Using Stop-Motion Video with Advertising to Promote Perceptions Judgment of Others and Situational Awareness in Adolescents with ASD

Chien-Hsu Chen, National Cheng Kung University, Taiwan I-Jui Lee, National Cheng Kung University, Taiwan

The Asian Conference on Society, Education & Technology 2015 Official Conference Proceedings

Abstract

Individuals with autism spectrum disorders (ASD) are characterized by deficits in understanding others' minds, an aspect of which involves recognizing emotional signals. In this study, we used Stop-Motion Video (SMV) with advertising to focus on the broad range of nonverbal social cues to promote perception judgments of others and situational awareness in adolescents with ASD. We reviewed judgment data from typically developing (TD) children (n = 38) and those with ASD (n = 33), all between the ages of 10 and 14. We examined the differences between their judgments data after they viewed two types of advertising videos: Video-Based Advertising (VBA) & SMV. The results indicated that SMV materials offered structured and specific social signals of close-up images for adolescents with ASD, helping raise their levels of perceptions judgment and situation comprehension.

Keywords: Perceptions of Others; Situational Awareness; Close-Up Images; Stop-Motion Video



The International Academic Forum www.iafor.org

Introduction

ASD are mainly characterized by deficits in the development of socialization and communication skills, particularly impairments in social–emotional reciprocity and non-verbal communication such as gestures, eye contact, and facial expressions (APA, 2000). Individuals with ASD only respond to the dialogue with other people using echolalia because they find that it is difficult to interpret nonliteral language, such as sarcasm and metaphor (Krasny, Williams, Provencal, & Ozonoff, 2003). Peoples with ASD have a range of cognitive and affective defects, resulting in individuals' difficulty in recognizing perceptions in themselves and others (Lacava, Golan, Baron-Cohen, & Myles, 2007). Although they may understand and recognize basic emotions, they still have difficulty in understanding more complex emotions in both themselves and others (Bauminger, 2004; Capps, Yirmiya, & Sigman, 1992; Hillier & Allinson, 2002).

Related Work

According to Theory of Mind (often abbreviated "ToM") studied by Baron-Cohen, Leslie, and Frith (1985), people with ASD are deficient in the ability to view things from other people's perspective—the ability to empathize. Individuals with ASD lack such abilities, especially intuitive awareness of others' emotion. This phenomenon leads people with ASD to experience barriers and hesitation when responding to facial expressions and emotions; not only is it difficult for people with ASD to identify emotions (Dyck, Ferguson, & Shochet, 2001), and perceiving gazes (Ashwin, Ricciardelli, & Baron-Cohen, 2009).

Most studies have found facial expressions are a key determinate non-verbal cues in social development and ability to interact with others (Back, Ropar, & Mitchell, 2007; Baron-Cohen, Wheelwright, & Jolliffe, 1997). There is also thought to be impaired in autism understanding more complex emotional and social information from facial stimuli (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). Although the majority of studies have focused on face stimuli, there is other evidence to propose that the impairments of emotion processing may also be present in other types of visual stimuli such as body movement (Hubert et al., 2007; Moore, Hobson, & Lee, 1997). Furthermore, studies have verified emotion processing in ASD across a broad range of social signals involve the face, body movement, vocal (Philip et al., 2010), and in context (Golan, Baron-Cohen, & Golan, 2008; Klin, Jones, Schultz, Volkmar, & Cohen, 2002).

For example, Blum-Dimaya, Reeve, Reeve, and Hoch (2010) also demonstrated that individuals with ASD can be taught through facial pictures and video training to develop social communication skills, and can learn to focus on the specific visual representation and facial cues to judge others' emotions. Furthermore, clinical observation has proven that films and videos can significantly arouse the levels of motivation in children with ASD (Mechling, 2005). Video based instruction are attracted to making these visual stimuli an effective approach in teaching functional, social, and behavioral skills to individuals with ASD (Ayres & Langone, 2005; Bellini & Akullian, 2007). Another study reported benefit from use photographs (Bolte et al., 2002; Tseng & Do, 2010) and parts of facial expressions as experimental stimuli to train adolescents with ASD to focus on specific visual characteristics and facial cues in order to teach them to recognize the perceptions of other people (Axe & Evans, 2012) and social situations (Bernard-Opitz, Sriram, & Nakhoda-Sapuan, 2001).

Why need to create SMV materials?

Accordingly, previous studies in ASD have focused on the use of facial stimuli which combined the specific attributes of social-emotional function can as a means to encourage adolescents with ASD to develop social emotional function. However, the studies only focused on facial stimulate, face recognition, and facial emotion recognition (Back et al., 2007; De Sonneville et al., 2002), it might not cover situations and interactive plots in all coherent linkage in social-communication, so we try to reinvent the visual media of advertising video as the main testing material for adolescents with ASD to increase their situational awareness with social contents and promote their perception of other people. But, direct to use the advertising video for individuals with ASD is too complicated and fast, individual with ASD is difficult to understand the social signals and details in the film without visual supports (Quill, 1997). Therefore, the goal of this study was created SMV materials to enable adolescents with ASD to enhance perceived value on their perceptions of others and situational awareness through the viewing key frame selection based on specific nonverbal social cues, including close-up of facial expressions, body movements, and particularly in situations. To date, we can use this visual support of advertising that using static and concrete images of non-verbal social cues with advertising has become a strategy for adolescents with ASD to improve the ability of recognize perceptions of others.

Methods

In this study, we arranged two different types of advertising videos to test: VBA and SMV test—in order to understand whether the particular type of advertisement video can improve the ability of adolescents with ASD to judge situations and enhance their perceptions of others. VBA test included dynamic advertisement videos, and SMV test was created from frozen images captured from the VBA.

Participants

Thirty-eight TD children and 33 adolescents with ASD in the elementary and junior high school in Taiwan were chosen as the participants. The participants ranged in age from 10 to 14 (mean age = 12.35). The ratio of TD children was male: 28, female: 10; among adolescents with ASD the ratio was male: 28, female: 5. All members of the ASD group had previously received a diagnosis of an ASD through multidisciplinary assessment of clinical services in Taiwan; all possessed the disability identification card issued by medical institutions, and all received counseling in special education schools in Taiwan. Moreover, their full-scale IQ were more than 80, and their mean (SD) full-scale IQ, verbal IQ, and performance IQ scores were 92 (10.07), 89 (10.23), and 91 (8.73), respectively. They were able to read and use computers, and all had experience in watching advertisements on TV. All participants signed a youth assent form.

Test Materials: Stop-Motion Video

SMV was created from frozen images captured from VBA. In each video we selected 10 to 15 freeze-frames sequentially in accordance with video context and story development; including 3 to 5 close ups of facial expressions, situations, and body movements to develop SMV materials for participants with ASD (see Figure 1).



Stop-Motion Video with Advertising (SMV)

Figure 1 Example of SMV materials were created from VBA to promote the nonverbal social cues of social communication skills

Procedure

The TD children and adolescents with ASD watched VBA and SMV. The entire VBA and SMV materials were played back on the desktop PC. The SMV test began eight weeks after the VBA test to reduce recall interference. The experimental procedures were identical for all participants. The test for adolescents with ASD was conducted individual test in a special education room (3m*5m) containing a table and chairs, an Intel Core i7 personal computer, with a counselor and a professional teacher accompanying each student in order to avoid having the students influence each other's answers. Before watching the videos, (a) the participants received explanations of the meanings of the 12 emotion adjectives, includes six basic emotions (happy, sad, angry, surprised, fearful, and disgusted) and six complex emotions (disappointment, pain, stress, warmth, desire, and satisfaction). After watching the videos, (b) the participants chose one of the 12 emotion adjectives which could best reflect the feelings of the characters (perceptions of others) in each video, (c) then select the best answer to describe the video's situation. The therapist accompanied among participants with ASD answered the questionnaire (each question with a standard answer) to verify that participants truly understood the descriptions of the story situations, as well as to help us calculate the correct rate of perception and comprehension judgment.

Questionnaire for VBA and SMV Tests

This questionnaire was designed to examine the participants with ASD can or cannot judge the feelings of the characters in each video. The each test in the video which consisted of 2 sections: 1) judgments of role's emotions; 2) situational judgment; this test involves the ToM ability to understand characters' mental state terms and match them to the test picture represents a state.

Results

Perceptions judgment

Among the adolescents with ASD, their correct judgment rate on their perceptions of others also improved from 32.77% in VBA to 68.91% in SMV. This finding demonstrated to improve between the two tests (VBA & SMV). The average correct judgment rate in SMV test was increased, indicating that in SMV test, the correct judgment rate on their perceptions of others increased. This finding indicated that in SMV test enhanced focus on the fixed visual structure and enlarged details of facial expressions, body movements and other non-verbal social cues provided for adolescents with ASD increases pay more attention on those social signals to enhance their judgments. To perform a paired t-test (Bland & Altman, 2010) were used to compare the relationship between the two test values. The difference in assessment performance between the VBA and SMV tests was significant (p < .05) for ASD group, indicating that the SMV material was effective.

Situational comprehension

Among the adolescents with ASD, their situational comprehension rate also improved from 34.45% in VBA to 72.27% in SMV, indicating that fixed visual structure and enlarged details of plots improved the situational awareness of the adolescents with ASD. The positive phenomenon was observed in adolescents with ASD: the simplified and structured freeze-frames with advertising helped them become sure of their feelings and improved their judgments related to empathy. To perform a paired t-test (Bland & Altman, 2010) were used to compare the relationship between the two test values. The difference in assessment performance between the VBA and SMV tests was significant (p < .05) for ASD group, indicating that the SMV material was effective.

Discussion and Conclusions

In this study, we found SMV materials can be applied to adolescents with ASD to help them focus attention in specific nonverbal social cues on the situations and perceptions of others, indicating that adolescents with ASD can be attracted by the facial expressions, gesture, and situations from the close-up structure of an advertisement in SMV test. The SMV can help adolescents with ASD develop their observation ability in perceptions judgment for others and promote their comprehension of situations. In the VBA test beginning, participants with ASD group always cannot pay attention to watching the whole video, they feel too complex and difficult to understand the story scenario, and eventually feel bored, they cannot tell the story meaning to the therapist, and confuse the more complex emotion interaction in different context, however, when the SMV materials applied, they improve their judgment ability to determine the relationship and activities between the roles, they more easily to judge the perception of others and situational awareness, and they more likes to initiative to ask questions about the story and communicate with the therapist. It shows that a limited amount of information with structured and specific close-up images was found to help adolescents with ASD improve their situational awareness and perceptions of others. As a whole, although adolescents with ASD may encounter other barriers, the visual support and structured situational characteristics of advertisements were beneficial to their perceptions awareness, and also helped them to develop social-emotional function.

References

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

Ashwin, C., Ricciardelli, P., & Baron-Cohen, S. (2009). Positive and negative gaze perception in autism spectrum conditions. *Social Neuroscience*, *4*(2), 153-164.

Axe, Judah B., & Evans, Christine J. (2012). Using video modeling to teach children with PDD-NOS to respond to facial expressions. *Research in Autism Spectrum Disorders*, *6*(3), 1176-1185.

Ayres, K. M., & Langone, J. (2005). Intervention and instruction with video for students with autism: A review of the literature. *Education and Training in Developmental Disabilities*, 40(2), 183-196.

Back, E., Ropar, D., & Mitchell, P. (2007). Do the eyes have it? Inferring mental states from animated faces in autism. *Child Development*, 78(2), 397-411.

Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a "theory of mind"? *Cognition*, *21*(1), 37-46. doi: citeulike-article-id:550127

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The "Reading the Mind in the Eyes" Test revised version: a study with normal adults, and adults with Asperger syndrome or high-functioning autism. *J Child Psychol Psychiatry*, *42*(2), 241-251.

Baron-Cohen, S., Wheelwright, S., & Jolliffe, T. (1997). Is there a "language of the eyes"? Evidence from normal adults, and adults with autism or Asperger Syndrome. *Visual Cognition*, 4(3), 311-331.

Bauminger, N. (2004). The expression and understanding of jealousy in children with autism. *Development and Psychopathology*, *16*(1), 157-177.

Bellini, S., & Akullian, J. (2007). A meta-analysis of video modeling and video selfmodeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children*, 73(3), 264-287.

Bernard-Opitz, V., Sriram, N., & Nakhoda-Sapuan, S. (2001). Enhancing social problem solving in children with autism and normal children through computer-assisted instruction. *Journal of Autism and Developmental Disorders*, *31*(4), 377-384.

Blum-Dimaya, Alyssa, Reeve, Sharon A., Reeve, Kenneth F., & Hoch, Hannah. (2010). Teaching Children with Autism to Play a Video Game Using Activity Schedules and Game-Embedded Simultaneous Video Modeling. *Education and Treatment of Children, 33*(3), 351-370.

Bolte, S., Feineis-Matthews, S., Leber, S., Dierks, T., Hubl, D., & Poustka, F. (2002). The development and evaluation of a computer-based program to test and to teach the recognition of facial affect. *Int J Circumpolar Health, 61 Suppl 2*, 61-68.

Capps, L., Yirmiya, N., & Sigman, M. (1992). Understanding of simple and complex emotions in nonretarded-children with autism. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *33*(7), 1169-1182.

De Sonneville, L. M. J., Verschoor, C. A., Njiokiktjien, C., Op het Veld, V., Toorenaar, N., & Vranken, M. (2002). Facial identity and facial emotions: Speed, accuracy, and processing strategies in children and adults. *Journal of Clinical and Experimental Neuropsychology*, 24(2), 200-213.

Dyck, M. J., Ferguson, K., & Shochet, I. M. (2001). Do autism spectrum disorders differ from each other and from non-spectrum disorders on emotion recognition tests? *European child & adolescent psychiatry*, *10*(2), 105-116.

Golan, O., Baron-Cohen, S., & Golan, Y. (2008). The 'Reading the mind in films' task [child version]: Complex emotion and mental state recognition in children with and without autism spectrum conditions. *Journal of Autism and Developmental Disorders,* 38(8), 1534-1541.

Hillier, A., & Allinson, L. (2002). Understanding embarrassment among those with autism: Breaking down the complex emotion of embarrassment among those with autism. *Journal of Autism and Developmental Disorders*, *32*(6), 583-592.

Hubert, B., Wicker, B., Moore, D. G., Monfardini, E., Duverger, H., Da Fonseca, D., & Deruelle, C. (2007). Brief report: recognition of emotional and non-emotional biological motion in individuals with autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, *37*(7), 1386-1392.

Klin, A., Jones, W., Schultz, R., Volkmar, F., & Cohen, D. (2002). Visual fixation patterns during viewing of naturalistic social situations as predictors of social competence in individuals with autism. *Archives of General Psychiatry*, *59*(9), 809-816.

Krasny, L., Williams, B. J., Provencal, S., & Ozonoff, S. (2003). Social skills interventions for the autism spectrum: essential ingredients and a model curriculum. *Child and Adolescent Psychiatric Clinics of North America*, *12*(1), 107-+.

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

Mechling, Linda. (2005). The Effect of Instructor-Created Video Programs to Teach Students with Disabilities: A Literature Review. *Journal of Special Education Technology*, 20(2), 25-36.

Moore, Derek G., Hobson, R. Peter, & Lee, Anthony. (1997). Components of person perception: An investigation with autistic, non-autistic retarded and typically developing children and adolescents. *British Journal of Developmental Psychology*, 15(4), 401-423.

Philip, R. C., Whalley, H. C., Stanfield, A. C., Sprengelmeyer, R., Santos, I. M., Young, A. W., . . . Hall, J. (2010). Deficits in facial, body movement and vocal emotional processing in autism spectrum disorders. *Psychol Med*, *40*(11), 1919-1929.

Quill, K. A. (1997). Instructional considerations for young children with autism: The rationale for visually cued instruction. *Journal of Autism and Developmental Disorders*, *27*(6), 697-714.

Tseng, Rung-Yu, & Do, Ellen Yi-Luen. (2010). Facial expression wonderland (FEW): a novel design prototype of information and computer technology (ICT) for children with autism spectrum disorder (ASD). Paper presented at the Proceedings of the 1st ACM International Health Informatics Symposium, Arlington, Virginia, USA.

Contact email: chenhsu@mail.ncku.edu.tw