

Technological Interventions and Facial Emotional Recognition in Autism Spectrum Disorders

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1. Introduction

Individuals with Autism Spectrum Disorders (ASD) have deficits in the recognition of facial expressions when compared with typically developing population (Begger et al., 2006 & Deruelle et al., 2004). Computer training and multi-technology have been shown to be successful in teaching emotional skills to children with autism (Golan & Baron-Cohen, 2006; Silver & Oakes, 2001; Tanaka et al., 2010). We can find numerous educational technological resources that aim to teach facial recognition to people with ASD, but few present empirical validation of results. The majority of these techniques are non-standardized material, with no reference to research work (Ryan & Charragáin, 2010).




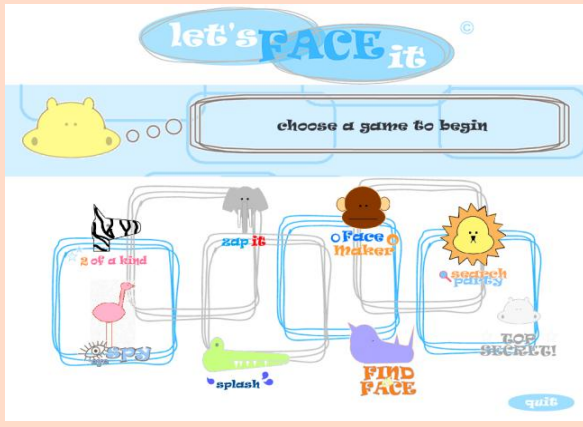

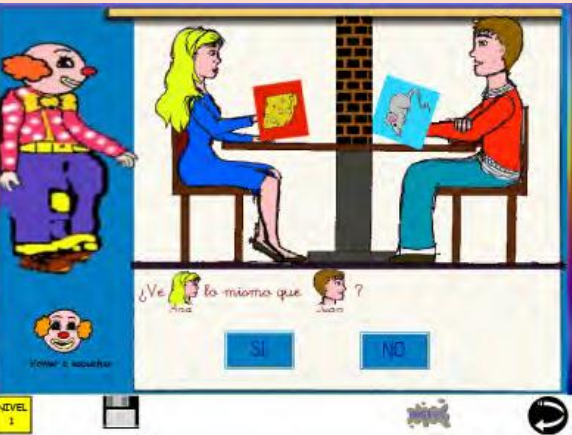
2. Objective

To present computer games with scientific research validation in facial emotional recognition and emotions teaching for people with ASD.

3. Method

The research took place between February and August of 2011. We recall to EBSCO, Google and Google Scholar, parents of children with ASD’s forums, autism and special education organizations websites. Computer games found were characterized according to source, target-population, empirical studies, game-task and a critical reflection is offered.

4. Results

Valid Games (n=6) Images of print screen shoots	Source	Target-Population	Empirical Studies	Game Task	Critical Reflection
 The Emotion Trainer	Teaches to recognise and predict emotions in others Silver & Oakes (2001), St. James Hospital, Leeds, Hull University (UK)	Children with ASD, age > 7yrs	Silver & Oakes (2001)	Game tasks focus on expression recognition, interpretation and emotion prediction in context.	This game uses photos of real people and values mental states but the player needs good reading skills and is not very interactive.
 Mind Reading	Teaches emotional recognition Baron-Cohen et al., (2004), Cambridge University, (UK)	Adults and children with ASD	Baron-Cohen, Golan, Wheelwright & Hill (2004) Golen & Baron-Cohen (2006) Golan, Baron-Cohen, Hill & Rutherford (2007) Lacava, Golan, Baron-Cohen & Miles (2007)	3 types of games: Emotions library, learning centre and game zone. Possibility of creating own lessons and matching faces to voices.	Advantage of use of voice in the expression of emotions; good customizing options. Players need good reading skills. The lessons offered are very scholar type and could be more fun.
 Secret Agent Society	Develops emotional and social understanding skills Beautmont & Sofronoff (2008), Queensland University, Austrália	Children (8-12yrs) with high functioning autism and Asperger Syndrome	Beautmont & Sofronoff (2008)	The player is a junior detective cartoon character that has to complete 3 game levels. At 1st level, evaluates suspects through their facial expressions and body language and also recalls to physiological tools to measure own emotional reaction. At 2 nd level, learns to look at context and non-verbal info. In last level, completes virtual reality missions about specific topics (e.g. bullying).	Game also includes complementar courses for parents and teachers to learn how to best use the game. Role-play sessions and writing material about the game are also provided. The theory behind the game is not very clear and could be better explained.
 Let's Face It!	Teaches face processing skills, targeting specific face impairments associated with autism Tanaka et al., (2010), Universities of Victoria, Canada; Yale, USA; Rutgers, USA; Pennsylvania School of Medicine, USA	Children with ASD	Tanaka, Lincoln & Hegg (2003) Tanaka et al., (2010)	Seven interactive games with 24 complexity levels focused on recognition of identity across expressions, viewpoint and features, analytic and holistic face processing strategies and attention to eyes.	Strong theoretical background with development of the Hierarchical Face Processing model (Tanaka, Lincoln & Hegg, 2003). Game tasks are fun, simple and motivating. Game is accessible even for low functioning children. Only valid game with free download: http://web.uvic.ca
 Face Say	Teaches social skills attending to eye gaze and recognizing faces and emotions Hopkins et al., (2011), Alabama University, USA	Children with low and high functioning autism	Hopkins et al., (2011)	Three interactive games with realistic avatars: Amazing Gazing, Baid Aid Clinic and Follow the Leader.	Game recalls to realistic interactive characters. This is the only game that claims to help children to generalize social skills to playground context.
 Aprende Con Zapo	Teaches social and emotional skills Lozano, Ballesta & Alcaraz (2011), Murcia University, Spain	Primary and secondary school students with ASD (8-18yrs)	Lozano & Alcaraz (2011)	Two groups of games: Teaching facial recognition (5 levels) and action prediction based in people's believes (true and false) (5 levels)	Many game tasks are focused on Theory of Mind (ToM). Technology used is very basic and player needs good reading skills.

5. Conclusions

Several technological resources were found, but few present validated results. The variability of game tasks, type of characters and game *interface* is vast, maybe due to the diversity of the target population itself. Computer games are precious tools in the emotions and facial recognition teaching for children with ASD. Golan and collaborators (2009) believe that these children need to be intrinsically motivated to ensure that they pay attention to social-emotional stimuli that are of little interest for them. Computers offers a consistent, stable and free of social pressure environment, that is very pleasing to children with ASD (Moore, McGrath, & Thorpe, 2000), being this an area to be consider for future developing.

6.References

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