Developing Services to Enhance Social Functioning in Adults with Autism Spectrum Disorder

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INTERAGENCY AUTISM COORDINATING COMMITTEE (IACC) MEETING
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Defining Symptom Domains of Autism Spectrum Disorder (ASD)

- Social interaction / Social communication
  - Social-emotional reciprocity
  - Nonverbal social communication
  - Developing, maintaining, and understanding relationships

- Restricted, repetitive, stereotyped patterns of interests or behaviors
The Need for Increasing Focus on Treatment and Services for Adults with ASD

- Approximately 500,000 – 600,000 adolescents with ASD will enter adulthood in the next decade in the USA.
Challenges of Transition to Adulthood

- **Typical Challenges:**
  - Completing secondary or post-secondary education
  - Transitioning from educational setting to work setting
  - Developing social and communication skills necessary for adult life
  - Engaging with peers and the community
  - Developing independence / ability to function once one’s parents become elderly or pass away
  - Difficulties with **social functioning** heighten all of these challenges.
  - Lack of evidence-based treatment programs to improve social functioning in adults with ASD
Social Outcomes in Adults with ASD

Residential Outcomes in Adults with ASD

Employment Outcomes in Adults with ASD

Importance of Social Functioning

• Social Functioning: ability to navigate the social world in real-world settings, including home, school, work, and community

• Difficulties with social functioning have been cited as one of the main barriers to employment, independence, and overall functioning in adults with ASD.

• Social Functioning has many components
Domains Essential for Social Functioning

Motivation / Anxiety Domain
- Social Motivation
- Social Anxiety

Cognition / Skill Domain
- Social Cognition
- Social Skills

Context / Community Domain
- Generalizing and Applying Social Cognition and Skills
TUNE In: Training to Understand and Navigate Emotions and Interactions

- NIMH R34MH104407, Brodkin, PI

- Study Period: August 2014 to August 2017

- Objective
  - To develop and pilot a new treatment program to improve social functioning in adults with ASD

- Strategy
  - Design a treatment program that addresses the many components of social functioning
  - A focus on the fundamentals of social functioning
    - Ability to tune into one’s own state and into others
    - Ability to understand and navigate emotions
    - Ability to understand and navigate conversation
    - Generalize these skills to a community / work setting

- Tactics
  - The treatment program incorporates a variety of therapeutic “tools” to address social functioning (an eclectic treatment program)
  - Integration of cognitive, behavioral, and mindfulness-based approaches
Outline of TUNE In

• Determination of Eligibility

• Pre-Treatment Assessments

• Component 1—Social Motivation/Anxiety
  • 5 weekly individual sessions: Addressing goals / motivation, Cognitive Coaching, Exposure, Mindfulness

• Component 2—Social Cognition/Skill
  • 8 weekly group sessions: Group-based Social Cognition and Interaction Training for Individuals with ASD, Video Modeling of Social Skills

• Component 3—Generalization to Community
  • 4 weekly sessions: Participation in a Volunteer Work Team

• Post-Treatment Assessments
Study Eligibility, Setting, & Compensation

• Eligibility
  • Inclusion criteria: Adults age **18 years or older** with a diagnosis of autism spectrum disorder (ASD) who can attend weekly sessions (1-2 hours each) for a ~5 month period
  • Exclusion criteria: intellectual disability, current psychotic symptoms, current severe mood symptoms, current severe substance use disorder, recent suicidal or aggressive behaviors

• Setting
  • Perelman School of Medicine at the University of Pennsylvania and the Center for Autism Research at the Children’s Hospital of Philadelphia
# Participants

## Demographics Summary

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Males</th>
<th>Females</th>
<th>White</th>
<th>African-American</th>
<th>Asian-American</th>
<th>Mean Age (years)</th>
<th>SD Age (years)</th>
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<tbody>
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<td><strong>Cohort 1</strong></td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>27.9</td>
<td>7.4</td>
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<tr>
<td><strong>Cohort 2</strong></td>
<td>13</td>
<td>11</td>
<td>2</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>27.8</td>
<td>8.9</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>20</td>
<td>18</td>
<td>2</td>
<td>19</td>
<td>1</td>
<td>0</td>
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<td></td>
</tr>
</tbody>
</table>
Study Design / Timeline

Recruitment, Eligibility Determination, Random Assignment to Cohorts

Assessments Round 1—both cohorts

6 weeks

Cohort 1: Study Treatment
Cohort 2: Treatment as Usual

17 weeks

5 weeks – Component 1
8 weeks – Component 2
4 weeks – Component 3

Typically Developing Controls

Assessments Round 2—both cohorts

6 weeks

Cohort 1: Treatment as Usual
Cohort 2: Study Treatment

17 weeks

5 weeks – Component 1
8 weeks – Component 2
4 weeks – Component 3

Typically Developing Controls

Assessments Round 3—both cohorts

6 weeks

Typically Developing Controls

Round 2—both cohorts

6 weeks

Typically Developing Controls

Round 3—both cohorts

6 weeks

Typically Developing Controls
Pre/Post Assessments of Various Domains

- **Overall ASD Symptoms**
  - Social Responsiveness Scale, ADOS, SCQ
- **Social Motivation**
  - Broad Autism Phenotype Questionnaire, MAP-SR
- **Social Anxiety**
  - Liebowitz Social Anxiety Scale, Schizotypal Personality Questionnaire
- **Social Cognition and Attention**
  - Penn Social Cognition Battery (ER40, MEDF, ADT), The Hinting Task, Eye Tracking
- **Social Skills**
  - Contextual Assessment of Social Skills
- **Size of Social Network**
  - Social Network Index
- **Overall Psychological Well Being**
  - Scale of Psychological Well-Being

Ashley Pallathra, B.A.

Monica Calkins, Ph.D.  Julia Parish-Morris, Ph.D.
Component 1: Addressing Social Motivation and Social Anxiety

Motivation / Anxiety Domain
- Social Motivation
- Social Anxiety

Cognition / Skill Domain
- Social Cognition
- Social Skills

Context / Community Domain
- Generalizing and Applying Social Cognition and Skills

The image shows a diagram with three domains: Motivation / Anxiety, Cognition / Skill, and Context / Community. Arrows indicate the flow and interaction between these domains.
Component 1: Addressing Social Motivation and Social Anxiety

- Once weekly, hour-long individual session for 5 weeks
  - Logistics: Identify and address any logistical / executive functioning hurdles to participating in the program
  - Building motivation: Identify activities that participant finds rewarding, and ways in which improving social functioning can improve his or her ability to engage in those rewarding activities
  - Regulating emotion / social anxiety: Learn and practice mindfulness exercises – reduce social anxiety, manage stress during social interactions (progressive series of exercises from solo to interactive)
  - Cognitive approach to social anxiety: Identify automatic thoughts, feelings, and behaviors that occur during these interactions
Component 2: Building Social Cognition and Social Skills

Motivation / Anxiety Domain
- Social Motivation
- Social Anxiety

Cognition / Skill Domain
- Social Cognition
- Social Skills

Context / Community Domain
- Generalizing and Applying Social Cognition and Skills
Component 2: Building Social Cognition and Social Skills

- **Objectives**
  - Didactics: Develop social understanding
    - Where to direct attention
    - How to recognize social and emotional cues
    - Perspective-taking ("Theory of mind")
  - Video modeling of social skills: Develop and practice social skills using video modeling

- **Structure**
  - Once weekly group sessions for 8 weeks
  - 90 minutes per session
    - 30 minutes of didactic instruction and discussion focused on developing social understanding
    - 60 minutes of video modeling and practice of social skills
  - ~6-8 participants per group
Building Social Skills

- **Video Modeling of Social Skills**
  - An evidence-based intervention that has proven effective in building social skills in children and adolescents with ASD
  - 40-60 minutes of social skills practice using pre-recorded video models
    - Examples: greeting, maintaining back-and-forth conversation, listening skills
    - Use multiple examples to practice

- **Collaborators**
  - James Connell, PhD. & Jessica Day-Watkins, MSEd, MSEd, BSBA
  - *Drexel University Autism Institute*
## Component 2: Social Cognition and Social Skills Group

<table>
<thead>
<tr>
<th>Session</th>
<th>Social Cognition Didactics</th>
<th>Video Modeling of Social Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Introduction to Social Cognition</td>
<td>Baseline Assessment of Social Skills</td>
</tr>
<tr>
<td>2</td>
<td>Directed Attention—Distinguishing Social from Nonsocial information</td>
<td>Social Cues Indicating that It Is, or Is Not, a Good Moment to Approach</td>
</tr>
<tr>
<td>3</td>
<td>Directed Attention-- Where to Look for Social Information (Facial Expression, Body Language, Direction of Gaze, Tone of Voice)</td>
<td>Social Approach and Greeting</td>
</tr>
<tr>
<td>4</td>
<td>Emotion Recognition—Identify Distinguishing Features of Various Emotions</td>
<td>Initiating Conversation</td>
</tr>
<tr>
<td>5</td>
<td>Perspective Taking—Catch the Social Cues</td>
<td>Reciprocal Communication: Conversation and Listening Skills, Empathic Responding</td>
</tr>
<tr>
<td>6</td>
<td>Emotion Recognition and Perspective Taking</td>
<td>Reciprocal Communication: Conversation and Listening Skills, Empathic Responding</td>
</tr>
<tr>
<td>7</td>
<td>Integrating Directed Attention, Emotion Recognition, and Perspective Taking</td>
<td>Reciprocal Communication: Conversation and Listening Skills, Empathic Responding</td>
</tr>
<tr>
<td>8</td>
<td>Review, Wrap Up, and Integration of Skills</td>
<td>Putting It All Together: Naturalistic Conversation Practice</td>
</tr>
</tbody>
</table>
Effect of Video Model on Acquisition of Social Approach and Greeting in Cohort 1

Odds ratio 36, p < 0.05
Component 3: Context and Community

Motivation / Anxiety Domain
- Social Motivation
- Social Anxiety

Cognition / Skill Domain
- Social Cognition
- Social Skills

Context / Community Domain
- Generalizing and Applying Social Cognition and Skills

The diagram illustrates the interconnections between the Motivation / Anxiety Domain, Cognition / Skill Domain, and Context / Community Domain, highlighting how social motivation, social anxiety, social cognition, and social skills are interconnected and influence each other.
Component 3: Generalizing Social Understanding and Social Skills to the Community

• Goals
  ○ Practice newly acquired social understanding and social skills in a new context -- a “real-world” setting outside of a health care setting
  ○ Participating on a volunteer work team that is helping others in need

• Structure
  ○ Site: Ronald McDonald House (3925 Chestnut St., Philadelphia, PA)
  ○ Work teams consisting of both study participants and typically developing volunteers, including research study personnel
  ○ 4 sessions; 60-90 minutes per session
  ○ Assess social understanding and social skill in this setting
Volunteer Work Team Setting

- Philadelphia Ronald McDonald House (PRMH)
  - 3925 Chestnut St., Philadelphia, PA
  - A philanthropic institution that supports families of seriously ill children
  - Family members stay at the PRMH and have some meals provided to them there
  - Participants are part of a work team that prepares meals for families
Follow Up

- Re-contact participants at 3, 6, and 12 months following the end of the study
  - To determine whether they are still engaged in volunteer work
  - Inquire about employment status
  - Inquire about participation in vocational rehabilitation
Effects of TUNE In on Social Functioning: Preliminary Results

**Social Responsiveness Scale II (SRS-II)**

**Social Network Index (SNI)** – # of people that participant is in regular contact with

Wilcoxon Rank Sum Test: SRS-II $p = 0.03$; SNI $p = 0.02$
Future Directions

- Complete data analysis for Cohorts 1 and 2
- Refine the procedures based on the experience and data from this pilot study
- Larger-scale clinical trials with a larger number of participants to more fully test the treatment
- If effective, dissemination to community mental health providers
- Develop more advanced modules for development of social understanding and social skills
- Develop a program that suitable for intellectually-disabled participants
Our Team

Ted Brodkin, M.D.  Ashley Pallathra, B.A.  Shreya Kangovi, M.D.  Rachel Tomlinson, M.Ed.
Torrey Creed, Ph.D.

Monica Calkins, Ph.D.  Jessica Day-Watkins, MSEd  James Connell, Ph.D.  Femida Handy, Ph.D.
Gabriel Dichter, Ph.D.
Our Team (continued)

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- Department of Psychiatry, Perelman School of Medicine at the University of Pennsylvania
- Center for Autism Research (CAR) at Children’s Hospital of Philadelphia (CHOP)
- A.J. Drexel Autism Institute at Drexel University
- University of North Carolina