

Background

- Nearly 1 in 45 U.S. adults are diagnosed with autism spectrum disorder (ASD).¹
- ASD patients have impairments in social interaction, communication, sensory perception, and executive functioning skills.²
- These social difficulties often persist into adulthood and severely impact functioning in family, work, and community settings.³
- Currently, there are many social functioning treatment programs available for children, but few exist for adults.
- TUNE In (Training to Understand and Navigate Emotions and Interactions), a cognitive behavioral treatment, has been developed to support social functioning in late adolescents and adults with ASD.⁴
 - Addresses behavioral domains such as social skills, social cognition, and social motivation.
- The current study aims to test the efficacy of TUNE In to improve social functioning in late adolescents and adults using the *Social Responsiveness Scale, Second Edition, for Adults (SRS-2)* as the primary outcome measure.⁵
 - SRS-2 is widely used to identify the presence and severity of social impairments associated with ASD.
 - Lower SRS-2 scores correspond with reduced autistic symptoms and better social functioning while higher scores represent poor social functioning.

TUNE In Treatment Protocol

Phase 1

Individual Therapies

Duration:

- 5 sessions
- 60-minutes each

Methods:

- Cognitive therapy
- Mindfulness exercises

Addressing:

- Social anxiety
- Social motivation

Phase 2

Group Therapies

Duration:

- 8 sessions
- 90-minutes each

Methods:

- Group cognitive therapy
- Conversation practicing

Addressing:

- Social cognition
- Social skills

Phase 3

Philanthropic volunteering or advocacy work

Duration:

- 4 sessions
- 90-minutes each

Methods:

- Generalize acquired skills in a community setting through a group project

Addressing:

- Acquired social skills

Figure 1. Structure of TUNE In Treatment Protocol

Participant Demographics

Demographic	Combined		Treatment		Control	
	N	%	N	%	N	%
Sex						
Male	13	48%	4	33	9	60
Female	14	52%	8	67	6	40
Race						
Caucasian/White	24	89	11	92	13	87
African-American/Black	1	4	0	0	1	7
Asian/Pacific Islander	1	4	1	8	0	7
Hispanic/Latino	1	4	0	0	1	7
Multiracial	1	4	0	0	1	7
Native American	1	4	1	8	0	0
Education						
High School/GED	7	27	0	0	7	47
Some College	8	31	6	55	2	13
Associates Degree	2	8	1	9	1	7
Technical School Degree	0	0	0	0	0	0
Bachelor's Degree	5	19	3	27	2	13
Master's Degree	4	15	1	9	3	20
Living situation						
Independently	8	30	4	33	4	27
With Family	19	70	8	67	11	73
Residential Facility	0	0	0	0	0	0

Table 1. Demographics of participants in randomized control trial of TUNE In

Baseline Results

Variable	Combined		Treatment		Control	
	Mean	SD	Mean	SD	Mean	SD
Age (in years)	25.85	8.42	27.83	10.89	24.27	5.68
SRS-Informant Report	70.19	5.49	70.25	5.48	70.14	5.71
SRS-Self Report	71.88	10.16	71.08	11.84	72.57	8.88
SCQ-Lifetime Report	15.44	7.46	12.58	7.33	17.73	6.96
Shipley-2 — Abstraction	106.96	17.31	104.75	20.6	108.73	14.68
Shipley-2 — Vocabulary	116.11	10.23	118.33	6.88	114.33	12.23

Table 2. Age and social functioning assessment results for all participants prior to treatment.

SRS= Social Responsiveness Scale, Second Edition.
SCQ= Social Communication Questionnaire

Social Responsiveness Scale-2 (SRS-2) Scores Before Treatment

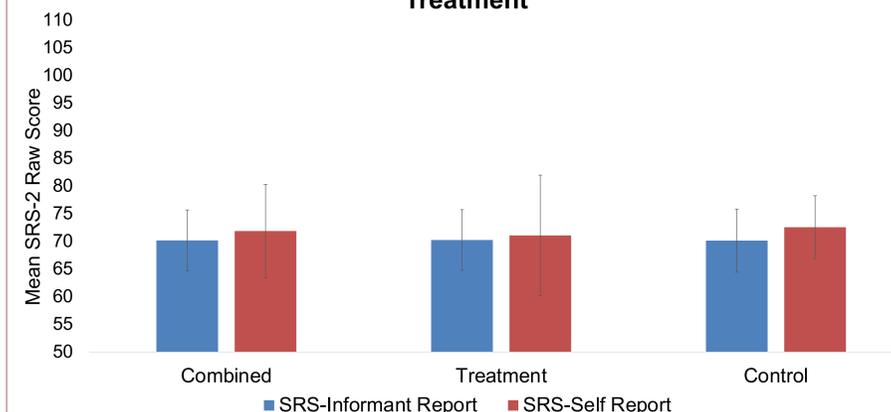


Figure 2. There were no statistically significant differences among the groups in SRS-2 scores (mean ± SEM) for both informants (p=0.96) and self reports (p=0.71). Participants in both the treatment and control group have similar baseline SRS-2 scores (n=27).

Conclusion

- Overall, the SRS-2 scores for both the control and treatment groups along with other social functioning measurements such as Shipley-2 (Abstraction and Vocabulary) did not show statistically significant differences (p>0.05).
- Similar baseline results between the study groups provide effective grounds needed to analyze the efficacy of TUNE In, post-treatment.
- The mean age of participants in the randomized controlled trial is 25.85 years (± 8.42 years).
- There is an equal division of female and male in the study but not within the treatment and control groups.
- Most of the participants in the study are Caucasian/white, comprising 89% of the sample size.

Future Directions

- Baseline results for social functioning related assessments of the first cohort have been collected. These participants will now begin their respective treatment protocol.
- Process raw data for The Contextual Assessment of Social Skills (CASS), a performance-based, measure of social skills designed for adolescents and adults with ASD, and the Hinting Task Assessment, a performance-based measure of a person's understanding of others' mental states or social cognition.^{6,7}
- Cohort 2 will begin to collect more data on TUNE In efficacy.
- Recruitment of more women and minority groups needed for cohort 2 of the trial in order to analyze the broader impact of TUNE In on various demographics with ASD.
- After cohort 1 and cohort 2 complete the treatment protocol, baseline assessments, such as the SRS-2, will be repeated to highlight any changes in the social functioning of study participants

Acknowledgements

This work was supported by a grant from Eagles Autism Foundation (Eagles Autism Challenge Pilot Grant, E.S.B.) and The Ruth Marcus Kanter College Alumni Society Undergraduate Research Grant from the Center for Undergraduate Research and Fellowship.

References

- CDC estimates 2.2 percent of adults in the U.S. have autism. (n.d.). Retrieved March 04, 2021, from <https://www.autismspeaks.org/science-news/cdc-estimates-22-percent-adults-us-have-autism>
- Faras, H., Al Ateeqi, N., & Tidmarsh, L. (2010). Autism spectrum disorders. Retrieved March 04, 2021, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931781/>
- Howlin, P., Moss, P., Savage, S., & Rutter, M. (2013). Social outcomes in mid- to later adulthood among individuals diagnosed with autism and average nonverbal IQ as children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52(6), 572–81. e1. <https://doi.org/10.1016/j.jaac.2013.02.017>
- Pallathra, A. A., Calkins, M. E., Parish-Morris, J., Maddox, B. B., Perez, L. S., Miller, J., ... & Brodtkin, E. S. (2018). Defining behavioral components of social functioning in adults with autism spectrum disorder as targets for treatment. *Autism Research*, 11(3), 488-502..
- Eddy, C. (2019, May 29). What do you have in mind? Measures to assess mental state reasoning in neuropsychiatric populations. Retrieved March 04, 2021, from <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.00425/full>
- Ratto AB, Turner-Brown L, Rupp BM, Mesibov GB, Penn DL. Development of the Contextual Assessment of Social Skills (CASS): a role play measure of social skill for individuals with high-functioning autism. *J Autism Dev Disord*. 2011;41(9):1277-1286.
- Corcoran R, Mercer G, Frith C. Schizophrenia, symptomatology and social inference: investigating "theory of mind" in people with schizophrenia. *Schizophrenia Research*. 1995;17(1):5-13.