Virtually Augmented Social Skills Training

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Abstract. This poster will detail a pilot study conducted at the City University of New York assessing the usability of a virtual environment for teenagers. In this study, the PI sought to test the viability of social skills measures for this population, find glitches in the code of tasks built into the virtual environment, and seek feedback from participants on improvements to be made to the intervention. The results of this study will aid in the creation of a social skills intervention designed for individuals with autism spectrum disorders.

Keywords: Second life · Virtual environments · Autism · Social skills

1 Virtual Environment and Social Skills Training Needs

Virtual Environments (VEs) allow for the creation of realistic 3d representations of real world environments which can be interacted with and explored in real time (Cobb et al., 2002). In addition, there are virtual environments that specialize in supporting interactions between large masses of users known as collaborative virtual environments (CVE) and those specializing in supporting interactions between smaller groups or individual users referred to as single-user virtual environments (SVE). Within virtual environments, human representations are employed and controlled by the user. An avatar is a human representation within the VE that represents an actual human, while an agent is a human representation within the VE that represents only a computer algorithm. Virtual environments may be especially suited for training individuals with disabilities in skills that cannot be effectively practiced safely in real life scenarios because of the detrimental outcomes associated with failure in the expression of the targeted skill. For example, VEs have been used to train individuals in skills including crossing the street, grocery shopping, and banking.

An ideal SST intervention identified by Parsons and Mitchell (2002) includes: repetition of the target skill or task; rote learning of social rules; fading of prompts over time; verbal instruction/explanation of the social skill; a consideration of how one's behavior impacts others (i.e. understanding other minds); practice of skills in realistic settings; the ability to practice the skill across contexts; role-play of target behaviors; accessibility and ease of use for schools and teachers; and affordability for home and school environments. Virtual environments have the capability of meeting all of these recommendations.

Autism is a complex developmental disability that involves impairments in social interaction; communication; and restrictive or repetitive behaviors, activities, or

interests (American Psychiatric Association 2000). Autism, or Autistic Disorder, is one of a group of Autism Spectrum Disorders (ASDs), a category that also includes Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) and Asperger's syndrome (AS). According to information from the Center for Disease Control and Prevention, it is estimated that 1 in 68 children in the U.S. have an Autism Spectrum Disorder (http://www.cdc.gov/ncbddd/autism/data.html).

Virtual environments meet the recommendations of McConnell (2002) and they can be manipulated to enhance social skills training for individuals with autism. The virtual world can capture the child's perceptions and fantasies to help confront distorted thoughts as well as problematic behaviors (Smokowki and Hartung 2003). For example, a program to teach children how to interact with a bully would be able to make a bully appear to grow bigger if the input from the user was negative or have the bully shrink in size as the learner uses appropriate ways of communicating with the bully.

2 Pilot Study

A pilot study was conducted with eight participants at the Children's Interactive Learning and Development (CHILD) Lab in the City University of New York (CUNY) Graduate Center. The intent of the study was to assess the usability of Second Life for individuals ages 13–18 as a tool for learning social skills. In addition, the principal investigator (PI) sought to test the viability of social skills measures with this population, find and correct glitches or bugs in the virtual environment, and seek feedback from participants on improvements to be made to the intervention.

2.1 Participants

Healthy subjects between the ages of 13–18 were recruited using CUNY Institutional Review Board (IRB) approved flyers and snowball sampling methods. The Principal Investigator (PI) obtained informed consent and parental consent forms from all eight participants recruited. Subjects were 7 males and 1 female ranging in age from 13–17. The mean age of the participants was 15.5. Subjects were named Ryan, Raymond, Glendon, Christopher, Evan, Rehat, Jerry, and Hannah. All subjects were native English speakers who attended New York City public schools.

2.2 Materials

The materials used for this study were the Social Skills Improvement System (SSIS) Student Rating Scales (13–18) by Gresham and Elliot (2008) and an Apple desktop computer running a multi-user, online virtual reality environment created by Linden Labs called Second Life (SL).

3   Procedures

Subjects participated in this pilot study at the CHILD Lab located in the CUNY Graduate Center. Upon entering the lab for the experiment, the PI explained to each subject that the purpose of the study was to assess their social skills and their ability to complete social skills tasks in a virtual environment called Second Life. In one individual session, subjects completed the SSIS and then were assigned an avatar to use in Second Life. The subjects were restricted to the property of Southern Tier Health Link New York (STHLNY), a nonprofit electronic medical records advocacy group that the PI had partnered with. The PI guided the subject through the basics of how to move and chat in Second Life and when the subjects were comfortable moving around the virtual environment, they were asked to begin the Virtually Augmented Social Skills Training VASST) tasks at a school building on STHLNY's simulation or sim within Second Life designed and built by the PI.

For the pilot study, the VASST program consisted of four tasks. Each task began with a participant clicking on a red box within the virtual school which opened up a dialog menu from which the participant chose the task. Each red box had only one task and one level of the task. When the task was completed successfully, a dialog script told the participant that they made the correct choice and they must click on a blue box to teleport to the next task.

In Task 1, participants were asked to click on one of two computer based agents that they would approach for friendship. Subjects were told by a dialog menu that Person1 was friendly and had many friends, while Person 2 was not friendly and had very few friends. Participants were given the option of choosing a hint. The hint told them that it was best to choose someone friendly as a potential friend.

In Task 2, participants were asked to decide how they would introduce themselves to a potential friend and were given the option of choosing a hint. One introduction read, "Hi my name is_____, what is your name?" and the other introduction read, "What are you doing here?" The hint told the participant that it was best to choose an introduction that introduced themselves and asked the potential friend something about themselves.

For Task 3, participants had to choose the best response to a situation in which they were being threatened by a bully. One response available read, "Tell the bully to stop bothering you" and the other response read, "Ask for help from a teacher, a friend, or the school security guard". If they choose the former response, they were given feedback which said, "A bully may not stop bothering you if you tell them to. There is a better solution. Please try again". The hint told them that it would be best to contact school personnel when dealing with bullies.

For Task 4, participants were asked to choose a coping statement to give to someone who was bullied. One statement read, "I feel sad that you were bullied. I know that you are hurting now, but I hope that you remember that things will get better" and the other statement said, "Looks like you got picked on because you have no friends." The hint in this task told the participant to choose a statement that would address the individual's feelings and make them feel better.

Before each task, the participant was asked how they would act in real life in the situation described in the task. After each task, the participant was asked to explain the choice they made. Participants were given a $10 Amazon.com gift card for participating and they were also asked to voluntarily provide feedback on a short, online survey.

4   Results

All participants completed the SSIS and were able to complete all of the VASST tasks. The SSIS measured social skills, problem behaviors, and academic competence. Sex based norms were used as social skills have been found to develop at different rates for males and females. Christopher received a SSIS Social Skills Scale Standard Score of 96 (Confidence Interval, 89–103) placing him in the average range. Christopher's SSIS Problem Behaviors Scale Standard Score was 128 (Confidence Interval, 122–134) which placed him in the above average range. Glendon received a SSIS Social Skills Scale Standard Score of 104 (Confidence Interval, 97–111) placing him in the average range. Glendon's SSIS Problem Behavior Scale Standard Score was 110 (Confidence interval 104–116) which placed him in the average range. Evan received a SSIS Social Skills Scale Standard Score of 90 (Confidence Interval 83–97) placing him in the average range. Evan's SSIS Problem Behavior Scale Standard Score was 87 (Confidence Interval 81–95) which placed him in the average range. Raymond received a SSIS Social Skills Scale Standard Score of 92 (Confidence Interval 85–99) placing him in the average range. Raymond's SSIS Problem Behavior Scale Standard Score was 104 (Confidence Interval 98–110) which placed him in the average range. Jerry received a SSIS Social Skills Scale Standard Score of 107 (Confidence Interval 100–114) placing him in the average range. Jerry's SSIS Problem Behavior Scale Standard Score was 108 (Confidence Interval 102–114) which placed him in the average range. Ryan received a SSIS Social Skills Scale Standard Score of 93 (Confidence Interval 86–100) which was in the average range. Ryan's SSIS Problem Behavior Scale Standard Score was 101 (Confidence Interval 95–107) which placed him in the average range. Rehat received a SSIS Social Skills Scale Standard Score of 96 (Confidence Interval 89–103) which was in the average range. Rehat's SSIS Problem Behaviors Scale Standard Score was 92 (Confidence Interval 86–98), placing him in the average range. Finally, Hannah's SSIS Social Skills Scale Standard Score was 92 (Confidence Interval 86–98) which was in the average range. Hannah received a SSIS Problem Behaviors Scale Standard Score of 89 (Confidence Interval 82–96) which was in the average range.

A correct response on each VASST task was scored as 1 point. Only the individual's first response was recorded for scoring purposes. While only the individual's first response was used for scoring purposes, all participants were required to choose the correct response before advancing to the next task. The highest possible total score for all tasks was 4 points. Christopher, Glendon, and Evan had VASST scores of 4 points. Jerry, Ryan, and Hannah had VASST scores of 3 points. Raymond and Rehat had VASST scores of 2 points. Sixty-two and a half percent of participants completed Task 1 correctly, 87.5 % completed task two correctly, 62.5 % of participants

completed Task 3 correctly, and 100 % of participants completed Task 4 correctly. Participants demonstrated learning while completing the tasks. For example, Ryan answered that he would "fight someone who tried to bully him" before completing Task 3, but chose a solution for the task that was non-confrontational and involved school personnel to resolve the issue. If they failed on their first attempt, participants were able to make the appropriate response for each task by using the "hint" feature.

5   Conclusion and Discussion

This usability study was successful in confirming that participants would view the virtual environment as a simulation of the real world, participants would be able to navigate and complete tasks in the virtual environment, and participants would learn to use information from the virtual environment coupled with their real world experience to make decisions for the VASST social skills tasks. In addition, participants in this pilot study made suggestions for improvements in the design and implementation of the virtual environment and were able to uncover glitches with scripting that the PI was able to correct.

From participant suggestions as well as witnessing participants complete the VASST tasks, a number of enhancements will be made to the virtual environment. For example, the SSIS Intervention Guide will be used to create personalized interventions for participants based off of data gathered from their SSIS Rating Scales self-report answers. These interventions will be made into additional VASST tasks and the current VASST tasks will have 3 additional levels of complexity for the situations they depict. Lastly, as suggested by multiple participants, the computer based agents, or NPCs, will be animated using a newly available "puppeteering" feature in Second Life. This will allow the participants to be more engaged with the tasks as well as witness vignettes of each VASST task rather than just reading about what each task entails. Using animations should also reduce the cognitive load of understanding each task. This research has the potential to positively impact the lives of many individuals who below average and well below average social skills. Further study must be done with a high-functioning autism population to determine if the intervention will lead to an increase in social functioning. This research is of paramount importance to the field of educational psychology as the findings of future research will further the understanding of virtually augmented training methods as well as their efficacy with an ASD population. Moreover future research may offer a method of preventing some of the detrimental social and emotional effects of victimization. Lastly, as the push for the use of educational technology heightens, future VASST research will give educators and psychologists an intervention to use that can be replicated at low or minimal cost and benefit a host of individuals.

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