THE SCTL SCOOP

Enjoy the first of the Biannual Newsletters giving our families, friends and colleagues an update and summaries of our most recent work! We are so excited to share this with you!

The Social Competence and Treatment Lab
Stony Brook University

www.lernerlab.com

Some Upcoming Dates:

05/06 SCTL goes to the Spring AHA Conference (Autism and High Functioning Asperger's Association)

05/08 SCTL goes to INSAR: The International Society for Autism Research!

05/19 SCTL participates in the Color Run!

08/25 SCTL goes to SASI Fun Day!

Contact Us!

E-mail: lernerlab@stonybrook.edu

Phone number: 631 632 7857

Hey SCTL Families and Friends!

We're so thrilled to share this newsletter with you regarding the significant research done at our lab! As RAs here in lab, we enjoy when we get to meet the individuals, parents and children we get to work with on any of our studies. We hope to make your time at lab with us as fun and enjoyable as possible! Thank you so much for your willingness to volunteer in our work here. We're so grateful to be part of the SCTL Family!

Sincerely,

The SCTL Research Assistants

Letter From Dr. Matthew Lerner, Director

Dear Families, Friends, and Colleagues,

After nearly 5 years at Stony Brook, we at the Social Competence and Treatment Lab (SCTL) are thrilled to have been welcomed into such a large, supportive and vibrant community of collaborators and families here on Long Island. Throughout the course of our time here, we have been delighted to get to know so many of the wonderful children, families, community organizations and providers that have been invested and involved in the work that we do here. We hope that this new series of Newsletters serves to inform you of the results of your participation and the effort that our research team has employed in order to provide meaningful information that will have an impact on the lives of those with whom we work. Getting to work with you and your family members is an enormous a privilege, and we're grateful to have the opportunity to do what we do; of course, none of that would be possible without your participation, so we sincerely thank you!

The work included here highlights findings from three of our largest studies so far, SDARI (Socio-Dramatic Affective Relational Intervention – also known as our Social Groups for ASD Study), PASI (Paying Attention to Social Interactions) study, and SELWeb (Seeing the Social World), as well as past data collected from relevant work, and current studies underway. We have published many papers and presented work at international research conferences related to topics such as the characteristics that affect treatment outcomes, the efficacy of intervention on neurobiological factors specific to Autism Spectrum Disorder (ASD), and different self and parent-reported measures reveal more behavioral distinctions that tell us more on the way individuals with ASD experience the world.

Data collected from the SDARI study have helped us better distinguish the neurobiological markers associated with decreases in anxiety in response to social skills interventions. We've also found that the sense of importance that children in these groups assign to certain social skills actually predicted the degree that they were liked and disliked by their peers in their groups, as well as how much time they spent in social interactions during free play.

These findings have contributed to the field to help us have a better understanding of what individuals with ASD are experiencing, and understanding individual differences among individuals on a behavioral and neurobiological levels, in order to aid the development of targeted interventions.

We are also proud to share with you that we completed the national Usual Care for Autism Study (UCAS), where we led 7 national University sites (Stony Brook, Adelphi, St. John's, Drexel, Michigan State, Rush, and San Diego State) across five different states to poll providers regarding their use of common and/or evidence-based intervention practices across all groups that treat individuals with ASD. With the contributions of over 66 experts and 700 providers, synthesized an inventory of 55 different interventions currently in use for children with ASD. The information collected from this study is the first of its kind – a Rosetta Stone of practices for communicating between all professions that treat individuals with ASD. We are now using these data to map the national landscape of practices, and help to better understand the notable "gap" in bridging research to practice when it comes to the services provided for individuals with ASD.

Along with this, the SCTL has also had the opportunity to join in policy work alongside our friends at Curtin University in Perth, Australia, and Karolinska Institution in Sweden, through the ASD Employment Survey. In this project, we conducted the largest study to date on factors related to successful employment of adults with ASD. The SCTL is honored to be able to participate as the US site of this international study and inspire change in favor of increasing inclusive practice at the workplace, and is excited to present the most recent findings on this work at the International Society for Autism Research (INSAR) Meeting in May, held in the Netherlands.

This spring, the SCTL is embarking on a new project, the SENSE Theatre Study. With our colleagues at the University of Alabama and Vanderbilt University, we are embarking on a 4-year multi-site study exploring the effects of a musical theater treatment program involving children with and without ASD. We are anticipating the enrollment of 240 families to participate in this work with us and are excited for your continued support. We also currently have three other active studies, Paying Attention to Social Interactions, Seeing the Social World and Investigating Social Patterns in Youth, for which we are recruiting participants as young as four all the way through adulthood!

Thank you again for your enthusiastic partnership with us as we seek to make a difference in the lives of individuals and their families.

Sincerely,
Matthew D. Lerner, PhD
Assistant Professor of Psychology, Psychiatry, & Pediatrics
Director, Social Competence and Treatment Lab
Department of Psychology
Stony Brook University

THE SCTL SPOTLIGHT

Rebecca Bianchi, MSc., Lab Coordinator

Rebecca has recently joined the SCTL team from England. She completed her psychology undergraduate degree at the University of Birmingham (England). During a gap year, she volunteered as a Reciprocal Imitation Therapy therapist, at the Cerebra Centre for Neurodevelopmental Disorders. Alongside this, Rebecca volunteered at Mind, a charity for individuals with mental health issues, as well as working in a residential home for individuals with intellectual disabilities. She received her MSc in health and social psychology from Maastricht University (Netherlands). Following this, Rebecca worked as a Trial Coordinator for a weight loss intervention program, in the Appetite and Obesity Lab at the University of Liverpool (England). She is interested in working with individuals who have mental health issues or intellectual difficulties, and is excited to contribute to the research being done by the SCTL team.

Erin Libsack, B.A. PhD student

Erin is from the Pacific Northwest and earned her B.A. in psychology from the University of Washington in Seattle. She is in her first year of the Clinical Psychology Ph.D. program at SBU. She is interested in exploring the heterogeneity of ASD behavioral phenotypes, including symptom presentation in girls and individuals with and without intellectual disability. She aims to optimize intervention strategies for individuals with ASD by identifying factors which mediate and moderate intervention outcomes, and exploring the use of electrophysiological methods to measure and predict variability in individuals' response to treatment. Outside of the lab, Erin enjoys reading books and spending time outdoors with friends, hiking, camping, and playing badminton. She is also an avid sports fan, especially of football and basketball, and loves watching the Seattle Seahawks and Washington Huskies.
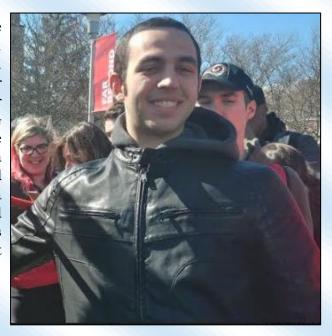
Heather Watson, Research Assistant

Heather is graduating Summa Cum Laude with a Bachelor of Science in Psychology. She has been a team member at the Social Competence and Treatment Lab for the past two and a half years. Most of the work Heather does involves managing the lab's data collection, including creating the online surveys through which participants and families can answer questions and scoring measures. She also actively trains the SCTL team members on how to use our data collection platform. Aside from her work in lab, Heather works as a Direct Support Professional with developmentally disabled adults and plans on applying to Medical School after graduation. She is interested in comorbid psychiatric diagnoses and how they play a role within the autism spectrum, and eventually hopes to apply her knowledge and experiences through a career in medicine.

Joseph Tirella, Research Assistant

Joe is graduating Summa Cum Laude with a Bachelors of Arts in Psychology. Joe has been at the SCTL for about a year. Joe has served as a member of one of our coding teams for the Social Groups for ASD Study and is now involved as an EEG visit proctor and as team leader of the EEG processing team. When he is not in lab, Joe enjoys playing video games and relaxing. Joe eventually hopes to become a Psychiatric Nurse Practitioner and aid individuals experiencing mental disorders and help them recover to their fullest potential.

SOME CURRENT STUDIES

SEEING THE SOCIAL WORLD

Our Seeing the Social World study is designed for us to gain a deeper understanding of how kids process their social world. We are recruiting children aged 4-10 with and without ASD.

SENSE THEATRE

Our SENSE theatre intervention will be running Saturdays at 9 AM from June 16th- August 25th! We are currently recruiting children with ASD to participate in a theatre intervention along with other peers to rehearse and perform a play at the end of this summer!

INVESTIGATING SOCIAL PATTERNS IN YOUTH

We are currently recruiting pre-teens and adolescents aged 11-17 to participate in our I-SPY study. This study is helping us further our understanding of the different forms in which children in this age group interact with one another and process social information. Added perk: free pizza party!

PAYING ATTENTION TO SOCIAL INTERACTIONS

We are recruiting adults (18+) on the Autism Spectrum to participate in our PASI study. Our aim is to understand how attentiveness to social interactions impacts the processing of social information. This study requires the use of a smartphone and being attentive to your social interactions throughout the course of one week. Participants will receive a $30 credit upon completion!

SELECTED WORKS RECENTLY PUBLISHED AND PRESENTED

On the following pages, we've included concise, easy to read summaries of some of our most recent findings. We hope you enjoy learning alongside us and we hope this inspires you to stay connected with the SCTL! Please share these findings with your friends, family, and anyone interested!

Efficacy of group social skills interventions for youth with autism spectrum disorder: A systematic review and meta-analysis.

Group social skills interventions (GSSIs) are a commonly and widely used method of treating social challenges in youth with Autism Spectrum Disorder (ASD). However, there is limited research to date examining exactly how successful these interventions are in improving youth's social functioning – how well do they really "work?" We conducted a meta-analysis of randomized control trials (RCT) of GSSIs in order to better understand the outcomes of these interventions for youth with ASD. We also examined factors that contribute to these outcomes, and explored whether outcomes in social functioning differ based on parent, teacher, observer, task performance and self-reported data.

Overall, GSSIs were found to produce moderate improvements in social functioning across parent, observer, task performance and self-reported data, but not teacher report. Further analysis revealed that parents reported improvements in youth's social functioning, but that these were small changes. In the teacher reported data, we saw no differences between treatment and control groups, potentially suggesting that generalization of learned social skills may be difficult to achieve in settings such as school, where social "demands" are usually higher and where peers may already hold negative biases.

Self-report measures revealed a large effect, but these effects were seen *only* in terms of social knowledge (kids saying they "know what do to"), *not* gains in social functioning (kids saying they "do what they know"). This finding suggests that though children may have learned these skills, they may still struggle with actually using them.

Based on these findings, it would be important for GSSIs to provide more opportunities for youth with ASD to practice social skills with peers, to gain experience in using these skills in the real world. It also points to the need of developing strategies that reinforce appropriate social behavior in different contexts, in order to aid youth with ASD in generalizing these learned behaviors. Lastly, future studies should examine whether the gains in social skills are due to children with ASD just being in a group, or due to specific aspects of GSSIs. If so, it will be necessary to understand what components of GSSI's are the "active ingredients" making the difference in social functioning for youth with ASD.

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A Multisite, Multidisciplinary Delphi Consensus Study Describing "Usual Care" Intervention Strategies for School-Age to Transition-Age Youth With Autism.

There is a current gap between research-supported practices and commonly used methods of clinical intervention (also known as "usual care") used to treat individuals with Autism Spectrum Disorder (ASD) in the United States. This is mainly due to the shortage of professionals trained in these practices across disciplines, which impacts health outcomes for individuals with ASD. To assess why there is a lack of evidence-based practices being used, it is necessary to understand the practices with which providers are familiar, most commonly use, find most useful, and believe to be research supported for individuals with ASD. Understanding the core components of evidence-based practices and seeing how they can be implemented into commonly used interventions, rather than focusing on larger treatment packages, is a more feasible method of closing this research to practice gap.

This current study utilized the feedback and consensus of expert different providers for individuals with ASD. These providers were truly experts: they had many years of experience working with the population, spent more than 50% of their time working with individuals with ASD, and treated more than 50 youth with ASD within the last 5 years of their practice. Information was collected from providers in New York, Long Island, San Diego, Chicago and Philadelphia.

Providers helped us develop an inventory of 55 different usual care practices used to treat youth with ASD, while also informing us upon the usefulness, research-support and personal familiarity they had with each practice. This is particularly useful in helping clinicians communicate about these common practices across a diverse range of disciplines (e.g., Psychology, Psychiatry, Social Work, Special Education, Nursing, Behavior Analysis, etc.).

Findings revealed that about 75% or more of providers who synthesized this inventory were familiar with 86% of these practices, and many of these practices were found to use common elements of research-supported ASD treatments. There were also a number of practices which were not familiar to 8-15% of providers, indicating that some practices may not be as widely spread or used; may be less relevant to treating ASD; or are very new or specialized to certain areas, clinical settings, or symptom presentations (older youth, youth with comorbidities or non-verbal youth), such that some practices are more widely used in some places than in others. Some of these practices include research-supported methods such as video modeling and the use of technology aided instruction – this may suggest that practices aren't widely used because of difficulties in financial access and proficiency. Understanding the barriers preventing clinicians from using research-supported practices is useful in determining the kinds of elements to investigate in research.

Across treatments addressing anxiety, externalizing behaviors and social skills, a majority of practices were found to be useful by at least 75% of providers, but not all providers agreed on whether certain practices were research supported - this shed light on the delay between interventions and practices developed through clinical research and the actual dissemination of information to clinical providers.

This research has created a "Rosetta Stone" for communicating about practices across clinicians and practitioners who treat ASD. This research allows researchers to understand the scope of the gap between research and practice, while also understanding which treatments already in use are most useful and commonly employed for youth with ASD and thus warrant further research as they are more likely to be used in the community. In this way, providers themselves benefit as we initiate bi-directional conversation in efforts to understand the differences and similarities of different components between usual care practices and evidence-based practices, while also informing researchers of the relevant behavioral health needs of the populations of children with ASD that providers encounter. The next step in this study is seeking responses from non-clinical community providers to obtain further insight into practices commonly used to treat these youth in non-clinical settings.

Social Skills Importance Ratings, not Social Skills Themselves, Predict Sociometric Status in Youth with Autism Spectrum Disorder

Children with Autism Spectrum Disorder (ASD) experience difficulties with social situations while also experiencing rejection and dislike by their peers. Social skills interventions focus on both teaching social skills as well as stressing their importance, but it has not been examined whether knowing skills, or perceiving them as important, leads to better social outcomes such as friendship making. Using data of participants in our Social Groups for ASD Study (SDARI) we explored whether self-reported importance ratings of social skills or self-report of acquired social skills led to being more disliked or liked by their peers in their group.

Our findings revealed that greater child self-reported ratings for the importance of certain social skills, rather than having social skills themselves, were related to fewer instances of being both *less disliked* at the end of the Social Groups intervention and being the *most disliked person* in a playgroup. Moreover, it was found that believing certain skills were important, such as self-control, cooperation, assertion, responsibility and empathy - had the most impact on these associations.

This current study expands on our previous findings regarding the perceived importance of social skills for children with ASD and their parents. These results point to the importance of social skills as being a significant component in social skills interventions as it could potentially aid children with ASD to be less disliked by their peers. Future research should include understanding the difference in the perception of social skills importance between children with ASD and their typically developing peers to understand how this impacts social functioning overall.

Hostile Attribution Bias in ASD Youth Predicts Treatment Response to Social Skills Intervention

Previous research indicates that one of the facets of social information processing is attribution biases - more specifically, the way individuals perceive the actions of others. It has been found that individuals with Autism Spectrum Disorder (ASD) have a tendency to label ambiguous social situations as hostile. Research has yet to indicate whether this bias somehow affects treatment outcomes for children with ASD undergoing intervention.

Our findings focused on child self-report responses of attribution bias to different social situations and their progress through a social skills intervention. We found that children who reported high levels of hostile attribution bias also tended to show greater improvements as a result of the intervention, and this association was influenced by an increased improvement in social awareness.

These results point to the possibility of hostile attribution bias leading to a type of hyper-awareness to social contexts, allowing children to reap greater benefits from social skills intervention. These findings also suggest that children with greater levels of hostile attribution bias ratings at the beginning of these interventions could potentially label social situations as less hostile during the progression of the intervention. Finally, it could be that screening for these biases may be a helpful tool when enrolling youth with ASD in social skills intervention programs.

Expert Provider Use of Empirically-evaluated Treatment Elements for Anxiety in Youth with ASD

Rosen, T., Weber, R., Marro, B., Kerns, C., Drahota, A., Moskowitz, K., Wainer, A., Sommer, S., Jospehson, A. & Lerner, M.D. (2017). *Expert Provider Use of Empirically-evaluated Treatment Elements for Anxiety in Youth with ASD.* Poster presented at the Annual Meeting for the International Meeting for Autism Research, San Francisco, California, May 10-13.

Children with Autism Spectrum Disorder (ASD) are at an increased risk for developing anxiety. Though this has led to an increased interest in developing effective treatments for treating anxiety symptoms for children with ASD, research suggests that there may not be a wide use of research-supported treatments for treating anxiety in youth with ASD. In this current study, we explored the extent to which clinicians were using research-supported treatments found to be effective for treating anxiety in youth with ASD.

This study used data from our "Usual Care" study and included 53 different providers across the United States, such as psychologists, social workers and behavioral technicians. In order to qualify for this study, providers had to primarily treat youth with ASD for more than 5 years, to currently work in a setting with more than half of the individuals being youth with ASD, and having treated more than 50 individuals with ASD in the last 5 years. We found that the majority of providers were using research-supported methods to treat anxiety in youth, and that they were not using methods that were not generally supported by research. We also found that the majority of providers were using visual support strategies and graduated exposure to treat anxiety in youth with ASD.

For future research, we are suggesting a proposed "two way bridge" which will allow greater amount of communication between researchers and clinical practitioners in the field in order to ensure that research-reliable treatment methods are in use, and also to ascertain whether these treatments are truly effective in the clinical setting.

The Importance of Parent-Teacher Informant Discrepancy in Characterizing Youth with ASD

While research indicates that symptoms related to Autism Spectrum Disorder (ASD) vary between different social contexts, there is relatively little work on the implications of these differences. To gain better insights into this concept, it is necessary to rely on reports from different informants (such as parents and teachers) to assess contextual variability in behavior of children with ASD. It is possible that understanding the input of different sources may serve to better describe possible differences between groups of individuals on the Autism spectrum. Having these different reports also may serve to have a better idea of expected intervention outcomes based on informant ratings of a child's symptoms. Understanding the differences between their reports is also essential to better understand how behavior varies across contexts.

Findings revealed that there were two "profiles" of children in the sample studied - one group which exhibited greater amounts of agreement between parent and teacher reports of ASD-related symptoms, and another group who exhibited greater levels of disagreement between these reports. Children whose informants had a greater amount of agreement were more likely to experience a greater severity of Autism symptoms, receive school-based services, and experience co-occurring psychiatric symptoms than those who had informants with more disagreement between reports of symptoms.

These findings help us understand that having multiple informants reporting on symptom severity of children better supports the organization of the symptom-profile of ASD in different contexts. Understanding how these symptoms are the same or different across social contexts aids us in painting a clearer, more comprehensive picture of ASD.

The Relation between Prosocial Peer Interactions and Anxiety Varies as a Function of Parent-Reported Social Engagement in Youth with ASD

Children with Autism Spectrum Disorder (ASD) have been known to show varying associations between anxiety and their level of pro-social interaction. This association has also been observed in typically developing children, but it has varied based on their level of social engagement skills. In this study we sought to understand whether children's level of social engagement affected the relation between anxiety and pro-social interaction. Using data from our Social Groups for ASD Study (SDARI), we had two interesting findings that may shed more light into the unique way anxiety affects children with ASD.

We found that children in this sample who reported low levels of anxiety and low social engagement skills, reported a *greater* level of pro-social interactions. Additionally, these children also reported lower levels of panic, performance related, and obsessive-compulsive anxiety symptoms. Further, children in this sample who reported high anxiety and high social engagement skills *also* exhibited a greater level of pro-social interactions. These same children also reported high levels of humiliation and rejection fears, as well as generalized anxiety.

Oftentimes, children who experience high levels of panic, performance-related, and obsessive compulsive anxiety symptoms may tend to be preoccupied with anxious thoughts, which may be potentially distracting from the world around them. Thus, the children who had *low* levels of these symptoms may have had higher levels of pro-social interaction due to the fact that they were less attuned to their internal anxious thoughts and therefore were more pro-social, even if they lacked social engagement skills. Conversely, the children in this sample that reported greater levels of anxiety and social engagement skills also reported high levels of humiliation and rejection fears, as well as generalized anxiety. Their high levels of pro-social interaction may suggest that this type of anxiety, being self-evaluative in nature, may spur children to become more engaged socially so as to reduce the risk of being evaluated negatively.

The findings of this study help us further understand how levels of social engagement may be beneficial or impairing for children with ASD based on the type of anxiety they present. Moreover, these results also shed light in the ways that anxiety can present differently in children with ASD. This is of interest because anxiety is often comorbid with ASD, and understanding how it plays a role in social engagement may be helpful in developing interventions for children on the Autism Spectrum.

Developmental Differences in the N170 in Individuals with ASD

Individuals with Autism Spectrum Disorder (ASD) exhibit a difficulty in the speed of visual processing of emotional faces. Previous findings have shown that normally, these speeds tend to increase until children reach age 14. It has also been found that, throughout development, children with ASD exhibit slower facial processing speeds to emotional faces than their typically developing peers.

In this current study, we had two main findings. Our first finding revealed that in this population of individuals with ASD, the speed of facial processing increased with age, and that this was not affected by the severity of ASD symptoms nor how well individuals could identify different facial emotions. Moreover, the increase of these processing speeds over time seems to supersede the developmental timeline of typically developing individuals.

These results lend further insight into the neurodevelopmental trajectory of individuals on the Autism spectrum. While this could indicate a delay in development for these individuals, it also reveals extended opportunities for intervention to affect neural development of facial processing well into young adulthood.

Hemispheric Asymmetry as an Electrophysiological Marker of Anxiety in Youth with Autism Spectrum Disorder

Many of the studies we conduct here at the SCTL involve the use of an electroencephalogram (EEG). This non-invasive tool allows us to monitor brain activity in real time. This kind of information is useful in order to parse out individual differences among individuals with and without ASD in order to better characterize different patterns of brain activity.

This current study examined the phenomenon of hemispheric asymmetry, a measure of relative brain activity across the right or left hemisphere at rest in individuals with ASD. Hemispheric asymmetry profiles are implicated in internalizing symptoms anxiety, as well as relative tendency to approach others in social situations. Using data from participants involved in our Social Groups for ASD Study, we observed that individuals with a more "left-dominant" brain activity in the frontal area of the brain were less likely to have anxiety at the beginning of this intervention, and were also more likely to show improvements in anxiety symptoms after the intervention.

This kind of research aids us in gathering insight into the individual differences across the spectrum and in understanding unique neurobiological presentation of anxiety in ASD. This may further allows us to identify and develop effective treatments for children with ASD with different neurological and behavioral profiles.

ERN as a Predictor of Treatment Response to Social Skills Interventions in ASD

Past research within typically developing populations has shown that increased magnitude of brain activity in response to making errors on tasks is a potential indicator of increased levels of anxiety symptoms. This brain activity is known as error-related negativity (ERN), an electrophysiological brain response detected when participants make an error on a task. The ERN has yet to be studied thoroughly in individuals with Autism Spectrum Disorder (ASD), and is especially important considering that anxiety symptoms have been shown to affect intervention outcomes for children with ASD. In this current study, we focused on examining the association between the ERN and anxiety symptoms as well as whether the size of the ERN response and anxiety symptoms at baseline might relate to children's response to social skill interventions.

Our results revealed two main findings. First, the magnitude of relative brain activity (a greater ERN response) in response to errors made during computer tasks was associated with a greater amount of anxiety based on children's self-reported anxiety symptoms. Second, children who exhibited larger ERN responses were more likely to have *stronger* improvements in anxiety symptoms after treatment, and children who had smaller ERN responses were more likely to have *weaker* improvements in anxiety symptoms after treatment. The types of anxiety symptoms associated with these outcomes were humiliation and rejection, performance fear, generalized anxiety, obsessions and compulsions, panic and physical symptoms. This pattern of association was not observed in relation to symptoms of restlessness, harm avoidance, tension or separation anxiety symptoms. Moreover, this relationship between ERN and reduction in anxiety symptoms was only observed in self-reported symptoms and not parent-reported symptoms.

From this research, we were able to conclude that the magnitude of the ERN response may be able to predict which children are likely to see the greatest improvements in self-reported anxiety symptoms among children with ASD following a social skills intervention. This is important in helping us create targeted interventions addressing anxiety for children with ASD.

Error-related Brain Activity and Anxiety Symptoms in Youth with Autism Spectrum Disorder

Anxiety is a common comorbidity experienced by individuals with Autism Spectrum Disorder (ASD). Anxiety has also been noted to present itself differently among children with ASD; for example, children may show symptoms of social anxiety without fear of being negatively evaluated by peers. In youth without ASD, anxiety has been found to be associated with a physiological brain response recorded via EEG related to threat sensitivity, called the error-related negativity (ERN). This physiological response has yet to be studied within a population of children with ASD as it relates to specific anxiety symptoms. Our current study sought to observe whether the ERN response is significant in children who have ASD and experience anxiety symptoms, and if it is affected by other factors such as depression, age and verbal abilities.

Results showed that among the children with ASD in our sample, this ERN activity was most related to self-reported performance-based (not humiliation or rejection) fears. These results were maintained even when we took depression, intellectual functioning (IQ) and age into account during analyses. This may give us some more insight into understanding the underlying brain mechanisms which may be implicated in certain anxiety symptoms in children with ASD, as it suggest that a heightened reaction to threat sensitivity may be present in youth with ASD who present with these specific anxiety symptoms. Thus, these findings suggest that the ERN could potentially be a potential marker for children with ASD who may present with social anxiety and fearfulness *without* sensitivity to humiliation or rejection.

Neural, Cognitive and Motivational Mechanisms Underlying Reciprocal Friendship in Youth with Autism Spectrum Disorder

Children with Autism Spectrum Disorder (ASD) often experience difficulty making high-quality friendships. In order to better understand why this is the case, understanding the neurological and psychological factors that contribute to friendship making and development are worth exploring. One of the potential contributing factors is the speed at which individuals process social information (social information processing, or "SIP"). Moreover, previous research indicates that children with ASD have difficulties with being aware of the mental state of others (also known as "Theory of Mind"), and may exhibit lower levels of social motivation. *Social motivation* is defined as one's desire or initiative to participate in social interaction. This current study explored the relationship between children's SIP and their ability to make friends, and whether Theory of Mind and social motivation played a potential role in this relationship.

Our results revealed that children in this study who showed slower SIP to positive information (such as smiling faces) had more reciprocated friendships, but *as a result* of greater levels of social motivation. This relation was only seen in children who had greater difficulty with Theory of Mind.

Our findings suggest that SIP speed alone is *not* the only factor important for having reciprocated friendship, but the degree of social motivation and Theory of Mind may also play important roles in friendship making for children with ASD.

Differences in the LPP as a function of valence versus intensity in adults with and without ASD

Past studies have shown that individuals with Autism Spectrum Disorder (ASD) process social cues differently than their typically developing peers. Most of these studies look at the early visual processing of faces as a representative social cue. However, later stages of face processing, related to motivation and sustained attention, haven't been studied as widely in individuals with ASD. To address this gap in our knowledge, we examined an electrophysiological index of emotional-face processing, known as the Late Positive Potential (LPP), in adults with and without ASD. The LPP is a marker of sustained attention and motivation.

This study produced two main findings. First, we found that individuals with ASD showed a greater amount of relative brain activity as compared to typically developing individuals in later stages of visual processing, when directing their attention to low-intensity emotional faces. Secondly, we found that individuals with ASD showed a greater amount of brain activity in relation to typically developing individuals when directing their attention to negative emotions in faces.

These findings help us to further understand the differences in the processing of social cues and how it differs within individuals with ASD. They could suggest that individuals with ASD use a greater amount of neural resources in order to "decode" low intensity facial expressions. Additionally, they also suggest that individuals with ASD exhibit heightened sensitivity to negative emotions in faces. Together, these results suggest that difficulties in processing social stimuli may be present across early and late stages of visual processing.

Externalizing and Internalizing Symptoms Moderate Longitudinal Patterns of Facial Emotion Recognition in Autism Spectrum Disorder

Externalizing symptoms (disruptive behaviors or conduct problems) and internalizing symptoms (withdrawal, anxiety, and depressive behaviors) have been known to affect adolescents' ability to properly recognize and identify facial emotions. The ability to correctly identify emotions in faces is thought to be a core social deficit for youth with Autism Spectrum Disorder (ASD). However, several studies have shown that there are differences within adolescents with ASD in their ability to recognize and identify certain emotions. It also remains to be examined whether this skill improves or worsens over time.

In this current study, we sought to examine adolescents' facial emotion recognition (FER) ability and how it changed over time, and how externalizing or internalizing symptoms present in youth affected their FER ability. Their FER ability was measured by a facial-emotion recognition task administered repeatedly over the course of 18 weeks.

We found that children in this sample improved in their FER ability over the course of the 18-week period. We saw that these effects were *less pronounced* in children with externalizing symptoms, and *enhanced* for children with internalizing symptoms. This could be due to the fact that children who tend to "act out" or express their emotions externally may have more difficulty paying attention to certain social cues. Children with higher internalizing symptoms may be more attuned to social stimuli due to heightened social sensitivity. It may also be likely that these children were better at recognizing emotions as a result of becoming more comfortable with the same facial representations over time.

These findings reveal that children with ASD can indeed improve their emotion recognition over time. The improvements observed in FER suggest that children with ASD can improve upon this skill without explicit instruction, challenging the pre-existing notion that FER represents a core deficit in youth with ASD.

Hooked on a feeling: Repetitive cognition and internalizing symptomatology in relation to autism spectrum symptomatology

Depression is a common co-occurring condition in individuals with Autism Spectrum Disorder (ASD) and is experienced at a greater frequency by adults with ASD than typically developing adults. It is also found that individuals with ASD have higher rates of *repetitive cognition* than other populations, and that forms of these repetitive thought patterns are found to correlate with depression symptoms. Thus, in this current study we examined repetitive cognition in relation to symptoms of ASD and depression. These questions were explored by administering a survey to 200 adults.

This study produced two main findings. Our first finding revealed that repetitive cognition was also highly associated with rumination, depression and *rejection sensitivity* (emotional reactivity to social rejection) across people with *varying* levels of ASD symptoms. Our second main finding revealed that perseveration (a form of repetitive cognition) was an important link between symptoms of ASD and depression.

These findings suggest that when evaluating depressive symptoms for individuals with ASD, it may be of particular importance to evaluate the degree of self-reported repetitive cognition in order to better understand depression within ASD and to produce better treatment outcomes. Additionally, these results help us highlight the importance of the relationship between repetitive cognition and internalizing symptoms such as anxiety, indicating that this form of perseverative thinking may have an impact beyond symptoms of depression among individuals *with and without* ASD. Understanding the shared similarities of symptoms experienced by individuals with and without ASD not only leads us to improved treatments for depression, but also a greater understanding of how depression is particularly experienced by individuals with ASD.

SELECTED WORKS TO BE PRESENTED AT

THE ANNUAL MEETING OF THE INTERNATIONAL SOCIETY FOR AUTISM RESEARCH

May 10 - 13

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Subjective Beliefs About Social Skills Importance, But Not Social Skills themselves, Predict Peer Interactions in Adolescents with Autism Spectrum Disorder.

Santore, L.A., Kang, E., Sommer, S.L., Simson, C.E., Kumar, D., Lerner, M.D. (May, 2018). *Subjective Beliefs About Social Skills Importance, But Not Social Skills themselves, Predict Peer Interactions in Adolescents with Autism Spectrum Disorder.* Poster presented at the International Society for Autism Research. Rotterdam, Netherlands.

Children with Autism Spectrum Disorder (ASD) often report difficulties in communicating with others. Recently, research has examined how children with ASD may perceive their own social interactions in ways that differ from their typically developing peers. While adolescents with ASD rate certain social skills as important and even tend to "over-report" their own social skills, work has yet to be done in examining whether subjective beliefs held by adolescents with ASD regarding their own social skills are related to their experienced social interactions.

In this current study we analyzed video-recorded sessions of our Social Groups for ASD Study (SDARI) to determine which factors led to a greater amount of peer interactions during sessions of free, unstructured social time. We found that children with ASD rated specific social skills such as communication, cooperation, engagement and self-control as important, but these ratings were *not* associated with increased social time - rather, children that reported these skills as especially important actually spent *less* social time with peers. This relationship was only observed for importance ratings of these social skills and not any self-reported social skill behaviors. Moreover, the relation between self-reported social skills and social skills importance ratings did not impact these findings.

These results suggest that children with ASD may identify the social skills they struggle with the most as those that are most important, but this does not necessarily indicate a use of these skills. Furthermore, this helps us understand how children with ASD may perceive their own behavior and how that relates to the actual behavior they display in social settings.

Supportive School Services for Youth with ASD and their Relations to ASD Symptoms, Intellectual Functioning, and Co-occurring Psychiatric Symptoms

It is usually assumed that children with Autism Spectrum Disorder (ASD) are more likely to receive supportive school services (SSS) due to the severity of their ASD symptoms. However, it has also been shown in past research that children with ASD may present varying levels of symptoms in different contexts, including in the school, clinic, and home settings. Therefore, when evaluating ASD severity, it is particularly important to obtain the reports of all relevant informants, including teachers, clinicians, and parents. Moreover, intellectual functioning and co-occurring psychiatric symptoms may relate to SSS, though these relations have received little examination. Thus, in this particular study, we chose to examine how teacher, clinician, and parent ratings of ASD symptom severity relate to SSS receipt. We also examined whether intellectual functioning and co-occurring psychiatric symptoms were related to SSS receipt.

This study revealed three main findings. First, we found that clinical evaluation of ASD severity was associated with greater likelihood of SSS receipt of services commonly provided for children with ASD (such as speech therapy, occupational therapy and social skills training). Both clinical evaluation and teacher ratings of ASD severity were related to how often these commonly provided, and additional services, were received. It was also found that children with lower IQ received both types (e.g., commonly provided and additional services) of SSS more often, while children with higher levels of parent rated externalizing symptoms (such as "acting out" or using aggressive physical or verbal behaviors) were less likely to receive the commonly provided SSS.

These results shed light on the need to examine levels of ASD severity across different informants when examining the trends of SSS service receipt among youth with ASD. Moreover, result suggest that SSS receipt is associated with challenges related to ASD as well as intellectual functioning, but not necessarily those related to co-occurring challenges.

Mapping Patterns and Correlates of In-Vivo Social Interactions of Adults with and without ASD via Ecological Momentary Assessment

While some research suggests that adults with ASD tend to have less social interaction than those without ASD, these reports have mainly been based on information reported by caregivers of these adults and can be subject to retrospective biases. Using data from our study, Paying Attention to Social Interactions (PASI), we sought to examine the number of social interactions experienced by adults with ASD based on an ecological momentary assessment (EMA) - a measure of in-vivo social interactions self-reported by adults via a phone application. In this current study, we had participants fill out quick surveys reporting their social interaction throughout the day. "Social interactions" are defined in this study as an interaction that involves reciprocal conversation lasting for longer than 5 seconds. We wanted to investigate which factors affected the average number of daily social interactions experienced by these adults. One of these factors is the condition of alexithymia, a condition in which individuals express a difficulty in identifying their emotions. Past research suggests that having this condition may be related to social impairment in adults with ASD.

We had three main findings. First, we determined that there is not a significant difference in the number of social interactions experienced between adults with ASD and adults who do not have ASD. Secondly, we found that among individuals with ASD, there was a greater variability in the number of interactions. Thirdly, we found that alexithymia was one contributing factor that predicted a lower number of social interactions across all participants.

These findings shed more light on the actual amount of social interaction adults with ASD engage in on average. Furthermore, this individual variability among individuals with ASD may indicate that reports of reduced social interaction may be more likely attributed to individual factors. Moreover, we found that alexithymia, and not severity of ASD symptoms, was the most significant predictor of how many social interactions were experienced by adults with ASD.

Atypicality of the N170 Event-Related Potential in Autism Spectrum Disorder: A Meta-Analysis

Kang, E., Keifer, C.M., Levy, E.J., Foss-Feig, J.H., McPartland, J.C., & Lerner, M.D.(May, 2018). *Atypicality of the N170 Event-Related Potential in Autism Spectrum Disorder: A Meta-Analysis.* Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands.

It is known that individuals with Autism Spectrum Disorder (ASD) face specific challenges in processing social information. One facet of processing this information involves recognizing and attending to social information such as faces. In several of our laboratory studies, we are interested in monitoring brain activity via a non-invasive electroencephalogram (EEG) in order to examine the brain signals that are more active when processing certain kinds of information. Our lab as well as other researchers take a particular interest in the specific brain signal associated with facial recognition is known as the N170. In particular, the speed of the N170 seems to be a real-time detection of the time it takes for an individual to recognize an image as a face. There have been several studies to date that have examined how this signal presents differently in individuals with ASD and have discussed the implications of using the N170 signal as a potential marker for ASD diagnosis and treatment. However, many of these studies to date have varied information and some have smaller sample sizes, and there is yet to be a compilation of all of this research into a comprehensive overview of the data gathered regarding the N170. Thus, this current study analyzes the recently published literature to examine the atypical presentation of the N170 in individuals with ASD and what this could mean for further research and clinical treatment.

This meta-analysis examined data from 23 different studies involving a total of 374 individuals with ASD and 359 typically developing (TD) individuals. We examined the differences in the speed of the N170 signal and how it differed between individuals with ASD and those who were typically developing, and we also examined the effect of related factors such as intellectual functioning (IQ), severity of ASD symptoms, use of diagnostic measures and individual sex distribution of participants across these different samples.

This work revealed three main findings. First, we found that the N170 signal was found to be significantly slower in individuals with ASD, and that overall, these signals had the same magnitude between these groups. When taking age and IQ into account, we saw that adults in particular and those with higher IQ were more likely to have a lower magnitude signal than TD participants in these samples. Lastly, we also found that another social processing signal of interest, the P1 signal, wasn't found to be different between participants with ASD and TD participants in this sample, which makes the N170 an even more favorable candidate of social processing in ASD.

The findings from this work suggest that the N170 signal is a promising biological marker that seems to present a different pattern of brain processing in individuals with ASD. Now we can look forward to future research that examines this marker's response to treatment and also understanding what contributes to the differences in this signal across individuals with ASD.

Adolescents with ASD Show Unique Electrophysiological (EEG) Responses in a Novel Theory of Mind Reasoning Task: An ERP Study of the LPC and LSW

Using preliminary data from an ongoing study, we examined behavioral and neural responses to a newly developed computer-based "Theory of Mind" (ToM) task. ToM reasoning involves making inferences about others' mental states and is critical for understanding and predicting others' behavior in social situations. Impairments in social communication, including ToM, are commonly seen in Autism Spectrum Disorder (ASD).

Previous research using electroencephalography (EEG; a way of measuring the electrical activity of the brain via electrodes placed on the scalp), has examined event-related potentials (ERPs; electrical signals sent by the brain in response to stimuli) elicited during ToM reasoning tasks in typically developing youth. These studies have suggested that correct ToM reasoning is associated with two distinct ERP components, called the Late Positive Complex (LPC) and Late Slow Wave (LSW). The LPC occurs earlier and is thought to relate to more automatic, perceptual processing, whereas the LSW occurs later and is thought to relate to more complex processes involved in making attributions about others' mental states (i.e., anticipating what others may be thinking or feeling in certain situations).

During the computer task, adolescents were presented with a series of narrated stories and were asked to make inferences about a character's behavior or thoughts. After the end of each story, correct and incorrect response options were presented one-by-one, and brain activity in response to correct and incorrect response option presentation was recorded. Participants then used a button box to select their answer choice, indicating either correct or incorrect engagement of ToM. We compared the number of correct and incorrect behavioral responses, as well as brain activity during the presentation of correct and incorrect answer choices, in a group of typically developing adolescents and a group of adolescents with ASD.

Preliminary results show that youth with ASD in this sample made more errors on the task than did typically developing adolescents. Additionally, compared to typically developing adolescents, adolescents with ASD showed a smaller difference between the magnitude of brain responses to correct and incorrect ToM response options during the later LSW, with a similar but smaller trend evident during the earlier LPC.

These results further our understanding ToM reasoning in ASD youth. Adolescents with ASD showed less behavioral accuracy and less differentiation between neural responses to correct and incorrect ToM reasoning during the LSW. The LPC has been associated with more attentional aspects of ToM reasoning, whereas the LSW has been associated with more elaborative processing of mental states. Our results suggest that these later, more complex ToM reasoning processes may be particularly responsible for differences in ToM reasoning seen in individuals with ASD.

Published and presented papers, talks, and abstracts from the last several years at

The Social Competence and Treatment Lab

* = Grad or Undergrad student author. ¥ = Shared first-authorship

Published Articles

Rosen, T.E.,* Mazefsky, C.A., Vasa, R.A., & Lerner, M.D. (in press). Co-occurring psychiatric conditions in autism spectrum disorder. *International Review of Psychiatry*. DOI: 10.1080/09540261.2018.1450229.

Kang, E.,* Keifer, C.M.,* Levy, E.J.,* Foss-Feig, J.H., McPartland, J.C., & Lerner, M.D. (in press). Atypicality of the N170 event-related potential in autism spectrum disorder: a meta-analysis. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging.*

Rosen, T.E.,* & Lerner, M.D.^ (in press). Error-related brain activity and anxiety symptoms in youth with autism spectrum disorder. *Autism Research*. DOI: 10.1002/aur.1898.

Black, S.R.,* Lerner, M.D., Shirtcliff, E.A., & Klein, D.N. (2018). Patterns of neuroendocrine coupling in 9-Year-Old children: effects of sex, body-mass index, and life stress. *Biological Psychology*, 132, 252-259. DOI: 10.1016/j.biopsycho.2017.11.004.

Goldstein, T.R., Lerner, M.D. (in press). Dramatic pretend play games uniquely improve emotional control in young children. *Developmental Science.* DOI: 10.1111/desc.12603.

Gates, J.A.,* Kang, E.,* Lerner, M.D. (2017). Efficacy of group social skills interventions for youth with autism spectrum disorder: a systematic review and meta-analysis. *Clinical Psychology Review*, 52, 164- 181. DOI: 10.1016/j.cpr.2017.01.006. NIHMS 847192.

Kerns, C.M., Moskowitz, L., Rosen, T.E.*, Drahota, A., Wainer, A., Josephson, A.,* Soorya, L., Cohn, E., Chacko, A., & Lerner, M.D. (in press). A multi-site, multidisciplinary Delphi consensus study describing "usual care" intervention practices for school- to transition-age youth with autism. *Journal of Clinical Child & Adolescent Psychology.*

Lerner, M.D., ¥ Mazefsky, C.A., ¥ Weber, R.J.,* Transue, E., Siegel, M.S., Gadow, K.D., and the Autism and Developmental Disabilities Inpatient Research Collaborative (in press). Verbal ability and psychiatric symptoms in clinically-referred inpatient and outpatient youth with ASD. *Journal of Autism & Developmental Disorders*. DOI: 10.1007/s10803-017-3344-5.

Tudor, M.E.,* Rankin, J.A.,* Lerner, M.D. (in press). Getting to know siblings of youth with autism spectrum disorder: A model of family predictors and clinical functioning. *Journal of Autism & Developmental Disorders.*

Lerner, M.D., De Los Reyes, A., Drabick, D.A.G., Gerber, A.H.,* Gadow, K.D. (2017). Informant discrepancy defines discrete, clinically-useful autism spectrum disorder subgroups. *Journal of Child Psychology and Psychiatry,* 58, 829 - 839. DOI: 10.1111/jcpp.12730.

Fjermestad, K.W., Lerner, M.D., McLeod, B.D., Wergeland, G.H., Haugland, B.S.M., Havik, O.E., Öst, L.E., Silverman, W.K. (in press). Motivation and treatment credibility predict alliance in cognitive behavioral treatment for youth with anxiety disorders in community clinics, *Journal of Clinical Psychology*. DOI: 10.1002/jclp.22551.

Keenan, E.G.,* Gotham, K., Lerner, M.D. (in press). Hooked on a feeling: repetitive cognition and internalizing symptomatology in relation to autism spectrum symptomatology. *Autism.* DOI: 10.1177/1362361317709.

Kim, H.,* Keifer, C.M.,* Rodriguez-Seijas, C.,* Eaton, N.R., Lerner, M.D., Gadow, K.D. (2018). Structural hierarchy of autism spectrum disorder symptoms: an integrative framework. *Journal of Child Psychology and Psychiatry*, 59, 30 - 38. Doi: 10.1111/jcpp.12698. NIHMS 845371.

Wainer, A., Drahota, A., Cohn, E., Kerns, C., Lerner, M. D., Marro, B.,* Moskowitz, L., Soorya, L.(2017). Understanding the landscape of psychosocial intervention practices for social, emotional, and behavioral challenges in youth with ASD: A study protocol. *Journal of Mental Health Research in Intellectual Disabilities*, 10, 178-197. DOI: 10.1080/19315864.2017.1284289.

Kang, E.,* Klein, E.F.,* Lillard, A.S. & Lerner, M.D. (2016). Predictors and moderators of spontaneous pretend play in children with and without autism spectrum disorder. *Frontiers in Psychology*, 7, 1577. doi: 10.3389/fpsyg.2016.01577

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De Los Reyes, A., Aldao, A., Qasmieh, N., Dunn, E.J., Lipton, M.F., Hartman, C., Dougherty, L.R., Youngstrom, E.A., Lerner, M.D. (in press). Graphical representations of adolescents' psychophysiological reactivity to social stressor tasks: reliability and validity of the chernoff face approach and person-centered profiles for clinical use. *Psychological Assessment*. DOI: 10.1037/pas0000354.

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recognition in autism spectrum disorder. *Child Psychiatry and Human Development*, 47, 890 - 902. DOI:10.1007/s10578-015-0620-5.

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Rankin, J.A.,* Weber, R.J.,* Kang, E.,* Lerner, M.D. (2016). Parent- and self-reported social skills importance in autism spectrum disorder. *Journal of Autism & Developmental Disorders,* 46, 273-286. DOI: 10.1007/s10803-015-2574-7.

Lerner, M.D., Potthoff, L.M.,* Hunter, S.J. (2015). Optimizing cross-sectional prediction of social functioning in youth referred for neuropsychological testing. *PLoS One*, 10(15), 1 - 16. DOI: 10.1371/journal.pone.0128303.

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Tudor, M.E.*, Lerner, M.D. (2015). Intervention and support for siblings of youth with developmental disabilities: a systematic review. *Clinical Child and Family Psychology Review*, 18, 1 - 23. DOI:10.1007/s10567-014-0175-1.

Book chapters

Lerner, M.D., Mazefsky, C.A., White, S.W., McPartland, J.C. (*in press*). Autism spectrum disorder. In J. Butcher, J. Hooley, P.C. Kendall (Eds.), *American Psychological Association Handbook of Psychopathology*. Washington, DC: American Psychological Association Books.

Lerner, M.D., Rosen, T.E.,* Kang, E.,* Keifer, C.M.,* Gerber, A.* (*in press*). Autism spectrum disorder. In Ollendick, T.H., White, S.W., & White, B.A. (Eds.), *Oxford Handbook of Clinical Child and Adolescent Psychology*. New York: Oxford University Press.

Lerner, M.D., Girard, R.M. (*in press*). Appreciating and promoting social creativity in youth with Asperger's Syndrome. In Kaufman, S.B. (Ed.), *Supporting and Educating Twice-Exceptional Children*. New York: Oxford University Press.

Hauser, M.J., Kohn, R., **Lerner, M.D.**, Stein, M., Lory, B., Bursztajn, H.J. (*in press*). Intellectual disabilities, autism, and aging: medical-legal issues. In Holzer, J.C. (Ed). *Geriatric Forensic Psychiatry*. Oxford University Press.

Moskowitz, L. J., Rosen, T.,* **Lerner, M. D.,** & Levine, K. (2017). Assessment of anxiety in youth with autism spectrum disorder. In C. Kerns, E. Storch, P. Kendall, J. J. Wood, & P. Renno (Eds.),

Evidence Based Assessment and Treatment of Anxiety in Children and Adolescents with Autism Spectrum Disorder (pp. 79 – 104). Elsevier.

Gabriel, J.,* Angevin, E.,* Rosen, T.,* **Lerner, M.D.** (2016). Use of theatrical techniques and elements as interventions for autism spectrum disorders. In Sofia, G. (Ed.), *Theater and Cognitive Neuroscience* (pp. 163 – 176). London, UK: Bloomsbury Academic.

<u>Poster presentations</u>

Vogel, R.A.,* **Lerner, M.D.** (2018). *The Influence of Attention Deficit Hyperactivity Disorder Comorbidity on Social Functioning in Children with Autism Spectrum Disorders*. Poster at the 16th Annual Conference of the American Academy of Clinical Neuropsychology, San Diego, CA, June.

Keifer, C.M.,* Libsack, E.J.,* & **Lerner, M.D.** (2018). *Socio-Dramatic Affective-Relational Intervention (SDARI) Changes the N100 ERP to Prosodic Voices*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 9 – 12.

Sommer, S.,* Simson, C.E.,* Santore, L.A.,* and **Lerner, M.D.** (May). *Lower Lifetime ASD Symptom Severity Predicts Increase in Separation Anxiety with Age in Adolescents with ASD*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 9 – 12.

Paterson, S. J., **Lerner, M.D.**, Goldstein, T.R., Toub, T.S., Golinkoff, R., & Hirsh-Pasek, K. (2018). *Acting out in Public School: How a Theatre Program Can Impact Imitation Skills in Children with ASD*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 9 – 12.

Gerber, A.H.,* Scott, S.B., Finsass, M.,* Girard, J.M.,* **Lerner, M.D.** (2018). *Mapping Patterns and Correlates of In-Vivo Social Interactions of Adults with and without ASD via Ecological Momentary Assessment*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 9 – 12.

Young, P.E.,* Santore, L.A.,* Esposito, C.M.,* Gerber, A.,* **Lerner, M.D.** (2018). *Relative Expressive Language Deficits Predict Anxiety in Youth with Autism Spectrum Disorder*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 9 – 12.

Keenan, E.G.,* Madison, M.J., Wood, J.J., & **Lerner, M.D.** (2018). *Psychometric Analysis of the Autism Spectrum Quotient Using Diagnostic Classification Modeling*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 9 – 12.

Halpern, C.H.,* Clarkson, T.,* **Lerner, MD.** (2018). *Autism Symptom Severity Predicts Accuracy of Facial Emotion Recognition Under Conditions of Low Theta-Power Early in Visual Processing.* Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 10 – 12.

Mayor Torres, J.M.,* Libsack, E.J.,* Clarkson, T.,* Keifer, C.M.,* Riccardi, G., **Lerner, M.D.** (2018). *EEG-based Single trial Classification Emotion Recognition: A Comparative Analysis in Individuals with and without Autism Spectrum Disorder*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 10 – 12.

Simson, C.E.,* Sommer, S.,* Santore, L.A.,* Kang, E.,* **Lerner, M.D.** (2018). *Social Game Interactivity Levels as Active Ingredients in Performance-Based Intervention for Adolescents with Autism Spectrum Disorder (ASD)*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 10 – 12.

Santore, L.A.,* Kang, E.,* Sommer, S.,* Simson, C.E.,* Kumar, D.,* & **Lerner, M.D.** (2018). *Subjective Beliefs about Social Skills Importance, but not about Social Skills, Predict Peer Interactions in Adolescents with Autism Spectrum Disorder.* Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 10 – 12.

Kang, E.,* Keifer, C.M.,* Levy, E.J.,* Foss-Feig, J.H., McPartland, J.C., & **Lerner, M.D.** (2018). *Atypicality of the N170 Event-Related Potential in Autism Spectrum Disorder: A Meta-Analysis*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 10 – 12.

Libsack, E. J.,* Keifer, C.M.,* Clarkson, T.,* Mayor Torres, J.M.,* **Lerner, M.D.** (2018). *Adolescents with ASD Show Atypical Electrophysiological (EEG) Responses to a Novel Theory of Mind Reasoning Task: An ERP Study*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 10 – 12.

Rosen, T.E.,* Spaulding, C.,* Gates, J.A.,* Gadow, K.D., & **Lerner, M.D.** (2018). *Supportive school services for youth with ASD and their relation to ASD symptoms, intellectual functioning, and co-occurring psychiatric symptoms*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 10 – 12.

Rosen, T.E.,* & **Lerner, M.D.** (2018). *Heightened neural processing of errors uniquely relates to social anxiety symptoms in youth with ASD*. Poster at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands, May 10 – 12.

Simson, C.E.,* Rosen, T.E.,* Kang, E.,* **Lerner, M.D.** (2017). *The relation between prosocial peer interactions and anxiety varies as a function of parent-reported social engagement in youth with ASD.* Poster at ASDD Special Interest Group session at the Association for Behavioral and Cognitive Therapies Conference (ABCT), San Diego, CA, November 16 - 19.

Santore, L.A.,* Kang, E.,* Esposito, C.M.,* Sommer, S.,* Stoerback, A.,* Gross, D.,* & **Lerner, M.D.** (2017). *Self-reported Social Skills Importance Ratings, not Social Skills Themselves, Predict Sociometric Status in Youth with Autism Spectrum Disorder.* Poster at the Association for Behavioral and Cognitive Therapies (ABCT) 51st Annual Convention, San Diego, CA, November 16 – 19.

Gerber, A.H.,* Mulhall, A.,* Kang, E.,* Wagler, L.,* & **Lerner, M.D.** (2017). Impact of Psychotropic Medication Use on Outcomes of a Group Social Skills Intervention. Poster at the 51st Annual *Convention of the Association for Behavioral and Cognitive Therapies*, San Diego, CA November 16 – 19.

Sommer, S.,* Gerber, A.H.,* Santore, L.A.,* Bhatt, R.,* McLean, C.,* & **Lerner, M.D.** (2017). Hostile Attribution Bias in ASD Youth Predicts Treatment Response to Social Skills Intervention. Poster at the 51st Annual *Convention of the Association for Behavioral and Cognitive Therapies*, San Diego, CA, November 16 – 19.

Stoerback, A.,* Santore, L.A.,* Esposito, C.M.,* Keifer, C.M.,* **Lerner, M.D.** (2017). Increased vocal, not facial, emotion recognition predicts positive evaluation by peers in youth with Autism Spectrum Disorder. Poster at the *Icahn School of Medicine Research Symposium in Biological, Chemical, Structural, and Computational Sciences*, New York, NY, September 16.

Day, C.,* Rosen, T.,* **Lerner, M.D.,** & Kerns, C.M. (2017). Treatment strategies across clinical disciplines: A Delphi consensus study of expert ASD providers. Poster at the *American Psychological Association* Annual Convention, Washington, D.C, August 3 - 6.

Clarkson, T.,* Kang, E.,* **Lerner, M.D.**, Jarcho, J.M., & Prinstein, M.J. (2017) A Meta-analysis of the RDoC Social Processing Domain across Units of Analysis. Poster at the *Journal of Clinical Child and Adolescent Psychology (JCCAP) Future Directions Forum*. College Park, MD. June 1-2.

Kang, E.,* Gerber, A.H.,* Lewis, S.,* Santore, L.A., *Genovese, J.G.,* & **Lerner, M.D.** (2017). *Interpersonal Synchrony and Pretense during Group Activities as Active Ingredients of Social Skills Intervention for Youth with ASD.* Poster accepted at the 1st Journal of Clinical Child and Adolescent Psychology (JCCAP) Future Directions Forum, College Park, MD, June 1 – 2.

Stewart, D., Gordon, L., Rauk, L., Kerns, C. M., Rosen, T.,* Marro, B.,* Moskowitz, L., Wainer, A., Soorya, L., Cohn, E., **Lerner, M.D.,** & Drahota, A. (2017). You're doing what? Delphi study describing usual care for youth with autism and externalizing behaviors. Poster presented at the 16th Biennial Conference of the *Society of Community Research and Action*, Ottawa, Ontario, Canada, June.

Kang, E.,* Wagler, L.,* Santore, L.A.* & **Lerner, M.D.** (2017). *Neural, Cognitive, and Motivational Mechanisms Underlying Reciprocal Friendship in Youth with Autism Spectrum Disorder*. Poster at the 29th Association for Psychological Science Annual Convention, Boston, MA, May 25 – 28.

Goldstein, T.R., **Lerner, M.D.,** Paterson, S., Toub, T.S., Hirsh-Pasek, K., & Golinkoff, R. (2017). Stakeholder perceptions of the effects of a theatre program for children with ASD. Poster at the 29th *Association for Psychological Science Annual Convention.* Boston, MA, May 25 – 28.

Weber, R.J.,* Kang, E.,* Trimber, E.,* Karls, A., Russo-Ponsaran, N., McKown, C., & **Lerner, M.D.** (2017). Web-based tool to assess social cognition in youth with ASD: Reliability and criterion validity. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May 10-13.

Keenan, E.G.,* Esposito, C.M.,* Labozzetta, A.,* & **Lerner, M.D.** (2017). Repetitive cognition mediates the relationship between autism symptoms and depression. Poster at the *International   Meeting for Autism Research*, San Francisco, CA, May 10 – 13.

Janvier, D.,* O'Brien, M.C.,* Kang, E.,* **Lerner, M.D.** & Tudor, M.* (2017). ASD Symptom Severity Moderates the Relationship Between Child Externalizing Behavior and Maternal Stress. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May 10-13.

Gerber, A.H.,* Kang, E.,* Mulhall, A.,* Clarkson, T.,* & **Lerner, M.D.** (2017). Performance-based Social Skills Training Improves Treatment Outcomes for Youth with Comorbid ADHD or Anxiety. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May 10 – 13.

Kerns, C.M., Moskowitz, L., Josephson, A,* Jeffay, M.,* Day, C.,* Guha Ray, A., Cohn, E., Drahota, A., Wainer, A., & **Lerner, M.D.** (2017). A cross-regional and multidisciplinary Delphi consensus study describing usual care for anxiety problems in school to transition-age youth with ASD. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May 10 - 13.

Rosen, T.E.,* Rodriguez-Seijas, C.,* Gadow, K., Kim, H.,* **Lerner, M.D.,** & Eaton, N. (2017). Is the Latent Structure of Psychopathology the Same in ASD and Non-ASD Youths? Evidence from Multi-Group Invariance Testing. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May 10 – 13.

Rosen, T.,E.* Weber, R.J.,* Marro, B.,* Kerns, C.M.,* Drahota, A.,* Moskowitz, L., Wainer, A.,* Sommer, S.,* Josephson, A.,* & **Lerner, M.D.** (2017). Expert Provider Use of Empirically-Evaluated Treatment Elements for Anxiety in Youth with ASD. Poster at the *International Meeting for Autism Research*, San Francisco, CA.

Clarkson, T.,* Rosen, T.,* Keifer, C.M.,* **Lerner, M.D.** (2017). ERN As a Predictor of Treatment Response to Social Skills Interventions in ASD. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May 10 - 13.

Zhou,* J., Keenan, E.G.,* Zinn, L.,* Burns, A.,* **Lerner, M.D.** (2017). Effect of ASD Traits on Young Adults' Romantic Relationship Experience. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May 10 – 13.

Kang, E.,* Keifer,* C.M,* Rosen, T.E.,* Clarkson, T.,* & **Lerner, M.D.** (2017). HemisphericAsymmetry as an Electrophysiological Marker of Anxiety in Youth with Autism Spectrum Disorder. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May, 10 -13.

Esposito, C.M.,* Keifer, C.M.,* Kang, E.,* Santore, L.A.,* Genovese, J.G.,* **Lerner, M.D.** (2017). Developmental Differences in the N170 in Individuals with Autism Spectrum Disorder. Poster session presented at the *International Meeting for Autism Research*, San Francisco, CA, May 10 - 13.

Keifer, C.M.,* Clarkson, T.,* Kang, E.,* Stoerback, A.,* & **Lerner, M.D.** (2017). Differences in the Late Positive Potential ERP as a function of valence versus intensity in adults with and without ASD. Poster at the *International Meeting for Autism Research*, San Francisco, CA, May 10 - 13.

Esposito, C.M.,* Keifer, C.M.,* Santore, L.A.,* Watson, H.J.,* Stoerback, A.,* **Lerner, M.D.** (2017). The Relationship Between Processing Speed, the P100, and Autism Symptoms in Adults. Poster session presented at the Undergraduate Research and Creativity Symposium, Stony Brook, NY, April 26.

Clarkson, T.,* Smith, A., Rappaport, B., **Lerner, M.D.**, Leibenluft, E., Pine, D., Nelson, E., Jarcho, J. (2017) Subclinical impairments in social competence differentially predict brain activation and anxiety symptoms in healthy youths. Poster at the *Society for Research in Child Development Biennial Meeting*. Austin, TX, April 6-8.

Weber, R.J.,* Kang, E.,* Russo-Ponsaran, N., McKown, C., & **Lerner, M.D.** (2017). Validation of a web-based tool to assess social cognition in youth with ASD. Poster at the *Biennial Meeting of Society for Research in Child Development*, Austin, TX, April 6-8.

Sommer, S.,* Rosen, T.,* O'Brien, M.C.,* **Lerner, M.D.** (2016). The Unique Trajectory of Self-Reported Separation Anxiety Symptoms in Youth with Autism Spectrum Disorders. Poster presentation at the *Society for Research in Child Development Biennial Meeting*. Austin, TX. April 6-8.

O'Brien, M.C.,* Zinn, L.,* Sommer, S.,* **Lerner, M.D.,** Tudor, M.E.* (2016) Contextual Influences on Internalizing Symptoms for Youth with ASD and Their Typically Developing Siblings. Poster presentation at the *Society for Research in Child Development Biennial Meeting.* Austin, TX. April 6 - 8.

Rosen, T.,* Marro, B.,* Josephson, A.,* Moskowitz, L., Kerns, C., Drahota, A., Wainer, A., & **Lerner, M.D.** (2017). The effects of perceived research support on the use of anxiety treatment strategies for youth with ASD. Poster at *2017 Biennial Meeting of Society for Research in Child Development,* Austin, TX, April 6 - 8, 2017.

Lerner, M.D., De Los Reyes, A., Drabick, D.A.G., & Gadow, K.D. (2016). Informant discrepancies define discrete, clinically-useful autism spectrum disorder subgroups. Poster at the 50th Annual Convention of the Association for Behavioral and Cognitive Therapies, New York, NY October 27 - 30.

Rosen, T. E.,* Weber, R.J.,* Kang, E.,* Burns, A.,* & **Lerner, M.D.** (2016, October). Effects of In-vivo Social Attention Training: Improvements in Empathy and Moderation by EEG-indexed social processing. Poster at the 50th Annual *Convention of the Association for Behavioral and Cognitive Therapies*, New York, NY, October 27 - 30.

Rosen, T. E.,* Kang, E.,* Keenan, E.,* Jin, J.,* Weber, R.J.,* & **Lerner, M D.** (2016, October). Do affective processing impairments in ASD extend to non-social stimuli? Findings from an olfaction task. Poster at the 50th Annual *Convention of the Association for Behavioral and Cognitive Therapies*, New York, NY, October 27 - 30.

Keifer, C. M.,* Weber, R. J.,* Burns, A.,* Stoerback, A.,* & **Lerner, M.D.** (2016). In-vivo social attention training improves EEG-indexed facial processing speed. Poster at the 50th *Annual Convention of the Association for Behavioral and Cognitive Therapies*, New York City, NY, October 27-30.

Kim, H.,* Keifer, C.,* Rodriguez-Seijas, C.,* Eaton, N. R., **Lerner, M. D.,** & Gadow, K. D. (2016). Hierarchical Structure of Autism Spectrum Disorder Classification. Poster at the 50th *Annual Convention of the Association for Behavioral and Cognitive Therapies*, New York City, NY, October 27-30.

Kang, E.,* Sommer, S.,* Gerber, A.,* & **Lerner, M.D.** (2016). Gender Differences in Treatment Response to a Social Skills Intervention for Children with Autism Spectrum Disorder. Poster at the 50th Annual *Convention of the Association for Behavioral and Cognitive Therapies*, New York, NY, October 27 - 30.

Culoso, A.*, Keifer, C.,* Burns, A.,* Keenan, E.,* **Lerner, M.D.** (2016). Greater sensory arousal impedes affect recognition: evidence across olfactory and auditory domains. Poster at the Annual Meeting of the *Society for Psychophysiological Research*, Minneapolis, MN, September 21 - 25.

Kang, E.,* **Lerner, M.D.**, & Gadow, K.D. (2016). Association of Atypical Communication Characteristics with Psychiatric, Social, and Academic Functioning in Clinic-Referred Children with and without Autism Spectrum Disorder. Poster at the *International Meeting for Autism Research*, Baltimore, MD, May 11-14.

Kang, E.,* Burns, A.,* Allegue, L.,* & **Lerner, M.D.** (2016). Performance-Based Social Skills Intervention Improves Explicit Social Cognition in Children with Autism Spectrum Disorder. Poster at the *International Meeting for Autism Research*, Baltimore, MD, May 11-14.

Keenan, E.,* Rosen, T.E.,* Kang, E.,* & **Lerner, M.D.** (2016). *Sniff check! Adults with greater autism symptoms report odors as being more positive.* Poster at the International Meeting for Autism Research, Baltimore, MD, May 11 - 14.

Mendelson, J.,* Gates, J.* & **Lerner, M.D.** (2016). *A Meta-Analysis of Friendships in School-Age Youth with ASD.* Poster at the *International Meeting for Autism Research*, Baltimore, MD, May 11- 14.

Marro, B.M,* Weber, R.J.,* Bungert, L.M.,* Sommer, S.,* Kerns, C.K., Moskowitz, L.J., Cohn, E.J., **Lerner, M.D.** (2016). Deconstructing the Literature on the Treatment of Anxiety in Youth with ASD. Poster at *International Meeting for Autism Research*, Baltimore, MD, May 11-14.

Qasmieh, N.,* De Los Reyes, A., Aldao, A., Dunn, E.J., Lipton, M.F., Hartman, C., Dougherty, L.R., Youngstrom, E.A., & **Lerner, M.D.** (2016). Graphical representations of adolescents' psychophysiological reactivity to social stressor tasks: Reliability and validity of the Chernoff Face approach and person-centered profiles for clinical use. Poster at the annual meeting of the *Association for Psychological Science*, Chicago, IL, May 26 – 28.

Kim, H.,* Eaton, N. R., **Lerner, M.D.,** & Gadow, K. D. (May, 2016). Is the Autism Spectrum Really a Spectrum? Poster at the annual meeting of the *Association for Psychological Science*, Chicago, IL, May 26 – 28.

Culoso, A.,* Keifer, C.,* Burns, A.,* Keenan, E.,* & **Lerner, M.D.** (2016). Greater Sensory Arousal Impedes Affect Recognition: Evidence across olfactory and auditory domains. Poster at 2016 URECA Undergraduate Research Symposium, Stony Brook, NY, April 27.

Keenan, E.,* Culoso, A.,* Burns, A.,* **Lerner, M.D.** (2015). The emotional looking-glass: alexithymia predicts vocal affect recognition only in individuals with greater autism symptoms. M.D. Lerner & C.M. Kerns (Chairs), Poster at ASDD Special Interest Group meeting at the Annual Meeting of the *Association for Behavioral and Cognitive Therapies Convention*, Chicago, IL, November 11 - 14.

Pichardo, J.M.,* Rosen, T.E.,* Weber, R.J.,* **Lerner, M.D.** (2015). Taking Notice of Perspective Taking: the Effects of Attending to Social Interaction. M.D. Lerner & C.M. Kerns (Chairs), Poster at ASDD Special Interest Group meeting at the Annual Meeting of the *Association for Behavioral and Cognitive Therapies Convention*, Chicago, IL, November 11 - 14.

Kang, E.,* Rosen, T. E.,* **Lerner, M. D.**, & Gadow, K. D. (2015). *Trajectories of Atypical Communication Characteristics as Early Prognostic Indicators of Psychiatric Comorbidity in Children with Autism Spectrum Disorders*. Poster at the 49th Annual Convention of the Association for Behavioral and Cognitive Therapies, Chicago, IL, November 11 – 14.

Rosen, T.E.,* Weber, R.J.,* Rankin, J.A.,* Kang, E.,* Levine, K., **Lerner, M.D**. (2015) Emotion recognition trajectories in autism spectrum disorders: effects of internalizing and externalizing

comorbidities. Poster at the *2015 International Meeting for Autism Research*, Salt Lake City, UT, May 14 - 16.

Spaulding, C.J.,* Gates, J.A.,* Gadow, K.D., **Lerner, M.D.** (2015). Trajectories of school-based services for youth with ASD. Poster at *2015 International Meeting for Autism Research*, Salt Lake City, UT, May 13– 16.

Lerner, M.D., Mazefsky, C.A., Siegel, M., Gabriels, R., Williams, D.L., Pierri, J., Peura, C., & Gadow, K.D. (2015). Burden of psychiatric symptoms in ASD: understanding the full range from inpatients to outpatients and across IQ. Poster at the *2015 International Meeting for Autism Research, Salt Lake City, UT, May 14 - 16.*

Rankin, J.A.,* Weber, R.J.,* Kang, E.,* Medina, P.,* & **Lerner, M.D.** (2015). Social skills importance beliefs among parents of youth with autism spectrum disorder. Poster at the *2015 Association of Psychological Science Annual Convention*, New York City, NY, May 21 – 24, 2015.

Weber, R.J.,* Rankin, J.A.,* Kang, E.,* Gates, J.,* Medina, P.,* **Lerner, M.D.** (2015). Parent and self report informant discrepancy of social skills importance in adolescents with autism spectrum disorders. Poster at *2015 Biennial Meeting of Society for Research in Child Development*, Philadelphia, PA, March 19 – 21, 2015.

Spaulding, C.J.,* Marro, B.M.,* Rosen, T.E.,* Gadow, K.D., **Lerner, M.D.** (2015). Different perspectives on symptom severity in autism spectrum disorders and their impacts on service frequency and specificity. Poster at *2015 Biennial Meeting of Society for Research in Child Development*, Philadelphia, PA, March 19 – 21, 2015.

Rankin, J.A.,* Spaulding, C.,* Tudor, M.E.,* Rosen, T.E.,* Jack, A., **Lerner, M.D.** (2014). interventions for maladaptive behaviors: predictors and implications for adolescents with autism spectrum disorder. Poster at the 25th annual *New York State Association for Behavior Analysis Conference*, Saratoga Springs, NY, October 16 – 17, 2014.

Rankin, J.,* Tudor, M.E.,* **Lerner, M.D.** (2014). Who's Ready?: Predictors of Transition Planning for Adolescents with Autism Spectrum Disorder. Poster at 2014 *URECA Undergraduate Research Symposium,* Stony Brook, NY, April 30.

Garman, H.D.,* Spaulding, C.,* **Lerner, M.D.** (2014). Wanting It Too Much: The Unexpected Effect of Social Motivation on Emotion Recognition. Poster at 2014 *URECA Undergraduate Research Symposium,* Stony Brook, NY, April 30.

Marro, B.M.,* **Lerner, M.D.** (2014). Restricted Interests and Repetitive Behaviors as Coping Methods for Children with Autism. Poster at 2014 *URECA Undergraduate Research Symposium,* Stony Brook, NY, April 30.

Garman, H.D.*, Spaulding, C.,* **Lerner, M.D.** (2014). Wanting It Too Much: The Unexpected Effectof Social Motivation on Emotion Recognition. Poster at 2014 *International Meeting for Autism Research,* Atlanta, GA, May 14 - 17.

Rankin, J.*, Tudor, M.E.,* **Lerner, M.D.** (2014). Who's Ready?: Predictors of Transition Planning for Adolescents with Autism Spectrum Disorder. Poster at 2014 *International Meeting for Autism Research,* Atlanta, GA, May 14 - 17.

Tudor, M.E.,* **Lerner, M.D.** (2013). The role of treatment fidelity in the therapeutic alliance in a social skills intervention for adolescents with ASD. S.W. White & J.J. Wood (Chairs), Poster at ASDD Special Interest Group meeting at Annual Meeting of the *Association for Behavioral and Cognitive Therapies Convention*, Nashville, TN, Nov. 21 – 24.