ASPERGER’S SYNDROME AND TECHNOLOGY FOR EMOTION RECOGNITION

by

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INTRODUCTION

Albert Bandura is the father of the social cognitive theory that suggests that people learn behavior by observing others. He also states that self-efficacy and self-regulation are a critical component to the learning process. Some of Bandura’s tenants can be related to people who have high functioning autism. Bandura’s theory and the effectiveness of assistive technology, such as video modeling and computer assisted software aid people with high functioning autism in recognizing specific emotion in others.

PART 1

“Understanding emotions is one element of the ability to take another’s perspective” (Lacava, Golan, Baron-Cohen, & Myles, 2007). People with Asperger’s Syndrome, AS, have difficulty distinguishing emotions in others and this leads to numerous social problems throughout their lives such as withdrawal from social situations, making and maintaining friendships, and this even contributes to secondary psychiatric disorders such as depression (Wilkenson, 2007). Baron-Cohen (Polirstok, Houghteling 2006) report that people with Asperger’s have a deficit in executive functioning and are not able to read other’s emotions, as coined in the term, “mind-blind.” Because of this deficit, people with Asperger’s Syndrome need to over learn strategies to address social situations and need a highly structured and systemic approach to learning social skills so strategies can be generalized to a variety of situations, this approach is called Social Skills Instruction (Polirstok, Houghteling, 2006). One of the strengths of people with AS is their visual learning capacity and educators can utilize these strengths to aid in Social Skills Instruction (Sansoti & Powell-Smith, 2008).

Autism and autism spectrum disorders have received notable attention from the general public and the media due to the rise of people being diagnosed with autism spectrum disorders. Autism Speaks (Sansoti & Powell-Smith, 2008) reports that this diagnosis has increased approximately 173% in the past decade, making it the fastest growing developmental disability. What are some of the characteristics of this impairment and how is it viewed differently today than it was twenty years ago? In the past, persons with autism spectrum disorder may have been considered odd, quirky, or socially inept, although this may be the case today among the common lay person, these characteristics are now viewed in the lens of a disability (Polirstok, Houghteling, 2006).

There is some debate about people with High Functioning Autism (HFA) and people with Asperger’s Syndrome (AS) because both are in the autism spectrum and have some similarities with characteristics such as crying, avoidance of social situations and social avoidance but there are major differences in how the brain functions in each of these disorders. Volkmar & Ehlers (Polirstok, Houghteling 2006 ) report that people who are considered HFA, show delays in the left hemisphere of the brain while people with AS show delays in the right hemisphere of the brain. The Diagnostic and Statistical manual of Mental Disorders-Fourth Edition-Text Revision (DSM-IV-TR) states that in order to be diagnosed with Asperger’s Syndrome, there must be a measurable impairment in social interactions. Specifically, individuals with Asperger’s may not develop appropriate peer relationships, may lack empathy for others, may not share enjoyment or interests with other people and will lack nonverbal behaviors such as facial expression, eye contact, and body postures. In addition to these criteria, the DSM-IV-TR also states that the individual must be in the average range of intelligence and there has not been a delay in language development. Because people with Asperger’s function in the average range of intelligence and are mainstreamed into society, it is crucial that social skills are taught so that they can function in society and have healthy relationships and maintain employment. Achieving appropriate social skills for people with Asperger’s Syndrome can be accomplished by using assisted technology such as video modeling and computer-assisted instruction.

PART 2

While there are different strategies to meet the needs of people with Asperger’s, some of the newest research uses assistive technology to facilitate Social Skills Instruction (Lacava, Golan, Baron-Cohen, & Myles (2007). Cook & Hussey (Chmiliar, & Cheung 2007) state that assistive technology (AT) is a general term for various devices that can aid people with disabilities. Derer, Polsrove, & Reith (Chmiliar, & Cheung 2007) further report that assistive technology has the potential to improve the quality of life for people with disabilities. Two of the newest strategies that combine social skills instruction and technology are video modeling and computer-assisted instruction (Sansoti & Powell-Smith, 2008). Video modeling is useful for people with Asperger’s to increase emotion recognition in others and is described as a video that models target behaviors in an organized and systematic manner and then the person memorizes and mimics these behaviors (Sansoti & Powell-Smith, 2008). Computer-assisted instruction also aids people with AS in recognizing emotions in others as a systematic, computer based intervention that teaches people with AS to predict and recognize emotion in others (Lacava, Golan, Baron-Cohen, & Myles 2007).

There have been several studies to demonstrate the effectiveness of video modeling in both school and community settings (Sansoti & Powell-Smith, 2008). These studies have shown that video modeling has increased communication skills, perspective-taking, and spontaneous social interactions. Schreibman, Whalen, & Stahmer (Lang, et al, 2009) state that video modeling has helped reduce challenging behaviors and Sansoti also reports that computer-assisted instruction has also shown a decrease in inappropriate behaviors and an increase in social skills. While these results seem promising, more research needs to be conducted to see if these skills are being transferred to other environments and this could be a fault for the technology (Lacava, Golan, Baron-Cohen, & Myles, 2007). In addition to this, people with AS may be able to perform better in the artificial settings of video modeling and computer assisted instruction rather than in face-to-face interactions with other people (Moore, Cheng, McGrath, & Powell, 2005).

Asperger syndrome has been referred to a *hidden disability* because it does not manifest itself as a difference in physical appearance and “While these individuals may succeed as adults, they continue to have social ‘vulnerabilities’ which often necessitate clinical services” (Wilkenson, 2005, p. 7). People with AS, also have difficulty recognizing emotions in others which can be a hindrance in social situations and can lead to social problems (Wilkenson, 2007). The American Psychiatric Association (Lacava, Golan, Baron-Cohen, & Myles, 2007) reports that individuals with Asperger’s Syndrome have impairment in recognizing facial expressions. Video modeling and computer-assisted instruction are tools that can teach a person with AS to recognize emotion in others (Lacava, Golan, Baron-Cohen, & Myles, 2007). Lavaca further states that various research, although limited in sample size, has shown that both of these techniques have been helpful in teaching people with Asperger’s to recognize emotions in other people and actually calls these interventions promising. “ Many children with ASC [autism spectrum conditions]enjoy technology such as computers, and their relative ease in using clear, rule-based systems make AT an ideal way to support individuals with ASC in various areas of functioning, including the social domain” (Lacava, Golan, Baron-Cohen & Myles, 2007, p. 179).

PART 3

“According to Bandura, since individuals learn best by observing others, learners are tremendously influenced by the role models who they observe” (Gannis, 2009, p.2). Quite simply, people construct knowledge by social interaction with others and by receiving feedback (Hill, Song, & West, (2009). Included in the Social Learning Theory is the idea of self-efficacy. “Self-efficacy refers to the beliefs concerning one’s capabilities to learn or perform behaviors at designated levels” (Schunk, 1996). Schunk also goes on to state that people acquire self-efficacy through modeling and social comparisons.

One experiment that was used to research social modeling was the Bobo doll experiment in 1961 (Artino, 1997). In this experiment, Bandura and his colleagues conducted an experiment that consisted of two experimental groups and a control group. One of the experimental groups observed adults playing with the Bobo doll in a non-aggressive manner while the other experimental group saw adults playing with the Bobo doll in an aggressive manner and the control group did not observe anyone playing with the Bobo doll. The results of the experiment showed that the children who were exposed to the adults who played with the Bobo doll aggressively showed more aggressive behaviors while playing with the Bobo doll than the children who saw the adults playing non-aggressively and the control group (Artino, 1997). “Bandura’s findings suggested that ‘observation of cues produced by the behavior of others is one effective means of eliciting certain forms of responses for which the original probability is very low or zero.” (Artino, 1997, p.5). It is important to note that this learning occurred even though the children were not given any reinforcement such as rewards nor did they observe the role models receiving any reinforcement (Artino, 1997).

Self-efficacy is the “learners perceived capabilities for learning or performing actions at designated levels (Schunk & Zimmerman, 2007). People acquire self-efficacy through modeling and this influences the choice of activities, the effort, the persistence, and the achievement of the learner (Schunk & Zimmerman, 2007). Bandura (Schunk,1996) states that success raises self-efficacy while failure lowers it unless the learner already has a strong sense of self-efficacy. While it is important for the learner to observe a peer’s success there are other factors that play into how the learner will view his or her own success (Schunk, 1996). Schunk goes on to state that factors such as analysis of the learner’s perceived ability, difficulty of the task, and the similarity to the observed peer are key factors to self-efficacy. Learners receive information on their performance through external and internal factors. Internal factors that influence self-efficacy are goal setting and information processing while external factors include rewards and feedback (Schunk, 1996). Another way to acquire information about one’s self-efficacy is through physiological reactions such as heart rate and sweating (Schunk, 1996). It is also important to note that even if a learner has a high self-efficacy the appropriate skill and knowledge level must still be present in order to accomplish the task (Schunk, 1996). Schunk also contends that in order to judge one’s efficacy, the learner needs to consider such factors such as difficulty of the task, the effort required to complete the task, how much outside help one needs and the pattern of success and failure for the learner. In addition to this, there must be a perceived value to the learner otherwise the learner will not be motivated to learn the material or task (Schunk, 1996).

Still another major tenent of Bandura’s social cognitive theory that affects learning is self-regulation. Zimmerman, (Schunk & Zimmerman, 2007) state that self-regulation are one’s self thoughts, feelings, and actions that impact learning. Zimmerman contends that there are three phases to self-regulation which are forethought, performance control, and self-reflection. Forethought precedes the behavior and one aspect of it is goal setting while performance control occurs during the behavior and are processes such as social comparisons, feedback, and learning strategies (Schunk & Zimmerman, 2007). Zimmerman and Schunk have expounded on Bandura’s theory and postulate that there are four levels of development, observational, emulative, self-controlled, and self regulated. Observation is obtaining a skill from a modeled behavior while emulation is the application of the skill with assistance, and both of these levels are impacted by social factors. The self-controlled level is where the learner internalizes the skill and the last level is self-regulation where to learner adapts the skill to fill his or her own personal preference and style (Schunk & Zimmerman, 2007).

PART 4

The basic premise of Bandura’s social learning theory is behavior is learned by observing others and while this observation can be a live demonstration, it can also be a videotape or filmed model (Corbett,& Abdullah, 2005). Webster-Stratton report that (Corbett & Abdullah, 2005) video modeling can be used for modeling and it has been used for social skill instruction in children with social problems. Corbett & Abdullah further explain that video modeling is effective because it reinforces the four processes of attention, retention, production, and motivation that are needed for learning to occur. Video modeling is effective for attention because it “provides a restricted field of focus” (Corbett & Abdullah, 2005, p. 4). Corbett & Abdullah go on to explain that video modeling aids in the retention process because the person can watch the video repeatedly and gain multiple exposure to the desired behavior. The third step in the learning process is motor production and Corbett & Abdullah report that “video modeling techniques are generally active processes that allow for the production of the observed behavior through practice” (Corbett & Abdullah, 2005, p. 4). Finally, the learner must have the motivation to reproduce the behavior. Videos are often seen as a recreational pursuit and this could reinforce the motivation in the learner (Corbett & Abdullah, 2005, p. 4). Dorwick & Jesdale, (Corbett & Abdullah, 2005) report that since video modeling utilizes attention, retention, reproduction, and motivation, and it can be a highly effective tool to teach social skills to individuals.

Self efficacy is a one’s perception of his or her capacity to learn a new behavior. One of the ways that learners acquire self-efficacy is through modeling the behavior others. Video modeling and computer assisted technology target modeling and the results show that it is very successful in teaching social skills to people with AS. Other factors in increasing self efficacy are rewards and feedback. Rewards and feedback are a crucial key to using this software and support self efficacy. The assistive technology had a reward system built into it and most of the students in the study found it motivating (Lacava, Golan, Baron-Cohen, & Myles, 2007). Overall, there are components of the technology that would increase self efficacy such as modeling and success rates but it would not aid in setting goals.

Self-regulation is one’s thoughts, feelings, and actions that impact learning. The three phases of self-regulation are forethought, performance control and self-reflection. Forethought precedes the behavior and one of the aspects is goal setting. The next phase is performance control which occurs during the performance and includes social comparisons. The technologies support performance control because both video modeling and computer assisted instruction are based on the person with AS making social comparisons. There are also four levels to self-regulation which are observation, emulation, self-controlled, and self-regulation. The purpose of video modeling and computer assisted technology is for the person with AS to observe the person in the simulation and then use the technology to emulate the behavior. The goal of both of these programs is for the person with Asperger’s to internalize the behavior and then adapt it to fit his or her life. The research indicates that the technology supports Bandura’s tenent of self-regulation.

Overall, assistive technologies used with people with Asperger’s syndrome support the major premises of Bandura’s social cognitive theory. The basic premise of Bandura’s theory is that people learn behavior by observing others. The heart and soul of both video modeling and computer assisted technology is modeling a peer’s behavior. The assistive technology grabs the attention of the viewer and then it aids with retention because the person can watch it repeatedly. The technology allows for production because the person is expected to perform the task that has been modeled and finally, motivation is high because people view videos as a recreational pursuit. In addition to this, the technology increases self-efficacy through successfully modeling behavior to the person with AS and furthermore, the studies have shown that this software is successful in helping people with AS in social skills. While goal setting aids in self-efficacy it is not a component in video modeling or computer assisted technology and therefore, this would not increase self efficacy. However, rewards do increase self efficacy and this is an integral part of the technology. Self-regulation is another tenant to Bandura’s social cognitive theory. Two of the three phases of self-regulation are forethought and performance control. Forethought is goal setting and this is not a component in the assistive technology and therefore does not aid in self-regulation but performance control is major component and therefore, this piece would aid in self-regulation. There are also four levels to developing self-regulation, observation, emulation, self-control, and self-regulation. Observation and emulation is the major component and the very reason the technology is used in both of the technologies.

REFERENCES

American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders (4th ed., text rev.). Washington, DC: Author.

Artino, A. (2007). Bandura, Ross, and Ross: Observational learning and the Bobo doll. *Online Submission*, Retrieved from ERIC database.

Chmiliar, L., & Cheung, B. (2007). Assistive technology training for teachers--innovation and accessibility online. *Developmental Disabilities Bulletin*, *35*18-28. Retrieved from ERIC database.

Corbett, B., & Abdullah, M. (2005). Video modeling: Why does it work for children with autism?. *Journal of Early and Intensive Behavior Intervention*, *2*(1), 2-8. Retrieved from ERIC database

Ganis, F. (2009). Social Learning" Buzz masks deeper dmensions: Mitigating the confusion surrounding "social learning. *Online Submission*, Retrieved from ERIC database.

Hill, J., Song, L., & West, R. (2009). Social learning theory and web-based learning environments: A review of research and discussion of implications. *American Journal of Distance Education*, *23*(2), 88-103. Retrieved from ERIC database.

Lacava, P., Golan, O., Baron-Cohen, S., & Myles, B. (2007). Using assistive technology to teach emotion recognition to students with asperger syndrome: A pilot study. *Remedial and Special Education*, *28*(3), 174-181. Retrieved from ERIC database.

Lang, R., Shogren, K., Machalicek, W., Rispoli, M., O'Reilly, M., Baker, S., et al. (2009). Video self-modeling to teach classroom rules to two Students with asperger's. *Research in Autism Spectrum Disorders*, *3*(2), 483-488. Retrieved from ERIC database.

Moore, D., Cheng, Y., McGrath, P., & Powell, N. (2005). Collaborative virtual environment technology for people with autism. *Focus on Autism and Other Developmental Disabilities*, *20*(4), 231-243. Retrieved from ERIC database.

Polirstok, S., & Houghteling, L. (2006). Asperger Syndrome: A primer for behavioral interventionists. *Journal of Early and Intensive Behavior Intervention*, *3*(2), 187-195. Retrieved from ERIC database.

Sansosti, F., & Powell-Smith, K. (2008). Using computer-presented social stories and video models to increase the social communication skills of children with high-functioning autism spectrum disorders. *Journal of Positive Behavior Interventions*, *10*(3), 162-178. Retrieved from ERIC database.

Schunk, D. (1996). *Self-efficacy for learning and performance*. Retrieved from ERIC database.

Schunk, D., & Zimmerman, B. (2007). Influencing children's self-efficacy and self-regulation of reading and writing through modeling. *Reading & Writing Quarterly*, *23*(1), 7-25. Retrieved from ERIC database.

Wilkinson, L. (2007). Adults with Asperger Syndrome: A childhood disorder grows . *Online Submission*, Retrieved from ERIC database.