms "computer-mediated" and "computer-based" to refer to all software-controlled interactions, regardless of platform. We will conclude with a synopsis of key points and recommendations for how to locate further information.

CORE DIFFICULTIES ASSOCIATED WITH ASD

ASD is defined by social difficulties and "restricted, repetitive patterns of behavior, interests, or activities" (American Psychiatric Association, 2013). Individuals with ASD often experience difficulties communicating with others and developing relationships. They may attend to people in different ways than typically developing individuals do (Ploog, 2010); for example, they may look less at eyes and faces while interacting (Speer, Cook, McMahon, & Clark, 2007). People with ASD may struggle with recognizing faces, understanding their own and others' more complex emotions (such as pride or jealousy), and regulating their own emotions (Chamak, Bonniau, Jaunay, & Cohen, 2008). Some difficulties in responding to others' faces and emotions may arise from unusual perceptual experiences associated with ASD, such as enhanced or atypical attention to details (Behrmann et al., 2006; Ploog, 2010). People with ASD are often interested in connecting with others but do not always know how to do so, which can lead to feelings of loneliness and depression (Jones et al., 2003).

Our focus in this chapter is computer-mediated applications that address the social-emotional challenges that people with ASD often encounter. However, to select effective computer-mediated applications, it is also essential to consider non-social characteristics associated with ASD that might contribute to social challenges and/or alter how an individual with ASD interacts with computerized interfaces. People with ASD often report atypical sensory experiences (APA, 2013; Bogdashina, 2003): These

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