TOWSON UNIVERSITY
OFFICE OF GRADUATE STUDIES

BY WORD OF MOUTH: PILOT TEST COMPUTERIZED ATTENTION TRAINING TO IMPROVE SOCIAL ATTENTION IN AUTISM

by

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A Thesis

Presented to the faculty of

Towson University

In partial fulfillment for the degree

Master of Arts

Department of Clinical Psychology

Towson University
Towson, Maryland, 21252

May, 2017

TOWSON UNIVERSITY
OFFICE OF GRADUATE STUDIES

THESIS APPROVAL PAGE

This is to certify that the thesis prepared by [INSERT Student's Name] Yvette Bean

entitled [INSERT Title of Thesis]

By Word of Mouth: Pilot Testing Computerized Attention Training to Improve Social Attention in Adults with Autism

has been approved by the thesis committee as satisfactorily completing the thesis requirements for the degree _ [INSERT Type of Degree] Master of Psychology
(for example, Master of Science)

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Abstract

By Word of Mouth: Pilot Testing Computerized Attention Training to Improve Social Attention in Autism

Yvette Bean

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder with diagnoses quickly on the rise. The disorder exhibits several deficits, particularly the processing of social information. Research suggests that individuals with ASD have an irregular gaze pattern and may glean social information from the mouth instead of the eyes. To this end, this thesis used an altered dot-probe task as an attention training mechanism for increasing the degree to which individuals with ASD gaze at the mouth. A descriptive analysis and paired sample t-tests shows that the means for identifying the probe during the dot probe task did decrease with accuracy remaining stable. Means on pre and post measures depict trends of increased social competence. Correlations between changes scores for reaction time and pre and post measures, however; do not support this claim. The study would need to be replicated with a larger sample to further explore this contradiction.

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Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by two major areas: deficits in social communication and interaction; and limited/repetitive sequences of behaviors, interests, or activities. Symptoms of ASD begin in early childhood and persist into adulthood. Individuals with ASD often have several comorbidities, such as an intellectual disability, Attention Deficit Hyperactivity Disorder, and sleep issues (American Psychiatric Association, 2013). The severity and manifestation of ASD vary greatly, but deficits impair daily functioning (American Psychiatric Association, 2013) and can make it difficult to become contributing members of society. Intervention costs and medical bills for ASD and its comorbidities are expensive and can be a burden for many families. Total healthcare costs for a child with ASD can reach $22,653 with Medicaid and $5254 with a private insurer per year (Wang, Mandell, Lawer, Cidav, & Leslie, 2012).

The social deficit component can prevent those with ASD from interpreting social cues appropriately and from effectively communicating with those around them. Treatment options have been explored to ameliorate these social deficits, but the outcomes have produced varying results due to the complexity of social processing and interaction (Wang & Spillane, 2009). Thus, additional treatment methods and improvements to existing treatment options for those with ASD would be beneficial, especially in the area of social interaction and communication.

One area of social interaction and communication, the eye-gaze pattern of those with ASD, suggests that they visually attend to others' faces in patterns not consistent with gaze patterns of typically developing peers. Typically developing children tend to systematically look at others' eyes and mouth in a triangular gaze path (see Figure 1)

(Bayram & Esgin, 2012). Individuals with ASD tend not to exhibit such a systematic gaze pattern, but instead focus on non-focal regions (i.e., any area other than then eyes, mouth, nose). Some examples include ears, cheeks, or forehead. (Irwin & Brancazio, 2014).

Even if the individual with ASD exhibits a triangular gaze pattern, they tend to focus less on the eyes than typically developing children (Bayram & Esgin, 2012). This is problematic because perception of others' emotions and facial recognition represent vital social information one typically gathers from others' eyes (Bayram & Esgin, 2012). A study by Wallace, Coleman, Pascalis, and Bailey (2006) examined the identification of eye gaze direction using the whole face, the eye region alone, and directional arrows. The study demonstrated that typically developing individuals possess a sensitivity to direct eye gaze (as opposed to averted) and use the whole face to aid in the processing of eye-gaze direction. Individuals with ASD did not illustrate the same sensitivity to direct eye gaze or the use of whole-face processing. This difference may explain why individuals with ASD avoid direct eye contact and may indicate differences in areas of the brain used in social processing (Wallace et al., 2006).

Research may point to the importance of the eyes of others for gleaning social information, but the eyes of others can be aversive to individuals on the spectrum (Stagg, Davis & Heaton, 2013). Stagg et al. (2013) propose that the eyes are aversive or lack stimulation due to hyper or hypo-arousal (too much vs. not enough arousal) in persons with ASD. Hyper-arousal is thought to associate with unpleasant feelings when gazing at eyes, which therefore elicits avoidance of eye contact. Hypo-arousal is based on the notion that eyes are not salient enough to draw proper attention to that location during social interaction. Hypo-arousal seems to be more associated with those with language

delays on the spectrum. The differences in social processing, the abnormal gaze pattern, and the fact the eyes may cause hyper or hypo arousal indicate that teaching those with ASD to glean information from the eyes may be a difficult task.

As an alternative to eyes, some research suggests that individuals with ASD can glean vital social information when visually focused on the mouth of others (Klin, Jones, Schultz, Volkmar & Cohen, 2002). It was originally thought that all individuals on the spectrum have a propensity to view objects (as opposed to social stimuli). However, this tendency seems to vary across the spectrum and does not necessarily indicate more severe symptoms (Pierce, Conant, Hazin, Stoner & Desmond, 2011). In actuality, individuals with ASD seem to have at least one of three major fixations: mouth, body, or objects. Fixations with the mouth are associated with greater social competence (Klin et al., 2002). Gazing at the mouth appears to help with facial and emotional identification and may be a way of compensating for the lack of information gleaned from the eyes (Spezio, Adolphs, Hurley & Piven, 2006). Using this natural inclination could be an important target for intervention. It might be possible to change visual attention such that individuals with ASD adopt a less haphazard visual attention pattern when looking at faces, and instead gaze predominantly at mouths of others in the service of improving their ability to glean social information from social interactions.

Over the last decade, methods for changing visual attention have become more heavily researched. Clinical researchers have been successful with identifying and altering pathological visual attention in a host of clinical populations, such as those with anxiety or depression. For example, individuals with social anxiety have an attentional bias such that they tend to readily identify negative visual cues reinforcing their social anxiety (e.g., instantly noticing all of the ambiguous expressions in a mostly happy crowd

of people and interpreting the expressions in a negative way, like “They think I’m weird”) (Schmidt, Richey, Buckner & Timpano, 2009). Attention modification programs have been created to target these types of attention biases by altering visual attention. These programs have shown some promise for ameliorating depression and anxiety symptoms. In the social anxiety example, visual attention was shifted to neutral social cues. A computer program called the dot-probe task was used in these modification paradigms. For this task, a cross presents in the middle of the computer screen for 500 milliseconds. The cross then vanishes and two pictures appear on the screen (one above and one below the location of the cross). One picture is disorder-relevant (e.g., for social anxiety, the picture of an actor with a shocked or disgusted face, in which those with social anxiety tend to be biasedly tuned), and the other picture is neutral (e.g., for social anxiety, a picture of an expressionless actor). These pictures remain on the screen for 500 milliseconds. Once the pictures disappear, a probe of an E or an F appears in the location of one of the pictures. The participant is then asked to identify the probe letter (E or F), which stays on the screen until an answer is given (Schmidt et al., 2009). During the training, the probe is placed behind the neutral stimulus (e.g., expressionless face) 80% of trials, which trains participants to gaze at neutral stimuli instead of disorder-relevant stimuli based on predicting the location of the probe most of the time. Using a similar method with adults with ASD, the aim of the current pilot investigation is to use this attention training paradigm to shift visual attention from non-focal areas on the face (e.g., akin to disorder-relevant stimuli in the social anxiety training) to the mouth (e.g., akin to the neutral stimuli in the social anxiety training) in an effort to maximize the degree of social information gleaned during a social interaction. This visual attention training, however, will use video instead of pictures to help simulate human interaction. The goals

of this pilot study are that attention training will increase attention to social stimuli and the increased attention to social stimuli will be associated with a rise in the amount of eye-gazes at the mouth, as well as improvements in theory of mind and recognizing and interpreting social cues.

Methods

Participants

Five participants were recruited from the Hussman Center for Adults with Autism in Towson, Maryland. Each person was a high functioning adult with ASD. All participants were at least 18 years of age and spoke English fluently. In addition, language development was normal with no apparent pragmatic language impairments as measured by the Pragmatics Checklist. One participant dropped out the study, leaving four remaining participants to complete the study. The remaining participants ranged from 21 to 31 years of age; three were male and one was female.

Procedure

Each participant received baseline assessments and then five consecutive weekly training sessions lasting 60 minutes each. At the conclusion of the last training session, participants provided data on select measures for comparison purposes. During the first assessment session, participants completed a series of self-report questionnaires and tasks, as well as a cognitive assessment. Participants were told they would be compensated for their time and participation with a $50 gift card. They were also told that if their time identifying the probe increased over the course of the five weeks, they would receive $100 instead of $50 (as a motivator). However, all participants received a $100 MasterCard gift card at the end of the study, regardless of task performance.

After the baseline assessments were completed, the participant began the training sessions. Each training session consisted of a unique hour-long clip of the soap opera *Sunset Beach* to represent human interaction. The clip was interrupted periodically (particularly during scenes of close interaction) and the probe E or F appeared behind a person's mouth or eyes (Figure 3). Participants had to identify the letter and research assistants manually recorded the time taken for each participant's response. For the trials, the probe was presented behind the mouth for 80% of the trails. This methodology is consistent with the procedures for the dot-probe task outlined in research (Schmidt et al., 2009). The goal of the training session was to teach participants that attending to the mouth is a useful strategy for quickly identifying the location and type of letter probe. One iPad was used as a timer with the minute, seconds, and milliseconds. It was placed in front of the computer screen. A second iPad was used to record the computer screen and the timer. After the session, a coder looked at the recording to determine the time of the interruption and when the participant said the letter E or F. Reaction time per interruption and average per session was then calculated from the recording. To increase motivation, participants were told the number of times they identified the letter correctly and their average speed at identifying the probe before each session. The data collector stated, "Hello, you got___X___ correct and your average time was___X___. Lets see if you can do better this week!" After the last training session, all participants completed selected assessments given during baseline.

Measures

Baseline assessments included the following: Ritvo Autism Asperger Diagnostic Scale Fourteen (RAADS-14), The Social Responsiveness Scale-2 (adult-report version; SRS-2), Hospital Anxiety and Depression Scale (HADS), the Movie for the Assessment

of Social Cognition (MASC), the Adult ADHD Self-Report Scale (ASRS), and the Pragmatics Checklist. During the baseline assessment, participants also completed the Stanford Binet-5 routing subtests as a measure of their cognitive abilities. If the participant rated themselves with subclinical symptoms on the SRS-2 Self-Report form, then a rater form was given to a family member or caregiver to confirm an autism diagnosis. The rater form was used with two out of the three participants who reported subclinical symptoms (Table 1). The rater form was only used as a baseline assessment. Post-training assessments only included the SRS-2 and MASC (Table 1).

The RAADS-14 was used to assist in the diagnosis of ASD in adults. This 14-question self- report questionnaire is the abridged version of the Ritvo Autism and Asperger Diagnostic Scale- Revised, and focuses on three main symptom areas: mentalizing deficits, social anxiety, and sensory reactivity (Eriksson, Andersen, & Bejerot, 2013). The measure has high internal consistency with an alpha level of .90. The RAADS-14 also has discriminant validity between an ASD and non-ADHD psychiatric population (AUC=. 91) and between ASD and non-psychiatric population (AUC = .99) (Eriksson et al., 2013). A cutoff score of 14 or above reached a sensitivity of 97% at accurately identifying individuals with ASD (Eriksson, et al., 2013).

The SRS-2 is a 65 item rating scale designed to measure social deficits in individuals with ASD. The measure examines social deficits using the following subscales: Social Awareness, Social Cognition, Social Communication, Social Motivation, and Restricted Interests and Repetitive Behavior. The SRS-2 reports T-scores (*M*=50, SD=10), with 60 or higher indicating clinical significance. Different raters can complete the scale, but for current purposes participants completed the adult self-report version (Bruni, 2014). Reliability coefficients ranged from .61 to .95. Mean differences between diagnostic

categories on the spectrum (i.e., Autistic Disorder, Asperger's Syndrome, Pervasive Developmental Disorder-Not Otherwise Specified, and ASD) had a large effect size (*d*= 2.7). Predictive Validity showed a sensitivity value of .92 when identifying those with and without ASD. The construct validity showed a good fit for a two-model factor (i.e., social communication/ interaction and the restricted interest and repetitive behavior) (Bruni, 2014). In this study, the SRS-2 aided in corroborating an ASD diagnosis and provided a quantitative measure of myriad ASD symptom domains, including various facets of social competence.

The HADS is a questionnaire focusing on the psychological traits of anxiety and depression. Self-report anxiety and depression scales in children with ASD have proven to reflect an accurate depiction of their symptoms (Kanai et al., 2011). This result should generalize to adults (Kanai et al., 2011). A measure of anxiety and depression was included because anxiety and depression have been implicated in visual attention disturbances (Schmidt et al., 2009). Internal consistency reliability is strong with individuals on the spectrum, with one study reporting a Cronbach's alpha of .84 (Kanai et al., 2011). There are seven questions about anxiety and seven questions about depression. Responses are recorded as, "Often, Sometimes, Not Often, or Very Seldom" and correspond to a number zero through three. Each domain receives its own score. Scores of zero to seven are considered "Normal," eight to 10 "Borderline Abnormal, " and 11-21 are considered "Abnormal."

The MASC is 15-minute video that pauses several times to ask the participant about the video character's thoughts, feelings, emotions, and intentions. The MASC has been used with higher functioning individuals with ASD to measure advanced social processing skills, such as perspective taking and recognizing emotions in others (Dziobek

et al., 2006). The MASC has been reported to have good reliability and validity with this population, with reports of internal consistency ranging from .82 to .84 and with test-retest reliability intraclass correlations of .97 (Dziobek et al., 2006). Participant's correct responses earn a score of 1; incorrect responses earn a score of 0. The more correct answers, the better the person's ability to interpret mental states. Dziobek et al. (2006), the creators of the assessment, report an average of 24.4 (SD= 5.9) correct responses in a sample of high functioning adults with ASD.

The ASRS is self-report measure for adults with ADHD. The use of ADHD self-report measures has good validity with typically developing populations (Mazefsky et al., 2011). However, caution was used in their interpretation in this study because of the unknown reliability and validity of the ASRS in the ASD population (Mazefsky et al., 2011). The ASRS has a Part A and Part B in which a rater indicates how likely a behavior is to occur. In Part A, authors report that four or more marks endorsing behaviors occurring "Often, or Very Often" indicate symptoms consistent with ADHD. In Part B, the rater endorses additional behaviors that are meaningful for intervention development, but do contribute to a total score. (Mazefsky, Kao & Oswald, 2011).

The Pragmatics Checklist was developed by Towson University's Speech Language Group and consists of 18 questions that are marked by an observer as "Always", "Often," "Sometimes," "Never," "Not Observed," or "N/A." Some examples of questions include: "Initiates greetings and farewells," "Responds to appropriate questions during conversations with adults," and "Engages/interacts cooperatively with peers." The Pragmatic Checklist was used to document the participant's pragmatic abilities. As a qualitative measure, the Pragmatic Checklist does not use a cut-off score.

The Stanford Binet-5 is an assessment used to evaluate cognition in people ages two to 85+ years. The Object Series Matrices and Vocabulary routing subtest calculate an abbreviated intelligence quotient (IQ). For most children with ASD, the abbreviated battery is representative of the full scale (Coolican, Bryson, & Zwaigenbaum, 2007). The abbreviated IQ (ABIQ) has an average reliability coefficient of .91 across age groups. Test-retest reliability ranged between .84 to .88 across age groups. Scores of 85-115 (M=100, SD=15) on the Stanford Binet-5 reflect average performance.

Results

For all participants, except for one, scores on the RAADS-14 (see Table 1) indicated no ASD symptoms. On the HADS assessment (Table 1) all persons had “normal” depression levels. Two participants had a “borderline abnormal” anxiety level. The ASRS (Table 1) indicated one participant reported symptoms consistent with ADHD. All participants had some conventions of pragmatic discourse as measured by the Pragmatic Checklist (Table 1). Table 1 also details the ABIQ for all participants, calculated using the Stanford Binet-5 routing subtests.

Due to the small sample size and the nature of this pilot study, a descriptive and correlational analysis was used to analyze the results. Paired sampled t-tests were also used to evaluate if a significant difference existed between the reaction times (measured in seconds) in session one and session five. Figure 2 depicts the average reaction time for each subject A paired-samples t-test indicated there was a significant decrease in reaction times for all participants from session one (M=1.24, SD=. 297) to session five (M=1.05, SD=. 018), $t(74)=5.19$, $p< .001$, $R^2=.267$. When examining the reaction times from session one to session five for each participant, two participants yielded significant results (Table 2). Participant two showed a significant decrease from session one (M=

1.41, SD=. 164) to session five (*M*=. 960, SD=. 113), *t*(17)= 9.60, p< .001, R^2= .844. Participant three also showed a significant decrease from session one (*M*= 1.23, SD=. 151) to session five (*M*= 1.10, SD=. 116), *t*(17)=3.13. *p*<.05, R^2 = .365.

Bivariate correlations were performed to see if the change scores from session one to session five, the SRS-2 Social Awareness and Social Cognition change scores, and the Total MASC change scores showed any relationships (Table 3). Due the small samples size, correlation coefficients were computed for descriptive purposes, but sample size precluded tests of statistical significance. The reaction time change scores exhibited a negative relationship with the change scores on the Social Awareness (Pearson's *r*(4)= -.438) and Social Cognition (Pearson's *r*(4)= -.142) subscales on the SRS-2. The reaction time change scores also had a negative relationship with the MASC change scores, Pearson's *r*(4)= - .032. It is important to note, however, that this correlation is almost zero and could be considered negligible.

Discussion

ASD is a complex disorder with varying social deficits. One aspect of these social challenges is an irregular eye-gaze pattern to non-focal areas that prevents the retrieval of essential social information from a person's eyes (Bayram & Esgin, 2012). Some individuals with ASD, however, have a natural inclination to look at the mouth (Klin et al., 2002). According to the literature, adults with ASD may be able to glean vital social information from the mouth and that visual fixations on the mouth are associated with greater social competence (Klin et al., 2002). Using this concept, the dot-probe task was used as an attention training mechanism to see if the amount of eye-gazes toward the mouth would increase social competence.

The present study had two hypotheses. The first was that training would increase attention to social stimuli, noted by the decrease in time to identify the letter of the probe and increased accuracy identifying the letter associated with mouths in the active phase of the trial. The second hypothesis was that the increased attention to social stimuli would be associated with improvements on the MASC and on the Social Awareness (recognition of social cues) and Social Cognition (interpretation of social behavior) subscales on the SRS-2.

Concerning the first hypothesis, the reaction time to identify the probe decreased across sessions (Figure 2). A paired sample *t*-test confirmed that the decrease in reaction time between session one and session five was significant. The accuracy of identifying the letter remained stable throughout training (95%-100% for all participants). For the second hypothesis descriptive statistics illustrate that the mean on the MASC total scores slightly increased. Further, the means on the Social Awareness and Cognition scores on the SRS-2 went down from pre-training to post-training. These findings should be interpreted with caution because of the small sample size.

In terms of the correlational trends, decreases in reaction time from session one to session five was associated with increases in the change score from baseline to post-training on both the Social Awareness and Social Cognition subscales (i.e., increases in these two subscales over time, which means an increase in clinical severity). This result was contradictory to the expected outcome and did not support the second hypothesis. On the other hand, decreases in reaction time from session one and session five were associated with decreases in total MASC scores from baseline to post-training. This result supported the second hypothesis. The training may have helped improve theory of mind, but did not enhance the ability to recognize and interpret social cues.

Limitations and Future Directions

There are some limitations that need to be considered. As aforementioned this study is a pilot study, so the sample size is small. A reaction time program was not readily available, which required the use of the iPads. The iPads required some troubleshooting due to limited storage space. Because of the lack of memory on the Ipad, interrater reliability was not collected on the videos. Consequently, a second data collector did not code the videos for reliability purposes. In addition, the data collector did not always share the reaction time from the previous session with the participant at the beginning of the session; it was at varying times throughout the session. Participants self-report on their own symptoms could have affected the data collected across measures. Inaccurate self-reporting may explain why the RAADS-14 did not coincide with symptoms of autism. The SRS-2 helped confirm an ASD diagnosis. When the self-report SRS-2 scores illustrated subclinical symptoms, the caregiver rater form supported symptoms of autism. It should also be noted that participant one showed some difficulty with the control questions on the MASC, hence participant one's scores should be interpreted with caution (Table 1)

Future researchers should seek a larger sample size, more advanced technology, and more control of outside variables. In addition to a self-report rating form, the researcher should consider collecting caregiver ratings for all participants. The use of video instead of picture stimuli should be kept for generalization in future research. This pilot study yields conflicting results, but further research is warranted due to the need to improve social interventions for individuals with ASD.

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Figure 1. Triangular Gaze Path (Bayram & Esgin, 2012).

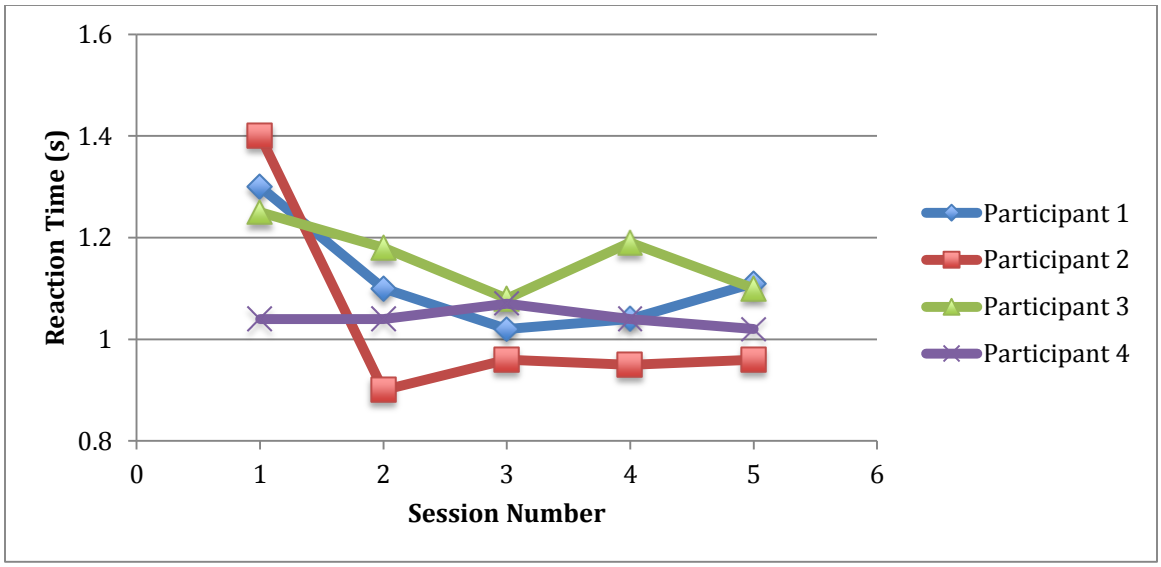

Figure 2. Average reaction times across sessions. This graphs illustrates how each participant's average reaction time changed across each of the five sessions.

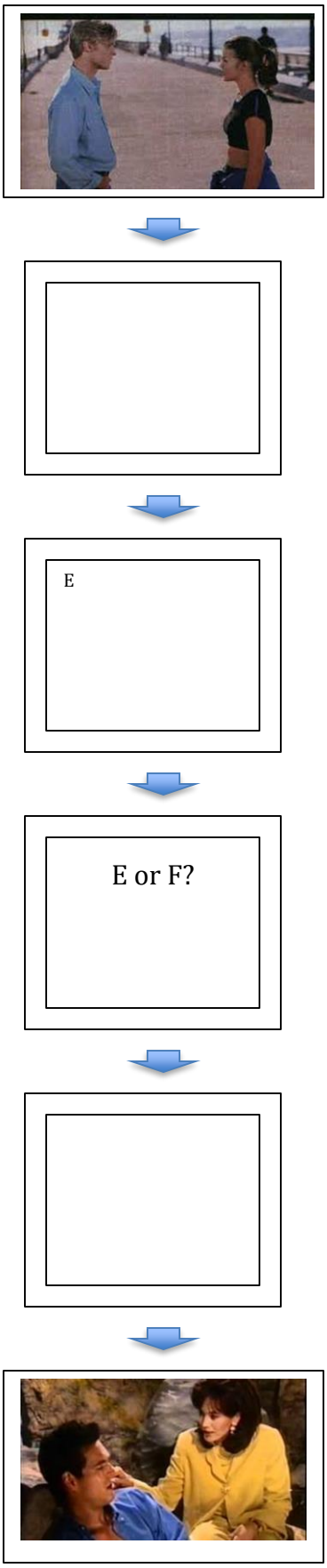

Figure 3. Dot-probe task diagram. This figure demonstrates the computer task used during the training sessions.

Table 1

Pre and Post Training Scores and Means and Standard Deviations of Post-Training Measures

	Participant 1		**Participant 2**		**Participant 3**		**Participant 4**		**Rater**		**M**		**SD**	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	P2	P3	Pre	Post	Pre	Post
RAADS-14														
Total	9	-	11	-	10	-	19	-	-	-	12.25	-	4.57	-
Mentalizing Deficits	6	-	4	-	5	-	15	-	-	-	7.5	-	5.07	-
Social Anxiety	0	-	0	-	1	-	4	-	-	-	1.25	-	1.89	-
Sensory Sensitivity	3	-	7		2	-	0	-	-	-	5.5	-	7.77	-
HADS														
Depression	1	-	1	-	1	-	2	-	-	-	1.25	-	.50	-
Anxiety	8	-	10		6	-	2	-	-	-	6.5	-	3.42	-
ASRS														
Part A Endorsed	5	-	0		2		0	-	-	-	-	-	-	-
Pragmatic Checklist														
Always	2	-	0	-	5	-	2	-						
Often	10	-	5	-	6	-	3	-	-	-	-	-	-	-
Sometimes	6	-	9	-	4	-	9	-	-	-	-	-	-	-
Never	0	-	3	-	0	-	4	-	-	-	-	-	-	-
Not Observed	0	-	1	-	2	-	0	-	-	-	-	-	-	-
Stanford Binet-5														
Routing Subtests														
ABIQ	94	-	121	-	106	-	85	-	-	-	101.5	-	15.59	-
SRS-2														
Awr	49	37	47	51	66	59	66	65	65	78	57.00	53.00	10.42	12.11
Cog	62	39	49	58	51	55	60	66	78	55	55.50	54.50	6.45	11.32
Com	57	41	47	52	43	51	64	71	76	58	52.75	53.75	9.53	12.53
Mot	54	39	42	48	51	38	53	64	63	51	50.00	47.25	5.48	12.04
RRB	75	41	55	59	62	65	55	66	83	70	61.75	57.75	9.43	11.59
Total	61	54	48	55	52	53	51	71	79	61	53.00	58.35	5.60	8.54
MASC														
Control	2	2	4	4	5	4	5	4	-	-	4.00	3.50	1.41	1.00
Total	27	33	29	28	34	34	29	27	-	-	29.75	30.50	2.99	3.51

Note. On the RAADS-14, scores of 14 or higher indicate symptoms of ASD. On the HADS, 0-7= Normal; 8-10= Borderline; 11 and up= Abnormal. For the ASRS the number represents the total score earned in Part A. The numbers in the Pragmatic Checklist section represent the number of questions in each of those categories. On the SRS-2: Awr=Social Awareness; Cog=Social Cognition; Com=Social Communication; Mot=Social Motivation; RRB=Restricted Interests and Repetitive Behaviors. P2= Participant 2; P3=Participant 3, those were the only participants with rater form data. Scores over 60 and over are clinically significant. On the MASC: *Note.* ToM= Theory of Mind. Control is the number correct out of 6 control questions.

Table 2

Paired Sample *t*-tests from Session 1 to Session 5

	Session 1		Session5			
	M	*SD*	*M*	*SD*	***t***	***p***
Participant 1	1.30	.470	1.11	.232	1.73	.099
Participant 2	1.40	.164	.960	.113	9.60	.000*
Participant 3	1.23	.151	1.16	.027	3.13	.006*
Participant 4	1.04	.093	1.02	.038	.998	.332

Note. *=Statistically significant. Sample size varied from 17-19 due to the removal of outliers.

Table 3

Correlational Analysis between Change Scores and Baseline Data

	1	2	3	4	5	6	7
Reaction Time Change Scores	-						
SRS-2 Awr Change Scores	-.438	-					
SRS-2 Cog Change Scores	-.142	.845	-				
MASC Change Scores	-.032	-.824	-.977	-			
SRS-2 Awr Baseline	.799	-.073	.397	-.498	-		
SRS-2 Cog Baseline	.650	-.570	-.694	.524	.064	-	
MASC Total Baseline	.146	.016	.520	-.443	.653	-.614	-

Appendix A: IRB Approval Email

IRB Protocol #1607002718 - modification

Taylor, Amy L.
Sun 10/2, 1:29 PM
IRB; Bean, Yvette*; Mortenson, Bruce

Reply all

Inbox

Action Items

Hi Yvette –
The modifications have been approved by the IRB as of October 2, 2016.

If you should encounter any new risks, reactions, or injuries to subjects while conducting your research, please notify IRB@towson.edu . Should your research extend beyond one year in duration, or should there be substantive changes in your research protocol, you will need to submit another application.

Regards,
Amy
Amy L. Taylor
Assistant Vice President for Research
Office of Sponsored Programs & Research

OSPR Website: http://www.towson.edu/academics/research/sponsored/

Appendix B: Consent Form

INFORMED CONSENT FORM

PRINCIPAL INVESTIGATOR: Yvette Bean PHONE: 614-440-4146

Purpose of the Study:
The purpose of the study is to use a computer program to test and train the visual attention of adults on the autism spectrum and to improve their social skills. The hope is that results from this study will help improve the use of the program to better assist individuals on the autism spectrum in the future.

Procedures:
You will be asked to participate in 7 sessions, which includes one session to complete surveys before visual training starts. Visual training will have 60-minute sessions once a week for five-weeks. After five sessions, you will return for one more survey session.

Each training session will consist of watching an hour-long video clip. The video will be sometimes be stopped and a letter of the alphabet will pop up that you will be asked to find and name.

At the completion of the trial, you will be given a list of community treatment providers so that you may seek out additional ways of working on social skills.

Risks/Discomfort:
Some of the questions in the assessments may make you feel uncomfortable. Should the interview become upsetting to you, you can stop at any time.

Benefits:
It is hoped that the results of this study will have a positive effect in naming ways to help individuals with Autism Spectrum Disorder improve their overall social skills.

Alternatives to Participation:
Participation in this study is by choice. You are free to end your participation in the study at any time. Should you wish to stop participating in the study, you will receive a list of community treatment providers so that you may seek out other ways of working on social skills.

Cost Compensation:
You do not have to pay to participate in the study At the end of the study you will get a visa gift card for $50. If you do very well in the training, you can earn a $100 gift card.

Confidentiality:
All information collected during the study will be kept private. You will be named through identification numbers. No publications or reports from this project will include

personal information on any participant. If you agree to join this study, please sign your name below.

_____ I have read and understood the information on this form.

_____ I have had the information on this form explained to me.

_____ _____
Subject's Signature Date

_____ _____
Witness to Consent Procedures Date

_____ _____
Principal Investigator Date

If you have any questions regarding this study please contact Yvette Bean (614) 440-416 or the Institutional Review Board Chairperson, Dr. Debi Gartland, Office of University Research Services, 8000 York Road, Towson University, Towson, Maryland 21252; phone (410) 704-2236.

YVETTE BEAN

[redacted]

EDUCATION

Towson University, Towson, MD May 2016

Master of Arts: Clinical Psychology
Post-Baccalaureate Autism Certificate
GPA: 3.751

Study Abroad

Ghana January 2016

- Studied gender, health, and social justice
- Visited historical and cultural sites
- Interacted with local officials and dignitaries

Elon University, Elon NC May 2014

Bachelor of Arts: Psychology, Minor in Criminal Justice
GPA: 3.421

Study Abroad

South Africa January 2013

- Traveled to Cape Town and Johannesburg South Africa
- Participated in multiple service projects in the community
- Visited historical museums and tourist sites

Brazil January 2014

- Traveled to Rio de Janiero and Salvador Brazil
- Visited historical and religious sites
- Volunteered at CASAH: a center for children infected by or affected by HIV/AIDS

AWARDS AND HONORS

Phillips Perry Black Excellence Award for Academic Achievement 2011 - 2014
Dean's List 2011- 2014

PROFESSIONAL MEMBERSHIPS

American Psychological Association-*Active*
Association for Behavioral and Cognitive Therapies-*Active*

RESEARCH SKILLS/ EXPERIENCE

Towson University Towson, MD- *Research Assistant* 2015-2016

- Currently assisting professor, Dr. Gregory Chasson, with Hoarding Disorder research

- Conducted faculty sponsored research about ADHD in college students under Dr. Linda Wilmshurst
- Became familiar with IRB submission
- Collected data and administered questionnaires and tests
- Gave a poster presentation at Elon's student undergraduate research forum 2014

Children's Hospital Columbus, OH – *Research Intern* Summer 2012

- Completed Human Subjects Training
- Prepared and tracked study material for large scale postal surveys
- Contacted participants via phone to answer study related questions and provided reminders to return study materials
- Prepared study material for in-person clinical trial study visits
- Conducted literature searches, located articles, and provided a synopsis of the relevant information
- Assisted in the appropriate handling of biospecimens

PROFESSIONAL PRESENTATIONS AND POSTERS

Bean, Y. F., Luxon, A. M., Alapati, S., Divecha, P., Powers, K. & Chasson, G. S. (2016). Autism characteristics as predictors of treatment motivation and outcome in adults with hoarding disorder involved in FAM Training. Poster presented at the 50th annual Association for Behavioral and Cognitive Therapies conference, New York, NY.

Bean, Y. F., Alapati, S., Luxon, A. M., Divecha, P., Powers, K. & Chasson, G. S. (2016). Multi- informant evaluation of autism characteristics in adults with hoarding disorder. Poster presented at the 50th annual Association for Behavioral and Cognitive Therapies conference, New York, NY.

Chasson, G. S., **Bean, Y. F**., Hollern, E. A., & Luxon, A. M. (2015). Family support and intervention for hoarding: Introduction to Family-As-Motivators Training. Workshop presented at the 22nd annual conference of the International OCD Foundation, Boston, MA.

Chasson, G.S., Hollern, E. A., Luxon, A. M., **Bean, Y .F**., Taylor, C. L., Divecha, P. N., Holzinger, J., & Brown, D. J. (2015). Preliminary results of a randomized waitlist controlled trial of Family-As-Motivators Training for hoarding disorder. Paper presented at the 49th annual Association for Behavioral and Cognitive Therapies conference, Chicago, IL.

Chasson, G. S., Luxon, A. M., Powers, K., Divecha, P. N., **Bean, Y. F**., & Alapati, S. (2016). Keep it in the family: Reporter patterns of family functioning and distress in individuals with hoarding and their relatives. Poster to be presented at the 50th annual Association for Behavioral and Cognitive Therapies conference, New York, NY.

RELEVANT WORK AND VOLUNTEER EXPERIENCE

Liberty Horse Farm, Columbus, OH- *Assistant Camp Director* Summer 2016

- Assisted with horse camp activities (Children ages 6-14)
- Facilitated basic riding skills (steering, stopping, position)
- Taught basic horse care (tacking up, grooming, horse etiquette)
- Supervised children doing arts and crafts and games

Intern at Kennedy Krieger Institute, Columbia, MD Fall 2015-Present

- Under the supervision of a licensed psychologist and staff therapist, I am responsible for the following roles and responsibilities:
    - Work as a member of the behavior team assisting therapists in conducting assessment and treatment sessions with individuals with developmental disabilities who display severe behavior problems
    - Assist with caregiver training in behavioral protocols and treatment procedures
    - Collect data during client sessions via computer and paper/pencil
    - Analyze, enter, and graph client data
    - Assist with development of client materials (e.g., picture cards used for functional communication)

Hussman Center for Adults with Autism, Towson, MD Summer 2015-Present

- Helps facilitate and manage social group events for adults with Autism

Hussman Center for Adults with Autism, Towson, MD January 2015

- Completed Mentoring and Autism class with a service learning component
- Acquired 20 service hours
- Participated in cooking and fitness classes with adults with autism
- Learned specific tools and controversies within the autism community

Community for New Direction, Columbus Ohio Summer 2013

Camp Counselor

- Led a group of 5-7 year olds
- Facilitated age appropriate lessons on drug, alcohol, and violence prevention for at risk youth
- Supervised field trips and group activities

Boys and Girls Club, Burlington, NC January 2011

- Helped elementary and middle school students of low income status with homework
- Participated in various activities with them (basketball, art and crafts, bingo, tag, etc.)

Leap of Faith Christian Dance Studio, Columbus, OH Summers 2007-2010

- Assisted with summer dance camp (Children ages 4-10)
- Taught basic dance skills and helped teach dance combinations
- Facilitated dance games and other camp activities

LEADERSHIP AND WORK EXPERIENCE

Center for Student Diversity, Towson, MD August 2014-present
Graduate Assistant

- Assists in the planning and execution of events centered around diversity and African American student development
- Advertises and promotes events
- Aids in the advising of student groups
- Organizes and facilitates external group visits

Delta Sigma Theta Sorority Inc. April 2012- present
Organization that focuses on sisterhood, scholarship, and service

- Hosted several programs and events for campus
- Have held several leadership positions within the sorority
    - Member of the Membership Intake Special Operations Task Force (2015-present)
        - Appointed by the National President
        - Participates in conference calls and meetings
        - Researches and collects information relevant to the topic
        - Assist in the development of presentations
    - President (2013-2014)
    - Elected Collegiate Member of National Committee (2013-2015)
        - Travel to National and Regional Sorority meetings
        - Conduct various training and informational workshops
        - Participate in conference calls and meetings with major decision making power for the sorority
    - Vice President (2012)
    - Programming Chair (2012)
    - Chaplain (2012)

Equestrian Team

- Prepared and practiced for horse competitions within region 2010- 2014

Urgent Message Christian Troupe 2010- 2014

A Christian organization that performs mime, hip-hop, and liturgical dances

- Practiced twice a week for Gospel Choir concerts, performances, and a spring break tour
- Co-president (2013)

References available upon request