

Editorial: The Versatility of Using Free Internet Videogames for Motor Therapy for Persons with Disabilities

Virtual reality-based interventions are increasingly popular for motor therapy for persons with disabilities. However, many virtual reality (VR) systems used in these interventions involve cumbersome technologies and expensive, custom-designed videogames [1-4]. As an alternative, there are thousands of videogames freely available on the internet that can capture the attention of almost anyone. These games are often developed by professional designers and are highly polished, vast in number, and of great variety. There are games of: 1) diversions (e.g., card, board, marble, strategy, and puzzle games), 2) imaginary activities (e.g., world ruler, super hero, animal, spy, pirate, adventure, shopping, dress-up, romance, makeover), 3) activities requiring special abilities (e.g., surfing, skiing, scuba/sky diving, hang gliding, combat, race car driver, sports, astronaut, fashion), and 4) activities of daily living (e.g., shopping, washing clothes, ironing, bathing/showering, personal hygiene/grooming, dressing, meal preparation/clean-up, eating, financial/health management). The use of these free internet videogames has the potential to increase the accessibility of VR-based therapies for many populations while also decreasing associated development time and cost.

We have integrated free internet videogames into individualized motor training programs for persons with motor disabilities including stroke and cerebral palsy [3,4]. Briefly, to create these VR-based interventions we use customizable movement conversion software to control free internet games via an off-the-shelf motion sensor and a large screen display for better client immersion. A laptop or desktop computer hosts the software and is connected to the motion sensor, typically a Microsoft Kinect. The conversion software takes the movement data recorded by the motion sensor, identifies when a client-specific movement threshold has been achieved, and activates the keyboard or mouse to interact with the videogame. This solution creates a seamless experience that facilitates the performance of high repetition volumes while simultaneously motivating and challenging the client. Additionally, it allows for a cost-efficient form of biofeedback as an alternative to the rote repetitions traditionally performed in movement therapy.

Our preliminary studies have included persons with stroke and children with cerebral palsy [3,4]; yet the flexibility of our methods are not limited to these two populations nor are they strictly limited to the methods described in the publications. The purpose of this special issue in the *Journal of Intellectual Disability Diagnosis and Treatment* is to demonstrate the versatility of our methods in providing motor training to persons with disabilities under different settings and conditions.

The first two articles focus on girls with Rett Syndrome. In the first article, Dr. Mraz presents our trial and error methods to discover the necessary paths permitting girls with Rett Syndrome to play videogames for motor therapy. In the second article, she reports on the effects of our training program in a single girl with Rett Syndrome.

In the third article, Dr. Behar demonstrates the flexibility of our methods in both the clinic and the home settings. Two participants begin their videogame motor training in their outpatient clinic and then transition the training to their home. Attributes and limitations of the process itself and the effects of the intervention are described.

In the fourth article, Dr. Carter shows how we adapted our methods to take a somewhat mundane intervention (i.e., button pressing task) for persons with unilateral spatial neglect following a stroke and make it more engaging. In this project we demonstrate that we can elicit the same type of visual shift with our methods as those elicited by the button pressing task. We have recruited persons without disability to demonstrate this effect.

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