Choreografish: Co-Designing A Choreography-Based Therapeutic Virtual Reality System With Youth Who Have Autism Spectrum Advantages

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ABSTRACT

Choreografish is a virtual reality, therapeutic arts engagement leveraging participatory research and design to collaborate with young adults with autism spectrum disorder (ASD). The research team was motivated by the social anxiety some with ASD have, and the attendant difficulties accessing art forms that may actually play well to Autism Spectrum Advantages (ASA). This project was co-designed with youth with ASA to explore the use of VR and choreographic thinking to empower users and designers to engage with the arts and self-manage anxiety. This paper describes the project, and gives a brief design history of *Choreografish*.

RESEARCH APPROACH: PARTICIPANT ORIENTED RESEARCH/DESIGN (POR)

Participatory-oriented research and design are committed to an inclusive process with individuals whose real-life, meaningful experiences are critical to examining research issues [3,10,15,22]. POR is an orientation to research and game development that “focuses on relationships between academic and community partners, with principles of co-learning, mutual benefits, and long-term commitment, and incorporates community theories, participation, and practices into the research efforts” [23:312]. It also shares power of knowledge between the community researchers and game developers [20]. The process enables community co-researchers to take equal ownership of the research and to question traditional approaches and curriculum strategies [9]. The approach also promotes social change strategies developed with researchers and community participants to design practical, beneficial programs and games for primarily underserved groups such as those with autism. They bring their experiences, knowledge and abilities into the research process and provide unique perspectives and insights [11]. The combined views of academic professionals and community research partners are critical to our research.

Choreografish screenshot

INDUCTIVE PARTICIPATORY DESIGN

Our initial design was informed by a series of “design box” sessions with the research team [1,16]. While we began with multiple pitches in hand we set them aside to take the time to focus on who the audience was, what problem we wanted to solve, how we wanted the game to feel and which technologies we could leverage allowed us to narrow down our design ideas and constraints. Constraints, after all, breed creativity. Over the course of development, we conducted four focus groups to learn more about autism, to ideate around the project, and to test game mechanics during actual development. Sessions included young adults with autism as well as educators and specialists in ASD. We also had regular drop-ins, parents and young adults who were interested in and found *Choreografish* helpful who visited the lab of their own accord to let their child with ASA experience it. These visits were casual but informed our work. This work leveraged the design box method.

Choreografish Design Box session

CHOREOGRAFISH DESCRIBED

The design of *Choreografish* is the product of initial design box sessions by the research team, focus groups with youth on the spectrum, design box sessions with the student game developers and an iterative development strategy that used multiple playtests with NeuroVersity, graduate dance and game students, as well as the general public from events such as the Sundance Film Festival and smaller, local events. The current prototype is an underwater VR (HTC Vive) experience where the user stands at a pedestal, chooses a song and controls a school of fish that swims around and in front of them on a set path. By manipulating two sliders they control the speed and formation of the fish. They can also rewind the song, and animation of the fish, to get the choreography they desire.

Inspirations For Design: Choreographic Thinking and Arts Access There are many dance games on the market, yet we have not been able to identify choreography games. This left a space for a game that allows users to produce motion patterns that engage and develop “choreographic thinking.” The relationships between moving objects and their coordination to music is of prime interest to the choreographer. Choreographic thinking, by extension, is produced when a person creates relations between objects in space and time through movement [13,18,21]. *Choreografish* enables users to coordinate the actions of external objects to music of their choosing in order to trigger sensations, actions, responses and emotions. It is through synchronizing motor, visual, spatial and auditory inputs that “good Gestalt” of emotional resonance is produced [6].

ACKNOWLEDGMENTS

We would like to thank the University of Utah for its generous funding of the project, as well as the playtesters and volunteers from NeuroVersity, the Therapeutic Games and Apps Lab, and the Marriot Center for Dance

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Choreografish being demonstrated at the Sundance Film Festival, 2016