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TITLE: Clinical Trial of a Comprehensive Treatment for High-Functioning Children with ASD

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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
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14. ABSTRACT

This RCT tested the efficacy of an outpatient psychosocial treatment for children with ASD without intellectual disability (ID). Eighty-eight children (ages 7-12 yrs) were randomly assigned to the treatment or control condition. The 18-week cognitive-behavioral treatment (two 90-min sessions per week) included small-group instruction and therapeutic activities targeting social/social-communication skills, face-emotion recognition, nonliteral language skills, and interest expansion. A behavioral system was used to increase skills development and reduce ASD symptoms. Efficacy was assessed immediately following the 18-week treatment (posttest) and 4-6 weeks post-treatment. Measures included parent ratings of the children's social/social-communication skills, ASD symptoms, broad social skills, and behavior symptoms, child tests of social-cognitive skills (emotion recognition and nonliteral language), and behavioral observations. Results revealed significant effects favoring the treatment group at posttest on the primary measures of ASD symptoms and social/social-communication skills, and secondary measures of nonliteral language skills, broad social skills, and behavior symptoms (measures of emotion-recognition skills and social behaviors during structured game sessions were non-significant). The significant treatment effects found at posttest were all maintained at follow-up.

The RCT is completed and the results have been published (see Lopata, Thomeer et al., 2020; Appendix C).

15. SUBJECT TERMS
High-functioning children with ASD, outpatient treatment, comprehensive psychosocial treatment, MAXout, group-based treatment

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TABLE OF CONTENTS

1. INTRODUCTION

This RCT tested the efficacy of an outpatient comprehensive psychosocial treatment (MAXout) on the ASD symptoms and social-communicative functioning of 7-12 year olds with HFASD. The manualized treatment targeted social/social-communication skills, interpretation of nonliteral language skills, emotion-decoding skills, and interest expansion. Treatment was delivered over 18 weeks (two 90 min. sessions/wk.) with each treatment group consisting of 4 children with HFASD and 2 staff clinicians. The protocol utilized direct instruction, modeling, role-play (rehearsal), performance feedback (reinforcement), transfer of learning, and repeated practice to foster skills acquisition and maintenance and reduce ASD symptoms. Treatment efficacy was assessed immediately following the 18-week treatment and 4-6 weeks post-treatment.

2. KEYWORDS

High-functioning children with ASD, outpatient treatment, comprehensive psychosocial treatment, MAXout, group-based treatment

3. ACCOMPLISHMENTS

Major goals of the project

Per the approved SOW, this single-site RCT was conducted to evaluate the efficacy of the innovative outpatient comprehensive psychosocial treatment (MAXout) on the ASD symptoms and social-communicative functioning of 7-12 year olds with HFASD compared to control (waitlist) children with HFASD.

Accomplishments under the goals

Per the SOW, the project objectives fell into two Major Tasks. Major Task 1 included meeting IRB and regulatory review requirements and completion of the randomized controlled trial, and Major Task 2 included completion of the data analyses and dissemination of findings. The following is a summary of accomplishments per each of the objectives.

IRB and regulatory review requirements

As documented in the quarterly and annual reports across the 4-year study, all local IRB and HRPO requirements were meet with no lapses in approvals. The Completed Project Study Report and Closure Notice was submitted to the local IRB prior to the expiration date of the project. The local IRB completed its review and closed the study protocol. The approved closure letter and the Completed Project Study Report and Closure Notice were provided to the HRPO on July 22, 2019 with a request for the HRPO to also close the protocol. The HRPO subsequently closed the IRB protocol (email dated July 30, 2019). There were no adverse events or unanticipated problems involving risks to subjects or others and no suspensions, clinical holds

(voluntary or involuntary), or terminations of this research by the IRB, the institution, the sponsor, or regulatory agencies during the 4-year study period. **Per the SOW, all IRB and regulatory review requirements were completed as proposed.**

Completion of the randomized controlled trial

A detailed description of the study procedures and results are contained in a recently published article so only a summary is provided here (see Lopata, Thomeer et al., 2020 in Appendix C). The current study targeted the inclusion of 88 children, ages 7-12 years with HFASD. A total of 100 children were screened, with 88 enrolling and 83 completing the study (2 children withdrew from the treatment group and 3 from the control). Children were recruited during 6 sampling waves and were randomly assigned to treatment conditions (treatment or waitlist control condition). The children randomly assigned to the treatment group completed the 18-week treatment protocol and each treatment group consisted of 4 children with HFASD and 2 staff clinicians. Treatment was delivered during two 90-minute sessions per week, with each 90-minute session consisting of two 45-minute treatment cycles (each cycle included 15 minutes of skills instruction followed by a 30-minute therapeutic activity). The treatment cycles targeted social/social-communication skills, facial-emotion recognition skills, nonliteral language skills, and interest expansion using direct instruction, modeling, role-play/rehearsal, performance feedback/reinforcement, and transfer of learning. A structured behavioral reinforcement system was used to strengthen skills acquisition and maintenance and reduce ASD symptoms and problem behaviors. Six group parent training sessions were also provided. Fidelity (implementation accuracy) was measured during 60% of sessions (randomly selected) by research assistants uninvolved with treatment delivery, through one-way-mirrored observation rooms; fidelity was 96% each for skills groups and therapeutic activities. Outcome measures were administered at baseline, immediately following the 18-week treatment, and 4-6 weeks post-treatment for children in both treatment conditions. Children in the waitlist control condition received the treatment after completing follow-up testing (see Lopata, Thomeer et al., 2020 in Appendix C for a detailed description of the protocol and method). **Per the SOW, the RCT was completed as proposed.**

Completion of the data analyses and dissemination of findings

Multilevel longitudinal mixed models were examined for each primary and secondary outcome. Significant effects favoring the treatment group were found at posttest on the primary measures of ASD symptoms (SRS-2) and social/social-communication skills (ASC), and secondary measures of nonliteral language skills (CASL Idiomatic Language), broad social skills (BASC-3 Social Skills), and behavior symptoms (BASC-3 Behavior Symptoms Index) (measures of emotion-recognition skills and social behaviors during structured game sessions were non-significant). The significant treatment effects found at posttest were all maintained at follow-up. The effect sizes on the primary outcomes were in the large and medium ranges. Results of this study were disseminated in a peer-reviewed scientific journal (see Lopata, Thomeer et al., 2020 in Appendix C for a detailed description of the findings and implications published in the *Journal of Clinical Child and Adolescent Psychology*).

Additionally, we have completed the final draft of the treatment manual (see Appendix C) that we will make available to the public. We have contacted a publisher to determine

interest in bringing the manual to market (commercially available). In the absence of publisher interest, we will make the manual available for free download from our website at the Institute for Autism Research. We have also conducted 24 presentations to professionals, state and federal legislators, and policy makers during the course of the study. Prior to the efficacy results, these presentations were used to increase awareness of the treatment and study, and once the results were available, the presentations included data on efficacy.

Beyond dissemination of findings of the RCT and the treatment manual, we were able to leverage resources from this project to simultaneously collect accompanying data to answer other ASD-related questions and conduct psychometric tests of study measures and other ASD measures. Specifically, we leveraged all or a portion of the data from the current project to publish 4 additional articles in peer-reviewed scientific journals (for the list of published articles and the actual articles, see Appendices A and C).

Opportunities for training and professional development provided by project

Although this project was not intended to provide training and professional development opportunities, a number of opportunities were inherent in the project activities including the enhancement of knowledge, skills, and proficiency of undergraduate and graduate students, and parents of children with HFASD who participated in the trial. These opportunities were afforded to these individuals as a function of their involvement in the evaluation of the outpatient treatment (MAXout) (e.g., treatment implementation, fidelity monitoring, assessment, data management, parent training).

In this study, undergraduate and graduate students served as staff clinicians (delivering the manualized treatment), research assistants, behavioral coders, and research clinician supervisors. These students received extensive training in ASD/HFASD, the current state of treatments for HFASD, the empirical basis of the MAXout framework, administration of the MAXout protocol, and effective fidelity monitoring. Depending on their position/role, they spent considerable time prior to the intervention practicing and demonstrating proficiency ($\geq$ 90% fidelity) implementing all components of the treatment, or establishing IOA measuring fidelity or coding behaviors. The undergraduate and graduate students also received training in the administration and scoring of several outcome measures, as well as in data management and monitoring of data accuracy. Lastly, parents of children with HFASD participated in parent training when receiving the treatment. These parent training sessions educated parents on the components of the program, and strategies for reducing ASD symptoms and promoting skills and generalization. All of these training opportunities were provided and/or supported by the study coordinator, developers of the MAXout protocol, and/or data manager.

Professional development opportunities were provided via presentations to local practitioners/educators, and local, state, and federal legislators and policy makers. As previously noted, we conducted 24 of these presentations for approximately 170 professionals, legislators, and policy makers over the course of the study.

Dissemination of results to communities of interest

Prior to completion of the study and determination of efficacy, outreach activities were undertaken to share information about the project with clinical practitioners, school administrators/staff, and policy makers who would not ordinarily be aware of such research activities. Sharing information about the project increased public knowledge of the project, as well as assisted with recruitment of participants. Once efficacy data became available, the results were integrated into presentations for practitioners, educators, legislators, and policy makers. As previously noted, over the course of the project, we conducted 24 of these presentations for approximately 170 individuals. Beyond the dissemination of results via presentations, we published the study findings in a peer-reviewed scientific journal and have completed the treatment manual which will be disseminated by a publisher (commercially available) or made available for free download from our website (see Appendix C for the published article Lopata, Thomeer et al., 2020 and pdf of the treatment manual).

Plans for accomplishing project goals in next reporting period

Nothing to Report

4. IMPACT

Impact of the project on development of the principal discipline(s)

This study tested the efficacy of a comprehensive outpatient psychosocial treatment (MAXout) for children with HFASD. At present, little is known about how to effectively and robustly increase the social and communication skills, and reduce the ASD symptoms of these children in an outpatient format. This has posed a significant challenge to clinical and educational professionals, and parents. Findings from the study indicated that the outpatient treatment (MAXout) yielded significant improvements in several core areas of impairment for children with HFASD. Given the lack of available and efficacious multi-component treatments for these children, the study findings will impact the fields of psychology and psychiatry. Specifically, these professionals will now have access to a clearly-defined and manualized treatment protocol (instructional techniques, content, and progress monitoring measures) for use in clinical outpatient settings. Another unique aspect of this project is that the comprehensive outpatient treatment (MAXout) is an adaptation of other evidence-based psychosocial treatments for children with HFASD that are delivered in a summer program (summerMAX) or school (schoolMAX) format. The strong support for the efficacy of MAXout in this project, along with the prior empirical evidence for the summerMAX and schoolMAX programs will allow flexibility in the manner in which public resources may be directed or the delivery format of the critical elements in the programs. Additionally, this is the first comprehensive treatment for children with HFASD to be shown effective in outpatient (MAXout), school (schoolMAX), and summer (summerMAX) formats and it addresses the critical need for treatments that are adaptable and effective across settings. All of these treatments utilize a cognitive-behavioral framework, which represents a new treatment framework for these children. This model not

only exploits the children's relative cognitive and language strengths, it directly addresses their core social-cognitive impairments (and social skills/behaviors) that negatively affect long-term outcomes (this is important because behavioral interventions alone fail to address the characteristic social-cognitive deficit). Lastly, this line of research may serve as a model for intervention developers seeking to develop comprehensive interventions for children with HFASD that are adaptable and effective in different settings/delivery models. As such, the project has implications for the fields (disciplines) of psychology, psychiatry, and education.

Impact on other disciplines. Nothing to report

Impact on technology transfer

As noted, we will make the treatment manual and all related materials available for public use (either via a publisher or free download from our website).

Impact on society beyond science and technology

Results of this study found MAXout yielded significant improvements in social-cognitive skills, social skills/behaviors, ASD symptoms, and problem behaviors of children with HFASD. These constitute the primary areas of impairment that affect both short-term functioning and long-term outcomes. Studies have repeatedly found that problems with social-cognition (knowledge/understanding) and basic social/social-communication skills are the underlying reasons for poor long-term outcomes including limited employment, prolonged dependence on parents/caregivers and societal resources, social isolation, etc. for adults with HFASD. Results of this study suggest MAXout had a significant impact on the current functioning of these children. The areas of improvement are also the areas that interfere with long-term adult outcomes and addressing these areas during childhood may carry longer-term benefits. For example, improving the social-communication skills and ASD symptoms of children with HFASD may impact future adaptive functioning, and allow career- and vocational-development programs to yield greater successes. In this way, the project has impacted the current social conditions of the children and it may have ongoing benefits (e.g., social, adaptive, vocational, independence) that are realized into adulthood.

5. CHANGES/PROBLEMS

Changes in approach and reasons for change. Nothing to report

Problems or delays and actions or plans to resolve them

Over the course of the 4-year study, the only delay involved the coding of the videotapes that took longer than anticipated and hindered completion of the final 3 subtasks (1 – data compilation/quality check; 2 – data analyses; and 3 – dissemination). These 3 subtasks were completed during the Extension without Funds period.

Changes that had a significant impact on expenditures. Nothing to report

Significant changes in use or care of human subjects. Nothing to report

6. PRODUCTS

Journal publications. (For entire project period; also see Appendices A and C)

Lopata, C., Rodgers, J. D., Donnelly, J. P., Thomeer, M. L., McDonald, C. A., & Volker, M. A. (2017). Psychometric properties of the Adapted Skillstreaming Checklist for high-functioning children with ASD. *Journal of Autism and Developmental Disorders, 47*, 2723-2732. doi: 10.1007/s10803-017-3189-y *[acknowledgement of federal support – YES] Copy of article included in Appendix C*

Rodgers, J. D., Lodi-Smith, J., Donnelly, J. P., Lopata, C., McDonald, C. A., Thomeer, M. L., Lipinski, A. M., Nasca, B. C., & Booth, A. J. (2019). Brief report: Examination of sex-based differences in ASD symptom severity among high-functioning children with ASD using the SRS-2. *Journal of Autism and Developmental Disorders, 49*, 781-787 . doi: 10.1007/s10803-018-3733-4 *[acknowledgement of federal support – YES] Copy of article included in Appendix C*

Nasca, B. C., Lopata, C., Donnelly, J. P., Rodgers, J. D., & Thomeer, M. L. (2020). Sex differences in externalizing and internalizing symptoms of children with ASD. *Journal of Autism and Developmental Disorders, 50,* 3245-3252. doi: 10.1007/s10803-019-04132-8 *[acknowledgement of federal support – YES] Copy of article included in Appendix C*

Lopata, C., Donnelly, J. P., Thomeer, M. L., Rodgers, J. D., Volker, M. A., & Booth, A. J. (2020). Exploratory factor analysis of the Adapted Skillstreaming Checklist for children with autism spectrum disorder. *Autism, 24*(2), 437-446. doi: 10.1177/1362361319868639 *[acknowledgement of federal support – YES] Copy of article included in Appendix C*

Lopata, C., Thomeer, M. L., Rodgers, J. D., Donnelly, J. P., & Booth, A. J. (2020 online first). RCT of a comprehensive outpatient treatment for children with autism spectrum disorder. *Journal of Clinical Child and Adolescent Psychology*. doi: 10.1080/15374416.2020.1790380 *[acknowledgement of federal support – YES] Copy of article included in Appendix C*

Books (one-time publications) (For entire project period)

Thomeer, M. L., & Lopata, C. (2020). *MAXout: A comprehensive outpatient treatment for children with autism spectrum disorder*. [to be disseminated via a publisher or made available for free download from our website] *[acknowledgement of federal support – YES] Pdf of treatment manual included in Appendix C*

Website(s) or other internet site(s). Nothing to report

Technologies or techniques. Nothing to report

Inventions, patent applications, and/or licenses. Nothing to report

Other products. Nothing to report

7. PARTICIPANTS AND OTHER COLLABORATING ORGANIZATIONS (The following is a complete list of all individuals who worked on the project over the course of the entire project period. The 'nearest person month worked' is the total for the entire project period. See also Appendix B)

Individuals who have worked on project

Name:	Christopher Lopata
Project role:	PD/PI
Nearest person month worked:	16
Contribution to project:	No change
Funding support:	

Name:	Marcus L Thomeer
Project role:	Co-PI
Nearest person month worked:	17
Contribution to project:	No change
Funding support:	

Name:	James P Donnelly
Project role:	Co-PI
Nearest person month worked:	13
Contribution to project:	No change
Funding support:	

Name:	Jonathan D Rodgers
Project role:	Co-PI
Nearest person month worked:	21
Contribution to project:	No change
Funding support:	

Name:	Adam Booth
Project role:	Staff Clinician Supervisor
Nearest person month worked:	15
Contribution to project:	No change
Funding support:	

Name: Megan Starzynski
Project role: Graduate Assistant
Nearest person month worked: 4
Contribution to project: No change
Funding support:

Name: Alyssa Biscotto
Project role: Staff Clinician Supervisor
Nearest person month worked: 1
Contribution to project: No change
Funding support:

Name: Elizabeth Pittari
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Nearest person month worked: 7
Contribution to project: No change
Funding support:

Name: Stephanie Kowalak
Project role: Staff Clinician
Nearest person month worked: 1
Contribution to project: No change
Funding support:

Name: Ashley Darrow
Project role: Research Assistant
Nearest person month worked: 1
Contribution to project: No change
Funding support:

Name: Lydia Beinhauer
Project role: Research Assistant
Nearest person month worked: 1
Contribution to project: No change
Funding support:

Name: Rachael Kapuscinski

Project role: Graduate Assistant
Nearest person month worked: 8
Contribution to project: No change
Funding support:

Name: Mary Russo
Project role: Staff Clinician
Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Natalie Couse
Project role: Staff Clinician
Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Audrey Holt
Project role: Staff Clinician, Research Assistant
Nearest person month worked: 6
Contribution to project: No change
Funding support:

Name: Samantha Stanford
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Nearest person month worked: 8
Contribution to project: No change
Funding support:

Name: Zoe Gionis
Project role: Staff Clinician
Nearest person month worked: 4
Contribution to project: No change
Funding support:

Name: Cody Kucharski
Project role: Staff Clinician
Nearest person month worked: 1

Contribution to project: No change
Funding support:

Name: Megan Stoll
Project role: Staff Clinician
Nearest person month worked: 1
Contribution to project: No change
Funding support:

Name: Jane Grucella
Project role: Staff Clinician
Nearest person month worked: 1
Contribution to project: No change
Funding support:

Name: Allan Chadwick LaFlore
Project role: Staff Clinician
Nearest person month worked: 1
Contribution to project: No change
Funding support:

Name: Natalie Ryan
Project role: Research Assistant, Staff Clinician
Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Mary-Lynn McHugh
Project role: Research Assistant
Nearest person month worked: 1
Contribution to project: No change
Funding support:

Name: Mara Bengry
Project role: Research Assistant, Staff Clinician
Nearest person month worked: 4
Contribution to project: No change
Funding support:

Name: Megan Mathewson
Project role: Behavioral Coder
Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Katelynn Eck
Project role: Behavioral Coder
Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Abigail Kovalick
Project role: Staff Clinician
Nearest person month worked: 5
Contribution to project: No change
Funding support:

Name: Joana Moraes
Project role: Staff Clinician
Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Shelby Brennan
Project role: Staff Clinician
Nearest person month worked: 5
Contribution to project: No change
Funding support:

Name: Samantha Andrews
Project role: Staff Clinician
Nearest person month worked: 5
Contribution to project: No change
Funding support:

Name: Emily Neumeister
Project role: Research Assistant
Nearest person month worked: 2
Contribution to project: No change
Funding support:

Name: Christian Rajnisz
Project role: Staff Clinician, Research Assistant
Nearest person month worked: 5
Contribution to project: No change
Funding support:

Name: Helen Destro
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Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Jennifer Griebner
Project role: Behavioral Coder
Nearest person month worked: 3
Contribution to project: No change
Funding support:

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Nearest person month worked: 3
Contribution to project: No change
Funding support:

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Contribution to project: No change
Funding support:

Name: Julia Jarvis
Project role: Staff Clinician

Nearest person month worked: 2
Contribution to project: No change
Funding support:

Name: Annamaria Monte
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Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Robia Vedhanayakam
Project role: Staff Clinician
Nearest person month worked: 2
Contribution to project: No change
Funding support:

Name: Christian Connor
Project role: Staff Clinician
Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Meichi Chen
Project role: Behavioral Coder
Nearest person month worked: 3
Contribution to project: No change
Funding support:

Name: Fatima Mitu
Project role: Behavioral Coder
Nearest person month worked: 2
Contribution to project: No change
Funding support:

Changes in other support of the PD/PI(s) or senior/key personnel since last reporting period.
Nothing to report

Other organizations involved as partners. Nothing to report

8. SPECIAL REPORTING REQUIREMENTS

None

9. APPENDICES

See following pages

APPENDICES

Appendix A: Bibliography of all Publications

Appendix B: List of Personnel Who Received Pay from the Research Effort

Appendix C: Articles Acknowledging DoD Grant Award and MAXout Treatment Manual

Appendix A: Bibliography of all Publications

Journal Articles

Lopata, C., Thomeer, M. L., Rodgers, J. D., Donnelly, J. P., & Booth, A. J. (2020 online first). RCT of a comprehensive outpatient treatment for children with autism spectrum disorder. *Journal of Clinical Child and Adolescent Psychology*. doi: 10.1080/15374416.2020.1790380

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Rodgers, J. D., Lodi-Smith, J., Donnelly, J. P., Lopata, C., McDonald, C. A., Thomeer, M. L., Lipinski, A. M., Nasca, B. C., & Booth, A. J. (2019). Brief report: Examination of sex-based differences in ASD symptom severity among high-functioning children with ASD using the SRS-2. *Journal of Autism and Developmental Disorders, 49*, 781-787 . doi: 10.1007/s10803-018-3733-4

Lopata, C., Rodgers, J. D., Donnelly, J. P., Thomeer, M. L., McDonald, C. A., & Volker, M. A. (2017). Psychometric properties of the Adapted Skillstreaming Checklist for high-functioning children with ASD. *Journal of Autism and Developmental Disorders, 47*, 2723-2732. doi: 10.1007/s10803-017-3189-y

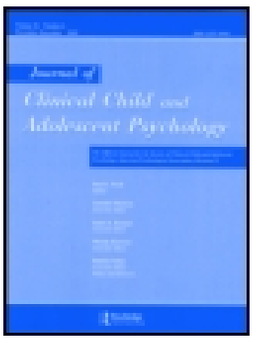
Treatment Manual

Thomeer, M. L., & Lopata, C. (2020). *MAXout: A comprehensive outpatient treatment for children with autism spectrum disorder*. [to be disseminated via a publisher or made available for free download from our website]

Appendix B: List of Personnel Who Received Pay from the Research Effort

Christopher Lopata
Marcus L Thomeer
James P Donnelly
Jonathan D Rodgers
Adam Booth
Megan Starzynski
Alyssa Biscotto
Elizabeth Pittari
Stephanie Kowalak
Ashley Darrow
Lydia Beinhauer
Rachael Kapuscinski
Mary Russo
Natalie Couse
Audrey Holt
Samantha Stanford
Zoe Gionis
Cody Kucharski
Megan Stoll
Jane Grucella
Allan Chadwick LaFlore
Natalie Ryan
Mary-Lynn McHugh
Mara Bengry
Megan Mathewson
Katelynn Eck
Abigail Kovalick
Joana Moraes
Shelby Brennan
Samantha Andrews
Emily Neumeister
Christian Rajnisz
Helen Destro
Jennifer Griebner
Stacey Moppert
Maxine McGuire
Julia Jarvis
Annamaria Monte
Robia Vedhanayakam
Christian Connor
Meichi Chen
Fatima Mitu

Appendix C: Articles Acknowledging DoD Grant Award and MAXout Treatment Manual



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RCT of a Comprehensive Outpatient Treatment for Children with Autism Spectrum Disorder

Christopher Lopata , Marcus L. Thomeer , Jonathan D. Rodgers , James P. Donnelly & Adam J. Booth

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RCT of a Comprehensive Outpatient Treatment for Children with Autism Spectrum Disorder

Christopher Lopata, Marcus L. Thomeer, Jonathan D. Rodgers, James P. Donnelly, and Adam J. Booth

Institute for Autism Research, Canisius College

ABSTRACT

Objective: This study tested the efficacy of an intensive outpatient psychosocial treatment for children with autism spectrum disorder (ASD) without intellectual disability (ID).

Method: Eighty-eight children (ages 7–12 years) were randomly assigned to the treatment or control (waitlist) condition. The 18-week cognitive-behavioral treatment (two 90-min sessions per week) included small-group instruction and therapeutic activities targeting social/social-communication skills, face-emotion recognition, nonliteral language skills, and interest expansion. A behavioral system was used to increase skills development and reduce ASD symptoms. Efficacy was tested immediately following treatment (posttest), with maintenance assessed 4–6 weeks later (follow-up). Measures included parent ratings of the children's social/social-communication skills, ASD symptoms, broad social skills, and behavior symptoms, child tests of social-cognitive skills (emotion recognition and nonliteral language), and behavioral observations.

Results: Significant effects favoring the treatment group were found at posttest on the primary measures of ASD symptoms (Social Responsiveness Scale, Second Edition; Constantino & Gruber, 2012) and social/social-communication skills (Adapted Skillstreaming Checklist; Lopata, Thomeer, Volker, Nida & Lee, 2008), and secondary measures of nonliteral language skills, broad social skills, and behavior symptoms (measures of emotion-recognition skills and social behaviors during structured game sessions were non-significant). The significant treatment effects found at posttest were all maintained at follow-up.

Conclusions: The outpatient treatment improved several core areas of functioning for children with ASD without ID. Additional elements may be needed to expand the efficacy of the treatment so that the observed skills/symptom improvements generalize to social interactions during gameplay.

Introduction

Children with ASD without intellectual disability (ID) comprise the majority of those diagnosed (Christensen et al., 2016). Despite relative cognitive and language strengths, these children exhibit social impairments and circumscribed and repetitive behaviors/interests that significantly impede daily functioning (American Psychiatric Association, 2013). The multi-faceted nature of the social difficulties, including impairments in basic social behaviors (e.g., initiations, responding to others) and higher-level social-cognitive understanding (e.g., interpreting facial expressions; Bellini et al., 2014), negatively affects the way these children approach, understand, and respond to others (Scarpa, Reyes et al., 2013). Higher levels of circumscribed and repetitive behaviors/interests have also been linked to lower adaptive and social skills in children with ASD without ID (McDonald et al., 2015).

Treating the multiple symptoms of school-age children with ASD without ID is a significant challenge and interventions are needed that address their unique social-cognitive and skill/behavioral deficits (Ho et al., 2018). Social skills interventions, including social skills groups, are considered especially applicable as they integrate cognitive and behavioral strategies to address characteristic impairments in social-cognition, social behaviors, and ASD symptoms (Scarpa, White et al., 2013). This is imperative as cognitive and behavioral elements are critically important for social performance (understanding social cues, selecting an appropriate response, enacting the response; Bauminger-Zviely, 2013). Reinforcement and repeated practice are also critical for increasing acquisition and maintenance of skills (Reichow & Barton, 2014). As a result, cognitive and behavioral techniques including direct instruction, modeling, role-play, reinforcement, and repeated practice are often used in social

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interventions, and some include parent training (Reichow et al., 2012).

Findings from a recent meta-analysis indicated that group social skills interventions yielded positive (modest) improvements in social competence for school-age youth with ASD without ID (Gates et al., 2017); however, there was significant variability in intervention targets and protocols, and outcomes. Such variability has made it difficult to draw conclusions about their efficacy (McMahon et al., 2013). Failure to yield consistent and robust gains has led to questions about intervention intensity and duration (Reichow et al., 2012). Social interventions commonly employ a one-session (60–90 minutes) per week format and approximately 12 sessions (Freitag et al., 2013) which will not likely be sufficient to yield significant gains across the multiple areas affected (Reichow & Barton, 2014). This is a major concern given a recent trend toward shorter treatments for this population (most ≤20 hours; Ho et al., 2018). Further, many social interventions for school-age children with ASD without ID are narrowly focused which can limit their effects (Lopata, Lipinski, et al., 2017). In contrast, comprehensive interventions consist of multiple components targeting multiple domains including specific skills, ASD symptoms, broader functioning, and the needs of individual children (Odom et al., 2010; Smith et al., 2007). These interventions are also manualized and instituted intensively over an extended period (Odom et al., 2010). Despite their potential to overcome limitations and inconsistent results in prior studies, there is a dearth of comprehensive interventions and comprehensive interventions using a cognitive-behavioral framework for children with ASD without ID (Stichter et al., 2012).

To address the unique symptoms of school-age children with ASD without ID, a comprehensive treatment is needed that targets social-cognitive understanding, basic social behaviors/skills, and problem behaviors/symptoms (Ho et al., 2018; Stichter et al., 2012). Although there is a paucity of comprehensive cognitive-behavioral intervention studies, a notable exception was an open-trial by Stichter et al. (2012) who tested an outpatient treatment targeting perspective taking, emotion recognition, problem-solving, and social skills for 20 children, ages 6–10 years, with ASD without ID. Treatment was delivered to groups of 4 to 7 children and included two 60-min sessions per week for 10 weeks. Results were non-significant for testing of emotion recognition and total problem-solving, and mixed for perspective taking; however, parents reported a significant increase in social skills and problem-solving. The authors noted that the duration of the intervention might have been insufficient to yield improvements across the areas targeted.

At present, outpatient social interventions are the most common. However, there is a need for comprehensive treatments for ASD that are adaptable to different formats and settings (Odom et al., 2014) and testing of individual interventions in different settings (McMahon et al., 2013). Lopata, Thomeer, and colleagues developed a 5-week comprehensive cognitive-behavioral summer intervention for children, ages 7–12 years, with ASD without ID. The protocol was delivered 5 days per week during five 70-min treatment cycles per day, with each cycle including a 20-min skills instruction session and 50-min therapeutic activity. It was conducted with groups of six children and three staff clinicians (undergraduate and graduate students) and targeted social, emotion-recognition, and nonliteral language skills, and interest expansion using direct instruction, modeling, role-play, feedback, and repeated practice. A behavioral system (response-cost and individual daily note) was also instituted and weekly parent training was provided. Results of two RCTs found that the treatment group performed significantly better on tests of social-cognitive skills (knowledge of social skills/behaviors and nonliteral language skills) and parent and staff ratings of social skills (Adapted Skillstreaming Checklist [ASC]; Lopata et al., 2008) and ASD symptoms (Social Responsiveness Scale [SRS]; Constantino & Gruber, 2005) versus waitlist controls (Thomeer et al., 2012; Lopata et al., 2010).

Despite these findings, an intensive full-day summer program might not be feasible for clinical providers and studies are needed to determine whether these programs can be efficacious in other settings (school, outpatient; Lerner et al., 2011). Lopata et al. (2019) adapted the summer treatment into a comprehensive school intervention for 6–12 year olds with ASD without ID and tested it in an RCT. The school-staff delivered intervention targeted social skills, emotion-recognition skills, and interest expansion using weekly social skills groups, emotion-recognition instruction, and therapeutic activities, and a daily reinforcement system (individual daily note), and monthly parent training was provided. The intervention group improved significantly more than children who received their typical educational services on the test of social cognition (emotion recognition) and parent-teacher ratings of ASD symptoms (SRS-2; Constantino & Gruber, 2012) and social skills (ASC; Lopata et al., 2008).

Although results supported the adaptability of the summer program to schools, there is also a need to assess its adaptability to an outpatient model (Lerner et al., 2011). Given concerns involving intensity and

duration of other social interventions, outpatient models should be more intensive and longer in duration, "while still retaining the relative efficiency of … [the] outpatient treatment model" (Danial & Wood, 2013, p. 713). Lopata, Lipinski, et al. (2017) adapted the summer program into an outpatient model and tested its feasibility and initial outcomes in an open trial. The outpatient model used the same treatment cycle framework, and content and procedures as the summer protocol. To overcome the variable and modest effects in other outpatient models, the intervention was instituted intensively over an extended period of time. Forty-four children, ages 7–12 years, with ASD without ID participated in the open trial and completed the intervention, which consisted of two 90-min sessions per week over 18 weeks. Each session was divided into two 45-min treatment cycles, each including 15 min of intensive skills instruction followed by a 30-min therapeutic activity. The intervention targeted social, emotion-recognition, and nonliteral language skills, and interest expansion using the same instructional and behavioral procedures as the summer treatment (see *Procedures*). Groups consisted of four children and two staff (graduate and undergraduate students). Feasibility was supported in high levels of fidelity (≥94%) and parent and child satisfaction, and there was no attrition. Significant improvements were found on child tests of social-cognition (emotion recognition and nonliteral language) and parent and staff ratings of social skills (ASC; Lopata et al., 2008; Social Skills scale, Behavior Assessment System for Children, 2nd Edition [BASC-2]; Reynolds & Kamphaus, 2004), ASD symptoms (SRS-2; Constantino & Gruber, 2012), and problem behaviors (Behavior Symptoms Index, BASC-2; Reynolds & Kamphaus, 2004).

The current study tested the efficacy of the outpatient model (MAXout) for children with ASD without ID in an RCT. Methodological improvements included a randomized design and analysis plan that accounted for clusters, and the addition of a comparison group, follow-up testing to assess maintenance, and a measure of social performance by masked observers.

Method

Participants

An *a priori* power analysis was conducted to determine the targeted sample size using estimates from the initial phase of the open trial. Given the use of two primary outcomes, alpha was set to .025, two-sided, for power estimation. Using a conservative target of the lower-bound estimate of the 95% CI (.58) for the smaller of the two ESs from the initial phase of the open trial (SRS-2 d = 1.148 [.58, 1.71]) and the observed correlation of .62 between pre and posttests, power was .86 with 40 participants per group. Although there was no attrition in the prior open trial, a 10% attrition rate was assumed to conservatively protect statistical power, bringing the targeted sample size to 44 participants per condition (total N = 88). The sample was recruited from urban and suburban areas in the United States using public announcements and flyers disseminated by area clinicians and school administrators. Written parental consent and child assent were obtained in two phases (prior to screening and prior to randomization for those meeting eligibility criteria). Eligibility criteria were a chronological age of 7–12 years, diagnosis of ASD (confirmed via the Autism Diagnostic Interview-Revised; Rutter et al., 2003), Wechsler Intelligence Scale for Children-4th Edition short-form IQ >70 (and VCI or PRI ≥80; Wechsler, 2003), and short-form Comprehensive Assessment of Spoken Language (Carrow-Woolfolk, 1999) expressive or receptive language score ≥80.

A total of 100 children were screened, with 88 meeting inclusion criteria and enrolling (Oct. 2015 – Jun. 2018). Individual children were randomly assigned to the treatment or control (waitlist) condition. The randomization sequence was generated independently by the study statistician and transferred to a study coordinator after treatment consent was obtained. Five children withdrew from the study (two from the treatment and three from the control; see Figure 1). Demographic and outcome measure data are presented in Table 1. No significant differences were found between conditions on any child variable, parent education, or baseline outcome measure (demonstrating baseline equivalence; Table 1). All children and their parents who inquired, were screened, and enrolled were native English language speakers. There was no minimum parent education level required for inclusion.

Procedures

The study was approved by the Institutional Review Board at Canisius College prior to initiation of the RCT to test the treatment. Baseline testing was conducted during the week preceding initiation of treatment, posttest immediately following the 18-week treatment, and follow-up 4 to 6 weeks after posttest for children in both the treatment and control conditions. Children and their parents were aware of their assigned treatment condition at baseline testing. Child testing and behavioral observations (coding of videos) were conducted by evaluators masked to the children's

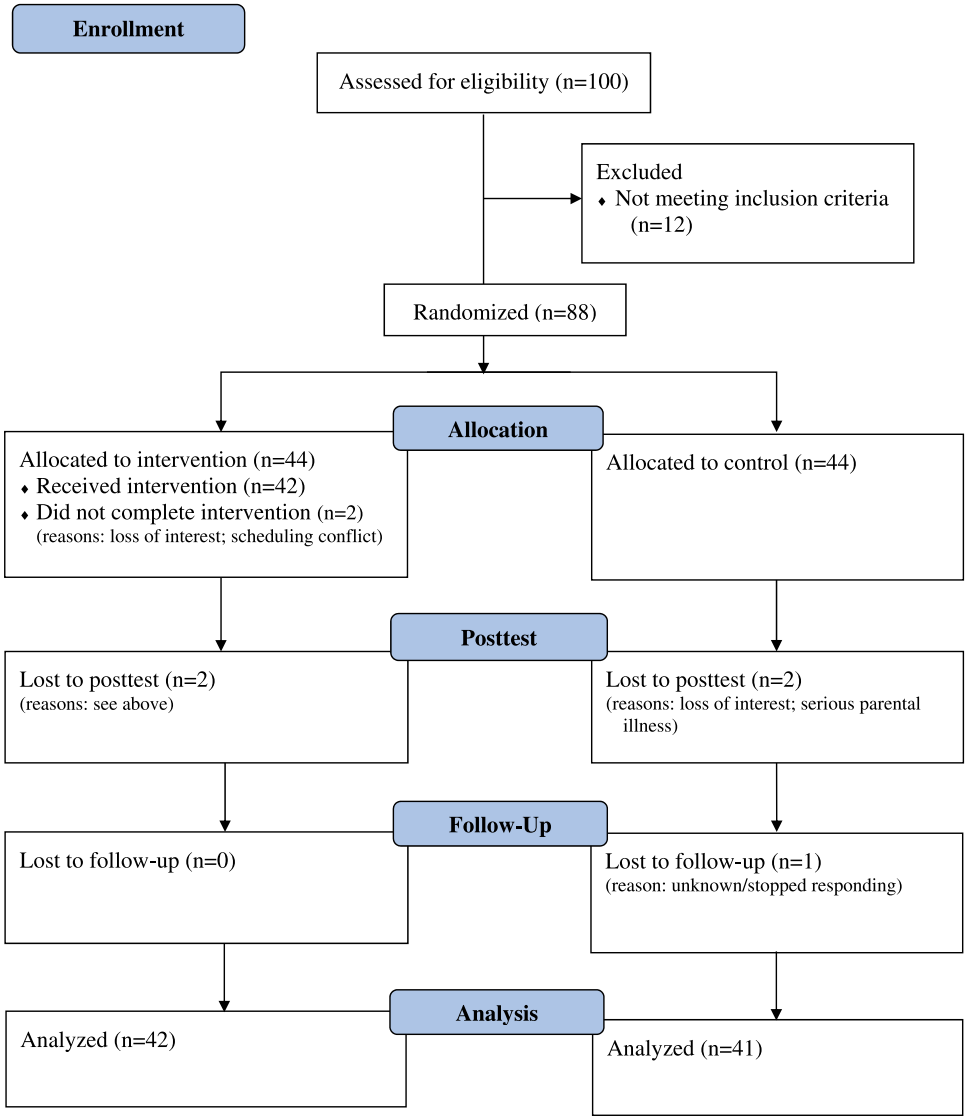

Figure 1. CONSORT flow diagram.

treatment condition; parent ratings were not masked. Children in the control were provided the intervention after completing following-up testing. Staff clinicians and research assistants (undergraduate and graduate students) completed training prior to initiation of the treatment and fidelity (implementation accuracy) was monitored throughout treatment implementation by the research assistants (see *Staff Training and Treatment Integrity*).

Treatment was administered in small group rooms on a college campus to groups of four children with ASD without ID by two staff clinicians. The manualized protocol consisted of two 90-min sessions per week over 18 weeks and each session included two 45-min treatment cycles (72 cycles total). Each cycle included a 15-min skills group (intensive instruction) followed by a 30-min therapeutic activity that required use of the skills taught in the skills groups. Given the small group size, each child was an active participant (actor or co-actor/respondent or model) in all skills groups, and engaged in repeated practice and received feedback during the skills groups and therapeutic activities. The treatment targeted social/social-communication, face-emotion recognition, and nonliteral language skills, and interest expansion using direct instruction, modeling, role-play, feedback, and reinforcement. The following describes the skills groups, therapeutic activities, behavioral system, and parent training.

Skills Groups

Each cycle began with 15 min of intensive skills instruction. Sixty skills groups were used to teach 30 social/social-communication skills (see Appendix; each skill was covered twice). Consistent with the prior open-trial

Table 1. Descriptive statistics for demographic and baseline measures.

Characteristic	Treatment (n = 44)	Waitlist Control (n = 44)	t/χ^2 (exact p)
Demographic			
Parent Education: Mean (*SD*)	15.45 (2.46)	15.36 (2.55)	.17 (.87)
Child: Mean (*SD*)			
Age	9.77 (1.76)	9.57 (1.73)	.56 (.58)
WISC-IV (short-form)[a]			
Full-scale	104.06 (13.13)	105.22 (12.29)	.43 (.67)
VCI	104.63 (12.13)	102.31 (12.63)	.88 (.38)
PRI	102.58 (15.48)	107.16 (16.04)	1.36 (.18)
CASL (short-form)[b]			
Expressive Language	101.71 (14.17)	98.53 (15.35)	1.01 (.32)
Receptive Language	108.48 (13.13)	105.05 (13.37)	1.21 (.23)
ADI-R Social Interactions	18.20 (4.66)	17.23 (4.71)	.98 (.33)
ADI-R Communication	14.57 (4.00)	15.02 (3.99)	.53 (.60)
ADI-R Repetitive Behavior	5.27 (1.90)	5.57 (2.04)	.70 (.48)
Gender (male): *n* (%)	38 (86)	37 (84)	.09 (1.00)
Ethnicity (Caucasian) *n* (%)	37 (84)	34 (77)	2.66 (.92)
Baseline Outcome: Mean (*SD*)			
SRS-2	78.73 (9.55)	77.0 (10.18)	.82 (.41)
ASC	100.86 (15.25)	102.77 (17.11)	.55 (.58)
CAM-C Faces	24.97 (6.46)	24.65 (6.26)	.23 (.82)
CASL Idiomatic Language	8.43 (5.42)	7.32 (6.10)	.91 (.37)
BASC-3 Social Skills	36.07 (8.30)	35.10 (8.01)	.56 (.58)
BASC-3 BSI	74.20 (10.22)	70.86 (12.32)	1.39 (.17)
SIOS Positive Interaction	58.20 (26.65)	64.45 (30.32)	1.03 (.31)

WISC-IV = Wechsler Intelligence Scale for Children-4th Edition; VCI = Verbal Comprehension Index; PRI = Perceptual Reasoning Index; CASL = Comprehensive Assessment of Spoken Language; ADI-R = Autism Diagnostic Interview-Revised; SRS-2 = Social Responsiveness Scale, 2nd Edition; ASC = Adapted Skillstreaming Checklist; CAM-C = Cambridge Mindreading Face-Voice Battery for Children; BASC-3 = Behavior Assessment System for Children, 3rd Edition; BSI = Behavior Symptoms Index; SIOS = Social Interaction Observation Scale.

[a]WISC-IV short-form consisted of the Block Design, Similarities, Vocabulary, and Matrix Reasoning subtests.

[b]CASL short-form consisted of the Antonyms, Synonyms, Syntax Construction, and Paragraph Comprehension subtests.

study (and summer program RCTs), these social skills groups followed the 9-step instructional protocol delineated in *Skillstreaming* including define the skill, model the skill, establish trainee skill need, select role-player, set up the role-play, conduct the role-play, provide performance feedback, assign skill homework, and select next role player (McGinnis & Goldstein, 1997). Six skills groups provided specific instruction in face-emotion recognition. These used direct instruction and repeated practice in deciphering facial feature positions that reflect various emotions and recognizing physiological states associated with each. Staff clinicians described different facial expressions and their corresponding emotional states, followed by in vivo practice identifying facial expressions and the physiological state and behavioral reaction associated with each internal state. Six skills groups specifically targeted nonliteral language skills. These groups used direct instruction and repeated practice exercises to identify and decipher nonliteral elements of common language and idioms. To ensure active participation, each child was required to complete at least one treatment sequence as the principal treatment recipient (actor or co-actor/respondent or model) in each skills group, along with actively observing and providing feedback to other children.

Therapeutic Activities

Following each skills group, a 30-min therapeutic activity was conducted targeting social skills, face-emotion recognition skills, nonliteral language skills, and interest expansion. These were created to practice and reinforce the children's skills, and were conducted using direct instruction, modeling, repeated practice, feedback, and transfer of learning. Each activity required cooperative peer interactions and as such directly or indirectly involved repeated practice of the targeted social/social-communication skills. Face-emotion recognition activities began with decoding of basic facial expressions in pictures, and progressed to decoding of expressions in a video and finally in vivo practice decoding other's expressions. These activities also focused on using facial expressions during social interactions and the association between expressions and physiological states. Therapeutic activities targeting nonliteral language skills involved games/exercises in which the children practiced identifying and deciphering nonliteral language. In these activities, the children initially evaluated whether a phrase/statement was intended to be interpreted literally. If not, they generated other possible meanings using contextual information, selected the best option, and received feedback. Interest expansion activities were created to increase the children's interest and participation in activities and

topics outside their narrow interests. During these activities, the children worked together to explore novel topics and the interests of others in the group. They then shared the information they learned with their group and identified social situations in which they might use the new information. Lastly, they identified the social skills used to complete the activity.

Behavioral System

A response-cost system and individual daily note (IDN) were used to facilitate skills development and maintenance and decrease ASD symptoms and behavior problems. The response-cost system addressed a set of common skills and ASD symptoms, along with program rules. As such, it was implemented with all the children. Points were verbally awarded immediately for demonstrating any previously taught skill (social, face-emotion decoding, or nonliteral language skill) or adhering to operationally defined rules and withdrawn for exhibiting operationally defined ASD-related behavior (lack of eye contact, run-on communication, sharing irrelevant information, etc.), not following directions, or violating a group rule. One clinician per group recorded each child's points on a standardized point sheet and provided brief feedback every 15 minutes on her/his performance during that interval. The intervention also employed an IDN that allowed for the inclusion of individualized targets. The IDNs included two or three operationally defined skill/behavioral targets unique to the child. IDN targets and baseline rates were determined during the initial 2 weeks of treatment using behavioral observations. Each IDN used a standardized template that included the child's individualized and operationally defined targets and performance goals/criteria. Feedback was provided at the middle and end of each session, and each child earned an on-site reinforcer (e.g., edible snack) and parent-provided reinforcer at home for achieving her/his daily IDN target level. Each child also earned a home reward for reaching her/his weekly response-cost point target. The IDN allowed for targeting of individual needs within the standardized treatment.

Parent Training

Group parent training consisted of six 90-min sessions conducted during the 18-week treatment. The manualized training included the delivery of specific content followed by a discussion of implementation strategies (how and when to apply the techniques). The sessions covered the components of the intervention, strategies for fostering prosocial skills and generalization, and techniques for reducing ASD symptoms and problem behaviors.

Staff Training and Treatment Integrity

Staff clinicians consisted of graduate and undergraduate students from the fields of psychology and education and approximately 80% had prior experience working with children with ASD without ID. Staff clinicians received the treatment manual 1 month prior to treatment and had to achieve a score of 100% on a written exam assessing mastery of the manual at the beginning of the training week. They then completed 5 days of classroom training and applied practice trials. During practice trials, each was required to demonstrate ≥90% fidelity implementing the protocol (measured using standardized fidelity checklists). Fidelity was also monitored throughout the 18-week treatment by research assistants uninvolved with treatment delivery using the standardized fidelity checklists. Each research assistant established an inter-observer agreement (IOA) ≥90% using the fidelity checklists prior to the study. Fidelity observations during the 18-week treatment were conducted through one-way mirrors and staff clinicians were unaware of when they were being observed. Fidelity was assessed in 60% of sessions (randomly selected) and was 96% for skills groups (range 93–98%) and 96% for therapeutic activities (range 94–98%). To monitor IOA, 37% of the fidelity observations were conducted simultaneously by a second research assistant and the average per observation agreement across the individual intervention elements was 98%.

Outcome Measures

Efficacy was assessed using a comprehensive battery that was determined *a priori* and included two primary measures assessing ASD symptom severity (SRS-2) and social/social-communication skills (ASC) and five secondary measures. The SRS-2 and ASC were primary measures as they most closely measure the symptoms/skills targeted in the intervention (they were also used in the open trial). Most social intervention studies for ASD have not measured changes in social-cognition; such measures are needed so that the effects of treatment on social-cognitive skills, and social skills and ASD symptoms are understood (Danial & Wood, 2013). Secondary measures consisted of tests of the children's social-cognitive skills (emotion-recognition and nonliteral language), observations of social behaviors in game situations, and ratings of broad social skills and behavior symptoms. Parent ratings were provided by the same primary caregiver at each testing point (also the same parent who participated in parent training).

Social Responsiveness Scale, 2nd Edition, School-Age Form (SRS-2)

The SRS-2 (Constantino & Gruber, 2012) is a 65-item measure of ASD-related symptoms including social-communication deficits and circumscribed and repetitive behaviors/interests. Continuous scaling of the SRS-2 makes it useful as a measure of symptom severity "in response to interventions" (p. 21). Parents rate the frequency of behaviors on a scale of 1 (not true) to 4 (almost always true); higher total scores indicate greater symptoms/severity. The total score has internal consistency estimates of 0.92–0.97. Moderate-to-high correlations are reported between the SRS-2 and other ASD diagnostic measures, and the test accurately discriminates ASD and non-ASD samples.

Adapted Skillstreaming Checklist (ASC)

The ASC (Lopata et al., 2008) measures social/social-communication skills and behaviors of children with ASD. Across the 38 items, 32 assess social/social-communication skills and 6 assess behavioral regulation and flexibility (e.g., Does your child take steps to become part of an ongoing activity or group? Does your child maintain eye contact when talking with others? Does your child have discussions without running on about a specific topic?) Parents rate each item on a scale from 1 (almost never) to 5 (almost always); higher total scores indicate greater use of the prosocial/adaptive skills. Psychometric testing of ASC parent ratings for children with ASD (Lopata, Rodgers, et al., 2017) yielded good internal consistency (0.92) and test–retest reliability (6-week = 0.81 and 9-month = 0.63). Validity was supported in significant inverse correlations with ratings of ASD symptoms and problem behaviors and positive correlations with prosocial/adaptive skills on established scales.

Cambridge Mindreading Face-Voice Battery for Children (CAM-C)

The CAM-C (Golan & Baron-Cohen, 2006) measures social-cognitive skills involving emotion recognition using facial expression video clips and speech audio clips. Children view/listen to each clip on a computer and select 1 of 4 emotion words that reflects the emotion of the person in the clip. It includes two subtests (Faces and Voices); given the focus of the treatment protocol, only the Faces score was used. The Faces subtest consists of 45 items and higher total scores indicate greater accuracy. Test–retest reliability over a 10–15 week interval was 0.74–0.76. The CAM-C accurately differentiates children with ASD from typical children and its scores are negatively correlated with ASD symptoms (Golan et al., 2015).

Comprehensive Assessment of Spoken Language (CASL) – Idiomatic Language

The CASL (Carrow-Woolfolk, 1999) Idiomatic Language subtest consists of 49 items in which the examinee is read an incomplete idiom and prompted to verbally provide the remaining word(s). Norms and psychometric information are provided only for individuals ages ≥11 years. Internal consistency reliability was reportedly 0.90. As the majority of children in the study were younger than 11, raw scores were used in the analyses. This subtest was selected as no other measure was identified that contained a standardized sample of idioms in ascending order of difficulty and it has shown treatment sensitivity for 7–12 year olds with ASD without ID in prior social intervention studies (Thomeer et al., 2012; Lopata et al., 2010).

Social Interaction Observation Scale (SIOS)

The SIOS (Bauminger, 2002) assesses social interactions of children during peer interactions. Raters observe the child interacting with peers and record the occurrences of operationally defined social behaviors (*positive, low-level*, and *negative interaction*). This study used interval sampling (60 seconds) and, given the focus of the treatment on the development of social and prosocial skills, the *positive interaction* scale only. This scale consists of behaviors that reflect positive social engagement and interactions (e.g., The child shares an object or experience with another child, The child offers help to another child). In this study, children were video-recorded interacting with a peer with ASD without ID during two 20-min sessions at each time point in which the children sat at a table and played predetermined board games. To eliminate social familiarity as a confound, each child interacted with an unfamiliar peer during each session. Further, each dyad consisted of one child from the treatment and one child from the control group (this avoided any advantage derived from pairing two children from the treatment group). Videos were coded by trained undergraduate and graduate students naïve to the treatment condition of the children and testing time point. IOA ≥85% was established during training by having the evaluators code videotaped game sessions from a prior study of children with ASD. IOA was checked for 24% of all videos and was 91%.

Behavior Assessment System for Children, Third Edition – Parent Rating Scales (BASC-3-PRS)

The BASC-3-PRS (Reynolds & Kamphaus, 2015) assesses behaviors across a variety of domains. Parents rate items on a scale from 0 (never) to 3 (almost always). This study used the Social Skills scale and Behavior Symptoms Index (BSI) as these assess broader social and behavioral functioning, and both were used in the prior open trial of the outpatient treatment. The

Social Skills scale measures interpersonal skills needed for successful interaction; higher scores indicate greater use of the skills. The BSI is a broad composite that includes items from the Hyperactivity, Attention Problems, Aggression, Withdrawal, Depression, and Atypicality scales; lower scores indicate fewer problem behaviors. Internal consistency reliabilities for the Social Skills scale were reportedly 0.91–0.92 and BSI were 0.95–0.97. Moderate correlations were reported between these scales and comparable scales on other well-known rating scales.

Data Analyses

Data Analysis Plan

The primary objectives were to evaluate the effect of treatment on ASD symptom severity (SRS-2) and social/social-communication skills (ASC). Multilevel longitudinal mixed models were examined for each primary and secondary outcome. Model comparisons were conducted via log-likelihood improvements ($p < .01$). Maximum Likelihood estimation of model parameters was used to enable these comparisons. The intervention, time (linear and quadratic), and intervention-by-time interaction were tested as fixed effects. Participants and clusters were included in the initial models as random effects. Following model testing, pairwise differences between means at baseline and posttest, and baseline and follow-up were examined. The two primary hypotheses were examined separately with alpha set to .025, two-tailed, maintaining a Type I error rate of .05. Secondary hypothesis tests of the group by time interaction were conducted on the CAM-C Faces, CASL Idiomatic Language, SIOS Positive Interactions, and BASC-3 Social Skills and BSI. The modeling strategy for secondary analysis was altered to reduce the number of significance tests. Specifically, the initial model included only the fixed effect of the group by time interaction and random effects of participant and cluster. If the group by time effect was significant, then linear and quadratic fixed effects of time were estimated. As in the primary analyses, the model improvement was assessed with a change in log likelihood. No adjustments were made for Type I error rate for the secondary measures.

Data Quality Assessment

Prior to analysis, the data were examined to identify outliers (scores >3 *SD* from the group mean at each time point), review distributions, and assess missing data. One control participant had CASL Idiomatic Language scores 1–2 points above the 3 *SD* threshold at all three time points; however, no other score exceeded the 3 *SD* parameter at any time point. The child's affinity for language, particularly idioms, was noted in the case record by the assessment coordinator. The scores were considered valid and no adjustments were made. Another control case included a high SIOS Positive Interaction score at pretest (9 points above the 3 *SD* marker); all other baseline, posttest, and follow-up scores were less than 3 *SD* and no adjustments were made in this case. No other baseline characteristic or outcome scores were outliers. The distributions of all continuous variables were examined via histograms, skewness, and kurtosis. Pretest scores of the CASL Idiomatic Language deviated slightly from a normal distribution with a skewness value of .81 with a *SE* of .17. In addition to the outlier case previously noted, the distribution was slightly left-leaning with a spike of 12 cases (14%) at the mode of 5 ($M = 7.9$, $Mdn = 7.0$). This small deviation from normality was judged to be insufficient to warrant transformation or nonparametric procedures. Skewness and kurtosis of all other distributions were within 2 *SE*, and no anomalies were noted in the histograms.

Assessment of missing data included an examination of individual cases and comparisons of cases with missing data to cases with complete data. All 88 children had complete baseline data and 81 (92%) had complete data at all time points. Five participants withdrew including four between baseline and posttest, and one between posttest and follow-up (two from treatment and three from control; see Figure 1 for reasons). Baseline scores of complete cases were compared to incomplete cases on child and family characteristics and outcome variables (variables in Table 1). *T*-tests with bootstrapped standard errors and exact *p*-values were used for continuous variables and Chi-square tests with exact *p*-values for gender and ethnicity; no comparison was below .05. The pattern of missingness in the outcome variables at the three time points was tested via Little's MCAR test (in SPSS 25); the test value was $\chi^2 = 32.01$, $p = .47$. Given that the missing data analysis showed no evidence of difference in baseline or outcome variables and the final sample size had sufficient power, no imputation of missing values was conducted.

Results

Primary Outcome Tests

Figure 2 displays the SRS-2 means by a group from baseline to follow-up. The plot shows a nonlinear pattern for the treatment group, with an initial decline that was maintained at follow-up. The control shows a small

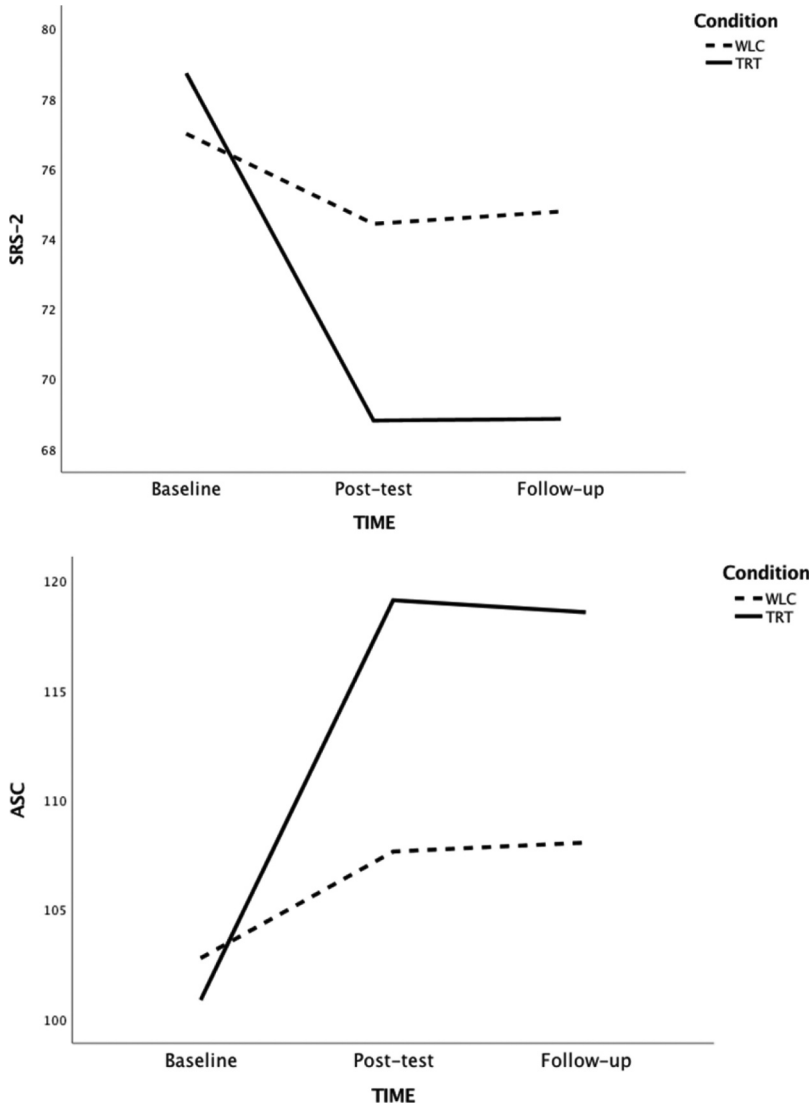

Figure 2. Plots of SRS-2 and ASC means by group and time.

decline following baseline with a similar level at follow-up. Table 2 presents the final model results for both primary dependent variables. For the SRS-2, the final model was a significantly better fit than the initial model that included fixed effects for group and random effects for participant and cluster (model deviance $\chi^2 = 28.24$, $p < .001$). The final model included fixed effects for the interaction of group by time, and both linear and quadratic effects of time (all p-values <.001). Significant random intercepts ($p < .001$) and slopes ($p < .05$) indicate that individual participant variability in initial means and change trajectory added significantly to the model. Coefficients for random intercepts and slopes for clusters were not significant. Contrasts were significant from baseline to posttest ($p < .001$; large effect

Table 2. Multilevel model parameters for linear and quadratic change in primary measures.

	Dependent Variable	
Effect	SRS-2	ASC
Fixed Effects		
Intercept	77.86 (1.06)***	101.82 (1.93)***
Time (Linear)	−7.28 (1.44)***	14.28 (2.77)***
Time (Quadratic)	3.10 (.67)***	−5.70 (1.29)***
Group by Time	−3.65 (.73)***	5.85 (1.38)***
Random Effects		
Variance components		
Participant intercept	74.54 (12.59)***	233.65 (40.39)***
Participant slope	6.91 (2.86)*	
Goodness of Fit		
$\Delta\chi^2$	28.24***	141.30***
Δdf	1	1

SRS-2 = Social Responsiveness Scale, 2nd Edition; ASC = Adapted Skillstreaming Checklist.
*p <.05, ***p <.001

d = 0.82, 95% CI = .46, 1.18) and baseline to follow-up (p < .001; medium effect d = 0.73, 95% CI = .37, 1.11).

Figure 2 also shows ASC data by group and time. Results for the fixed effect model tests were similar to the SRS-2, with significant effects for the group by time interaction, and linear and quadratic trend (all p < .001). Variance in participant intercepts was significant (p < .001) but the variance in slopes was not (p = .08). Random effects of cluster means and slopes were not significant. Contrasts were significant from baseline to posttest (p < .001; medium effect d = 0.74, 95% CI = .39, 1.09) and baseline to follow-up (p = .001; medium effect d = 0.59, 95% CI = .24, .93).

Secondary Outcome Tests

Table 3 lists the final model statistics for the secondary outcome tests. Figure 3 shows plots of the three variables with the significant group by time interactions. Significant group, linear and quadratic effects were observed on the CASL Idiomatic Language scale (all p < .001), and the contrasts were significant from baseline to posttest (p < .001; d = 0.29, 95% CI = .12, .46) and baseline to follow-up (p < .001; a slightly larger effect d = 0.40, 95% CI = .06, .74). The BASC-3 subscales also showed significant group by time interactions, as well as linear and quadratic effects (p < .05-.001), and the effect sizes were similar across the four contrasts. The effect size for Social Skills from baseline to posttest was 0.39 (95% CI = .06, .72) and baseline to follow-up was 0.38 (95% CI = .05, .72). The effect size for the BSI from baseline to posttest was 0.40 (95% CI = .09, .71) and baseline to follow-up was 0.35 (95% CI = .04, .66). The group by time effect was not significant for CAM-C Faces or SIOS Positive Interaction. The coefficients for random intercepts and slopes for clusters were not significant in any models of the secondary measures.

Discussion

Evidence suggests that social interventions have positive social benefits for children with ASD without ID; however, the effects have been modest and variable (Gates et al., 2017). As such, there is a need for interventions that are sufficiently intensive and long enough in duration to yield consistent, robust, and durable gains (Danial & Wood, 2013). These interventions should also be comprehensive and target the full range of social-cognitive skills, social skills, behaviors, and symptoms of these children. In addition to addressing these areas, the field is in need of comprehensive interventions that are adaptable to different formats and settings (Odom et al., 2014) and testing of specific treatments in various settings (McMahon et al., 2013). Lopata, Thomeer, and colleagues demonstrated the efficacy of a comprehensive cognitive-behavioral summer psychosocial treatment for children with ASD without ID, as well as its adaptability and efficacy as a comprehensive school intervention for these students. Based on the evidence of efficacy, Lopata, Lipinski, et al. (2017) adapted the summer protocol into an intensive outpatient treatment (MAXout) and pilot testing supported its feasibility and suggested it was associated with improvements in multiple skill and symptom areas. This study tested the efficacy of the outpatient treatment for children with ASD without ID in an RCT.

Results indicated that the outpatient protocol yielded significant improvements in multiple areas. Specifically, children who received the treatment (versus those in the control condition) exhibited significantly greater improvements in ASD symptoms, social/social-communication skills, understanding of nonliteral language, broad social skills, and problem behavior symptoms; no differences were found for face-emotion recognition skills or prosocial skills during structured game sessions. The significant

Table 3. Multilevel model parameters for linear and quadratic change in secondary measures.

	Dependent Variable				
Effect	CAM-C Faces	CASL Idioms	SIOS	BASC-3 SS	BASC-3 BSI
Fixed Effects					
Intercept	26.00 (.68)***	7.88 (.67)***	58.57 (2.63)***	36.19 (.85)***	72.53 (1.23)***
Time (Linear)		3.09 (.46)***		3.23 (1.22)**	−6.58 (1.48)***
Time (Quadratic)		−1.02 (.21)***		−1.48 (.57)**	2.71 (.69)***
Group by Time	.59 (.41)	1.14 (.27)***	3.29 (2.15)	2.26 (.46)***	−1.80 (.75)*
Random Effects					
Variance components					
Participant intercept	31.01 (5.59)***	32.21 (5.08)***	346.07 (79.28)***	53.22 (9.12)***	107.69 (17.71)***
Participant slope		.77 (.29)**			
Goodness of Fit					
$\Delta\chi^2$	#	74.68***	#	28.25***	18.08***
Δdf		1		1	1

CAM-C = Cambridge Mindreading Face-Voice Battery for Children; CASL = Comprehensive Assessment of Spoken Language; SIOS = Social Interaction Observation Scale; BASC-3 = Behavior Assessment System for Children, 3rd Edition; SS = Social Skills; BSI = Behavior Symptoms Index.

= model deviance not assessed because only one model was examined, which resulted in a non-significant interaction, terminating the analysis at that step.

*p <.05, **p <.01, ***p <.001

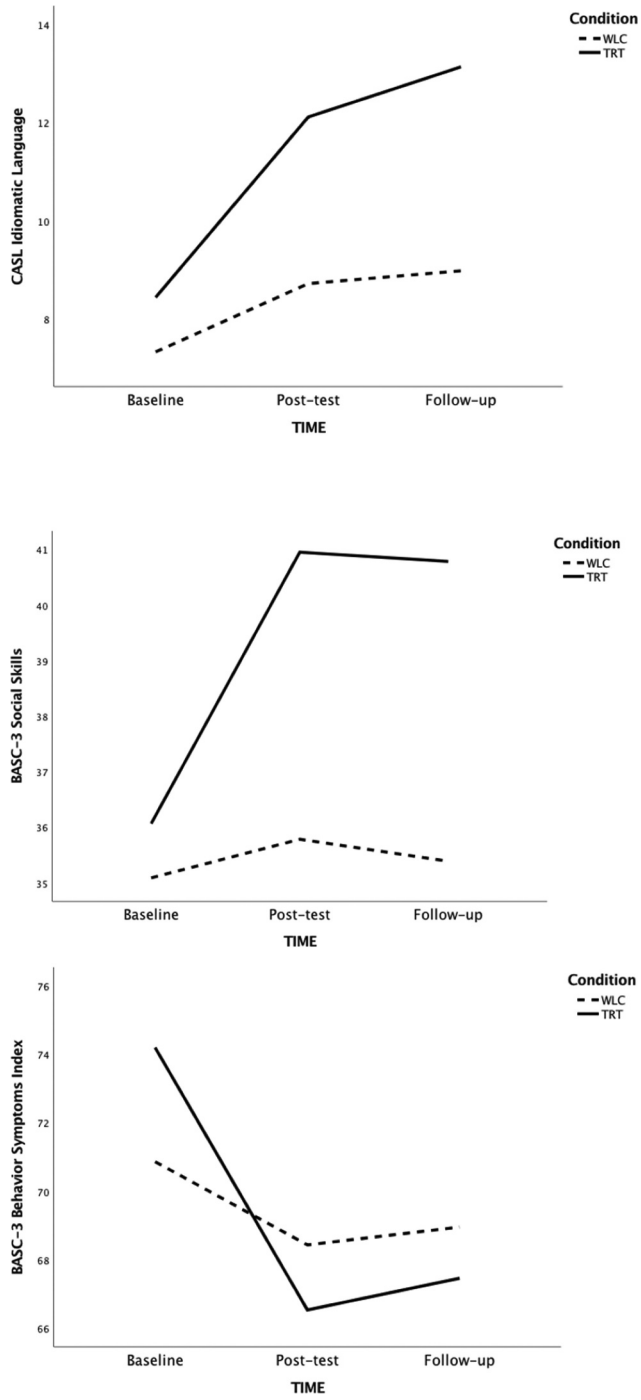

Figure 3. Plots of CASL idiomatic language, and BASC-3 social skills and behavior symptoms index means by group and time.

improvements were evident immediately following treatment and maintained at follow-up.

Findings were remarkably similar to the outpatient pilot study that also found significant improvements in ASD symptom severity, social/social-communication skills, nonliteral language skills, broader social skills, and behavior symptoms (Lopata, Lipinski, et al. (2017). The only difference was for face-emotion recognition testing that was significant (small effect) in the pilot but not in the current study. However, the change scores revealed that the average gain (pre vs. posttest) for the treatment group in both studies was similar (approximately two points). In the RCT, the control group exhibited an increase in face-emotion recognition scores which likely accounts for the difference in results (the pilot study had no comparison group). The lack of large gains in this skill area in both studies might suggest that the face-emotion recognition

component was not sufficiently intensive (only 6 of the 72 treatment cycles taught face-emotion recognition). Both RCTs of the summer treatment protocol also found non-significant gains in face-emotion recognition (using a different test) which might further indicate a need to target this area more intensively. Beyond increasing intensity, the emotion-recognition component might be enhanced by adding auditory information (voice-emotion recognition). Including visual and auditory elements and integration of the two might yield a greater increase in emotion-recognition skills.

Despite the substantial improvements in core social impairments, symptoms, and problem behaviors, no between-groups difference was found in prosocial behaviors during structured game sessions. The reason-(s) for this is unknown; however, there are several possibilities. For example, the highly structured and preset game activities did not allow the children to engage in other activities or interactions away from the table (each child had an assigned chair and was directed to remain in that assigned area). Measuring prosocial behaviors in dyads of unfamiliar children might have also affected their interactions if one of the children was non-responsive or overbearing. In all cases, the performance of an individual child would have been influenced by the performance of the other child. Further, the SIOS assesses prosocial skills using discrete behavioral categories that might not capture the range of ways in which children with ASD interact. To illustrate, some children with ASD without ID demonstrate social impairment in aloofness whereas others are intrusive (Bellini et al., 2014). Given this, an intrusive child might inappropriately and repeatedly attempt to initiate with the other child, and receive points for the initiations even though they were not appropriate or effective. Another possibility is that the measure lacked treatment sensitivity. An alternative approach might be to assess the children's social interactions in a more holistic manner using broad descriptors during an authentic play session with multiple peers. A recent study found that such an approach was treatment sensitive for a psychosocial intervention for 4 to 6 year olds with ASD without ID (Thomeer et al., 2020). Lastly, it is possible that the children failed to generalize the skills/symptom improvements to the dyad game sessions and additional practice is needed to foster generalization.

Overall, results supported the efficacy of the treatment (MAXout) and use of specific techniques (direct instruction, modeling, role-play, reinforcement, repeated practice, and parent training) when delivered as an outpatient model in an outpatient setting. Although some adjustments might be needed to enhance its efficacy (more intensive/modified emotion-recognition instruction, generalization strategies), the outpatient adaptation yielded improvements that were overwhelmingly consistent with those found for the summer and school versions of the treatment. To our knowledge, this is the first treatment tested and found effective in three formats/settings and it addresses a critical need for interventions that are adaptable and effective across settings/formats (Lerner et al., 2011; McMahon et al., 2013; Odom et al., 2014).

These studies may provide clinical practitioners with options for delivering a comprehensive intervention to children with ASD without ID based on local needs, resources, and/or interest. For example, the summer protocol might be beneficial in a locale that has limited summer programming for these children. If such a model is not feasible, the efficiency of the outpatient model might be preferred (Danial & Wood, 2013). The school version might also be appealing as it allows the children to learn and practice skills in the settings they are expected to use them, thus increasing generalization (Kasari & Smith, 2013). An important consideration for programming in community settings is feasibility. The level of staff training and fidelity monitoring in this study may not be viable in some community settings. Conversely, the highly manualized protocol and use of nonprofessional clinicians in this study might suggest the treatment can be successfully implemented in a community setting. A potentially positive indication of feasibility of this outpatient model in community settings derives from prior studies of the treatments from which it was adapted. Thomeer et al. (2019) found the summer intervention was feasible and yielded significant skills and symptom improvements for children with ASD without ID when implemented by a local community agency. In addition, the adapted school intervention previously described was implemented by school staff (professionals and paraprofessionals) with a high level of fidelity during the school year (Lopata et al., 2019). Such studies do not provide evidence that the outpatient treatment is viable in a community setting; however, they suggest the treatment elements and techniques may be good candidates for those settings. Further testing of the outpatient protocol in a community-effectiveness trial (under real-world conditions) will provide critical information into its viability and efficacy in such settings.

This study had a number of strengths such as a comprehensive staff training and fidelity monitoring system, a manualized treatment, a sample size determined via an *a priori* power analysis, child testing and observations by masked evaluators, the inclusion of follow-up testing to assess maintenance, the assessment of social-cognitive skills

(along with social skills and ASD symptoms), and a statistical adjustment for the primary outcomes. In addition, the analysis plan accounted for clusters; this is essential for group-based interventions as failure to do so can result in incorrect or exaggerated treatment effects (due to the cluster-level intraclass correlation coefficient; Boutron et al., 2008). Despite these strengths, the study had several limitations. The sample was limited to 7 to 12 year olds with ASD without ID and largely male and Caucasian which limits the generalization of the findings. The study also included some rating scale measures completed by non-masked raters (parents); as such, rater bias is a potential threat for those measures. Additionally, the study only assessed maintenance 4 to 6 weeks following posttest and there is a need to test the longer-term durability of the treatment effects. Another limitation involved the social-cognitive tests that only assessed face-emotion recognition and nonliteral language skills; no test was administered that measured social knowledge and understanding related to the 30 social/social-communication skills targeted in the treatment. The study was also limited in the manner in which the children's prosocial behaviors were assessed during the observations. The game situations were highly structured, did not allow for game/activity selection, and each child was paired with one other child. This contrived situation and use of dyads likely hindered more authentic social interactions (as previously noted, an individual child's performance would likely have been influenced by the performance of the other child). Relatedly, the children's social performance was only assessed while interacting with other children with ASD without ID. Use of more socially skilled typically-developing peers during the game activities might have created a more encouraging and engaging environment for trying newly learned skills/behaviors. The discrete behavioral categories used in the SIOS might also have failed to capture the various ways in which these children demonstrate social behaviors. The current study was powered to test the two primary outcomes and no statistical adjustment was applied to the secondary outcomes. As such, caution is warranted when interpreting the secondary outcomes, and replication is needed. Lastly, the high level and restricted range of fidelity in this study did not allow for testing of whether fidelity was associated with outcomes. Given these limitations, future studies should test the outpatient treatment in RCTs that include large diverse samples and longer-term follow-up testing. When assessing outcomes, studies would be strengthened by including a broader measure of social knowledge/understanding, as well as assessing social behaviors in a more authentic free-play game session with multiple peers. Research is also needed to develop observational outcome measures that capture the various ways these children exhibit social skills/deficits, can be completed by masked evaluators, and exhibit good treatment sensitivity and psychometric properties. An example of such a measure that uses role-play to assess social behaviors is the Contextual Assessment of Social Skills (Ratto et al., 2011). Future studies with greater variability in fidelity should also test the potential influence of fidelity on outcomes. Finally, studies might consider testing the efficacy of a lower-dose protocol (e.g., larger child-to-staff ratio, shorter sessions, fewer total sessions), as well as the cost-effectiveness of such variations.

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No potential conflict of interest was reported by the authors.

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Appendix. Social Skills Targeted in Social Skills Groups

Introducing yourself
Contributing to discussions
Listening
Giving a compliment
Being a good sport
Giving instructions
Having a conversation
Asking a question
Asking for help
Following instructions
Recognizing another's feelings
Showing understanding of another's feelings
Responding to teasing
Asking permission
Accepting consequences
Joining in
Offering to help an adult
Ending a conversation
Offering to help a classmate
Accepting a compliment
Sharing
Expressing your feelings
Apologizing
Ignoring distractions
Using self-control
Avoiding trouble
Dealing with another's anger
Negotiating
Expressing concern for another
Dealing with being left out

Sex Differences in Externalizing and Internalizing Symptoms of Children with ASD

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ORIGINAL PAPER

Sex Differences in Externalizing and Internalizing Symptoms of Children with ASD

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Abstract

This study examined sex differences in externalizing and internalizing symptoms of children with ASD without intellectual disability (ID). The sample ($n = 80$) included 40 girls and 40 boys, ages 6–12 years, with ASD (without ID) matched on age and IQ. Externalizing and internalizing symptoms were significantly elevated for this sample (girls and boys) relative to normative estimates for all the scales (hyperactivity, aggression, anxiety, and depression) except conduct problems. No significant differences were found between girls and boys for either externalizing symptoms or internalizing symptoms (based on standard score and raw score analyses). Implications for clinical practice and future research are discussed.

Keywords Sex differences · Externalizing symptoms · Internalizing symptoms · Children with ASD (without intellectual disability)

Introduction

There has been a significant increase in the number of children with autism spectrum disorder (ASD) including among children with ASD without intellectual disability (ID) who currently constitute approximately two-thirds of those diagnosed (Baio et al. 2018). Disparities in the prevalence of ASD by sex have long been documented, with the most recent data indicating a 4:1 male-to-female ratio for the broad ASD population and an even greater disparity among those with ASD without ID (Baio et al. 2018). The substantial prevalence discrepancy has led researchers to examine sex differences for a range of phenotypic variables (e.g., diagnostic symptoms, adaptive skills, etc.; Giarelli et al. 2010; Harrop et al. 2015; Rodgers et al. 2019). These studies have sought to inform assessment and treatment practices, as well as identify potential causal mechanisms for ASD and the male–female prevalence discrepancy (Kuusikko et al. 2008; May et al. 2014, 2016).

Beyond the core diagnostic symptoms, individuals with ASD have been found to exhibit a range of comorbid psychiatric symptoms that can further interfere with daily functioning (e.g., Gadow et al. 2005; Volker et al. 2010). Elevations in comorbid symptoms including ADHD-related symptoms have been reported in these studies despite the exclusionary parameters for a comorbid diagnosis of ADHD contained in the DSM-IV and DSM-IV-TR (APA 1994, 2000) that were frequently used to enroll participants. The common occurrence of comorbid symptoms in ASD has prompted studies into potential sex differences in externalizing and internalizing symptoms. Although the research is somewhat limited, the majority of studies have tested sex differences in these symptoms using functionally-heterogeneous samples (variable cognitive levels), with fewer studies using more functionally-homogeneous samples (ASD without ID; Mandy et al. 2012).

Studies of sex differences in externalizing symptoms using functionally-heterogeneous samples with ASD have yielded inconsistent results. For example, a large-scale review of behavioral records found higher levels of parent-rated externalizing symptoms (aggression, hyperactivity, and inattention) for boys with ASD compared to girls with ASD (Giarelli et al. 2010). In contrast, Frazier et al. (2014) found higher levels of parent-rated externalizing behaviors

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for child and adolescent girls with ASD relative to affected boys (total externalizing problems and irritability). Still others have found no sex differences on a range of externalizing symptoms in children and adolescents with ASD (e.g., oppositional behaviors, disruptive behaviors, conduct problems, hyperactivity/inattention, aggression; Brereton et al. 2006; Mandy et al. 2012; Postorino et al. 2015). Contradictory findings have also been reported for sex difference in internalizing symptoms, with some data indicating higher levels of parent-rated emotional problems for female youth with ASD compared to male youth with ASD (Mandy et al. 2012) and other data indicating no internalizing symptom (depression, anxious/depressed, withdrawn) sex differences for youth with ASD (Brereton et al. 2006; Postorino et al. 2015). Several authors have asserted that the contradictory findings are likely associated with the wide and variable range of cognitive/functional levels in samples that can mask important differences, and that studies are needed using functionally-homogeneous ASD samples (Lai et al. 2011; Mandy et al. 2012).

Given the potential effect(s) of cognitive level on results, some researchers have begun to test sex differences in comorbid symptoms in more homogeneous samples consisting of youth specifically with ASD without ID. These studies have also produced inconsistent findings (Oswald et al. 2016). For example, when examining sex differences in parent-rated externalizing symptoms, Worley and Matson (2011) reported no differences in tantrum behaviors or conduct problems for children and adolescents with ASD without ID. Holtmann et al. (2007) found female children and adolescents with ASD without ID had higher parent-rated inattention problems than males with ASD without ID; however, females and males did not differ on delinquent or aggressive behaviors. May et al. (2014) found no sex differences in ratings of inattention or aggression symptoms for children with ASD without ID but males had more symptoms of hyperactivity. In a subsequent study, May et al. (2016) also found more symptoms of hyperactivity/impulsivity, as well as inattention for boys with ASD without ID than girls with ASD without ID. Studies of internalizing symptoms have also produced inconsistent findings however no studies were identified indicating more internalizing symptoms for male youth than female youth with ASD without ID. To illustrate, several studies found no sex differences in parent-rated anxiety, depression, and/or withdrawal symptoms for children and adolescents with ASD without ID (Holtmann et al. 2007; Kuusikko et al. 2008; Solomon et al. 2012; Worley and Matson 2011); however, Solomon et al. (2012) also reported that when they examined only the subgroup of adolescents in their sample (ages 12–18 years), the females had higher levels of anxiety than males (no differences were reported for depression symptoms among the adolescents). May et al. (2014) also found higher parent ratings of social anxiety in girls with ASD without ID than affected boys and Oswald et al. (2016) reported higher parent-rated depression symptoms for adolescent females than adolescent males with ASD without ID (anxiety symptoms were comparable).

Although these studies provide important information on potential sex differences in comorbid symptoms in youth with ASD without ID, the findings have yet to render clear conclusions and a number of variables and limitations have likely contributed to the disparate results (Solomon et al. 2012). For example, the studies of youth with ASD without ID described had very small samples of females (ranging from 12 to 32) and many included both children and adolescents. The small samples and inclusion of youth from broad age ranges were likely associated with significant difficulty recruiting sufficient numbers of females due to the male–female prevalence disparity which is even greater among youth with ASD without ID (Harrop et al. 2015; May et al. 2016). However, broad age ranges can obscure sex differences (Worley and Matson 2011). Many studies also failed to control the statistical error rate despite conducting numerous comparisons, although some applied corrections to control family-wise error rates. A number of studies utilized matched samples (age and/or IQ) which is important given the significant challenges in enrolling females with ASD without ID (Frazier et al. 2014; Lai et al. 2011; Oswald et al. 2016). Lastly, some of the variability in results may be related to the scores used in the analyses as some studies used norm-referenced standard scores and others used raw scores. Although standard scores may assist in determining severity and/or the clinical range of those in the sample, they may also mask potential sex differences (Solomon et al. 2012); studies should include both types of scores (Frazier et al. 2014). This study addressed these limitations and was conducted to contribute to the research by testing sex differences in comorbid symptoms using a relatively large and matched sample of girls and boys with ASD without ID and a narrower age range. The study utilized a multivariate approach and statistical corrections to control experiment-wise error and the analyses were conducted for both standard scores and raw scores. Given the highly discrepant findings in the existing studies, no specific hypothesis was evident for externalizing symptom levels but it was anticipated that boys in the sample would not receive significantly higher ratings of internalizing symptoms than girls in the sample.

Method

Participants

The total sample was comprised of 80 children, ages 6–12 years, with ASD without ID including 40 girls and

40 boys matched on age and IQ. Data for this study were derived from databases of prior clinical studies testing various psychosocial treatments for children with ASD without ID. Recruitment for those trials was done via public announcements. Specifically, recruitment flyers were distributed by public school personnel and local clinicians (counselors, psychologists, etc.) to parents of potential participants in the community. Interested parents then contacted a study coordinator to learn about the studies and eligibility requirements.

Eligibility for the studies was determined using a multiple-gate screening procedure. Initially, parents submitted documentation of a prior clinical diagnosis of autism, Asperger's, or Pervasive Developmental Disorder-Not Otherwise Specified (PDDNOS), as well as prior psychological and special education reports. All the children received their diagnoses from 2002 to 2012 per the DSM-IV-TR (APA 2000). Next, the documentation and reports were independently reviewed by two senior members of the research team using a standardized checklist documenting prior IQ scores (if available; minimum IQ score of 70) and evidence of social/social-communication impairments and circumscribed and repetitive behaviors and interests; consensus between the two reviewers indicating that the criteria were met was required. Children meeting criteria then participated in a formal assessment session that included cognitive testing using a 4-subtest short-form of the Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV; Wechsler 2003) and informal observations of their symptoms, skills, and behaviors. The WISC-IV 4-subtest short-form consisted of the Vocabulary, Similarities, Block Design, and Matrix Reasoning subtests. The short-form composite score had an internal consistency reliability of 0.95 and correlated 0.92 with the Full Scale IQ of the complete test. The methods described by Tellegen and Briggs (1967) were used to calculate the composite reliability, correlation with the full test, and deviation quotient formula based on standardization information in the test manual. Following the formal assessment session, each complete file was again independently reviewed by two senior research team members using the standardized checklist and consensus was required that the child met inclusion criteria (i.e., ages 6–12 years, WISC-IV short-form IQ > 70, and clinical consensus supporting the prior diagnosis) to be enrolled in the trials. One of the studies included an additional exclusionary criterion involving a history of psychosis (per parent report). Other comorbid diagnoses were not assessed as part of the original studies, no specific data were collected on those, and there were no specific exclusionary criteria for other comorbid diagnoses.

The matched-samples for this study were predominately Caucasian, had mean IQ scores in the average range, and had comparable parent education levels. No significant differences were found between the girl and boy samples on major demographic characteristics (see Table 1 for demographics and results of between-groups demographic comparisons). The number of girls and boys taking a psychotropic medication was also very similar across the groups (15 of 40 girls and 17 of 40 boys) with ADHD medication by far the most common in both groups (11 of the 15 girls and 12 of the 17 boys). Data on comorbid symptoms used in this study were collected between 2008 and 2017 and, as noted, all the children received their diagnoses per the DSM-IV-TR, were recruited from the community, and were enrolled in a psychosocial (clinical) treatment study.

Measure

Behavior Assessment System for Children, Second Edition, Parent Rating Scales (BASC-2 PRS)

The BASC-2 PRS (Reynolds and Kamphaus 2004) is a standardized multidimensional rating scale used to assess a range of clinical symptoms in order to assist with differential diagnosis, intervention planning, and outcome monitoring. The BASC-2 PRS is available for three age groups, with this study utilizing the Child (6-to-11 years; PRS-C) and Adolescent (12-to-21 years; PRS-A) forms to assess externalizing and internalizing symptoms. The BASC-2 has consistent

Table 1 Demographic characteristics of the study samples

Characteristic	Boys ($n = 40$) Mean (*SD*)	Girls ($n = 40$) Mean (*SD*)	*t* value	*p* value
Age (years)	9.03 (1.76)	8.95 (1.80)	−0.19	0.85
IQ	103.35 (13.75)	103.25 (15.93)	−0.03	0.98
Parent education (years)	15.10 (1.70)	15.33 (2.22)	0.51	0.66
	n (% of total)	*n* (% of total)		Fisher's exact (*p*)
Ethnicity	Caucasian = 36 (90.0%) Minority = 4 (10.0%)	Caucasian = 35 (87.5%) Minority = 5 (12.5%)		1.00

scales across age levels which, "provides a basis for consistent interpretation of scales" (Reynolds and Kamphaus 2004, p. 2). Both forms include nine clinical behavior scales (i.e., Aggression, Anxiety, Attention Problems, Atypicality, Conduct Problems, Depression, Hyperactivity, Somatization, and Withdrawal); this study used the Hyperactivity, Conduct Problems, and Aggression scales to assess externalizing symptoms and Depression and Anxiety scales to assess internalizing symptoms. Parents rate each item on a 4-point frequency scale from 0 (Never) to 3 (Almost always) and item scores are summed and converted to standard *T*-scores ($M = 50$, $SD = 10$). Higher scores on the clinical scales indicate more problematic symptoms/behaviors. Clinical scale *T*-scores between 41and 59 are considered *average*, scores between 60 and 69 are classified as *at-risk*, and scores ≥ 70 are classified as *clinically significant* (Reynolds and Kamphaus 2004).

Coefficient alpha reliabilities for the PRS-C clinical scales used in this study reportedly ranged from 0.83 to 0.88 and for the PRS-A ranged from 0.81 to 0.87. Validity evidence supporting the grouping of externalizing or internalizing scales is reflected in moderate intercorrelations between scales within each grouping. Intercorrelations between the externalizing behavior scales (i.e., Hyperactivity, Aggression, and Conduct Problems) ranged from 0.67 to 0.76 for the PRS-C and 0.72 to 0.78 for the PRS-A and between the two internalizing behavior scales (i.e., Depression and Anxiety) was 0.54 for the PRS-C and 0.59 for the PRS-A. Concurrent validity was supported in moderate-to-high correlations between the BASC-2 scales used in this study and comparable clinical scales on other established rating scales (Reynolds and Kamphaus 2004). Additionally, studies have shown that the BASC-2 is sensitive to externalizing and internalizing symptoms in children and adolescents with ASD without ID when compared to typically-developing peers (Lopata et al. 2010; Volker et al. 2010).

Procedures

The treatment trials that generated the data used in this study were approved by the Institutional Review Board and conducted according to the approved procedures (including attainment of written parental consent and child assent). For each trial, parents completed a battery of pretreatment (baseline) measures that included the BASC-2 PRS. Once completed and returned, each protocol was immediately examined for any errors (e.g., items with multiple responses, omitted items, etc.) and promptly reviewed with the parent to correct the error(s). All protocols were scored by research assistants using the BASC-2 ASSIST Plus computer scoring software, which includes a second entry check for accuracy. Protocol and demographic data were initially entered into the study database by a research assistant and independently checked by a second research assistant, with any discrepancy resolved by a third member of the team.

Data Analysis Plan

Several statistical procedures were used to examine the externalizing and internalizing symptoms of girls and boys in the sample. Initially, descriptive statistics were calculated for the girl and boy samples including demographic data (Table 1) and scores on each of the externalizing and internalizing scales (both standard *T*-scores and raw scores; Table 2). Next, one-sample *t*-tests were calculated using the standard scores to compare the symptom levels of girls and boys separately against the BASC-2 normative estimates. These comparisons were conducted to characterize the symptom levels and assist with subsequent interpretation of the principle tests of sex differences in symptoms. A Bonferroni correction was applied for each sex-based set of comparisons (girl sample adjusted alpha ≤ 0.01 [i.e., 0.05/5 comparisons] and boy sample adjusted alpha ≤ 0.01 [i.e., 0.05/5 comparisons]). Effect size estimates (Cohen's *d*) were also calculated.

The primary research questions involving sex differences in externalizing and internalizing symptoms were tested using Multivariate Analysis of Variance (MANOVA). Two separate MANOVAs were calculated for the standard scores (one for externalizing symptoms and one for internalizing symptoms) and two for the raw scores (one for externalizing symptoms and one for internalizing symptoms). In this study, the Hyperactivity, Aggression, and Conduct Problems scales comprised the externalizing behavior sets and

Table 2 BASC-2 PRS means and standard deviations for standard scores and raw scores by group

Scale	Boys *T*-score Mean (*SD*)	Girls *T*-score Mean (*SD*)	Boys raw score Mean (*SD*)	Girls raw score Mean (*SD*)
Hyperactivity	64.73 (13.80)	64.80 (11.42)	13.95 (6.35)	14.00 (5.15)
Aggression	57.35 (12.15)	54.63 (9.99)	9.28 (5.28)	7.90 (4.59)
Conduct problems	50.88 (12.44)	52.28 (11.19)	5.30 (4.64)	5.70 (3.96)
Anxiety	57.73 (16.23)	58.30 (14.32)	16.68 (9.62)	16.80 (8.25)
Depression	62.75 (15.80)	62.35 (16.50)	13.03 (8.01)	12.65 (8.12)

All values based on $n = 40$ boys and $n = 40$ girls

the Anxiety and Depression scales comprised the internalizing behavior sets. To control the experiment-wise error rate at 0.05, each MANOVA was tested at the adjusted alpha < 0.0125 (i.e., 0.05/4 MANOVA tests). Assumptions of the MANOVA models (outliers, normality, linearity, and homogeneity of variance–covariance matrices) were assessed and all were met. Linear correlations among the externalizing scales and among the internalizing scales were all of moderate magnitude (Table 3). MANOVA tests were done using Pillai-Bartlett trace, and follow-up univariate *F* tests were calculated. Partial eta squared effect sizes were also calculated (Table 4).

Results

Initial tests compared the externalizing and internalizing symptom levels of girls and boys in the sample separately against the BASC-2 normative estimates. Results of the one-sample *t*-tests yielded significantly higher externalizing symptom levels for girls and boys in the sample on the Hyperactivity (girls $t = 8.20$, $p < 0.01$, $d = 1.38$ and boys $t = 6.75$, $p < 0.01$, $d = 1.22$) and Aggression (girls $t = 2.93$, $p = 0.01$, $d = 0.46$ and boys $t = 3.83$, $p < 0.01$, $d = 0.66$) scales but no differences on the Conduct Problems (girls $t = 1.29$, $p = 0.21$, $d = 0.22$ and boys $t = 0.45$, $p = 0.66$, $d = 0.08$) scale. Results also indicated significantly higher internalizing symptoms for girls and boys in the sample for the Anxiety (girls $t = 3.67$, $p = 0.01$, $d = 0.67$ and boys $t = 3.01$, $p = 0.01$, $d = 0.57$) and Depression (girls $t = 4.73$, $p < 0.01$, $d = 0.91$ and boys $t = 5.11$, $p < 0.01$, $d = 0.96$) scales. For the four scales on which significant differences were found, the effect sizes were generally medium-to-large in magnitude.

Potential sex differences for the externalizing and internalizing symptom scales were first tested using the standard scores. Results of the separate MANOVA analyses revealed no significant multivariate effect of sex for externalizing or internalizing symptoms, indicating similar levels of parent-reported symptoms across the sex groups (Table 4). Given the absence of a significant multivariate effect for either the externalizing symptoms or internalizing symptoms tests, the univariate *F* tests are reported but the significance tests are not interpreted. A review of the univariate effect sizes, however indicated small-to-negligible effects for each of the individual externalizing and internalizing scales. For the same tests using the raw scores, the MANOVA analyses also indicated no significant multivariate effect of sex for either externalizing symptoms or internalizing symptoms.

Table 3 BASC-2 PRS scale correlations for standard scores and raw scores

Clinical scale	Hyperactivity	Aggression	Conduct problems	Anxiety	Depression
Hyperactivity	–	0.66**	0.51**	0.22**	0.46**
Aggression	0.63**	–	0.78**	0.18	0.56**
Conduct problems	0.45**	0.78**	–	0.12	0.55**
Anxiety	0.25*	0.17	0.06	–	0.60**
Depression	0.40*	0.56**	0.53**	0.58**	–

Upper off correlations based on standard *T*-scores and lower off based on raw scores

*$p < 0.05$; **$p < 0.01$

Table 4 Multivariate and univariate results for sex comparisons for externalizing and internalizing symptoms

Effect	*T*-score comparisons				Raw score comparisons			
	Pillai's trace	*F* (*df*)	*P* value	Partial eta squared	Pillai's trace	*F* (*df*)	*P* value	Partial eta squared
Multivariate test								
Externalizing behavior	0.09	2.54 (3,78)	0.06	0.09	0.10	2.81 (3,78)	0.05	0.10
Univariate tests								
Hyperactivity		< 0.01 (1,78)	0.98	< 0.01		< 0.01 (1,78)	0.97	< 0.01
Aggression		1.20 (1,78)	0.28	0.02		1.55 (1,78)	0.22	0.02
Conduct problems		0.28 (1,78)	0.60	< 0.01		0.17 (1,78)	0.68	< 0.01
Multivariate test								
Internalizing behavior	< 0.01	0.05 (2,78)	0.95	< 0.01	< 0.01	0.05 (2,78)	0.96	< 0.01
Univariate tests								
Anxiety		0.03 (1,78)	0.87	< 0.01		< 0.01 (1,78)	0.95	< 0.01
Depression		0.01 (1,78)	0.91	< 0.01		0.04 (1,78)	0.84	< 0.01

Comparisons based on $n = 40$ boys and $n = 40$ girls and all tests were two-tailed

As such, the univariate *F* tests are reported but the significance tests are not interpreted. Consistent with results based on the standard scores, the raw score univariate effect sizes were small-to-negligible.

Discussion

Prior research has suggested that children with ASD experience a range of comorbid symptoms. Investigations into sex differences in these symptoms have yielded contradictory results both within and between studies (Solomon et al. 2012). A number of factors may have contributed to the inconsistent findings such as the testing of comorbid symptoms in cognitively-/functionally-heterogeneous and/or broad age-range samples which can mask important sex differences (Mandy et al. 2012; May et al. 2016; Worley and Matson 2011). Significantly fewer females with the diagnosis, especially among those with ASD without ID has also resulted in small female samples in the existing studies (Harrop et al. 2015; May et al. 2016). This study aimed to contribute to the research by testing sex differences in a relatively large sample of girls (ages 6–12 years) specifically with ASD without ID compared to age- and IQ-matched boys with ASD without ID.

To assist with the interpretation of the sex-based comparisons, the externalizing and internalizing symptom levels of the girls and boys in the sample were initially compared to population estimates. Results reflected significantly elevated comorbid symptoms in two of the three externalizing symptom areas (hyperactivity and aggression) and both internalizing areas (anxiety and depression). These findings are largely consistent with results of prior studies of parent-rated externalizing and internalizing symptoms in children with ASD without ID (e.g., Gadow et al. 2005; May et al. 2016; Oswald et al. 2016) including studies using the BASC-2 (Lopata et al. 2010; McDonald et al. 2016; Solomon et al. 2012; Volker et al. 2010). These results continue to suggest increased vulnerability for externalizing and internalizing symptoms, however the elevations were not uniform across the scales. Specifically, the mean Hyperactivity and Depression scores fell in the *at-risk* range, whereas Aggression and Anxiety scores fell in the mid-upper *average* range. Although the normative comparisons suggested vulnerability for these symptoms, the clinical interpretive ranges suggest that the risk might be somewhat greater for hyperactivity and depression symptoms among children with ASD without ID.

The primary purpose of this study was to assess sex differences in parent-rated comorbid symptoms and results revealed similar levels of overall externalizing and internalizing symptoms between girls and boys with ASD without ID in the sample. The lack of overall differences was found for both the standard and raw score comparisons, and was also indicated in the small-to-negligible effect sizes at the individual scale level. This reflects a consistent pattern of similarity in symptom levels for girls and boys in the sample. Interpreting the current findings relative to other studies is a challenge due to a range of methodological differences and/or mixed findings within a given symptom category in other studies (e.g., differences between individual externalizing symptom scales). Despite these challenges, the current findings are consistent with those of Holtmann et al. (2007) and Worley and Matson (2011) who found similar levels of parent-reported aggression and conduct problems in females and males (ranging from 4 to 20 years) with ASD without ID, as well as with May et al. (2014) who reported no sex differences in aggression among 7–12 year olds with ASD without ID. In contrast, May et al. (2014, 2016) found elevated symptoms of hyperactivity in 7–12 year old boys compared to girls with ASD without ID. Although the reason(s) for the differences in results between the current study and May et al. (2014, 2016) are unknown given the similarity in age and functional level of the samples, their studies were conducted with Australian samples and used a hyperactivity measure that more directly tested ADHD symptoms.

Consistent with the larger research base, the current study did not find males with ASD without ID had elevated internalizing symptoms (anxiety and depression) relative to females with ASD without ID. In fact, the current findings are in line with many studies that found no sex differences for children and/or adolescents with ASD without ID (e.g., Holtmann et al. 2007; Kuusikko et al. 2008; Solomon et al. 2012; Worley and Matson 2011). Despite this consistency, two studies found adolescent females exhibited elevations in a specific internalizing symptom (e.g., depression, Oswald et al. 2016; anxiety, Solomon et al. 2012) and May et al. (2014) found elevated social anxiety in girls with ASD without ID compared to boys. Again, some of the differences in results might be a function of differences in study characteristics (e.g., the age of the samples, country of origin of the samples, use of different measures and specificity of the measures [social anxiety], etc.).

Given the methodological strengths and consistent pattern of findings in this study, the results may have some practical implications. One possible implication derives from the finding that the comorbid externalizing and internalizing symptom levels did not differ significantly between girls and boys with ASD without ID in the sample. This suggests that clinicians might not necessarily have to enter the assessment process anticipating different patterns of elevations based on sex. Further, the lack of sex differences should not be misconstrued as a lack of vulnerability for comorbid symptoms for these children. In this study, both girls and boys with ASD without ID showed significantly elevated symptoms of hyperactivity, aggression, anxiety, and depression

when compared to population estimates. This suggests that clinicians, parents, and teachers should be cognizant of the susceptibility to externalizing and internalizing symptoms for many children with ASD without ID (Brereton et al. 2006; May et al. 2014). As such, it may be advisable for clinicians to include a broad screening measure of comorbid symptoms as part of any assessment of children with ASD without ID. Significant elevations in symptoms might then warrant a more in-depth diagnostic assessment to determine the presence of a comorbid diagnosis. In addition to assessment implications, results suggest that supplemental treatment (e.g., cognitive-behavioral, behavioral) might be needed to address the comorbid symptoms (Kuusikko et al. 2008; Oswald et al. 2016). This is often not the primary focus of interventions given the severe impairment caused by the ASD diagnostic symptoms and the need to enhance social functioning; however, these comorbid symptoms can further impair daily functioning and hinder other intervention efforts. Although both girls and boys appeared equally susceptible to comorbid symptoms, it is important to interpret those findings within the context of the sample. Specifically, the lack of sex differences found in this study could be characteristic of this particular sample, which was enrolled in psychosocial treatment studies and/or due to the overall elevated symptoms for this particular sample and therefore might not be representative of the larger ASD population.

The current findings represent an important step in understanding comorbid symptoms specifically in children with ASD without ID. Although this study had several strengths (e.g., relatively large matched sample with ASD without ID, narrow age and cognitive inclusion parameters, testing of sex differences using both standard and raw scores, statistical adjustments to control experiment-wise error, etc.), several limitations warrant mention. A primary limitation involved the characteristics of the sample. While utilizing narrow age (6–12 years) and cognitive inclusion parameters was considered a methodological improvement over prior studies (May et al. 2016; Worley and Matson 2011), those criteria limit the generalizability of the findings to others outside those parameters. The sample was also predominantly Caucasian which further restricts generalizability. This study was also limited by the use of parent raters only. Teacher reports may provide additional insight into potential sex differences in externalizing and internalizing symptoms within structured educational settings. Beyond these, there are limitations inherent in the use of rating scales to assess comorbid symptoms. For example, rating scales are based on parents' perceptions and their ratings may be influenced by potential biases. In addition, rating scales only yield information on symptom levels/severity and are not sufficient for a diagnosis of a comorbid disorder. As such, it is unknown how many of the girls and boys in the sample would have met full criteria for a comorbid diagnosis. It is also important to note that the participants in this study were diagnosed using the DSM-IV-TR which precluded a comorbid diagnosis of ADHD for those with autism (APA 2000). The DSM-V (APA 2013) has removed this restriction and encourages the identification of comorbid diagnoses (including ADHD) when present, and included autism, Asperger's, and PDDNOS under the heading of ASD, which could affect the results and make-up of samples in future comorbidity studies. Another limitation involved the fact that all the children were participants in specific psychosocial treatment studies, which might affect the generalizability of the findings. The study also utilized existing data (retrospective) and future prospective studies may want to use the effects found in this study to inform their sample sizes. Further, although this study had one of the largest samples of girls with ASD without ID, it was nonetheless limited. Considering these limitations, future research should seek to replicate the current findings using larger and more racially/culturally diverse samples. Given the need to study such phenomenon in functionally-homogeneous samples, future research might also examine sex differences in symptoms for younger and/or older youth with ASD without ID. Longitudinal studies will also be useful in documenting sex differences in the developmental trajectory of comorbid symptoms from childhood through adolescence. Finally, studies might benefit from the use of a diagnostic measure to determine the presence of a comorbid diagnosis (not simply symptom levels). It is clear that ongoing studies are needed as comorbid symptoms constitute a significant barrier to daily functioning of youth with ASD without ID.

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Authors Contribution BCN participated in the design, compiled the data, conducted some of the statistical analyses, and drafted the manuscript; CL participated in the study design and interpretation of the data, and drafted the manuscript; JPD participated in the design, led the statistical analyses, and helped to draft the manuscript; JDR coordinated the data compilation and management, and helped to draft the manuscript; and MLT participated in the design and data collection, and drafted the manuscript. All authors read and approved the final manuscript.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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Exploratory factor analysis of the Adapted Skillstreaming Checklist for children with autism spectrum disorder

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Abstract

The Adapted Skillstreaming Checklist measures social/social-communication skills and behavioral flexibility/regulation of children with autism spectrum disorder without intellectual disability. Prior studies provided support for the reliability and criterion-related validity of the Adapted Skillstreaming Checklist total score for these children; however, no studies have examined the Adapted Skillstreaming Checklist factor structure. This exploratory factor analysis examined the factor structure and internal consistency of parent ratings on the Adapted Skillstreaming Checklist for a sample of 331 children, ages 6–12 years, with autism spectrum disorder without intellectual disability. Results yielded a correlated three-factor solution. The individual factors and total score demonstrated very good internal consistency reliability. Findings supported the presence and interpretability of three subscales, as well as derivation of a total composite reflecting overall prosocial and adaptive skills and behaviors. Implications for assessment and research are discussed.

Keywords

Adapted Skillstreaming Checklist, exploratory factor analysis, parent ratings, children with ASD without ID

Significant social/social-communication impairments and circumscribed and repetitive behaviors and interests define autism spectrum disorder (ASD; American Psychiatric Association, 2013). The multi-symptom nature of the disorder, along with significant heterogeneity in symptom expression and functional levels of those diagnosed, poses a major assessment challenge. Factors such as cognitive and language abilities and developmental level influence the manifestation of skills and symptoms and can affect the psychometric properties of measures (Koenig, De Los Reyes, Cicchetti, Scahill, & Klin, 2009; Lord, Corsello, & Grzadzinski, 2014). This suggests the need for development and evaluation of measures for more homogeneous (narrower) subgroups with ASD (Lord et al., 2014). Assessment of clinical features and performance of children with ASD also requires consideration of the manner in which the symptom, skill, and/or behavior is measured. For example, diagnostic observations yield accurate diagnoses; however, they often rely on dichotomous measurement of symptoms (absent or present) which provides little information on the degree to which the skill, symptom, or behavior is exhibited or degree of impairment (Achenbach, 2011; Davis & Carter, 2014).

Rating scales are also used to measure the clinical features and skills of children with ASD (Davis & Carter, 2014; Lopata et al., 2017b). In contrast to diagnostic observations which can be time and labor intensive and require extensive training (Norris & Lecavalier, 2010), rating scales are easily administered, brief, and can assess a range of skills and symptoms based on informants in authentic environments (Constantino & Gruber, 2012; Lord & Corsello, 2005; Norris & Lecavalier, 2010). Continuous scaling of most rating scales is useful as the skills and symptoms of these children are not dichotomous (absent or present) and they exist on a continuum (Ibanez, Stone, & Coonrod, 2014). As such, rating scales can provide important information on the extent, frequency, or severity of the trait (Achenbach, 2011). Continuous scaling is also useful in measuring treatment outcomes (Achenbach, 2011;

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Reynolds & Kamphaus, 2015) including for ASD studies (Constantino & Gruber, 2012). There is widespread recognition of the need for treatment sensitive measures in ASD intervention studies and the negative impact of this issue on efficacy determinations (Bellini, Gardner, & Markoff, 2014; Stichter, Herzog, Owens, & Malugen, 2016; White, Keonig, & Scahill, 2007). Poor alignment of scale items with treatment targets can reduce a scale's sensitivity (Koenig et al., 2009; McMahon, Lerner, & Britton, 2013; Stichter et al., 2016) so developing interventions and scales that are keyed to the clinical features of ASD may improve sensitivity (White et al., 2007). Although researchers have developed study-specific measures to increase treatment sensitivity (e.g. DeRosier, Swick, Davis, McMillen, & Matthews, 2011), few have been rigorously tested for their psychometric properties. This led Lopata et al. (2017b) and White et al. (2007) to recommend that researcher-developed measures be tested for their psychometric properties (and ease of use and cost), especially those that exhibit good treatment sensitivity.

One segment of the ASD population that has increased is children with ASD without intellectual disability (ID); this subgroup currently comprises more than two thirds of those diagnosed (Christensen et al., 2016). The increase in prevalence among this subgroup indicates the need for measures that yield valid information on the skills and clinical features of these children, can be easily completed, and are treatment sensitive (Lopata et al., 2017b; McMahon et al., 2013). Assessing skills and performance on a continuum (continuous scaling) is particularly important for children with ASD without ID as there are few social/social-communication behaviors that are completely absent, which warrants a different type of scale item and assessment approach (Lord et al., 2014). Dichotomous measurement may also be limited as it fails to recognize that skills and symptoms can be observed in contradictory ways. For example, some children may exhibit limited social initiations or interactions, whereas others exhibit excessive, odd, or inappropriate initiations or interactions (Bellini et al., 2014; Davis & Carter, 2014). In addition to social functioning, measures should also assess behavioral performance related to circumscribed and repetitive behaviors and interests as these can interfere with the social and adaptive skills of children with ASD without ID (Bauminger-Zviely, 2014).

The Adapted Skillstreaming Checklist (ASC; Lopata, Thomeer, Volker, Nida, & Lee, 2008) is a rating scale specifically designed to assess the functioning of children with ASD without ID. In contrast to most measures that assess the absence of social-communication skills or behaviors and the presence of unusual interests or behaviors (Lord et al., 2014), the ASC assesses these two dimensions from an adaptive perspective (i.e. prosocial skills and behavioral flexibility and regulation). The ASC was originally developed as a study-specific measure to assess outcomes of a psychosocial treatment for children with ASD without ID, with the treatment targets keyed to the diagnostic elements (social/social-communication skills and circumscribed and repetitive behaviors and interests). Scale items measure prosocial skills and behaviors aligned with the treatment targets and diagnostic features. A number of psychosocial intervention studies for children with ASD without ID have found the ASC to be treatment sensitive (e.g. within-group pre-posttest effect sizes from medium-to-large for parent ratings; Lopata et al., 2017a; Lopata et al., 2008). Sample-specific psychometric data were only presented for two of the interventions studies; these indicated good internal consistency (0.94) and moderate-to-high correlations with related scales on established measures of adaptive and clinical functioning (Lopata et al., 2010; Lopata et al., 2008). Despite the initial support, the data were based on very small samples (i.e. $N=54$ and $N=36$).

Only one psychometric study tested the reliability and validity of ASC parent ratings for a large sample of children with ASD without ID ($N=275$; Lopata et al., 2017b). Internal consistency was very good (0.92) and test–retest reliability was very good at 6 weeks (Pearson $r=0.81$, ICC = 0.78) and good at 9 months (Pearson $r=0.63$, ICC = 0.64). Strong negative correlations were found between the ASC total score and ratings of ASD symptom severity ($r=-0.69$; Constantino & Gruber, 2012). Criterion-related validity was also supported in significant positive correlations between the ASC total and ratings of adaptive skills (including social skills $r=0.64$) and significant negative correlations with ratings of externalizing behavior problems (composite $r=-0.45$) on a broad clinical measure (Reynolds & Kamphaus, 2004, 2015). Based on these positive findings, the authors recommended exploratory factor analyses to assess the possible presence of subscales within the ASC. Given its treatment sensitivity, documenting the ASC factor structure may provide researchers with a more refined measure for testing efficacy.

This study assessed the factor structure of ASC parent ratings for a large sample of children with ASD without ID. It addressed the need for studies of standardized measures used to assess the skills and performance of these children, particularly those used to monitor changes over time or treatment outcomes (Davis & Carter, 2014; McMahon et al., 2013). It also addressed the need for studies of measures that assess skills on a continuous scale and testing for the presence of factors that parallel the primary symptom dimensions (Constantino et al., 2004; Fernandopulle, 2011). Finally, it met the need for studies using a well-characterized but narrowly defined subgroup with ASD (without ID) as cognitive and language abilities can affect a measure's properties including its factor profile (Fernandopulle, 2011; Lord et al., 2014).

Table 1. Demographic characteristics of child sample and parent raters.

Characteristic	Child participants ($N = 331$)
	M (*SD*)
Age (years)	9.31 (1.65)
Parent education (years)	15.66 (2.24)
WISC-IV Short-Form IQ	104.91 (14.38)
CASL	
Short-Form Expressive Language	99.84 (15.92)
Short-Form Receptive Language	105.15 (15.78)
ADI-R	
Impairment in Social Interaction	18.51 (5.33)[a]
Impairment in Communication	15.01 (4.31)[a]
Restricted Repetitive Behavior	5.78 (2.09)[a]
SCQ Total Score	21.54 (5.28)[b]
	n (% of total)
Gender	
Male	294 (88.8)
Female	37 (11.2)
Ethnicity	
White	289 (87.3)
African American	8 (2.4)
Latino	5 (1.5)
Asian American	7 (2.1)
Mixed race/ethnicity	22 (6.6)

WISC-IV: Wechsler Intelligence Scale for Children-4th Edition; CASL: Comprehensive Assessment of Spoken Language; ADI-R: Autism Diagnostic Interview-Revised; SCQ: Social Communication Questionnaire.
The WISC-IV 4-subtest short-form consisted of the Block Design, Similarities, Vocabulary, and Matrix Reasoning subtests and the CASL 4-subtest short-form consisted of the Antonyms, Synonyms, Syntax Construction, and Paragraph Comprehension subtests.
[a]ADI-R scores based on a sample size of $n = 262$.
[b]SCQ Total Score based on a sample size of $n = 69$.

Method

Participants

Parent ratings of 331 children, ages 6–12 years, with ASD without ID were included in the analyses. All children had participated in one of multiple prior trials testing the effectiveness of various psychosocial treatments for this population, and they were recruited for those trials via school and public announcements. Each child had a prior clinical diagnosis of ASD (or autism, Asperger's, or Pervasive Developmental Disorder–Not Otherwise Specified), Wechsler Intelligence Scale for Children–4th Edition (WISC-IV; Wechsler, 2003) short-form IQ > 70, and Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk, 1999) short-form expressive or receptive language score > 70. Each child also met criteria on the Autism Diagnostic Interview–Revised (Rutter, LeCouteur, & Lord, 2003) or Social Communication Questionnaire (Rutter, Bailey, & Lord, 2003) which was completed to confirm her or his diagnosis. The child sample was predominantly male (89%) and White (87%) and had a mean IQ and language level in the average range. Parents reported an average parent education level of 15.7 years (Table 1). Demographic data were compiled from the various treatment trial databases.

Measure

ASC. The ASC (Lopata et al., 2008) is a 38-item rating scale developed to measure the social/social-communication skills and behavioral and interest flexibility and regulation of children with ASD without ID. Each item measures a specific skill or behavior that is keyed to a clinical feature of ASD. As noted, the ASC items assess these skills from a prosocial and adaptive perspective (i.e. extent to which the skill or adaptive behavior is exhibited). Parents rate each item on a scale from 1 (almost never) to 5 (almost always). The ASC includes 30 items (including adapted items) from the Skillstreaming curriculum (Goldstein, McGinnis, Sprafkin, Gershaw, & Klein, 1997; McGinnis & Goldstein, 1997) and 8 researcher-created items. Individual item scores are summed to yield a total composite score, and higher scores indicate greater use of the prosocial and adaptive skill or behavior. (Data on the psychometric properties of the ASC were described in the introduction.)

Procedures

Institutional Review Board (IRB) approval was obtained for each of the treatment trials from which the cases were compiled, along with informed consent and assent (Canisius College IRB). For each treatment trial, parents completed a battery of baseline (pretreatment) measures that included the ASC. Upon completion and return, each protocol was immediately reviewed to ensure it was complete. Incomplete protocols or protocols containing errors (e.g. omitted items, multiple responses to an item, etc.) were immediately reviewed with the parent to correct the error(s). Each treatment trial also instituted a structured scoring and data entry protocol to ensure accuracy. Each ASC was scored independently by two research assistants, with any discrepancies in scoring resolved by a third scorer. Following a similar procedure, all demographic and protocol data were initially entered into the study database by a research assistant and independently checked by a second research assistant, with any discrepancy corrected by a third member of the team.

Data diagnostics and analysis plan

Exploratory factor analysis (EFA) was selected as no prior studies have tested for the presence of factors within the

ASC. This exploratory analytic method is useful in examination of latent constructs in a set of items or measures in the absence of prior theory or research (Floyd & Widaman, 1995). Prior to conducting the EFA, data quality, completeness, and suitability for factor analysis were examined. Complete data were available for all 331 cases, with no out-of-range values. The sample of 331 was considered adequate for EFA based on the study goal of conducting the first structural study of the measure, the homogeneous sample, and preliminary analysis (item analysis and matrix tests including the Kaiser–Meyer–Olkin and Bartlett's tests), as well as guidelines and empirical studies of sample size issues in the factor analysis literature. Individual item analysis was conducted to examine distributions of the items. Skewness, kurtosis, and item-total correlations were examined for all items; the range of skewness values was −0.38 to 0.51 and kurtosis values was −0.70 to 0.41, and the mean item-total correlation was 0.46 with a range of 0.27 to 0.63.

With regard to sample size guidelines for EFA, many recommendations have focused on total sample size or item/participant ratio, which may be set in study planning. However, the quality of the data also affects the quality of the analysis, knowable only once the data are obtained (Bandalos & Finney, 2010). In terms of guidelines, Tinsley and Tinsley (1987) recommended 5–10 participants per item up to samples of 300 (in the present study the ratio was 8.7 participants/item). Comrey (1988) recommended that a sample size of 200 is "reasonably good" (p. 759) for 40 or fewer variables (the present study included 38 with 331 participants). In summarizing the guidelines, DeVellis (2017) concluded that, while not capturing the full complexity of validity issues in factor analysis, the guidelines generally suffice in study planning. Costello and Osborne (2005) reviewed a wide array of guidelines and simulations that went beyond consideration of sample size and item/participant ratios. These simulations illustrated the impact of interactions between communality, sample size, item number, and factorial complexity on the accuracy of reproduced results. Costello and Osborne (2005) concluded that larger communality values in the context of relatively small numbers of factors will improve reproducibility of factor structures. In the present study, initial communality ranged from 0.265 to 0.714 with a mean of 0.450. Costello and Osborne (2005) also emphasized the importance of the exploratory context (not hypothesis testing or confirmatory analysis) in evaluating data for EFA. SPSS 25 (item and reliability analysis, EFA) and Stata 15.1 (parallel analysis) were used in the current analyses.

For the current data set, the Kaiser–Meyer–Olkin measure of sampling adequacy was 0.88, indicating that most of the variance in the data was attributable to underlying factors. Similarly, Bartlett's test of sphericity indicated that the correlation matrix was suitable for structural analysis ($p < 0.001$). Given the goal of identification of latent structure and expectation of correlated factors, principal axis factoring with oblimin rotation was utilized. Following examination of the communalities, scree plot, and eigenvalues, an optimal initial solution was identified. Follow-up analyses examined alternative solutions. Parallel analysis was also used in determining the optimal number of factors. The pattern and structure coefficients were reviewed and reported to facilitate interpretation of the final solution (Bandalos & Finney, 2010).

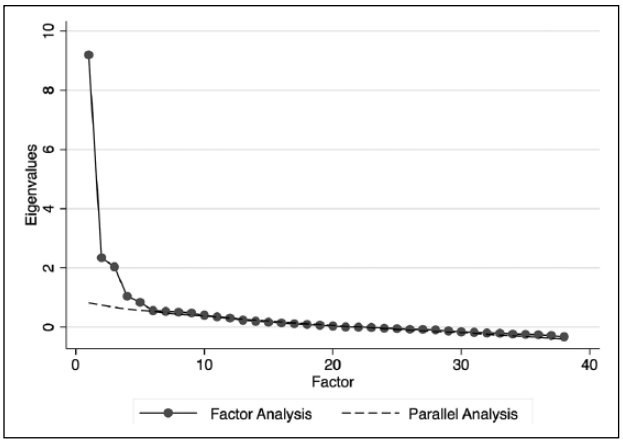

Figure 1. Scree plot with parallel analysis.

Results

The scree plot with results of the parallel analysis is displayed in Figure 1. The break in the eigenvalues appears at approximately 2, following the third factor. The eigenvalues and percent of variance for the first three factors were 9.72 (25.6%), 2.88 (7.6%), and 2.57 (6.8%). The parallel analysis also supports the viability of a three-factor solution, with the parallel eigenvalues well below the first three factors. The next step limited the analysis to three factors, followed by oblimin rotation. The pattern and structure coefficients from this analysis are presented in Table 2. The values in Table 2 further support the three-factor solution as both simple and interpretable. All three factors are represented by substantial numbers of items (19 for Factor 1, 9 for Factor 2, and 10 for Factor 3). The coefficients for each factor are generally moderate, and the pattern and structure coefficients correspond well overall in terms of relative position and at the item level in terms of magnitude. Table 3 presents the factor intercorrelations which are low to moderate (0.20–0.39). Coefficient alpha reliabilities for the three factors are 0.90 (Factor 1), 0.80 (Factor 2), and 0.79 (Factor 3), and 0.92 for the full scale.

The items that comprised the first factor were examined to determine the underlying construct (skill or behavioral feature). Factor 1 was labeled *Social Communication Skills* (SCS) as all 19 items were assessing prosocial interpersonal skills related to social-communication and

Table 2. Factor loadings for exploratory factor analysis of ASC items, principal axis with oblimin rotation.

Item	Pattern coefficients			Structure coefficients		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
5. Does your child let others know that he or she is grateful for favors, etc.?[a]	**0.708**			**0.665**		
22. Does your child show understanding of another person's feelings?[b]	**0.647**			**0.666**	0.347	
25. Does your child let others know that he or she cares about them?[a]	**0.640**			**0.587**		
18. Does your child make verbal or written apologies for things said or done?[b]	**0.640**			**0.605**	0.314	
20. Does your child let others know which emotions he or she is feeling?[a]	**0.637**			**0.649**		
7. Does your child tell others that he or she likes something they have done?[b]	**0.633**			**0.653**		0.330
19. Does your child recognize which emotions he or she has at different times?[a]	**0.616**			**0.631**		
21. Does your child understand what other people are feeling?[a]	**0.610**			**0.669**	0.437	
15. Does your child give assistance to other children who might need or want it?[a]	**0.558**			**0.584**		0.337
32. Does your child express an honest complement to others about how they played a game?[b]	**0.542**			**0.572**		
16. Does your child acknowledge and accept complements from others?[b]	**0.520**			**0.598**		0.347
2. Does your child begin conversations with other people?[a]	**0.513**	−0.374	0.336	**0.543**		0.463
6. Does your child become acquainted with new people on his or her own?[a]	**0.497**	−0.386		**0.506**		0.406
11. Does your child give assistance to adults who might need some assistance?[b]	**0.493**			**0.526**		0.316
14. Does your child take steps to become part of an ongoing activity or group?[a]	**0.451**		0.342	**0.511**		0.464
8. Does your child request assistance when he or she is having difficulty?[a]	**0.422**			**0.468**		
17. Does your child offer to share what he or she has with others?[a]	**0.403**			**0.483**		0.311
4. Does your child know how and when to ask questions of another person?[a]	**0.389**		0.367	**0.533**		0.520
31. Does your child help arrive at a plan that satisfies both him/herself and others who have taken different positions (i.e. negotiates)?[a]	**0.314**			**0.457**	0.378	0.364
29. Does your child stay out of situations that might get him or her in trouble?[a]		**0.622**			**0.636**	
26. Does your child exercise self-control under difficult circumstances?[b]		**0.555**			**0.609**	
30. Does your child accept the consequence of her or his behavior?[b]		**0.506**		0.318	**0.557**	
24. Does your child try to understand someone else's anger without getting angry him/herself?[a]	0.335	**0.457**		0.458	**0.547**	
33. Does your child deal positively with being left out of some activity?[a]		**0.456**			**0.488**	
27. Does your child understand when permission is needed and the right person to ask for it?[b]		**0.435**		0.367	**0.513**	
28. Does your child deal in a constructive way with being teased?[a]		**0.417**			**0.469**	
36. Does your child express her or his thoughts and concerns without complaining or whining?[c]		**0.414**			**0.469**	
23. Does your child express anger without verbal or physical aggression?[b]		**0.334**			**0.369**	
38. Does your child have discussions without running on about a specific topic?[c]			**0.605**			**0.591**
37. Does your child have discussions with others without sharing information that is unrelated to the topic at-hand?[c]			**0.571**			**0.544**

(Continued)

Table 2. (Continued)

Item	Pattern coefficients			Structure coefficients		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
3. Does your child talk to others about things of interest to both of them?[a]			**0.551**	0.369		**0.606**
9. Does your child carry out instructions from others quickly and correctly?[a]			**0.483**		0.318	**0.528**
13. Does your child end conversations before leaving or beginning a new topic?[c]			**0.470**			**0.452**
35. Does your child wait his or her turn to talk (without interrupting)?[c]			**0.460**		0.312	**0.501**
10. Does your child contribute to discussions occurring in the environment?[c]			**0.438**	0.407		**0.520**
34. Does your child maintain eye contact when talking with others?[c]			**0.401**	0.362		**0.483**
1. Does your child listen when you or others talk to him or her?[a]			**0.376**	0.342	0.341	**0.474**
12. Does your child ignore distractions and remain focused on the task at hand?[c]			**0.337**			**0.359**

Highest loadings per factor bolded. Coefficients < 0.30 are not displayed. Items reproduced with permission from Research Press and Lopata and Thomeer.
[a]Exact item from Skillstreaming curriculum (Goldstein, McGinnis, Sprafkin, Gershaw, & Klein, 1997; McGinnis & Goldstein, 1997).
[b]Item adapted from the Skillstreaming curriculum (Goldstein et al., 1997; McGinnis & Goldstein, 1997).
[c]Item created by Lopata and Thomeer (Lopata, Thomeer, Volker, Nida, & Lee, 2008).

Table 3. Factor correlations.

	Factor 1	Factor 2	Factor 3
Factor 1	1.00		
Factor 2	0.27	1.00	
Factor 3	0.39	0.20	1.00

social-cognition (social and emotion understanding and expression, initiating interactions, responding to and interacting with others, etc.). For example, Item 5 strongly loaded on this factor and it focuses on the communication of gratitude toward others. Items 22 and 25 also loaded strongly and describe empathic interaction skills (understanding and expressing emotions). There are eight items with pattern coefficient and seven items with structure coefficient loadings greater than 0.60. The lowest loadings were for Item 31, which assesses negotiation skills (pattern coefficient = 0.314, structure coefficient = 0.457). Overall, Factor 1 (SCS) accounted for approximately 26% of the total variance prior to rotation.

Based on the content of the items, Factor 2 was labeled *Behavior Regulation Skills* (BRS). The nine items on this factor comprise about 8% of the total variance and assess skills involving self-control and avoiding and responding appropriately to challenging situations. The item loading highest on this factor was Item 29 (avoiding trouble situations; pattern coefficient = 0.622, structure coefficient = 0.636) and the highest three items all had loadings that exceeded 0.50 for both pattern and structure coefficients. The item with the lowest loading was Item 23 (expressing anger without aggression; pattern coefficient = 0.334, structure coefficient = 0.369).

After reviewing the content of the items in the third factor, Factor 3 was labeled *Interest Regulation during Discussions* (IRD). The 10 items on this factor accounted for approximately 7% of the variance and they reflect the child's skills in regulating her or his interests during discussions and the manner in which those interfere with social conversations and interactions with others. The highest loading items on this factor (Items 38, 37, and 3) had pattern and structure coefficients above 0.50 and these directly assess skills in refraining from running on about or sharing unrelated information about a circumscribed interest during discussions, and discussing topics of interest to others. The lowest loading item was Item 12 (ignoring distractions and remaining focused; pattern coefficient = 0.337, structure coefficient = 0.359).

With regard to cross-loading, pattern coefficients for Factor 1 included four items with some degree of cross-loading, though all of these coefficients were less than 0.40. The higher loadings of these items on Factor 1, as well as the content of the items, clearly indicate their inclusion on Factor 1 (SCS). Factor 2 had one item that cross-loaded with another factor (Item 24, pattern

coefficient = 0.335); however, that item had a higher loading on Factor 2, and its content was clearly more aligned with the content of Factor 2 items. There were no cross-loading items for Factor 3 in the pattern coefficients. There were more cross-loaded items in the structure coefficients (the correlations of the item with the factor). Although the differences in magnitude of the structural coefficients and content of the individual items clearly supported their inclusion in the primary-assigned factor, the content of the cross-loaded items could be seen to represent overlap with the additional factor or factors. Given the relatively clear factor structure, importance of the items in terms of capturing important ASD-related features, and fact that this was the first test of the ASC factor structure, no items were dropped. Follow-up analyses examining two-, four-, and five-factor models showed that the three-factor model was superior in terms of both interpretability and in producing lower factor correlations.

Finally, because the ASC has been used to monitor treatment outcomes in several psychosocial intervention studies for children with ASD without ID, the relationship between age and each ASC item was examined. To assess the possibility of a correlation between age and each item, distribution statistics and plots were examined. Age was normally distributed (skewness = 0.28, kurtosis = −0.94). Next, 38 scatterplots with regression lines of the individual items with age were examined for evidence of unusual patterns (non-linearity, odd clustering, outliers). These analyses showed no evidence of unusual patterns that might influence correlations. Correlations of each item with age were then calculated. The mean correlation was −0.007 (*SD* = 0.060), median correlation was −0.008, and range was from −0.15 to 0.14. These analyses indicate that age was unrelated to ASC item ratings in these data. Lopata et al. (2017b) also reported no significant association between age and the ASC total score.

Discussion

Children with ASD without ID constitute a majority and increasing proportion of children with ASD. This subgroup is characterized by relative strengths in cognitive and language abilities which can affect both the expression of skills, behaviors, and symptoms and the properties of assessment instruments including its factor profile (Fernandopulle, 2011; Lord et al., 2014). As such, there is a need for development and testing of measures for narrower subgroups with ASD including those without ID. In addition, there is widespread recognition of the need for treatment sensitive measures (e.g. Bellini et al., 2014; Stichter et al., 2016), as well as measures that utilize continuous scaling which yields important information on the degree to which a trait is exhibited and/or responsive to treatment (Achenbach, 2011; Constantino & Gruber, 2012). Continuous scaling is also important as the skills and behaviors of children with ASD without ID exist on a continuum and there are few skills and behaviors that are completely absent (Lord et al., 2014). Given the problems with treatment sensitivity, White et al. (2007) suggested that this might be improved by aligning the measure items and treatment targets to common features of ASD.

The ASC (Lopata et al., 2008) is a rating scale developed to assess the social/social-communication skills and behavior and interest regulation and flexibility of children with ASD without ID. Prior studies provided strong support for the reliability, criterion-related validity, and treatment sensitivity of the ASC for these children; however, no studies were identified that examined its factor structure; this study examined the factor structure and reliability of the ASC for a large sample of children with ASD without ID. Results yielded a three-factor correlated solution. The correlations among the three factors were low-to-moderate supporting the derivation of a composite score reflecting overall prosocial and behavioral skills, in addition to the three separate factor (subscale) scores. Internal consistency estimates were high for the three individual factors (0.79 to 0.90) and total score. Internal consistency for the ASC total score in this study (0.92) is consistent with that reported by Lopata et al. (2017b) for children with ASD without ID.

The largest factor, *Social Communication Skills* (SCS), consisted of 19 items assessing a range of social-communication and social-cognitive skills (e.g. begins conversations, asks questions of another, understands another's feelings, recognizes own emotions). The second factor, *Behavior Regulation Skills* (BRS) consisted of 9 items. This factor was comprised of items measuring behavioral self-control skills such as appropriately responding to teasing, accepting consequences, expressing anger without aggression, dealing appropriately with being left out, and so forth. The third factor, *Interest Regulation during Discussions* (IRD), included 10 items. While many of these items clearly depicted interest regulation skills during conversations (e.g. talking without oversharing, talking about topics of interest to others, remaining on a topic), several items appeared to be related to social skills associated with interest regulation skills. For example, a child's skills in transitioning to a new conversational topic, ignoring distractions, and/or waiting her or his turn to talk would be affected by her or his ability to self-regulate her or his own interest and engage with/follow the interest(s) of others. The correlations among the ASC factors provide some additional support for the link between interest regulation and social competencies as the association was highest between the SCS and IRD factors. This association was also reported by McDonald et al. (2015) who found circumscribed and repetitive interests and behaviors were significantly associated with adaptive social skills. Bauminger-Zviely (2014) similarly noted that restricted

and repetitive interest and behaviors negatively impact social and adaptive functioning.

Overall, results suggest that the ASC items are measuring the skill areas identified by Lopata et al. (2017b, 2008); however, the prior descriptions identified two broad categories (i.e. social/social-communication skills and behavioral and interest regulation). The broad single area of behavioral and interest regulation skills described by Lopata et al. (2017b, 2008) appeared to consist of two factors in the current study, with BRS reflecting appropriate behavioral regulation and responses to negative events and IRD reflecting a separate skill area involving effectively managing intrusive circumscribed interests, especially during discussions, and their associated impact on some social skills.

Despite this being the first study to examine the factor structure of the ASC, the findings may have some clinical implications. For example, the prior intervention studies that used the ASC consisted of cognitive-behavioral treatments targeting social-communication and social-cognitive skills, as well as instructional techniques commonly used for children with ASD without ID in clinical and school settings (i.e. direct instruction, modeling, role-play/rehearsal, and performance feedback; McMahon et al., 2013; Reichow, Steiner, & Volkmar, 2012). Given the increasing use of cognitive-behavioral treatments (Ho, Stephenson, & Carter, 2018) and the common use of these individual instructional techniques in social interventions for children with ASD without ID, the ASC may provide researchers with a treatment-sensitive and psychometrically sound outcome measure. Findings of a correlated three-factor solution might also allow researchers testing interventions to examine treatment effects at a subscale level, as well as the overall ASC composite score. This might help more precisely measure treatment effects on specific areas of prosocial and adaptive functioning associated with ASD. Increased use of the ASC as part of social intervention studies for children with ASD without ID is needed to further assess its treatment sensitivity.

Although this study was the first to provide information on the ASC factor structure and it had a number of strengths (e.g. rigorous screening procedure, relatively large sample of children with ASD without ID, testing of a treatment sensitive measure, etc.), several limitations warrant mention. One limitation involved the relatively homogeneous and narrowly defined group of children in the sample (ASD without ID). While this helped minimize confounding of results (as child IQ, language, and developmental level can affect the properties of a measure), it limits the generalizability to others with ASD outside the inclusion parameters. The sample was also largely White and male, which further restricts the generalizability of findings. The current results were also limited to only parent ratings. Teachers are considered a critical source of information on the skills and symptoms of children with ASD (Norris & Lecavalier, 2010) due to their advanced knowledge of typical and atypical child development and observations of the children in educational settings (Constantino & Gruber, 2012; Mayes & Lockridge, 2018). Furthermore, because schools are the principal settings where psychosocial interventions are provided to these children (Kasari & Smith, 2013), teachers are often used to assess the children's treatment responsiveness. Another limitation involved the fact that neither the current study nor the initial ASC study by the scale developer (Lopata et al., 2017b) conducted or reported any interviewing of the informants' understanding of the items. A final cautionary note appears warranted regarding Item 34 that assesses eye contact during discussions. Although absent or reduced eye contact is a common clinical feature of ASD (APA, 2013), the expectation of eye contact may be culturally oriented toward White Western cultures and not necessarily expected or appropriate in all cultures. Given these limitations, future studies should consider testing the ASC with older and younger youth with ASD without ID, as well as with youth with ASD and ID to assess the potential impact of functional level on the scale's properties. Studies should also seek to test the ASC properties in more racially and ethnically diverse samples, as well as for other informants (e.g. teachers) and clinical groups. In addition, future studies would benefit from interviews to clarify informants' understanding of all the items; this includes studies with ASD and non-ASD samples. Such interviews will provide valuable information on the consistency with which informants interpret the items for children with ASD, as well as possible differences for non-ASD groups. For example, informants for typically developing children or children with other clinical diagnoses may interpret the items on the IRD factor as involving general conversational management skills that are not related to a circumscribed (i.e. special) interest. This may be in contrast to the core circumscribed and repetitive interests captured by informants' ratings of children with ASD without ID.

The current results, along with prior psychometric testing, suggest that the ASC yields reliable and valid information on the skills and behaviors of children with ASD without ID. It also appears to be treatment sensitive to social interventions which are commonly used to develop the social and social-cognitive skills of these children. A unique aspect of the ASC is its assessment of ASD-related features (dimensions) from a prosocial and adaptive perspective using continuous scaling; this yields valuable information on the extent to which the skill or behavior is exhibited, which is important when tracking performance over time. This approach is also considered useful as the skills and behaviors of these children exist on a continuum with few being non-existent. Ongoing testing and replication studies of the ASC are clearly warranted as the field moves toward psychometrically sound measures that can be completed quickly and efficiently and that are cost-effective (Murray, Mayes, & Smith, 2011).

Declaration of conflicting interests

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BRIEF REPORT

Brief Report: Examination of Sex-Based Differences in ASD Symptom Severity Among High-Functioning Children with ASD Using the SRS-2

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Abstract

Prior studies of sex-based differences in autism spectrum disorder (ASD) have yielded mixed findings. This study examined ASD symptom severity and functional correlates in a sample of 34 high-functioning females with ASD (HFASD; M age = 8.93; M IQ = 104.64) compared to 34 matched males (M age = 8.96; M IQ = 104.44) using the Social Responsiveness Scale-Second Edition (SRS-2). Results identified non-significant and minimal differences (negligible-to-small) on the SRS-2 total, DSM-5 symptom subscale, and treatment subscale scores. Significant negative (moderate) correlations were found between the SRS-2 Social Cognition subscale and IQ and language scores and between the SRS-2 Social Motivation subscale and receptive language scores for females only; no significant correlations were found for males.

Keywords Autism spectrum disorder · High-functioning · Sex-based differences · Social Communication and Interaction · Social Responsiveness Scale-Second Edition

Autism spectrum disorder (ASD) is defined by two symptom dimensions (deficits in social interaction/communication and restricted and repetitive behaviors, interests, and activities; American Psychiatric Association 2013). According to the most recent CDC estimates, high-functioning children with ASD (HFASD, i.e., without cognitive impairment) now account for a majority of those diagnosed (Christensen et al. 2016). For children with HFASD, the ratio of males-to-females in epidemiological research ranges from 5-to-1 to 16-to-1 (Baird et al. 2006; Christensen et al. 2016). This substantial discrepancy in prevalence makes studies of sex-based differences of clinical phenomenon/presentation difficult due to challenges in securing a sufficient number of comparable female participants (Hull et al. 2017; Kirkovski et al. 2013; Van Wijngaarden-Cremers et al. 2014).

Differences in ASD symptom severity between female and male children is a significant area of research interest. A difference in the severity of core symptoms could indicate sex-based variability in the manifestation of ASD in females versus males and a differential need for supportive services and resources. However, research specifically on individuals with HFASD is very limited. Most past research has focused on broad samples of individuals with ASD across the range of IQ. In this broader literature, past reviews (including meta-analyses) have not identified a consistent difference in the area of social impairment/communication across studies, but do frequently identify differences in the restricted and repetitive behaviors and interests of females versus males (see Kreiser and White 2014; Van Wijngaarden-Cremers et al. 2014), with females showing less identified characteristics in this area. Additionally, much of the past research included in these reviews has not controlled (by design or statistically) for age or IQ, despite these being important considerations in exploring variability in ASD symptoms (Hull et al. 2017; Hus et al. 2013).

In studies specifically about children with HFASD current results are mixed. The available research tends to compare groups using the gold-standard diagnostic measures (the Autism Diagnostic Interview-Revised [ADI-R; Rutter et al. 2003] or Autism Diagnostic Observation Schedule [ADOS; Lord et al. 2000]) which are comprised of symptom counts versus scaled ratings. For example, research

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using the ADI-R found no sex-based differences in a sample of 23 age and IQ matched pairs of children and adolescents with HFASD (Holtmann et al. 2007). However, this same study identified a higher degree of severity in social problems for females using the Child Behavior Checklist (Achenbach 1991), though this rating form is not specific to the social interaction and communication problems of ASD. Research on the ADOS in a sample of IQ equivalent groups (52 females, 273 males) reported a higher degree of restricted and repetitive behaviors, interests, and activities in males than females but no sex-based difference in social interaction/social communication problems (Mandy et al. 2012). Two studies in HFASD have used a measure indicative of symptom severity specifically for ASD (the Social Responsiveness Scale [Constantino and Gruber 2005]) and in these studies a more consistent lack of sex-based differences has been found. In samples of 28 and 20 age and IQ matched pairs no differences on overall ASD symptom severity were identified (May et al. 2014; Solomon et al. 2012). The scarcity and limitations of the previous studies in sex-based symptom differences in children with HFASD support a need for continued examination of this topic.

Current Study

This study was conducted to provide additional information on sex-based differences in ASD symptom severity for children with HFASD. Specifically, this study examines differences in ASD symptom severity for a sample of age- and IQ-matched children with HFASD using the Social Responsiveness Scale-Second Edition (SRS-2; Constantino and Gruber 2012). It also conceptually replicated past work on sex-based differences in ASD symptom severity, a critical need in the social sciences (Tackett et al. 2017). In addition, the association between IQ and language levels and ASD symptom severity were examined within each group. Further, we examined the correlates of the SRS-2 total, DSM-5 and treatment subscale scores with demographic (age and parent education) and functional (cognitive and language) characteristics in order to further explore possible factors related to sex-based differences.

Methods

Participants

A total of 68 children (34 females and 34 males), ages 6–12 years with HFASD comprised the sample. The children were participants in one of several prior psychosocial intervention studies for children with HFASD. Inclusion criteria for those studies were: a prior clinical diagnosis of ASD (with diagnostic confirmation using the ADI-R [Rutter et al. 2003]), Wechsler Intelligence Scales for Children-Fourth Edition (WISC-IV; Wechsler 2003) short-form IQ > 70 (with a verbal comprehension or perceptual reasoning index composite ≥ 80), and Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk 1999) short-form receptive or expressive language composite ≥ 80. The WISC-IV short-form consisted of the Block Design, Similarities, Vocabulary, and Matrix Reasoning subtests and the CASL short-form consisted of the Antonyms, Synonyms, Syntax Construction, and Paragraph Comprehension subtests. The only exclusion criterion for the prior studies was severe physical aggression because the psychosocial interventions being examined target primarily social interaction and social-communication skills.

The sample was 92.65% Caucasian with an average parent education of 15.12 years. Some participants had comorbid diagnoses of or received pharmacological treatment for anxiety, depression, or attention-deficit/hyperactivity disorder (ADHD), based on parent report. See Table 1 for a summary of the sample characteristics by group.

Procedures

The study was conducted using screening and pre-test scores from children participating in multiple clinical intervention trials at a university research center. The intervention studies from which the data were drawn were approved by an Institutional Review Board and completed according to the approved protocol. Parent informed consent and child assent were obtained. Recruitment for these trials was through public advertisements including announcements from community partners and school districts. All female participants meeting inclusion criteria from these trials were included in the current sample ($n = 34$). Matching was then conducted individually using the available pool of males ($n = 307$) who had also met inclusion criteria as part of their participation in the prior intervention studies. Participants were matched on age and IQ, as these are critical considerations in the interaction of sex and ASD characteristics (Hull et al. 2017; Hus et al. 2013). Male-matches were identified within 12 months of age and 10 short-form IQ points for each female. These criteria were selected because 12 months of age is a specific yet feasible (for matching purposes) developmental window and 10 standard score points of IQ is the basis for clinical ranges on the WISC-IV. If multiple matches were identified, an individual male match was randomly selected using the randomized list generator available from http://www.random.org (Haahr 1998). Matching was also attempted for majority (Caucasian) and minority (non-Caucasian or mixed-race) status however one minority female could not be matched to a minority male on age and cognitive function. In this case, a Caucasian male was matched with the minority female.

Table 1 Sample characteristics by sex

	Females ($n=34$)		Males ($n=34$)		Gender contrast		
	Mean	SD	Mean	SD	t (66)	p	d
Matched variables							
Age	8.93	1.78	8.96	1.72	−0.08	0.939	−0.019
WISC-IV							
Short-form IQ	104.64	16.04	104.44	13.99	0.06	0.956	0.013
Short-form VCI	104.03	16.09	104.10	14.15	−0.02	0.986	−0.004
Short-form PRI	104.74	16.40	103.84	16.53	0.23	0.822	0.055
% Caucasian	91.18%		94.12%		Fisher's exact test $p=0.500$		
Non-matched variables							
Parent education	15.32	2.13	14.91	1.70	0.88	0.382	0.214
ADI-R							
RSI	18.35	4.92	19.03	5.83	−0.52	0.607	−0.125
SC	13.94	4.64	15.41	3.85	−1.42	0.160	−0.345
RRSB	5.21	2.00	5.65	2.42	−0.82	0.416	−0.199
CASL							
Expressive language	99.64	17.21	99.81	17.18	−0.04	0.968	−0.010
Receptive language	101.84	15.81	106.76	14.03	−1.36	0.180	−0.329
Comorbid diagnoses							
Anxiety	8.82%		5.88%		Fisher's exact test $p=0.500$		
Depression	5.88%		5.88%		Fisher's exact test $p=0.693$		
ADHD	35.29%		41.18%		Fisher's exact test $p=0.402$		

WISC-IV Wechsler Intelligence Scale for Children-4th Edition, *VCI* Verbal Comprehension Index, *PRI* Perceptual Reasoning Index, *ADI-R* autism diagnostic interview-revised, *RSI* reciprocal social interaction, *SC* social communication, *RRSB* restricted, repetitive, and stereotyped behaviors, *CASL* comprehensive assessment of spoken language, *ADHD* attention-deficit/hyperactivity disorder

Measure

Social Responsiveness Scale, Second Edition, School Age Form (SRS-2)

The SRS-2 (Constantino and Gruber 2012) was completed by a parent or caregiver and was used to assess ASD symptom severity. The SRS-2 is a 65-item measure of ASD-related behaviors to assist in diagnosis, treatment planning, and progress monitoring. The SRS-2 items use a Likert scale with item values of 1 = Not True, 2 = Sometimes True, 3 = Often True, and 4 = Almost Always True. Item values are combined into subscales to provide a gradient of continuous values to measure symptom severity and frequency.

The current study used the raw scores from the total, DSM-5 symptom scales, and treatment subscales. Constantino and Gruber (2012) recommended that raw scores be used when examining group characteristics and differences in research studies. This is especially warranted in studies of sex-based differences because SRS-2 standard scores are derived based on sex-specific norm-reference groups (i.e., separate normative samples and standard scores for females and for males). The use of sex-specific normative samples and derivation of standard scores based on sex does not allow for the use of standard scores to compare sex-based differences in symptom severity; the use of untransformed raw scores allows for a direct comparison of ASD symptom severity using the SRS-2. The total score includes all 65 items with a raw score range of 0–195. The two DSM-5 symptom subscales measure the primary symptom dimensions of ASD including Social Communication and Interaction (SCI; 53 items) and Restricted Interests and Repetitive Behavior (RIRB; 12 items). The SRS-2 also yields five treatment subscale scores including Social Awareness (8 items; representing the ability to pick up social cues), Social Cognition (12 items; representing the interpretation of social cues), Social Communication (22 items; representing the expressive aspects of social interaction), Social Motivation (11 items; representing the willingness to engage in social interaction), and Restricted Interests and Repetitive Behavior (12 items; representing stereotyped and/or repetitive interests and behaviors). The first four treatment subscales combined comprise the DSM-5 SCI symptom subscale and the RIRB treatment subscale is identical to the DSM-5 RIRB symptom scale.

Validation studies reported in the test manual have indicated that the SRS-2 total score accurately detects ASD characteristics and discriminates ASD from other clinical

disorders (see Constantino and Gruber 2012). Internal consistency of the total raw score reportedly ranges from 0.91 to 0.97 across a range of studies and samples (see Constantino and Gruber 2012). While independent reliability and validity on the DSM-5 and treatment subscales of the SRS-2 have not been established, we use these scales for exploratory purposes.

Analyses

There were no missing data. The studies that generated the data instituted specific protocols for data processing and quality checks. All SRS-2 protocols were reviewed for completeness upon return and any errors in completion (e.g., omitted items) were immediately reviewed with the respondent and corrected. Each protocol was scored independently by two research assistants using the SRS-2 computer scoring software program and the resulting scores (along with other study data) were entered into the study database and independently checked by another research assistant. Any scoring or entry discrepancies were resolved by a third team member. Analyses were conducted in SPSS and R. Between-group comparability based on demographic and screening data was tested using independent samples *t* tests for continuous variables and Fisher's exact tests for categorical variables. Between-group differences in ASD symptom severity (SRS-2 scores) were tested using independent samples *t* tests and effect size estimates (Cohen's *d*) were provided. Levene's test confirmed homogeneity of variance for all study variables. Tukey's test was used to identify outliers outside the 1.5 interquartile range. Three potential outliers were identified in the SRS-2 subscales. These were confirmed as valid data points and retained for analyses. Anderson–Darling tests of normality confirmed that all SRS-2 variables were normally distributed. The associations between IQ and language scores and ASD symptom severity scores were calculated using Pearson's *r* for each group separately. The sample of 68 has sufficient power to detect an effect size (*d*) of 0.69 with power of 0.80 (two-tailed alpha set to 0.05). Within the female and male subgroups, a correlation of 0.33 can be detected in each group of 34 cases with power of 0.80 (two-tailed alpha = 0.05). Significance levels are reported alongside effect sizes for all analyses.

Results

Initial tests supported the comparability of the male and female samples on major demographic characteristics and screening measures scores (see Table 1). Overall, the male and female samples did not significantly differ on age, IQ, ethnicity, parent education, ADI-R scores, language level, or proportion of comorbid diagnoses. Given the high level of comparability on these variables, statistical adjustment was not warranted for the comparison of symptom severity between groups.

Between-group tests of ASD symptom severity yielded no statistically significant differences between female and male children with HFASD (Table 2). The lack of difference in symptom severity between groups was also evident in the effect sizes which were negligible for the total, DSM-5 symptom scales, and all but one of the treatment subscales (*d*s from 0.07 to 0.10); only the Social Motivation subscale had an effect size that reached the small range ($d = 0.28$).

Correlations between the children's demographic and functional variables and SRS-2 total, DSM-5 subscales, and treatment subscales scores were also examined (Table 3). No significant correlations were found for males between any of the WISC-IV scores and CASL language scores and ASD symptom severity scores, and the magnitudes of the correlations were negligible ($r \leq 0.19$) for all but one scale. For females, significant negative correlations were found between the SRS-2 Social Cognition treatment subscale and WISC-IV full-scale and verbal comprehension IQ scores and CASL receptive and expressive language scores; these correlations were of moderate magnitude (*r*s ranging

Table 2 SRS-2 scales by sex

	Females ($n = 34$)		Males ($n = 34$)		Sex-based contrast		
	Mean	SD	Mean	SD	t (66)	p	Cohen's d
SRS-2 total	99.44	26.51	97.56	29.34	0.28	0.782	0.067
SCI	81.12	22.76	78.74	23.34	0.43	0.671	0.103
SA	12.68	4.04	12.32	3.14	0.40	0.689	0.098
SCOG	18.18	5.98	18.65	6.89	−0.30	0.765	−0.073
SCOM	34.15	10.68	33.21	11.04	0.36	0.722	0.087
SMOT	16.12	5.80	14.56	5.54	1.13	0.262	0.275
RIRB	18.32	6.13	18.82	6.63	−0.32	0.748	−0.078

SRS-2 Social Responsiveness Scale-2nd Edition, *SCI* Social Communication and Interaction, *SA* Social Awareness, *SCOG* Social Cognition, *SCOM* Social Communication, *SMOT* Social Motivation, *RIRB* Restricted Interests and Repetitive Behaviors

Table 3 Correlations of sample characteristics with SRS-2 raw scores by sex

	Total		SCI		SA		SCOG		SCOM		SMOT		RIRB	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
Females ($n=34$)														
Age	0.13	0.464	0.10	0.574	0.01	0.955	−0.12	0.499	0.19	0.282	0.15	0.397	0.18	0.308
Parent education	−0.03	0.866	−0.03	0.866	−0.02	0.911	−0.26	0.138	0.07	0.694	0.02	0.911	−0.03	0.866
WISC-IV														
Short-form IQ	−0.18	0.308	−0.23	0.191	−0.04	0.822	−0.36	0.036	−0.16	0.366	−0.23	0.191	0.09	0.613
Short-form VCI	−0.16	0.366	−0.21	0.233	−0.12	0.499	−0.38	0.027	−0.08	0.653	−0.21	0.233	0.09	0.613
Short-form PRI	−0.15	0.397	−0.18	0.308	0.05	0.779	−0.23	0.191	−0.18	0.308	−0.19	0.282	0.05	0.779
CASL														
Expressive	−0.17	0.336	−0.22	0.211	−0.10	0.573	−0.36	0.036	−0.08	0.653	−0.25	0.154	0.05	0.779
Receptive	−0.29	0.096	−0.34	0.049	−0.11	0.536	−0.49	0.003	−0.22	0.211	−0.35	0.042	0.00	0.999
Males ($n=34$)														
Age	0.02	0.911	0.00	0.999	−0.11	0.536	−0.03	0.866	0.03	0.866	0.03	0.866	0.08	0.653
Parent education	0.20	0.257	0.23	0.191	0.10	0.574	0.33	0.057	0.18	0.308	0.14	0.430	0.09	0.613
WISC-IV														
Short-form IQ	−0.07	0.694	−0.06	0.736	0.09	0.613	−0.09	0.613	−0.08	0.653	−0.03	0.866	−0.10	0.574
Short-form VCI	−0.04	0.822	−0.03	0.866	0.16	0.366	−0.02	0.911	−0.11	0.536	0.03	0.866	−0.08	0.653
Short-form PRI	−0.07	0.694	−0.07	0.694	−0.01	0.955	−0.12	0.499	−0.03	0.866	−0.07	0.694	−0.09	0.613
CASL														
Expressive	−0.19	0.282	−0.15	0.397	0.12	0.499	−0.15	0.397	−0.19	0.282	−0.16	0.366	−0.28	0.109
Receptive	0.00	0.999	0.03	0.866	0.18	0.308	−0.04	0.822	0.01	0.955	0.03	0.866	−0.11	0.536

SRS-2 Social Responsiveness Scale-2nd Edition, *SCI* Social Communication and Interaction, *SA* Social Awareness, *SCOG* Social Cognition, *SCOM* Social Communication, *SMOT* Social Motivation, *RIRB* Restricted Interests and Repetitive Behaviors, *WISC-IV* Wechsler Intelligence Scale for Children-4th Edition, *VCI* Verbal Comprehension Index, *PRI* Perceptual Reasoning Index, *CASL* comprehensive assessment of spoken language

from −0.36 to −0.49). A significant negative correlation of moderate magnitude ($r=-0.35$) was also observed between the SRS-2 Social Motivation treatment subscale scores and CASL receptive language scores for females. All other correlations were non-significant and generally of weak/negligible strength for the female sample. Figure 1 illustrates the differential relationships in females and males using the strongest of these differences, receptive language to Social Cognition.

Discussion

The current study compared ASD symptom severity (i.e., SRS-2 total, DSM-5 symptom scales, and treatment subscales) scores for a well-characterized sample of females with HFASD to a sample of males with HFASD matched on age and IQ. Findings suggested no meaningful differences between female and male children with HFASD on the severity of symptoms or on the DSM-V symptom subscales/treatment subscales. Thus, the overall pattern of results suggests equivalence of female and male children with HFASD for the severity of the core symptom areas of ASD. This is generally consistent with past research exploring sex-based differences in symptom severity for children with HFASD, and thus conceptually replicates and extends previous findings (May et al. 2014; Solomon et al. 2012). Of particular note is the lack of differences in restricted, repetitive and stereotyped behaviors between male and female children with HFASD. This null finding is consistent with some (Solomon et al. 2012) but not all literature in this area (Kreiser and White 2014; Mandy et al. 2012; Van Wijngaarden-Cremers et al. 2014). Future research in a well-characterized and matched sample should consider this area using a more detailed measure of these behaviors. The current findings also do not specifically support the presence of a female-specific autism phenotype that may differ from the more commonly understood male phenotype (see Van Wijngaarden-Cremers et al. 2014), as expressed in symptom severity on the SRS-2. It is important to note that, while absolute severity of symptoms do not appear to be different, there is the possibility that male and female individuals respond differently to interventions and services and thus future studies should consider this point.

A unique finding of the current study was the differential relationships found between functional level variables

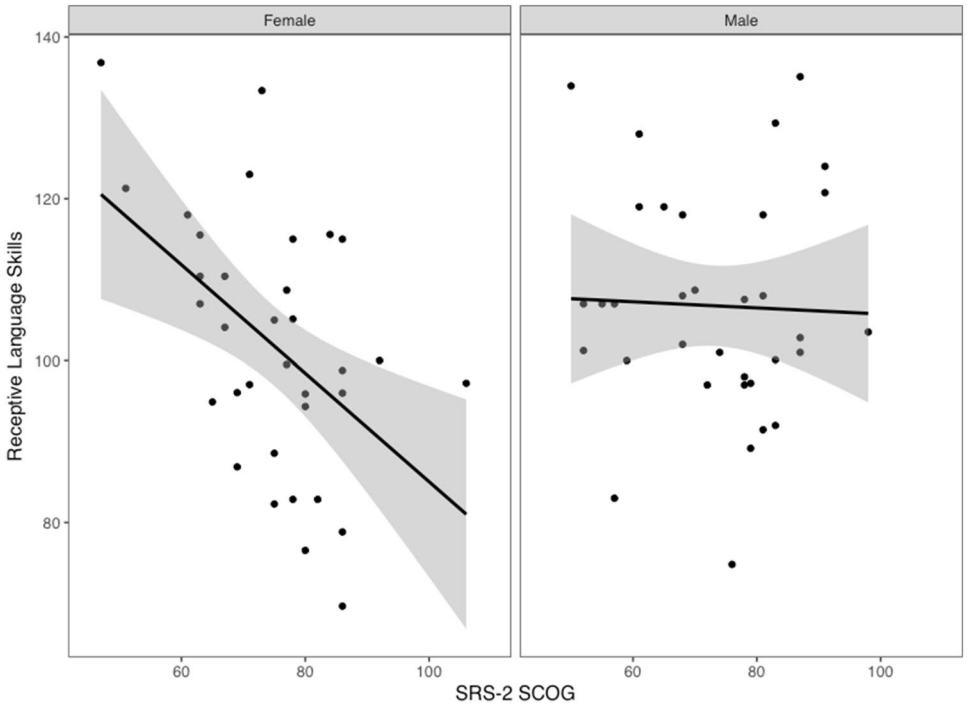

Fig. 1 Correlation of SRS-2 Social Cognition Raw Score with CASL receptive language skills by sex

(IQ and language) and ASD symptom severity for females with HFASD compared to males with HFASD. For male children with HFASD, IQ and receptive and expressive language levels were not associated with parent rated overall ASD symptom severity or with the DSM-5 symptom scales or treatment subscales. For female children with HFASD, IQ and receptive and expressive language were also unrelated to symptom severity, the DSM-5 symptom scales, and the Social Awareness and Social Communication treatment subscales. However, correlations on four of the five cognitive/language measures and the Social Cognition subscale were statistically significant and moderate in magnitude and receptive language and Social Motivation were significantly and moderately associated. More specifically, higher verbal ability and/or language skills were associated with lower Social Cognition and Social Motivation symptom severity. These results suggest that language abilities and receptive language skills in particular may play a unique role in the understanding and interpretation of social cues in females. However, further work is needed to explore these relationships and identify if this relationship is specific to HFASD, replicates in more nuanced symptom measures, and is present in the general population or unique to HFASD.

Strengths and Limitations

This is the largest study to date to examine sex-based differences in ASD symptom severity for matched children with HFASD using a continuous measure, and the only to use the SRS-2, a common and well-validated measure of ASD symptom severity. It included a relatively large and well-characterized sample of female children with HFASD that was individually and carefully matched to male children with HFASD. Another strength was the examination of sex-based differences using a measure that employs continuous scaling; this allows for a better assessment of the severity of ASD symptoms/impairments (vs a categorical or symptom count metric; Achenbach 2011; Constantino and Gruber 2012).

Despite the study's relatively large sample and contribution to the research on sex-based differences in ASD symptom severity for children with HFASD, the sample was none-the-less limited in both representativeness and size. Specifically, the sample was predominantly Caucasian, from well-educated families, and all of the children were high-functioning (IQ and language) and excluded if they showed severe physical aggression; this limits the generalizability of the findings to the broader ASD population. The present sample only had sufficient power to detect large but not small effects and thus may have been underpowered to identify more subtle group differences. In addition, the number of analyses conducted was large for the sample size, particularly without correction for multiple comparisons. Because of this attention should be paid to effect size estimates rather than significance values and, in particular, the findings related to the correlations between functional variables and Social Cognition and Social Motivation should be considered tentative.

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Author Contributions JDR conceived of the study, participated in its design, collected and coordinated the data, and drafted the manuscript; JLS contributed to the study design, conducted the statistical analyses, assisted in interpretation of the data, and contributed to manuscript preparation; JPD participated in the design, conducted the statistical analyses, and assisted in the interpretation of the data and preparation of the manuscript; CL participated in the study design and contributed to manuscript preparation; CAM participated in the study design, assisted with data coordination, and contributed to manuscript preparation; MLT participated in the study design and manuscript preparation; AML assisted in data collection, data management, and manuscript preparation; BCN assisted in data collection, data management, and manuscript preparation; AJB assisted in data collection, data management, and manuscript preparation. All authors read and approved the final manuscript.

Compliance with Ethical Standards

Ethical Approval All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

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ORIGINAL PAPER

Psychometric Properties of the Adapted Skillstreaming Checklist for High-functioning Children with ASD

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Abstract This study examined the reliability and criterion-related validity of parent ratings on the Adapted Skillstreaming Checklist (ASC) for a sample of 275 high-functioning children, ages 6–12 years, with ASD. Internal consistency for the total sample was 0.92. For two subsamples, test–retest reliability was very good at the 6-week and good at the 9-month intervals. Child age, IQ, and language abilities were unrelated to the ASC score. The ASC total score was inversely and strongly related to parent ratings of ASD symptom severity. Significant positive correlations (moderate-to-high) were found between the ASC and prosocial skills scales and significant negative correlations (low-to-moderate) with problem behavior scales on a broad measure of child functioning. Implications and suggestions for future study are discussed.

Keywords Adapted Skillstreaming Checklist · Parent ratings · Psychometric properties · High-functioning children with ASD

Introduction

Autism spectrum disorder (ASD) is characterized by a complex constellation of clinical features including social/social-communication deficits and circumscribed and repetitive behaviors and interests (APA 2013). Developing measures to assess the clinical features and performance of children with ASD is a challenge given significant heterogeneity in functional levels and the fact that cognitive, language, and developmental levels can affect the manner in which features are exhibited and the properties of assessment measures (Koenig et al. 2009; Lord and Corsello 2005; Lord et al. 2014). The implication of such factors strongly suggests the need for measures that are developed and evaluated for narrower subgroups with ASD (Lord et al. 2014). One such subgroup is high-functioning children with ASD (HFASD). This group is characterized by the core diagnostic features, but differentiated based on relatively intact and relative strengths in cognitive and language functioning (APA 2013).

The recent substantial increase in the prevalence of children with HFASD (i.e., without concomitant intellectual disability; CDC 2014) strongly indicates the need for instruments that efficiently yield information on the clinical features and skills of these children and the effectiveness of treatments. Diagnostic observations and interviews yield accurate diagnoses, however they are often impractical in clinical settings (schools, clinics, etc.) because they require a high degree of training and experience, and are time and labor intensive (Norris and Lecavalier 2010). Further, they are often limited by their dichotomous assessment of symptoms and behaviors (i.e., absent or present) and they do not yield information on the degree of impairment or the extent to which a skill/behavior is exhibited (Achenbach 2011). This has generally rendered them ineffective for monitoring treatment progress or assessing outcomes. This is not surprising as they were not developed to measure change and do not possess psychometric data to support such use (Lord et al. 2014).

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Rating scales are another type of measure commonly used to gather information on the clinical features and skills of children with HFASD/ASD. Advantages associated with rating scales include the fact that they are brief, simple to administer, economical, and based on informants in authentic settings, can be completed by different informants (Constantino and Gruber 2012; Norris and Lecavalier 2010), and have the capacity to assess a range of skills, behaviors, and symptoms (Lord and Corsello 2005). In addition, many utilize continuous scaling (Achenbach 2011; Reynolds and Kamphaus 2015) which is consistent with the diagnostic framework that characterizes ASD features/impairments on a continuum of severity (APA 2013). Continuous scaling also provides information on the degree to which a skill/behavior is exhibited and/or the severity of impairment (Achenbach 2011; Gadow et al. 2006). Another advantage to rating scales is that they can be keyed to diagnostic criteria (Gadow et al. 2006), thus yielding information involving features of ASD (Lord and Corsello 2005).

One final area of potential benefit involves the use of rating scales as an outcome measure. Continuous scaling makes rating scales useful as indicators of treatment response and outcomes (Achenbach 2011; Reynolds and Kamphaus 2015) including for ASD-related scales (Constantino and Gruber 2012). Identifying measures that yield information on the skills, behaviors, and/or symptoms of ASD and that are treatment sensitive continues to be a challenge and many authors have noted the lack of treatment sensitive measures, the negative effect of this on determining treatment efficacy, and the need for such measures (e.g., Bellini et al. 2014; Koenig et al. 2009; Reichow and Volkmar 2010; Smith et al. 2007; White et al. 2007). Treatment sensitivity may be low if the rating scale items are not aligned with the treatment targets (Koenig et al. 2009), although this might be improved if the intervention targets and scale items are aligned with (keyed to) the clinical features of HFASD/ASD (White et al. 2007). The need for better alignment of treatment targets and outcome indicators has led to suggestions that investigators create and/or adapt measures unique to a given study (Kaat and Lecavalier 2014; Lord et al. 2005). To date, HFASD treatment researchers have created study-specific social-cognitive tests (e.g., Laugeson et al. 2012; Lopata et al. 2010) and rating scales (e.g., DeRosier et al. 2011) in an effort to increase treatment sensitivity, yet little is known about the broader psychometric properties of such measures and studies are needed.

The Adapted Skillstreaming Checklist (ASC) is a study-specific rating scale that was created by Lopata and Thomeer to assess outcomes of a psychosocial treatment for 7–12 year olds with HFASD (Lopata et al. 2008). The targets of the treatment program were selected to address the clinical features of HFASD and were keyed to specific diagnostic elements (i.e., social/social-communication skills and restricted and repetitive behaviors/interests). Items on the ASC parallel the treatment targets and assess prosocial skills/behaviors aligned with the diagnostic features of children with HFASD. The ASC is comprised of items and adapted items from the Skillstreaming (Goldstein et al. 1997; McGinnis and Goldstein 1997) curriculum (a psychosocial intervention designed to teach prosocial skills to children lacking in such skills), along with researcher-developed items. Together the items assess social/social-communication skills and behavioral regulation and flexibility.

The ASC has exhibited good treatment sensitivity in multiple psychosocial treatment trials for children, ages 6–12 years, with HFASD; within-group (baseline-posttest) effect sizes ranging from medium (e.g., Lopata et al. 2008) to large (Lopata et al. 2017) for parent ratings. Despite good treatment sensitivity, sample-specific ASC psychometric data were described for only two of the treatment trials. Internal consistency reliability was 0.94 for both studies ($N=54$ parent ratings for Lopata et al. 2008 and $N=36$ parent ratings for Lopata et al. 2010). In addition, the authors reported correlations with scales on the Behavior Assessment System for Children (BASC)/BASC-2 (Reynolds and Kamphaus 1992, 1998, 2004). Correlations between the ASC total score parent ratings and BASC/BASC-2 social skills scores were 0.72 and 0.66, and leadership scores were 0.62 and 0.66, respectively (Lopata et al. 2008, 2010). In addition, the ASC correlated 0.79 with the adaptive skills composite (Lopata et al. 2010) and −0.45 with the withdrawal scale score (Lopata et al. 2008). The authors characterized these as basic evidence supporting the reliability and criterion-related validity of the ASC. Despite these initial indications, the psychometric data were based on small samples of parent ratings. In addition, the ASC was not compared against a measure of ASD-related clinical features (i.e., impairments). This is of particular interest given that the ASC was keyed to skills that reflect improvements in parallel ASD-related dimensions.

This study was conducted to assess the psychometric properties of the ASC using a large sample of parent ratings from multiple treatment trials. Given the impact of functional level on measure properties, it addresses the need for psychometric evaluation of ASD-related scales in carefully-characterized samples and more narrowly-defined subgroups (i.e., HFASD; Lord and Corsello 2005; Lord et al. 2014; Norris and Lecavalier 2010). Rigorous testing is especially warranted for researcher-developed instruments created for a specific study, as well as for measures that exhibit treatment sensitivity. According to White et al. (2007), "[t]he utility of new or adapted outcome measures should be evaluated for reliability and validity" (p. 1867). This study examined the (1) internal consistency and

stability (short- and long-term test–retest reliability) of the ASC; and (2) criterion-related validity against other established prosocial and ASD-impairment scales for a large sample of parent ratings of children with HFASD. The data used in this study were unique and not part of the studies or data reported by Lopata et al. (2008, 2010) in their preliminary psychometric information on the ASC.

Methods

Participants

A total of 275 parent ratings of children, ages 6–12 years, with HFASD were included in the analyses. Data were compiled from multiple prior clinical trials evaluating the efficacy of psychosocial treatments for children with HFASD. Children in those trials were recruited using public and school-based announcements. All of the children had a prior clinical diagnosis of ASD (or autism, Asperger's, or pervasive developmental disorder-not otherwise specified), Wechsler Intelligence Scale for Children-4th Edition (WISC-IV; Wechsler 2003) short-form IQ > 70, and Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk 1999) short-form expressive or receptive language score >70. All children also met criteria on the Autism Diagnostic Interview-Revised (Rutter et al. 2003) or Social Communication Questionnaire (Rutter et al. 2003), which was completed to verify their diagnosis.

The child sample for the current study was predominantly male (90.2%) and Caucasian (89.1%), with a mean IQ and language level in the average range. Average reported parent education of the parent raters was 15.76 years (Table 1).

Table 1 Demographic characteristics of child sample and parent raters

Characteristic	Child participants ($N = 275$) M (SD)
Age (years)	9.26 (1.63)
Parent education (years)	15.76 (2.19)
WISC-IV short-form IQ	105.14 (14.32)
CASL	
Short-form expressive language	99.76 (15.57)
Short-form receptive language	104.74 (16.22)
ADI-R	
Impairment in social interaction	18.79 (5.47)[a]
Impairment in communication	15.20 (4.34)[a]
Restricted repetitive behavior	5.90 (2.10)[a]
SCQ total score	21.35 (5.58)[b]
	n (% of total)
Gender	
Male	248 (90.2)
Female	27 (9.8)
Ethnicity	
Caucasian	245 (89.1)
African-American	7 (2.5)
Latino	3 (1.1)
Asian-American	4 (1.5)
Mixed race/ethnicity	16 (5.8)

The WISC-IV 4-subtest short-form consisted of the block design, similarities, vocabulary, and matrix reasoning subtests and the CASL 4-subtest short form consisted of the antonyms, synonyms, syntax construction, and paragraph comprehension subtests

WISC-IV Wechsler Intelligence Scale for Children-4th Edition, *CASL* Comprehensive Assessment of Spoken Language, *ADI-R* Autism Diagnostic Interview-Revised, *SCQ* Social Communication Questionnaire

[a] ADI-R scores M and SD based on a sample size of $n = 215$

[b] SCQ total score M and SD based on a sample size of $n = 60$

Measures

Adapted Skillstreaming Checklist (ASC)

The ASC (Lopata et al. 2008) is a 38-item rating scale originally created by Lopata and Thomeer to measure social/social-communication skills and behaviors targeted in a summer psychosocial treatment program for children with HFASD. Each of the scale items measures a specific treatment target (skill/behavior) and is keyed to a clinical feature of HFASD. The scale consists of 30 items (including adapted items) from the Skillstreaming curriculum (Goldstein et al. 1997; McGinnis and Goldstein 1997) and eight researcher-created items. Across the 38-items, 32 assess social/social-communication skills and six assess behavioral regulation and flexibility. Each item is rated on a scale ranging from 1 (almost never) to 5 (almost always). Individual items are summed to yield a total composite score and higher total scores indicate greater use of the prosocial/adaptive skill/behavior. (preliminary data on the psychometric properties of the ASC were described in the Introduction).

Social Responsiveness Scale, Second Edition (SRS-2)

The SRS-2 (Constantino and Gruber 2012) is an objective measure of ASD-associated symptoms. The School-Age Form (ages 4–18 years) consists of 65 items that assess ASD clinical features involving interpersonal behavior, communication, and stereotypic and circumscribed behaviors and interests on a continuous scale. Parents rate the frequency of behaviors on a scale of 1 (not true) to 4 (almost always true). Individual items are summed and converted to a total composite standard score ($M = 50$, $SD = 10$), with

higher scores indicative of greater ASD-associated symptom severity/impairments. The total score has internal consistency estimates of 0.95–0.96 for the parent reports (for ages 6–12 years). Data in the test manual indicate moderate-to-high correlations with other ASD measures, and that the SRS-2 accurately discriminates individuals with ASD from typically-developing individuals and individuals with other disorders (Constantino and Gruber 2012). Although factor analytic data found that the majority of items were assessing one ASD trait (*SCI* social communication and interaction), a subset of items reportedly indicated a second trait (*RRB* restricted interests and repetitive behavior). According to Constantino and Gruber (2012), these findings support the total score as a valid index of severity, as well as the derivation of two index scores (SCI and RRB) that map onto the two ASD diagnostic criteria dimensions (APA 2013).

Behavior Assessment System for Children, Second Edition/ Third Edition, Parent Rating Scales (BASC-2/3 PRS)

The BASC-2/3 PRS (Reynolds and Kamphaus 2004, 2015) assess a range of adaptive (prosocial) skills and clinical symptoms to assist with differential diagnosis, treatment planning, and progress monitoring. Items are rated on a 4-point frequency scale ranging from 0 (Never) to 3 (Almost always). Item scores are summed and converted to standard scores ($M = 50$, $SD = 10$). For the adaptive skills composite/scales, higher scores indicate more adaptive and prosocial skills and for the clinical composites/scales, higher scores represent more problematic symptoms/behaviors.

This study utilized the adaptive skills composite (and its constituent scales including adaptability, social skills, leadership, activities of daily living, and functional communication) and the externalizing problems composite (and its constituent scales including hyperactivity, aggression, and conduct problems). Internal consistency reliability estimates for the composites used in this study ranged from 0.95 to 0.97 for the adaptive skills composite (and from 0.76 to 0.92 for the individual adaptive scales) and from 0.93 to 0.96 for the externalizing problems composite (and from 0.79 to 0.91 for the individual externalizing scales). The developmental social disorders (DSD) content scale was also included as it assesses impairments in social and communication skills, and interests and activities associated with ASD. Internal consistency reliability for the DSD scale ranged from 0.82 to 0.91. Validity evidence is presented in factor analytic data supporting the derivation of scales, as well as in high intercorrelations among scales within the same composite. Concurrent validity is supported in moderate-to-high correlations between the BASC-2/3 composites and scales and comparable composites and scales on other established rating scales (Reynolds and Kamphaus 2004, 2015). These composites and scales were included because they assess prosocial and adaptive skills/behaviors, problems associated with behavioral regulation/rigidity, and ASD features that are related to the skills assessed by the ASC.

Procedures

Each of the study protocols for the psychosocial treatment trials from which the cases were compiled was approved by the Institutional Review Board and executed according to the approved procedures, including attainment of informed consent and assent. In each of the treatment trials, parents completed a battery of pretest (baseline) and posttest measures that included the ASC, as well as the SRS-2 and BASC-2/3. Once completed and returned, each rating scale was immediately reviewed to ensure it was complete. Any incomplete protocol or protocol containing errors (multiple responses to an item, omitted items, etc.) was immediately reviewed with the informant to correct the error. To ensure scoring accuracy, each ASC protocol was independently scored by two research assistants and any discrepancies were resolved by a third scorer. The SRS-2 and BASC-2/3 were scored using their respective computer scoring programs by research assistants. All demographic and protocol data were initially entered into the study database by a research assistant and independently checked by a second research assistant, with any discrepancies corrected by a third member of the research team.

Data Analysis Plan

Prior to estimation of reliability and validity coefficients, data quality and completeness was examined, followed by study of deviations from normality for all items. Complete data was available for all 275 cases. There were no instances of out-of-range values. Following the initial data review, the individual ASC item characteristics were examined. Full scale analysis included two forms of reliability that are important to ASD-related measures: internal consistency and stability over time (test–retest; Lord et al. 2014). Criterion-related validity was assessed by examining correlations between the ASC and measures of ASD-related symptoms/impairments (SRS-2 and BASC-2/3 DSD) and several prosocial and problem behavior scales from an established multi-dimensional rating scale (BASC-2/3).

Results

Item Analysis

Table 2 presents central tendency, variability, and distribution statistics for all items and the total score. The overall central tendency evident in the medians and means is close to the center of the scale. Twenty-nine of the 38 items have medians at the center point of the scale (3.0), while the remaining nine have a median of 2.0. Item distribution indicators, including standard deviations, skewness, and kurtosis are generally acceptable (AERA 2014; DeVellis 2003). The standard deviations are generally close to 1.0, and none are extremely high or low. The average skewness value for the 38 items was 0.06, and all were below 0.5. The average kurtosis value was 0.26. The largest kurtosis value was −0.69, slightly beyond the level of 2 standard errors ($SE = 0.293$). This value was identified for two items including item 6 (becoming acquainted with new people independently) and item 28 (dealing with teasing in a constructive way). These items had otherwise acceptable psychometrics and were retained for full scale inclusion and analysis. Specifically, item 6 had a skewness value of 0.196 ($SE = 0.147$), mean of 2.62, *SD* of 1.14, and item-total correlation of 0.42. Item 28 had a skewness value of 0.301 ($SE = 0.147$), mean of 2.22, *SD* of 0.94, and item-total correlation of 0.41. Corrected item-total correlations for all items (correlation of item to total scale excluding itself) ranged from 0.30 to 0.66 with a mean of 0.47.

Internal Consistency and Test–Retest Reliability

Internal consistency for the full scale was examined via Cronbach's coefficient alpha. The coefficient for the full scale was 0.92. Two separate subsamples of untreated children with HFASD were tested at two time points: 6 weeks ($n = 29$), and 9 months ($n = 36$). Pearson correlations and intraclass correlation coefficients (ICCs) were calculated for both subsamples. The two coefficients were included because the correlation shows the degree of covariation over time, while the ICC provides an accurate measure of agreement in which the level of endorsement as well as covariation is accounted for. That is, the Pearson *r* shows covariation but would not reveal a systematic increase from the first to the second assessment. The correlation for the 6-week test–retest was 0.81, with an ICC of 0.78. The correlation for the 9-month retest was 0.63, with an ICC of 0.64.

Criterion-Related Validity

Table 3 presents validity correlations for the ASC total score with selected child characteristics, the SRS-2 total score and scales, and the BASC-2/3 composites and scales. The correlations of the ASC total score with age, estimated IQ (WISC-IV), and receptive and expressive language (CASL) scales are all near zero, demonstrating independence of the ASC content from age and measured intellectual and language abilities. The strong negative correlations between the SRS-2 total score and the SCI scale are consistent with the direction expected. The moderate negative correlation with the SRS-2 RRB scale is also consistent with the direction expected, given the level of correspondence between ASC skills and restricted/repetitive behavior. Consistent patterns are also evident in the correlations with the BASC-2/3 composites and scales. The correlation of the adaptive skills composite with the ASC total was 0.75, reflecting convergence on the underlying prosocial skills construct in both measures. The scale correlations ranged from 0.47 for the activities of daily living scale to 0.64 for the social skills scale, again consistent with expectations. Similarly, low-to-moderate negative correlations with the externalizing problems composite and its component scales (−0.29 to −0.46) are indicative of construct validity of the ASC. Finally, as predicted a strong negative correlation (−0.67) was found with the DSD content scale of the BASC-2/3.

Discussion

There is a need for development and testing of scales that efficiently yield information on the skills/behaviors of children with ASD. Significant heterogeneity in functional levels of these children and the potential impact of functional level on psychometric properties indicates the need to study measures in more narrowly-defined and functionally-homogeneous samples including children with HFASD (Lord et al. 2014). Measures are also needed that are treatment sensitive as there is currently a dearth of scales that have exhibited treatment sensitivity (e.g., Bellini et al. 2014, etc.). Rating scales represent a potentially useful type of measure for assessing ASD symptoms and severity, prosocial skills, and/or adaptive behaviors due to their continuous scaling and capacity to assess the degree to which the skill/feature is exhibited (Constantino and Gruber 2012; Reynolds and Kamphaus 2015). These may be even more useful if the skills and adaptive behaviors and/or symptoms are keyed to the clinical dimensions of a disorder (Gadow et al. 2006). This study was conducted to assess the reliability and criterion-related validity of the ASC (Lopata et al. 2008), which has shown good treatment sensitivity in prior psychosocial treatment trials for children with HFASD.

The reliability of parent ASC total score ratings was tested for internal consistency and stability. Results indicated good internal consistency (0.92), which is consistent

Table 2 Item characteristics

Item	*Mdn*	*M*	*SD*	Skewness	Kurtosis	Corrected item-total *r*
1. Does your child listen when you or others talk to him/her?[a]	3.0	3.53	0.79	0.202	−0.217	0.53
2. Does your child begin conversations with other people?[a]	3.0	3.14	1.02	−0.036	−0.452	0.49
3. Does your child talk to others about things of interest to both of them?[a]	2.0	2.43	0.83	0.104	0.227	0.53
4. Does your child know how and when to ask questions of another person?[a]	3.0	2.81	0.89	0.012	0.328	0.57
5. Does your child let others know that he/she is grateful for favors, etc.?[a]	3.0	2.93	1.05	0.002	−0.384	0.51
6. Does your child become acquainted with new people on his/her own?[a]	3.0	2.62	1.14	0.196	−0.694	0.42
7. Does your child tell others that he/she likes something they have done?[b]	3.0	2.72	0.96	−0.056	−0.422	0.60
8. Does your child request assistance when he/she is having difficulty?[a]	3.0	3.28	0.98	−0.109	−0.601	0.46
9. Does your child carry out instructions from others quickly and correctly?[a]	3.0	2.61	0.84	0.029	0.089	0.46
10. Does your child contribute to discussions occurring in the environment?	3.0	2.63	0.92	0.189	−0.021	0.48
11. Does your child give assistance to adults who might need some assistance?[b]	3.0	2.76	1.00	0.038	−0.333	0.46
12. Does your child ignore distractions and remain focused on the task at hand?	2.0	2.25	0.99	0.462	−0.294	0.30
13. Does your child end conversations before leaving or beginning a new topic?	2.0	2.45	0.94	0.386	−0.096	0.31
14. Does your child take steps to become part of an ongoing activity or group?[a]	2.0	2.41	0.88	0.307	0.019	0.47
15. Does your child give assistance to other children who might need or want it?[a]	3.0	2.81	0.89	−0.089	0.219	0.53
16. Does your child acknowledge and accept complements from others?[b]	3.0	3.07	1.02	−0.105	−0.550	0.59
17. Does your child offer to share what he/she has with others?[a]	3.0	2.88	0.99	−0.038	−0.397	0.49
18. Does your child make verbal or written apologies for things said or done?[b]	3.0	3.00	1.05	−0.151	−0.439	0.51
19. Does your child recognize which emotions he/she has at different times?[a]	3.0	3.07	1.02	−0.222	−0.368	0.57
20. Does your child let others know which emotions he/she is feeling?[a]	3.0	2.93	1.02	0.007	−0.246	0.57
21. Does your child understand what other people are feeling?[a]	3.0	2.74	0.83	−0.142	0.173	0.66
22. Does your child show understanding of another person's feelings?[b]	3.0	2.71	0.84	−0.205	0.029	0.58
23. Does your child express anger without verbal or physical aggression?[b]	3.0	2.65	1.16	0.323	−0.628	0.32
24. Does your child try to understand someone else's anger without getting angry him/herself?[a]	2.0	2.47	1.01	0.479	−0.184	0.53
25. Does your child let others know that he/she cares about them?[a]	3.0	3.38	1.05	−0.320	−0.363	0.44
26. Does your child exercise self-control under difficult circumstances?[b]	3.0	2.49	0.90	0.149	−0.055	0.47
27. Does your child understand when permission is needed and the right person to ask for it?[b]	3.0	3.31	0.99	−0.377	−0.123	0.49
28. Does your child deal in a constructive way with being teased?[a]	2.0	2.22	0.94	0.301	−0.689	0.41
29. Does your child stay out of situations that might get him/her in trouble?[a]	3.0	3.24	1.05	−0.237	−0.418	0.41
30. Does your child accept the consequence of her/his behavior?[b]	3.0	2.91	1.02	−0.052	−0.506	0.42
31. Does your child help arrive at a plan that satisfies both him/herself and others who have taken different positions (i.e., negotiates)?[a]	3.0	2.51	0.96	0.127	−0.402	0.55
32. Does your child express an honest complement to others about how they played a game?[b]	3.0	2.54	1.03	0.113	−0.647	0.54
33. Does your child deal positively with being left out of some activity?[a]	2.0	2.32	0.93	0.332	−0.222	0.37
34. Does your child maintain eye contact when talking with others?	3.0	2.65	1.03	0.151	−0.375	0.47
35. Does your child wait his/her turn to talk (without interrupting)?	2.0	2.24	0.90	0.316	−0.210	0.43
36. Does your child express her/his thoughts and concerns without complaining or whining?	3.0	2.76	0.96	−0.053	−0.391	0.40
37. Does your child have discussions with others without sharing information that is unrelated to the topic at-hand?	3.0	2.50	0.86	−0.012	−0.143	0.33
38. Does your child have discussions without running on about a specific topic?	2.0	2.39	0.89	0.218	−0.219	0.37
Total score	105.0	104.36	18.69	−0.201	−0.059	

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[a]Indicates exact item from Skillstreaming curriculum (Goldstein et al. 1997; McGinnis and Goldstein 1997)

[b]Indicates item adapted from the Skillstreaming curriculum (Goldstein et al. 1997; McGinnis and Goldstein 1997). Other items created by Lopata and Thomeer (Lopata et al. 2008)

Table 3 Validity correlations between ASC total and child characteristics, SRS-2, and BASC-2/3

Variable/scale	*r* (*p*)
Child characteristics	
Age (years)	0.026 (0.67)
WISC-IV IQ	−0.063 (0.30)
CASL	
Short-form expressive language	−0.008 (0.59)
Short-form receptive language	0.000 (0.99)
SRS-2	
Total score	−0.69 (<0.001)
Social communication and interaction (SCI)	−0.72 (<0.001)
Restricted interests and repetitive behavior (RRB)	−0.41 (<0.001)
BASC-2/3 PRS	
Adaptive skills composite	0.75 (<0.001)
Adaptability scale	0.55 (<0.001)
Social skills scale	0.64 (<0.001)
Leadership scale	0.57 (<0.001)
Activities of daily living scale	0.47 (<0.001)
Functional communication scale	0.54 (<0.001)
Externalizing problems composite	−0.45 (<0.001)
Hyperactivity scale	−0.46 (<0.001)
Aggression scale	−0.40 (<0.001)
Conduct problems scale	−0.29 (<0.001)
Developmental social disorders content scale	−0.67 (<0.001)

All calculations based on $N = 275$ parent ratings

WISC-IV Wechsler Intelligence Scale for Children-Fourth Edition, *CASL* Comprehensive Assessment of Spoken Language, *SRS-2* Social Responsiveness Scale, Second Edition, School Age Form, *BASC-2/3 PRS* Behavior Assessment System for Children, Second/Third Edition Parent Rating Scales

with that reported by Lopata et al. (2008, 2010). Skewness and kurtosis indices were good across the items and for the total score. In addition, item total correlations were generally moderate for each item (ranging from 0.30 to 0.66). Together, these results provide support for the internal consistency of the 38 individual items and the total score. Stability of the ASC was assessed for two separate intervals and subsamples using both linear correlations (Pearson *r*) and ICCs. Results of the 6-week test–retest interval indicated very good stability (Pearson $r = .81$ and ICC = 0.78). Over the 9-month test–retest interval, stability was somewhat lower but continued to be good (Pearson $r = .63$ and ICC = 0.64).

Before examining criterion-related validity against other skill and symptom scales, the ASC total score was examined for its relationship to age, IQ, and language levels. Correlations were nonsignificant and negligible suggesting that the skills and behaviors assessed by the ASC operated relatively independent of those child variables for this sample of 6–12 year olds with HFASD. A similar lack of association has been noted in other studies of youth with HFASD assessing the relationship between adaptive skills (including social skills) and age and IQ (e.g., Kenworthy et al. 2010; McDonald et al. 2017). Criterion-related validity was assessed via associations between the ASC total score and scales measuring ASD-related symptoms and impairments, prosocial skills, and behavior regulation problems. Comparisons between the ASC and scales measuring ASD-related symptoms and impairments yielded significant inverse relationships (SRS-2 and BASC-2/3 DSD). Specifically, as ratings on the ASC (prosocial and adaptive skills) increased, ratings of ASD-symptom severity decreased. Further, the magnitudes of the relationships between the ASC and the SRS-2 total score and DSD were very similar (−0.69 and −0.67, respectively). Closer examination of the relationship between the ASC and SRS-2 scales indicated a stronger relationship between the ASC and the social/social-communication scale (SCI) scores than the circumscribed and repetitive behaviors/interests scale (RRB) scores. This was not surprising as the large majority of ASC and SRS-2 items assess social/social-communication skills and symptoms, respectively.

Beyond their association with ASD symptoms, ASC scores were compared to prosocial adaptive skills and behavior regulation problems ratings on the BASC-2/3. The pattern of findings was consistent and indicated significant positive associations, of moderate-to-high magnitude, with the adaptive skills ratings. Examination of the individual adaptive scales indicated that the strongest association was between the social skills scale and the ASC (0.64). This was anticipated because of the large number of items on the ASC assessing social/social-communication skills. Given that the ASC items also assess behavioral regulation and adaptive coping without engaging in ASD-related behaviors (e.g., uses self-control, has conversations without running on about a circumscribed interest, etc.), the ASC scores were also compared to the externalizing scales of the BASC-2/3. Across the scales, significant (small-to-moderate) negative correlations indicated that as ASC ratings increased problem behavior ratings decreased. Overall, results of the comparisons with the SRS-2 and BASC-2/3 scales provided support for criterion-related validity of the ASC as an indicator of prosocial and behavior regulation skills.

These initial findings supporting the properties of the ASC are promising, particularly as the ASC has previously shown treatment sensitivity. This is important because the psychosocial interventions for which it has been used have relied heavily on social skills groups which are widely used in schools and clinical settings (Koenig et al. 2009) and they employ similar instructional protocols (i.e., direct instruction, modeling, role-play/rehearsal, and performance

feedback; Kaat and Lecavalier 2014; Reichow et al. 2012). In addition, the ASC includes many items that assess skills targeted in the Skillstreaming curriculum (Goldstein et al. 1997; McGinnis and Goldstein 1997) which is commercially available and has been found effective and/or considered useful for youth with HFASD (e.g., Kaat and Lecavalier 2014; Thomeer et al. 2016). The current study also examined the properties of the ASC for the critical informant group of parents. Although questions have been noted about the reliability of parents as raters (Reichow et al. 2012), the current results supported the internal consistency of their ratings, and stability over 6-week and 9-month intervals.

The current study provides important information on the psychometric properties of the ASC however several limitations warrant mention and provide direction for future studies. As this was the first study to test the reliability and criterion-related validity of the ASC for children with HFASD using a large sample of parent ratings, additional psychometric studies are needed. This study utilized the total ASC score for the analyses and, as such the estimates were interpreted within that parameter (Lord et al. 2014). Additional studies using sufficiently large sample sizes are recommended to determine the possible presence of subscales within the ASC (i.e., exploratory factor analyses). Other psychometric studies utilizing item response theory and testing the capacity of the ASC to discriminate between children with HFASD and non-HFASD children (e.g., typically-developing, other clinical diagnosis) will provide important information on the properties and clinical utility of the ASC. An additional limitation involved the testing of parent ratings only. Though parents are considered critical sources of information, teachers constitute another key informant group (Norris and Lecavalier 2010). Ratings from multiple informants including parents and teachers provide important information on functioning across settings; as such additional studies of the psychometric properties of teacher ratings, as well as informant discrepancies are needed (Achenbach 2011). Lastly, the nature of the child sample constituted both a study strength and limitation. The narrowly-defined and relatively homogeneous sample helped minimize the confounding of the results because functional level can affect the properties of an instrument. Despite this strength, the sample was overwhelmingly Caucasian and lacked diversity. Recent research has indicated that a large majority of basic and intervention studies involving ASD samples have failed to report the race or ethnicity of the participants, and when reported the samples have been predominantly Caucasian (Pierce et al. 2014; West et al. 2016). In addition, research suggests that children with ASD from diverse backgrounds (i.e., Latino and African-American) receive fewer friendship nominations relative to a comparison group of Caucasian children with ASD (Azad et al. 2017). Overall, the functional-homogeneity and lack of diversity of the sample limits the generalizability of the results to the characteristics of the sample. Future studies should examine the properties of the ASC within different age and functional level samples of youth with ASD, as well as within more diverse samples with ASD.

While instruments often measure the absence of skills and/or presence of abnormalities (Lord et al. 2014), the ASC assesses ASD-related dimensions in terms of prosocial skills and positive behavior and interest regulation. Initial indications from this study suggest that it possesses good properties for parent ratings of 6–12 year olds with HFASD and prior studies suggest that it is treatment sensitive for this group of children. Ongoing studies will help further define the psychometric properties of the ASC.

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Author Contributions CL conceived of the study, participated in its design, developed the scale items, and drafted the manuscript; JDR contributed to the study design, managed and coordinated the data, and contributed to manuscript preparation; JPD participated in the design, conducted the statistical analyses, and assisted in the interpretation of the data and preparation of the manuscript; MLT developed the scale items, and participated in the study design and manuscript preparation; CAM participated in the study design, assisted with data coordination, and contributed to manuscript preparation; MAV participated in the study design and contributed to manuscript preparation. All authors read and approved the final manuscript.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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A Comprehensive Outpatient Treatment for Children with Autism Spectrum Disorder

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OVERVIEW OF COMPREHENSIVE OUTPATIENT TREATMENT: MAXout

Children with autism spectrum disorder ASD without intellectual disability (ID) are defined by significant impairments in social interactions and reciprocity, as well as restricted and repetitive behaviors and interests. These primary clinical features are often accompanied by secondary associated emotional and behavioral problems. Although children with ASD without ID are distinguished from other children with ASD based on relative strengths in cognitive and language skills, their primary and secondary clinical features significantly interfere with daily functioning and negatively impact long-term outcomes. The complex and pervasive nature of their difficulties warrants a comprehensive approach to interventions that addresses the range of affected areas and is manualized and responsive to the unique needs of the children. MAXout is a comprehensive outpatient intervention developed to address the unique profile of strengths and weaknesses of children ages 7-12 years with ASD without ID in an outpatient setting. The intervention was designed to be instituted intensively (high levels of engagement and feedback) over an extended period. MAXout consists of two 90-minute sessions per week over 18 weeks. The intervention targets multiple facets of social-interaction and social-communication (social, emotion-recognition, and nonliteral language skills) as well as behavioral flexibility and interest expansion (restricted/circumscribed behaviors and interests). In addition to targeting the core impairments and symptoms, MAXout is adaptable to the unique skills and behavioral needs of individual children with ASD without ID.

The instructional procedures and content included in the MAXout program were informed by a number of research reviews on psychosocial interventions for children with ASD without ID. In addition to the information described in those reviews, MAXout was informed by and adapted directly from a comprehensive psychosocial summer program, summerMAX, which was found to be effective in numerous clinical studies including several randomized controlled trials (RCT) for children with ASD without ID (Lopata et al., 2010; Thomeer et al., 2012; Thomeer et al., 2016). Cognitive-behavioral instructional strategies and procedures used in MAXout include direct and explicit instruction, modeling, role-play/rehearsal, repeated practice, performance feedback, and reinforcement. These techniques allow complex and multi-step skills/behaviors to be broken down into smaller components that can then be systematically taught in a part-to-whole sequence. Frequent and immediate feedback and reinforcement are then provided to increase acquisition and promote maintenance of taught skills and reduce maladaptive behavior. MAXout components include skill instruction groups (SIGs), therapeutic activities, a behavioral system (token economy/response cost and Individual Daily Note [IDN]), and parent training. The SIGs involve direct teaching and practice while the therapeutic activities provide the opportunity to practice the skills in more naturalistic social activities such as art activities, cooperative group activities and games. Treatment staff use these opportunities to teach, prompt, and reinforce targeted core and associated skills that characterize ASD without ID, as well as promote greater independent use of specific skills. MAXout also provides a protocol for the provision of ongoing consultation support to ensure the intervention is coordinated across staff members and sessions. Lastly, the MAXout program includes a system for monitoring fidelity of implementation of the components as well as each participant's progress.

MAXout was evaluated for feasibility and initial indications of effectiveness for children with ASD without ID in a pilot study (Lopata, Lipinski, Thomeer, Rodgers, Donnelly, McDonald, & Volker, 2017). Results indicated high levels of implementation accuracy (fidelity >94%) and high levels of parent, child, and staff satisfaction. Significant improvements were found for the children's non-literal language skills and facial emotion recognition skills, and parent and staff clinician ratings of targeted social/social communication skills, broad social skills, autism spectrum disorder symptoms, and problem behaviors.

MAXout was then tested in a large RCT (Lopata, Thomeer, Rodgers, Donnelly, & Booth, 2020). Results indicated that children with ASD without ID that received MAXout exhibited significantly greater improvements in ASD symptoms, social/social-communication skills, understanding of nonliteral language, broad social skills, and problem behavior symptoms. Additionally, the significant improvements were maintained at follow-up (4-6 weeks post treatment).

FEATURES OF AUTISM SPECTRUM DISORDER WITHOUT INTELLECTUAL DISABILITY

The diagnostic criteria for ASD have varied over time however the core symptom dimensions involving social interaction/social communication impairments and restricted and repetitive patterns of interests and behaviors have been consistent. The current diagnostic framework (APA, 2013) recognizes significant heterogeneity in functional levels, with a majority of children diagnosed with ASD now demonstrating cognitive ability above the intellectual disability range. These children demonstrate relative cognitive and language strengths and they are often referred to as children with ASD without Intellectual Disability (ID). For the purposes of this manual and to recognize their distinct profile and needs, the term ASD without ID will be used to describe children with ASD without concomitant cognitive and language disability. Despite their relative cognitive and language strengths, children with ASD without ID demonstrate the core diagnostic symptoms of social interaction/social communication impairments and circumscribed and repetitive behaviors and interests that interfere with adaptive daily functioning. Social interaction/social communication symptoms include impairments in social reciprocity (e.g., atypical or absent social approach, initiations, responses, and/or conversational back-and-forth, reduced sharing of emotions or interests), nonverbal communication (e.g., poor eye contact and integration of nonverbal and verbal communication, reduced facial expressiveness and nonverbal communication), and development, maintenance, and understanding of relationships (e.g., reduced interest in others, problems adjusting behavior to social context; APA, 2013). In addition to deficits in rudimentary social behaviors (e.g., initiating/responding to social bids), children with ASD without ID demonstrate impairments in more complex social-cognitive understanding, such as interpreting facial and vocal expressions and others' perspectives (Bellini, Gardner, & Markoff, 2014). Together, these problems with social-cognitive understanding and basic social behaviors negatively affect the way these children understand and respond to others (Scarpa, Reyes, & Attwood, 2013).

Contributing to their social difficulties are restricted, repetitive, and stereotyped patterns of behaviors, interests, and activities. These can include extremely fixated and restricted interests, inflexible adherence to routines or ritualized behaviors, repetitive motor movements, and/or unusual sensory responsiveness (APA, 2013). For children with ASD without ID, excessively focusing on a specific topic and engaging in one-sided conversations can block social reciprocity and exchanges (Bellini et al., 2014). In addition, their intense focus on a restricted area of interest, along with cognitive and behavioral rigidity can interfere with attention to important social and academic content. The impact of this symptom dimension on broader functioning has been highlighted in studies that found that higher levels of restricted and repetitive interests/behaviors were significant predictors of lower adaptive skills including social skills in children with ASD without ID (e.g., McDonald et al., 2015).

For children with ASD without ID, their impairments do not tend to improve over time without intervention, and they continue to interfere with daily functioning throughout adolescence and into adulthood. The broad range of affected areas requires a comprehensive approach to intervention that targets the core features of the disorder while also addressing the unique needs of the individual child with ASD without ID (Bellini et al., 2014; Smith et al., 2007). Interventions should also include a mechanism to reduce problem behaviors (e.g., inattention, oppositional behaviors, etc.) which often occur in children with ASD. At present, there is widespread recognition of the need for comprehensive psychosocial interventions for children with ASD without ID that increase social skills/competence while reducing ASD symptoms and problem behaviors.

MAXout is a comprehensive outpatient treatment designed to address the unique profile of social-cognitive and social behavior impairments and circumscribed and repetitive behaviors and interests of

children with ASD without ID in an outpatient setting. The intervention uses cognitive-behavioral techniques to address these features, as cognitive and behavioral elements play critical roles in social performance (understanding social cues and enacting an appropriate response; Bauminger-Zviely, 2013), and development of social-cognitive skills is a prerequisite for improvements in social performance of these children (McMahon, Vismara, & Solomon, 2013). Program staff target the social knowledge/understanding and skills/behaviors of the children with ASD without ID using structured environments, direct and explicit instruction, modeling, role-play/rehearsal, repeated practice, performance feedback/reinforcement, and parent training. Each of the MAXout treatment components addresses a specific feature and/or deficit and collectively, these components aim to improve the overall social competence, ASD symptoms, and behavioral performance of children with ASD without ID.

OVERVIEW OF MAXout COMPONENTS

MAXout was developed to address the unique social-cognitive and social skills/behavior impairments of children with ASD without ID. Recognizing the multiple symptoms that characterize ASD without ID, MAXout is a comprehensive treatment comprised of multiple treatment components targeting multiple domains and applied intensely for an extended period of time and at a specified level of engagement. Comprehensive treatments ensure that critical skill areas, core ASD features, and the unique needs of individual children are all addressed (Odom, Boyd, Hall, & Hume, 2010, 2014; Reichow & Barton, 2014). MAXout components use instructional techniques that adhere to a cognitive-behavioral framework and which have been identified as effective in social interventions for children with ASD without ID (Koenig et al., 2010; McMahon et al., 2013; Reichow, Steiner, & Volkmar, 2012; White, Koenig, & Scahill, 2007). Specific techniques used include clear and concrete rules, structured environments, direct and explicit instruction, modeling, role-play/rehearsal, repeated practice, and performance feedback/reinforcement. These techniques allow complex skills/behaviors to be broken down into small components and taught in a part-to-whole sequence, with reinforcement used to increase acquisition and maintenance (Bregman, Zager, & Gerdtz, 2005; Howlin, Baron-Cohen, & Hadwin, 1999).

MAXout consists of two 90-minute sessions per week over 18 weeks (36 sessions total) and each session comprises two 45-minute treatment cycles (72 cycles total). Each cycle begins with a 15-minute intensive skill instruction group followed by a 30-minute therapeutic activity that requires the children to use the skills taught in the skills group. Throughout each session, a behavioral system (consisting of a token economy and response-cost system and an IDN) is used to facilitate skills development and maintenance and decrease ASD symptoms and behavior problems. Additionally, over the course of the 18 weeks, six parent education sessions are offered on program elements and strategies for parents to help their child maintain and generalize taught skills to home and community settings.

While the subsequent sections provide a detailed description of the curriculum/content and implementation procedures of the MAXout treatment, the following is a brief overview of the four core intervention components, as well as a brief overview of the consultation support used to facilitate implementation and fidelity monitoring that ensures procedures are adhered to. The four core intervention components include (1) intensive skill instruction groups, (2) therapeutic activities, (3) behavior system (token economy/response cost system and IDN), and (4) parent education/training groups.

Intensive Skill Instruction Groups

Intensive skill instruction groups (SIGs) are a critical component as they directly address deficits in social/social-communication, emotion recognition, and nonliteral language skills. Instructional procedures used include direct instruction, modeling, role-play, and performance feedback and are consistent with techniques recognized in the research as effective for teaching children with ASD without ID. A total of 72 SIGs are conducted. Sixty SIGs teach 30 social/social-communication skills from *Skillstreaming* (McGinnis & Goldstein, 1997) and are taught in a sequence from basic to more complex. Each skill is covered twice. During these groups, children receive specific instruction in target social skills and the steps that comprise each skill (e.g., having a conversation). Each child then observes others modeling the skills and practices the skills her/himself followed by feedback from the group leader and peers in the group. Six SIGs provide instruction and practice in recognizing, labeling, and interpreting emotions and six SIGs seek to improve the children's literal and concrete interpretation of language. An essential feature of these instruction groups is active participation with multiple opportunities to

practice specific skills. All the skills taught in the SIGs are practiced in therapeutic activities and are integrated in the program's behavioral system as a means to promote practice and generalization of the skills outside the SIGs.

Therapeutic Activities

Following each SIG, the children participate in a 30-minute therapeutic activity (TA). There are 72 TAs conducted in MAXout. These activities have been developed to practice and reinforce social skills, face-emotion recognition, and interpretation of non-literal language that are taught in the instruction groups as well to promote interest expansion. These activities are fun and cooperative in nature and are conducted using direct instruction, modeling, repeated practice trials, feedback, and transfer of learning. Each activity requires social interaction and social cooperation as well as specific micro-skills that affect social performance. The majority of these activities are implemented in association with specific target social skills taught during the SIGs. Additional TAs provide opportunities for the participants to expand their areas of interest. Most of the TAs can be completed in a single session, while others can be conducted over two or more sessions. Each TA lesson plan describes its purpose, skills targeted, materials needed, and the deficit area addressed, along with the specific procedures for how to conduct the activity.

Behavioral System

Across each session, a behavioral system consisting of a token economy and response-cost system and an IDN are implemented to facilitate skills development and maintenance and decrease ASD symptoms and behavior problems. The behavioral system ensures that skills taught and learned during the skill instruction groups are also reinforced in settings outside the instruction groups. The token economy and response-cost system address a set of common skills and ASD symptoms and program rules. Points are verbally awarded whenever a participant adheres to operationally-defined rules, follows directions, and/or demonstrates newly or previously taught skills (social, facial emotion decoding, or nonliteral language skills). Points are withdrawn for violating a group rule, not following directions, or exhibiting operationally-defined ASD-related behavior (lack of eye contact, run-on communication, sharing irrelevant information, etc.). Children receive brief feedback every 15 minutes on his/her performance during the preceding interval. Each child earns a home reward at the end of each week for reaching his/her weekly response-cost point target. The IDN targets two to four operationally defined individualized behaviors or skills unique for each participant. Using a standardized template, each IDN includes the child's individualized targets and performance goals/criteria. Feedback on IDN targets is provided at the middle and end of each 90-minute session. Each child earns an on-site reinforcer (e.g., edible snack) and parent-provided reinforcer (desired activity/tangible item) at home for achieving his/her IDN target level for that given session. The IDN also serves as a critical means of communication between the program and home on identified social and behavioral targets. Both the token economy/response cost system and the IDN serve as a means to monitor the performance of each participant as each progresses in his/her social and behavioral development.

Parent Education/Training Groups

Parent involvement is recognized as an essential component of effective intervention programming for children with ASD without ID. One of the fundamental emphases of MAXout is integration of the intervention across settings. To increase the rate of learning and generalization of skills, MAXout requires coordination between MAXout and the children's homes. MAXout provides predetermined parent meetings to link program-based skill targets with targets and reinforcement at home. The groups initially instruct parents and caregivers on the MAXout components and how these components address core deficits and features of ASD without ID. The groups are then used to develop home-based techniques for teaching, prompting, and reinforcing skills that are also being implemented in MAXout and for managing behavioral challenges in the home and community. Additionally one group is dedicated to helping parents and caregivers deal with stress and anxiety they may have as a result of having a child with ASD without ID. The final groups discusses how parents and caregivers can advocate for their child and can help their child generalize skills beyond the MAXout program and into school and community environments. Effective implementation of comprehensive intervention requires careful coordination among all individuals involved in the social development of children with ASD without ID.

Consultation Support

Although not a core component of the direct intervention, consultation is considered a critical support service for those primarily responsible for MAXout implementation. MAXout has consultation and support services built in throughout the implementation of MAXout programming. This includes support to the clinicians implementing social skills groups, therapeutic activities, the behavioral system, and parent groups as well as guidance and problem solving for any issues that arise over the course of the program in component implementation or in the child's performance. The MAXout consultant is likely to be the program/clinic supervisor or director.

Treatment Fidelity

Critical to the success of MAXout is the implementation of MAXout as it is manualized. To ensure fidelity to the manualized MAXout protocol, a record is kept of each scheduled MAXout component, and staff members implementing treatment components are monitored for their adherence to the protocol at set intervals across the program's implementation. For fidelity monitoring of adherence, checklists are used that identify the core procedures for each element that the staff member must cover during its implementation. A designated staff member monitors facilitators implementing a component while completing the corresponding component checklist. The frequency of fidelity monitoring observations is specified for each component. The facilitators receive feedback regarding their adherence to implementing the program elements during weekly consultation meetings. During these meetings, the team members problem solve any deviations from the procedures.

INTENSIVE SKILL INSTRUCTION GROUPS

Frequency and duration of groups: Two 15-minute skill instruction groups per each 90-minute session for a total of 72 instruction groups over the course of MAXout program. Sixty of the groups teach social skills, six groups teach emotion recognition and six teach the interpretation of nonliteral language.

Group parameters: Each skill instruction group contains 4 children.

Facilitator(s): Two group clinicians conduct each group according to the procedures described below. The clinicians alternate between being the lead and the support clinician.

Group composition: The groups are composed of children who present with ASD without ID ages 7-12 years old.

Fidelity monitoring: The MAXout supervisor completes a Skill Instruction Group Fidelity Sheet dependent upon the instruction group being held (social skills; emotion recognition; interpretation of nonliteral language) once every five sessions to assess adherence to the manualized protocol. Fidelity sheets are provided in Appendix A.

Intensive social skills instruction is a central component of MAXout, as it addresses the most prominent and defining feature of ASD without ID – social impairment. Given the nature of these impairments, groups are often considered an appropriate format to teach and practice social skills. Seventy-two intensive SIGs are conducted in MAXout. Each SIG consists of 4 children with ASD without ID per group and two staff clinicians. Conducting the SIGs with children with shared social difficulties provides a safe environment for them to learn and practice basic social skills and ensures they are not is a setting in which their social status is further reduced by drawing attention to their social impairment. These groups also provide opportunities for development of social relationships around shared experiences and relationships that extend beyond the group setting.

It is critical to provide instruction and social curricula that is appropriate and effective for the unique needs of children with ASD without ID. All MAXout instruction groups utilize direct instruction, modeling, role-play, and performance feedback to teach social skills, facial emotion recognition, and nonliteral language skills. One curriculum that employs these procedures and has been found to be effective for teaching social skills to children with ASD without ID is *Skillstreaming* (McGinnis & Goldstein, 1997). "*Skillstreaming* is a method for teaching an extended curriculum of interpersonal, aggression management, and related skills to children who are weak or lacking in these competencies" (McGinnis & Goldstein, 1997, p. 40). In MAXout, 60 of the 72 SIGs are conducted according to the general framework of *Skillstreaming* (McGinnis & Goldstein, 1997) to teach 30 social skills (each skill is taught twice).

Six skill instruction groups teach how to recognize, label, and interpret their own and others facial expressions, as well as the physiological indicators that represent different emotions and expressions.

Like in the groups using *Skillstreaming* framework, the children observe others modeling the skill and then practice the skills themselves followed by feedback from the group leader and peers in the group. Another six SIGs expose the children to a variety of idioms and other colloquialisms and their nonliteral or alternative meanings. Children work together to decipher the meaning of various common phrases and idioms and the context where the phrases and idioms are used.

In order to ensure active participation in all the SIGs, each child must complete at least one treatment sequence as the principal treatment recipient (actor or co-actor/respondent or model) in each skills group, along /with actively observing and providing feedback to other children during the SIGs.

The following is a detailed description of the procedures for implementing the SIGs as well as the specific techniques used for the SIGs that teach 1) social skills, 2) emotion recognition, and 3) interpretation of nonliteral language. In MAXout, group clinicians strictly adhere to these established procedures to ensure treatment fidelity and consistent delivery of the intervention across groups.

Implementation of SIGs

Prior to the start of every SIG, the two staff clinicians must determine who is going to lead the SIG that session and who will be the assistant. Throughout the program, the two clinicians will alternate between the lead and assistant roles for the SIGs. The staff clinicians should know what skill they are teaching for the particular SIG and have whatever materials (e.g., skill steps, idiom cards) they need to run the SIG for teaching social skills, emotion recognition, or interpretation of nonliteral language.

Each SIG completes these three steps:

1. **Review Group Rules**.

   Given the importance of structure and consistency for children with ASD without ID, each group begins with a review of the group rules. The group rules are displayed visually during the group. At the outset of each group, the lead clinician prompts the children to state a group rule (e.g., "Who can tell me one of our group rules?"; if there is no response, the lead clinician should issue a directive for the children to state the rules - "Jared, tell me one of our group rules"). The lead clinician continues with the group rules discussion until all the group rules have been reviewed. If necessary, the lead clinician can point to the visual display of the rules as a prompt. The review of rules should take no more than two minutes.

   The specific group rules for MAXout SIGs are as follows:

   a) Be actively involved

   b) Stay in seat/area

   c) Use materials correctly

   d) Speak so others can hear you clearly

   e) Raise your hand to speak

2. **Implement specific procedures to teach social skills, emotion recognition, or the interpretation of nonliteral language** (detailed below).

3. **Debrief the Group**.

   At the end of each SIG, the lead clinician briefly (2-3 minutes) reviews the overall performance of the group. The facilitator has the group members:

   a) Identify positive events from group. Specifically, the leader asks, "What went well during the group?"

   b) Discuss negative events from group. Specifically, the leader asks, "What can we work on?"

   c) Report what they learned. The leader asks, "What did we learn?"

   d) State how they can use the skill taught in the upcoming therapeutic activity.

   While this debriefing should be quick, the facilitator must ensure that the group members' responses provide specific descriptions or examples.

SIG Procedures: Teaching Social Skills

Sixty of the 72 SIGs conducted in MAXout utilize the *Skillstreaming* curriculum to teach 30 social skills. Each skill is taught twice. The instructional methodology and components of the *Skillstreaming* curriculum have been found to be effective in promoting social skills and social understanding for children with ASD without ID (see Lopata, Thomeer, Rodgers, et al,, 2019; Lopata, Thomeer, Volker, Nida, 2006; Lopata, Thomeer, Volker, Nida, & Lee, 2008; Lopata et al., 2010; Thomeer et al., 2012, 2016). The standardized format of the instructional methodology allows all staff clinicians to administer the social intervention in a manner consistent with one another. Group content and structure are prescribed to parallel the *Skillstreaming* program (McGinnis & Goldstein, 1997). The *Skillstreaming* curriculum can be purchased at https://www.researchpress.com/.

The following nine teaching steps from the *Skillstreaming* model are used (McGinnis & Goldstein, 1997, p. 57):

1. Define the skill
2. Model the skill
3. Establish trainee skill need
4. Select role-player
5. Set up the role play
6. Conduct the role play
7. Provide performance feedback
8. Assign skill homework
9. Select next role-player

The 30 social skills taught from the *Skillstreaming* curriculum were specifically selected to align with core and associated features of ASD without ID. This ensures that the skills taught are anchored to core features that characterize these children.

The 30 social skills from the *Skillstreaming* curriculum (in the order in which they are taught in MAXout) are:

Introducing yourself	Joining in	Recognizing another's feelings
Contributing to discussions	Offering to help an adult	Showing understanding of another's feelings
Listening	Ending a conversation	Responding to teasing
Giving a compliment	Offering to help a classmate	Asking permission
Being a good sport	Accepting a compliment	Accepting consequences
Giving instructions	Sharing	Avoiding trouble
Having a conversation	Expressing your feelings	Dealing with another's anger
Asking a question	Apologizing	Negotiating
Asking for help	Ignoring distractions	Expressing concern for another
Following instructions	Using self-control	Dealing with being left out

Each SIG that teaches a social skill adheres to the nine *Skillstreaming* steps as follows:

1. **Define the skill.** Each group begins with the lead clinician introducing the target social skill for that group session. The sequence of steps required to exhibit the targeted social skill are presented visually on a chalkboard, dry erase board or poster board. The facilitator asks the children to define the skill in operational terms. For example, the facilitator asks: "What do you do when you have a conversation?" The clinician connects the child's responses to one of the specific steps posted. If a child provides a response that has already been provided, the clinician would ask the child to provide another behavior required to exhibit the skill. After all the steps of the social skill are identified, the facilitator reviews the specific steps required to exhibit the social skill being taught for the session. Goldstein, McGinnis, Sprafkin, Gershaw, and Klein (1997) identified this portion of the group as targeting orientation toward the skill, as well as a time when contents are described for their abstract meaning and concrete application.

2. **Model the skill**. The lead clinician models the skill according to the behavioral sequence previously presented when defining the skill. The clinician describes two examples of a time, place, or setting when they used the targeted skill. The clinician should select situations relevant to the children's real-life circumstances and portray her/himself as a person of similar age and characteristics as the children. The examples should reflect positive outcomes. The clinician then models one of the two examples with his/her co-facilitator of the group. This role-play should depict the behavioral steps, in correct sequence, of the skill being modeled.

3. **Establish trainee skill need**. The lead clinician asks each child to briefly describe where, when, and with whom he/she has used the skill being discussed. This discussion with each child should be brief. The co-facilitator writes down a few brief bullet points of each of the child's examples for later reference when the children are to role play their use of the skill.

4. **Select role-player**. In each group session, the lead clinician selects two children (one at a time) to role-play their example of how they used the social skill being discussed. The goal is to have each child serve as a primary actor and a co-actor at least once during the weekly sessions.

5. **Set up the role-play**. Per each child's role-play, the lead clinician reviews the scenario the child identified for when he/she used the social skill being taught. This child is the main actor and another child from the group is selected to serve as a co-actor for the role-play. The lead clinician describes and sets up the scene and the primary actor's and co-actor's roles in the role play. The description should make the role-play as similar to real life for the main actor as possible.

6. **Conduct the role-play**. The lead clinician assigns each of the children who are not in the role play to monitor whether or not the main actor exhibits a specific step of the social skill being role played. The clinician reminds the role-play actors of their roles and responsibilities and reiterates the behavioral steps of the social skill the main actor is role-playing. The clinician then instructs the actors to begin. The lead clinician is responsible for providing the child actors with coaching according to the behavioral steps and with making sure the actors remain in their roles. If needed, the role-play can be stopped, additional instruction provided, and the actors directed to begin again. During the role-play, one of the facilitators (either the lead or the assistant) positions her/himself near the chalkboard/dry erase board to point out the behavioral steps as demonstrated by the child actors.

7. **Provide performance feedback.** A brief feedback period accompanies each role-play in the following sequence. First, the co-actor describes how the main actor did using the behavioral steps. Then, each of the children observing the role-play report on how the main actor did in adhering to the specific behavioral step he/she was assigned to observe. Next, the lead clinician reports on how the main actor did in following the behavioral steps, and then lastly, the main actor identifies how he/she did in adhering to the behavioral steps of the skill that was role played. The children giving feedback should give their feedback directly to the primary actor.

8. **Assign skill homework**. The lead clinician asks the main actor how he/she will use the demonstrated social skill in the upcoming therapeutic activity.

9. **Select next role-player**. The lead clinician selects the next child to conduct his/her role-play (following same procedures).

MAXout participants must be a primary actor for one of the role-plays and a co-actor in another role-play conducted during each SIG teaching social skills. After each SIG, the group clinician should record what roles the children play during the social skill role-plays (primary actor or co-actor) conducted in the SIG on the SIG Social Skill Participant Roles Tracking Sheet (see Appendix B).

For video demonstrations of two SIGs teaching social skills go to www.canisius.edu/MAXout.

SIG Procedures: Teaching Emotion Recognition

While there are social skills taught via the SIGs using the *Skillstreaming* methodology that involve using emotion recognition skills in social situations (e.g., expressing your feelings, expressing concern for another, showing understanding of another's feelings), MAXout has six SIGs dedicated to recognizing, labelling, and interpreting emotions. The lead clinician for each session provides direct instruction, repeated practice, and feedback in deciphering facial feature positions that reflect various emotions and recognizing physiological states associated with the emotions. Staff clinicians describe different facial expressions and their corresponding emotional states, followed by in vivo practice identifying the staff's

and other children's facial expressions and the physiological state and behavioral reaction associated with each internal state.

Each SIG that teaches emotion recognition adheres to the following steps:

1. The lead clinician for the session reviews what facial expressions and body language reveal about an individual's emotional state.

2. The lead clinician models different facial expressions and explains what emotion he/she is modeling, a time he/she felt the emotion, and some events that provoked this emotion. The lead clinician describes and demonstrates what happens to his/her face and body when displaying the emotion. For example, "When I make a surprised face, my mouth will open in a circle, my eyes will get wider, and my eyebrows will move upward." The lead identifies internal states (e.g., heart rate, pulse, breathing, sweating, dry mouth, stomach pain/butterflies, chest pain, muscle tension, etc.) felt with each emotion modelled. Emotions staff can model include:

Happy	Surprised
Sad	Hurt
Angry	Worried
Afraid	Disgusted
Excited	Bored

3. The lead clinician picks a child to stand up front and model a facial expression (may include an emotion from this list) while the other participants try to identify the facial expression being displayed. The lead clinician asks the child and the group to identify what happens to the child's face and body when displaying the emotion. The lead prompts the child to describe the internal states (e.g., heart rate, pulse, breathing, sweating, etc.) felt with the modelled emotion. The lead clinician asks the child modeling the emotion where (context) he/she might use/display the emotion. Group members can contribute to this discussion. After the child is finished, another child is selected to display an emotion.

4. After each child has displayed an emotion, the lead clinician asks the children to identify several feelings, and he/she writes them on the board.

    a) Participants describe when/where the feelings they identified can happen.

    b) Participants describe the physiological reactions that accompany the feelings. The facilitator guides this discussion by asking questions such as, "How do you know when you have this feeling?" and "What happens to your body when you have this feeling?" The facilitator helps participants identify internal state (e.g., heart rate, pulse, breathing, sweating, dry mouth, stomach pain/butterflies, chest pain, muscle tension, etc.) felt with each emotion.

    c) The facilitator writes the responses on the board next to the corresponding feelings.

5. Next, the lead clinician asks participants describe the types of behaviors that will likely result for each feeling identified on the list. Facilitators guide the participants to focus on the likely positive behaviors associated with positive emotional states and likely negative behavior associated with negative states.

6. The lead clinician will summarize the discussion – including the importance of recognizing facial expressions, emotion, physiological correlates of emotion, and the effect of emotion on behavior

The following is an example of how the feelings, physiology, and behavior can be displayed on the board:

Feeling	**When/where could this feeling happen?**	**What happens to face or body?**	**Negative behavior**	**Positive behavior**
Scared	When I have a test; When I'm alone at night	Grit teeth, fast heart rate, fast breathing, sweating, hunched shoulders	Crying, running away	
Excited	My birthday; Last day of school	Fast breathing, tight chest, eyes widen, mouth may open, may smile		Smiling, talking to others, following directions

<u>SIG Procedures: Teaching Interpretation of Nonliteral Language</u>

Six SIGs specifically target nonliteral language skills. These groups use direct instruction and repeated practice to identity and decipher nonliteral elements of common language. These groups expose the children to a variety of idioms and colloquialisms and their nonliteral or alternative meanings. Children work together to decipher the meaning of various common phrases and idioms and review the context where these phrases and idioms may be used. The idioms/colloquialisms that are taught in MAXout are listed in Appendix C.

Each SIG that teaches nonliteral language interpretation skills adheres to the following steps:

1. Prior to each session, the clinicians chooses 15 idioms from the list of idioms/ colloquialism provided in Appendix C. Staff pick idioms from the list that have not been covered in previous sessions. Each of the chosen idioms is then written on the back of an index card. The clinician divides these 15 cards by level of difficulty from easiest to hardest to decipher. On the opposite side of each index card, the clinician records a monetary value of $100, $200, $300, $400, or $500. Three idiom cards per each value. The three easiest idiom cards to decipher would be assigned the $100 value, the next three cards that are little more difficult to decipher would be assigned the $200 value and so on such that the three idiom cards deemed the hardest to decipher would be assigned the $500 value.

2. The clinician creates a 3x5 grid on the board in front of the room with the rows corresponding to the point value and level of idiom difficulty:

$100 Row »			
$200 Row »			
$300 Row »			
$400 Row »			
$500 Row »			

3. The clinician places the 15 idiom cards with the point value facing out in each cell corresponding to its value and difficulty level.

4. After reviewing the group rules, the lead clinician starts the session by describing how language and phrases can have different meanings depending upon the context in which they are used.

5. The lead clinician will tell or remind the children that if they hear a phrase that does not make sense, they should do the following:

   a) Make sure you heard the phrase correctly.

   b) Consider the context in which the phrase was stated.

   c) Ask yourself if this could be a phrase that should not be taken literally.

   d) If you cannot translate the phrase, ask the person what they meant.

6. The lead clinician will model the steps in #5. The clinician gives the following example: It is a rainy day and I am about to walk outside. It is raining very hard. The person next to me says, 'It is raining cats and dogs.' Note that the clinicians would give similar examples in subsequent sessions.

Make sure you heard the phrase correctly	*"I ask myself if the person just said 'It is raining cats and dogs.' Yes, I definitely heard him say that."*
Consider the context where the phrase was stated	*"Okay, it is a rainy day. It is really raining and we are both about to walk in the rain."*
Ask yourself if this could be a phrase that should not be taken literally	*"Does this person really think it is raining cats and dogs? I do not see any cats or dogs. This does not make sense. It must be an expression."*
If can't translate, ask the person what they meant	*"I don't know what the expression means. I will ask, What does 'It is raining cats and dogs' mean?"*

7. The lead clinician provides an idiom and he/she asks the children to define this idiom and then summarizes their collective definitions.

8. The lead clinician reiterates how sometimes words and phrases are not meant to be taken literally and provides some examples from the idiom list such as “hit the road,” “you’re pulling my leg,” or “don’t put all your eggs in one basket.” Note each session, the lead will introduce new examples from the list that have not been covered previously.

9. The lead clinician asks each of the children for an example of an idiom, colloquialism, or other phrase that can have different meanings. Each child reports how his/her example can mean something different from its literal interpretation.

10. The lead clinician divides the children into two teams and tells each team told to choose a team name. Each child sits with his/her teammate in front of the 3 x 5 grid of idioms.

11. The lead clinician tells the children they are going to play a game, Idiom *Jeopardy*© where a team will get points for correctly giving the non-literal meaning of the phrase on the index cards on the board. The children are told to work with their partner to define the nonliteral meaning of the phrase on the card. The children are told that they will take turns picking an index card from the board and that the team of whoever picks the card gets to make the first attempt at defining the nonliteral meaning of the phrase. The team who did not pick the card will get a chance to define the idiom and steal the points on the card if the first team is not successful. The two clinicians of the group monitor the teams to make sure all team members are contributing. If neither team defines the idiom, correctly then the lead clinician defines the idiom.

12. The lead then picks one child of one of the teams in the group to announce an available dollar amount on the grid (“I’ll take $400 in column three.”). The lead clinician gives the corresponding card to the child and has him or her announce the phrase on the card to the whole group.

13. The two teams separately discuss possible non-literal meanings of the phrase. After 20-30 seconds, the lead clinician asks the team who chose the idiom, what they think it means.

14. If the team is correct, they are awarded the dollar value of the card and one of the clinicians records the amount the team earns on the board. If the team is incorrect, then the other team gets to make a guess as to what the non-literal meaning of the phrase would be. If they are correct, they get the dollar value added to their point total.

15. Note that it is possible that not all the idiom cards will be played during a 15-minute instruction group. Staff should make note of the idioms discussed and reviewed each session. Future sessions should cover idioms from the list that were not taught/reviewed on the list of idioms. Additionally, idiom that are not covered in the instruction groups can still be introduced and reviewed during TAs.

Monitoring Behavior during SIGs

As described in the Behavior System section below, the staff should award points to each child whenever he/she displays any newly or previously taught skill or complies with an instruction. Staff should provide high rates of social reinforcement whenever the children exhibit pro-social behaviors not taught in the SIGs. Staff feedback to the children should be specific to the action observed. If necessary, staff should provide instructional prompts to help the child with the activity. The clinicians should respond briefly and matter-of-factly whenever a child engages in inappropriate behaviors. The clinicians should identify and inform the child of any point loss due to inappropriate behaviors as per the response cost system describe below (see Behavioral System section below). Staff should ensure that children remain actively engaged in the activity. If a child were not actively participating, he/she would lose points per the response cost system described in the Behavior System section below.

Generalization of Skills beyond the SIGs

To ensure that the group members use the taught social, emotion recognition, and interpretation of non-literal language skills outside of the SIGs, as detailed in the Behavior System section below, each participant can earn points four using new and previously taught skills throughout the MAXout program. Additionally, each child will have at least one social target on his/her Individualized Daily Note. As the program is implemented, a list of skills taught will be displayed in the child's treatment room and serves as a reminder for the children to use the skills. The group clinicians are responsible for notifying parents at dismissal what skills their child learned during each session. Lastly, at the first parent education session, the parents or caregiver receives a list of skills taught and the dates each skill is taught during the program.

SIG Fidelity

To monitor accurate implementation of the SIGs, the MAXout supervisor completes one fidelity observations for every five social skill SIG sessions using a standardized checklist (Skill Instruction Group Fidelity Sheet dependent upon the instruction group being held (social skills; emotion recognition; interpretation of nonliteral language). For further information about fidelity, see Treatment Fidelity section below.

THERAPEUTIC ACTIVITIES

Frequency and duration of groups: Two 30-minute therapeutic activities per each 90-minute session totaling 72 therapeutic activities during MAXout.

Group parameters: Each therapeutic activity group contains 4 children although multiple groups can be combined for some of the therapeutic activities.

Facilitator(s): Two group clinicians conduct each group according to the procedures described below. The clinicians alternate between being the lead and the support clinician. If combining with another group for a therapeutic activity, the clinicians will share roles with each other.

Group composition: The groups are composed of four children who present with ASD without ID ages 7-12 years old.

Fidelity monitoring: The MAXout supervisor monitors the group clinician's adherence to the implementation of the therapeutic activities once every five TA sessions via the Therapeutic Activity Fidelity Sheet. Fidelity sheets are provided in Appendix A.

TAs are conducted for the children to practice and maintain the skills taught during skill instruction groups, as well as reduce ASD symptoms. Using direct instruction, modeling, repeated practice, feedback, and transfer of learning, TAs target social skills, face-emotion recognition skills, nonliteral language skills, and interest expansion. For TAs targeting taught social skills, the children engage in cooperative activities with their peers that require them to directly or indirectly use targeted social/social-communication skills. For face-emotion recognition TAs, the children participate in activities where they decode basic facial expressions, display requested facial expressions with their peers and staff, and decode other's expressions in a video and in vivo. Throughout these activities, the children are required to use facial expressions during social interactions and are made aware of the association between expressions and physiological states. TAs targeting nonliteral language skills involve games/exercises in which the children practice identifying and deciphering nonliteral language. In these activities, the children initially evaluate whether a phrase/statement was intended to be interpreted literally. If not, they generate other possible meanings using contextual information, select the best option, and receive feedback. Interest expansion TAs seek to increase the children's interest and participation in activities and topics outside their narrow interests. During these TAs, the children work together to explore novel topics and the interests of others in the group. They then share the information they learned with their group and identified social situations in which they might use the new information. Each TA has a defined purpose with objectives for teaching and reinforcing an identified skill. Each activity also includes a description of the activity, materials needed, and procedures for running the activity (see Appendix D). The TAs that can be conducted in MAXout include the following:

Balloon Volleyball	Four Square (Cooperative)	Self Portrait
Blind Fold/Obstacle Landing	Freeze Tag Emotions	Shore to Shore
Board Games	Group Island	Sports Games
Catch Me if You Can	Group Loop	Steal and Translate the Bacon
Computer Grab-bag (Team)	Hula Hoop Relay	Stranded on an Island
Computer Self-Peer (Book)	Human Wagon Train	Team Pictionary
Crab Soccer	If My Friends and I Were Animals	Three-legged Race
Don't Break the Egg	Mother May I	Trust Fall
Doubles Four Square	One-Handed Construction	Truth?
Expression Paintings	Peer Collage	T-Shirt Art
Faces Collage	People Builder	Video Facial Recognition
Faces Concentration	Scavenger Hunt Collage	What Does Jack Like?
Facial Emotion Bingo	Self-Collage	Who Are You?
Facial Pictionary		

A list of TAs to use with each of the skills taught during the SIGs in MAXout is in Appendix E. Most of the TAs are conducted within the group of four children but some TAs can be conducted by combining with other groups participating in MAXout. Whatever the group makeup, it is the responsibility of the group clinicians to make sure that participants of the group they are responsible for demonstrate the specific skills being practiced during the activity.

The location of where the TAs are conducted is dependent upon the group size, availability of space and specific activity being conducted. Staff must consider the season and availability of outdoor and larger spaces for those activities that involve gross-motor actions and require open space. Staff should also identify alternative activities in the case of inclement weather on the day of a scheduled outdoor activity.

Prior to running an activity, the clinicians should:

1. Know the skill being taught and/or practiced in the activity.

2. Be aware of all other prior skills that have been taught to date.

3. Know the objectives of the activity.

4. Have all the materials needed to run the activity.

5. Know where the activity is to occur and have the space prepared.

6. Know how to run the activity.

Each therapeutic activity session adheres to the following format:

1. **Review Group Rules**.

   The lead clinician reviews the following rules:

a) Be actively involved

b) Stay in seat/area

c) Use the materials correctly

d) Follow rules of the specific activity conducted during the TA.

2. **Introduce the Activity and Identify Social Skills to be used**.

a) The lead clinician provides a brief introduction of what the children will be doing and the object of the activity.

b) The lead clinician discusses with the children the skills targeted during the activity and how he/she can use previously taught skills in the activity.

3. **Set-up TA**.

a) The lead clinician describes the instructions for the activity and models, if necessary, how to do the activity.

b) The lead clinician assigns positions and/or placements as necessary for the activity.

Note that the completion of the first three steps should be completed in 2-4 minutes.

4. **Run the TA**.

a) The lead clinician tells the children to begin the activity.

b) Throughout the activity, the clinicians remain aware of their proximity to the children. This ensures that the clinicians monitor the children's use of the skills taught. The staff should spread out in the space so that they are equally distributed amongst the children participating in the activity. The nature of the TAs promotes multiple opportunities for the children to exhibit the skills, so it is important to reinforce the children frequently and provide corrective feedback when necessary.

c) As described in the Behavior System section below, the staff award points to each child whenever he/she displays any previously taught skill form the SIGs during the TA or complies with an instruction. Staff provide high rates of social reinforcement whenever the children exhibit pro-social behaviors not taught in the SIGs.

d) Staff feedback to the children is specific to the action observed. If necessary, staff provide instructional prompts to help the children with the activity.

e) The clinicians respond briefly and matter-of-factly whenever a child engages in inappropriate behaviors. The clinicians should identify and inform the child of any point loss

due to inappropriate behaviors as per the response cost system describe below (see Behavioral System section below).

f) Staff should ensure that children remain actively engaged in the activity. If a child is not actively participating, he/she would lose points per the response cost system described in the Behavior System section below.

5. **Debrief the Group.**

Following completion of the activity, the lead clinician conducts a quick debriefing (2-3 minutes). First, staff quickly reviews the activity rules (see Step 1) and then has the group members:

a) Identify positive events from the activity. Specifically, the lead clinician asks, "What went well during the activity?" and "What did we learn?"

b) Discuss negative events from the activity. Specifically, the lead clinician asks, "What needs to be improved?"

c) Discuss how they can use the target skill in other activities. The lead clinician asks, "How can we use the skills taught in future MAXout activities, at home, or in school?"

Note that while this debriefing should be quick, the lead clinician must ensure that the group members' responses provide specific descriptions or examples.

For a demonstration of a TA of "Don't Break the Egg" go to www.canisius.edu/MAXout.

While each TA lesson plan identifies what materials are needed to run the activity, a master list of what materials are needed to run each TA can be found in Appendix F. Group clinicians may find it helpful to store all the TA materials in a large bin in the space in which the TAs are done.

Therapeutic Activity Fidelity

To monitor implementation of the therapeutic activities, the MAXout supervisor completes one fidelity observation of a TA once every five sessions using a standardized checklist (Therapeutic Activity Fidelity Sheet). For further information about TA fidelity, see Treatment Fidelity section below.

BEHAVIORAL SYSTEM

Frequency and/or duration: The token economy and response cost system and the Individual Daily Note (IDN) are administered continually across the school day.

Group parameters: The point system and IDN are administered in all settings regardless of the number of children or composition of the group.

Facilitator(s): The group clinicians are responsible for implementing the behavioral system.

Group composition: The groups are composed of four children who present with ASD without ID ages 7-12 years old.

Outcomes: The group clinicians record and track points earned and lost for each child with the token economy and response cost system as well as performance on IDN targets for each session. Points earned by each child determine if he/she earns weekly home reinforcer and IDN performance determines if the child earns a session and a home reward.

A behavioral system that includes a token economy and response-cost procedures and an IDN are used in MAXout to strengthen and maintain newly acquired social skills and social behaviors, while reducing behaviors that inhibit social interactions. The basic orientation of MAXout is based on the assumption of an acquisition deficit. Specifically, it is assumed that the cause of the children's social and behavioral difficulties is a lack of skills and abilities necessary for successful social interaction. This is in accordance with the core and associated features of ASD. Use of clearly delineated rules, reinforcement, response cost, and other behavioral techniques are also considered appropriate for strengthening newly acquired skills and reducing problem behaviors within the SIGs and across the TAs.

The token economy and response-cost system addresses a set of common skills and ASD symptoms and program rules. Points are verbally awarded whenever a participant adheres to operationally-defined rules, follows directions, and/or demonstrates newly or previously taught skills (social, facial emotion decoding, or nonliteral language skills). Points are withdrawn for violating a group rule, not following directions, or exhibiting operationally defined ASD-related behavior (lack of eye contact, run-on communication, sharing irrelevant information, etc.). The clinician not leading the SIGs or the TAs, records points earned and lost for each interval on the MAXout point sheet (see Appendix G). Children receive brief feedback every 15 minutes on his/her performance during the preceding interval. Each child earns a home reward at the end of each week for reaching his/her weekly response-cost point target.

Using a standardized template, the IDN targets two to four operationally defined behaviors or skills unique for each participant. The clinicians provide feedback to each child at the middle and end of each 90-minute session on his/her IDN performance. Each child can earn an on-site reinforcer (e.g., edible snack) and parent-provided reinforcer (desired activity/tangible item) at home for achieving his/her IDN target level for that given session. The IDN also serves as a critical means of communication between the program and home on identified social and behavioral targets. Both the response cost system and

the IDN serve as a means to monitor the performance of each participant as they progress in their social and behavioral development.

The following provides the specific implementation procedures for the token economy and response-cost system and the IDN.

Token Economy and Response-Cost System

Children in **MAXout** are monitored and reinforced in each 15-minute interval of each 90-minute MAXout session. Prior to the start of each SIG and TA, a staff member reviews the program rules. Throughout the treatment cycles, the children are monitored for their adherence to following these rules and clinician instructions and for displaying taught social, emotion recognition, and interpreting non-literal language skills as well as their engaging in poor social/social-communication behaviors. Each treatment cycle will be divided up into three 15-minute intervals. Each interval, children earn points for their exhibiting positive category behaviors and lose points for exhibiting negative category behaviors. Points earned and lost in each interval are recorded on the MAXout point sheet (see Appendix G). The positive and negative category behaviors are as follows:

Positive Category Behaviors

A. Adheres to Program Rules (+50 points)

Throughout the program interval, the child adheres to the following program rules:

1. Be actively involved in the activity.

2. Stay in seat or area required for the activity (i.e., if doing an interest expansion activity on the computer, the child must be sitting at the table where the activity is occurring.

3. Use the materials as prescribed by the activity.

4. Follow the specific rules of the activity (SIGs or TAs).

    a) For SIGs and group discussions during TAs, the specific rules are:
        i. Speak so others hear you clearly
        ii. Raise your hand to speak

    b) For the TAs, the specific rules are dependent upon the activity (e.g., For board games, then must follow the specific rules of the board game(s) they are playing; for Group Island, the rules are specified by the clinician running the activity as per the lesson plan for that TA)

Note that each violation of any of these four rules are recorded in the corresponding Negative Categories section of the point sheet (see below). To earn the 50 points for an interval, a child may not have any rule violations during the corresponding interval.

The four main program rules are displayed on a large flip chart/white board/chalkboard in the treatment room/space across the session. In this way, group behavioral expectations are consistent.

B. Friendship Skills Bonus (+50 points per each interval)

The child exhibits at least three instances any of the "Skills Taught in SIGs" (see definition below) and has not lost points for the display of any of the seven Poor Friendship Behaviors (listed below in Negative Category Behaviors section) during the corresponding interval.

C. Exhibits Skill Taught in SIGs (+10 points per occurrence)

The child exhibits one of the following:

1. A social skill that has been taught in the SIGs teaching social skills;

2. The correct meaning of an idiom when asked by a staff clinician;

   OR

3. A socially appropriate facial expression (prompted or unprompted) that matches the context.

Note that for the child to earn points for exhibiting a social skill, it must have been taught. If the child exhibits a social skill that has not been taught yet in the SIGs for social skills, he/she would receive social reinforcement but not earn points for exhibiting the skill. Children would not earn points for correctly defining an idiom until after the first SIG on teaching interpretation of non-literal language skills and would not earn points for making a facial expression until after the first SIG is held in session six on face and emotion recognition. Staff clinicians will provide social reinforcement for a child's display of socially appropriate facial expressions and decoding of idioms prior to it being taught.

Note that some of the social skills taught from the *Skillstreaming* curriculum deal with emotion recognition skills in social situations (e.g., expressing your feelings, recognizing another's feelings, showing understanding of another's feelings, etc.) and a child can earn points for displaying these skills after they are taught in the SIGs.

D. Follows Instructions (+20 points per each occurrence)

The child completes a task requested by a staff member within five to ten seconds of the instruction given by a staff clinician.

When clinicians are giving instructions to the child/children, it is very important that prior to giving the instruction, the clinician should know exactly what it is he/she wants the child to do in clear, simple, and specific language, have the child's/children's attention, and be ready to follow through if the child complies or fails to comply. See protocol below for failing to comply with repeated instruction and the use of time-out.

<u>Negative Category Behaviors</u>

A. Not Following Instructions (-20 points per occurrence)

The child fails to complete a task within five seconds or within a time period specified by a staff member.

B. Violates Program Rules (-10 points per each occurrence)

Violates rules of specific activity - The child fails to follow rules of the specific activity being conducted as defined by the clinician(s) at the start of the activity

Not active in the group activity – The child fails to take part in the ongoing activity.

Uses materials in a way in which they were not intended to be used – The child uses or manipulates and object in a way that is contrary to its use for the ongoing activity.

Out of seat/area – The child is out of his/her assigned seat or area defined by staff for the activity being conducted.

C. Poor Friendship Skills (point deduction dependent on behavior)

Violates space of others (-10 points) - The child intrudes on another's personal space such that the person's movement is constrained.

Violates space of others that results in harm (-25 points) - The child exhibits any physical behavior towards another peer or staff member that constrains a person's movement and/or causes harm or injury to the person.

Poor eye contact (-10 points) – The child fails to look at the staff clinician who states the child's name just prior to the staff clinician giving the child feedback (e.g., point reviews) or the child fails to maintain appropriate eye contact when speaking or when being spoken to during a discussion or conversation with another person. To be judged appropriate one must not be looking away for more than 10 seconds during a discussion or conversation.

Interruption (-10 points) - The child disrupts an ongoing activity with behaviors that result in the ongoing activity having to be stopped unnecessarily or which pull staff's or other peer's attention away from the ongoing activity unnecessarily.

Negative comments (-10 points) – The child inappropriately exhibits verbal or nonverbal behavior about his/her preference or dissatisfaction with an event or action.

Sharing irrelevant information (-10 points) – The child contributes information to a conversation that is unrelated and meaningless to the topic of the conversation.

Run-on communication (-10 points) - The child provides information to a communication with another peer or staff member that is beyond what would typically be considered necessary or appropriate to convey the information he/she is communicating.

Monitoring and Recording Positive and Negative Category Behaviors during an Interval

Staff clinicians quickly and efficiently provide feedback to each child whenever he/she engages in a positive or negative category behavior as defined above during each 15-minute interval. If both clinicians observe a behavior, only one clinician (most likely the one closest to the child or the one interacting with the child) would provide the feedback.

For positive category behaviors, whenever a child follows an instruction or exhibits a skill taught in a SIG, the clinician must identify the specific behavior and the points earned for exhibiting that behavior. For example, "Marty you earn 20 points for doing what I asked." or "Jerome and Sue, you both earn 10 points for having a conversation." For following directions, the child should not receive points for following directions until he/she has completed the instruction. In addition, to identifying and reinforcing point earning behaviors, staff should also provide frequent verbal and non-verbal praise and encouragement for all appropriate efforts and pro-social behaviors that have not been taught yet or are not part of the point system.

For negative category behaviors, if a child fails to follow an instruction, violates any of the program rules, or exhibits one of the poor friendship skills, then the staff should immediately inform the child regarding his/her exhibition of a negative category behavior. Specifically, in a matter-of-fact tone of voice, the clinician would inform the child of the point loss for not following an instruction, violating a specific rule, or engaging in a specific poor friendship skill behavior. For example, "Seth, you lose 20 points for not doing what I ask," or "Lamar you lose 10 points for bringing up irrelevant information. We are talking about the art activity," or "Sebastian, you lost 10 points for not being active in the group, we are looking for pictures of our partner's favorite things." This feedback should be very short and specific. Staff should not get into a dialogue with the child on why the rule was broken or the behavior was inappropriate.

If a child repeatedly fails to follow an instruction or violates another's personal space such that he/she causes harm, staff will follow the sequence described in the section on time-out below.

It is possible that more than one child may exhibit a positive or negative category behavior at the same time. For these times, staff can let all the children know of their engaging in the positive category or negative category behavior and the respective points earned or lost. For example, "Maurice, Seth, and Austin, you each earn 10 points for following my instruction to line up." The clinician should make sure that each child heard of his/her point earning or loss.

For all positive and negative category behaviors that are identified, the staff clinician must make sure that the points earned or lost are recorded via a tally on the point sheet in the corresponding behavior for that interval. The clinician who is not leading the SIG or the TA is responsible for recording the points earned and lost during the interval on the point sheet.

Point Sheet Recording

Staff records all the points each child earns and loses in each 90-minute session on the MAXout point sheet. Each MAXout session consists of two 45-minute cycles. Each cycle includes a 15-minute SIG followed by a 30-minute TA to practice the skill taught in that cycle. Two skills are taught in each session, one skill per cycle. For point recording, each 90-minute session is divided into six 15-minute

intervals. The two 30-minute TAs are each divided into two 15-minute intervals. The intervals are as follows:

				Interval Designation
Interval 1	Cycle 1	SIG	Cycle 1 skill taught	SIG 1
Interval 2		TA	Cycle 1 skill practiced 1st 15 minutes	TA 1A
Interval 3		TA	Cycle 1 skill practiced 2nd 15 minutes	TA 1B
Interval 4	Cycle 2	SIG	Cycle 2 skill taught	SIG 2
Interval 5		TA	Cycle 2 skill practiced 1st 15 minutes	TA 2A
Interval 6		TA	Cycle 2 skill practiced 2nd 15 minutes	TA 2B

Each session's point sheet data (all six intervals) is recorded on one 8½ x14 MAXout point sheet. At the top left hand corner of the point sheet, staff record the session number and date of the session as well as the two skills (Cycle 1 Skill and Cycle 2 skill) that are to be taught that session (see Figure 1). In the first column of the point sheet are the positive and negative category behaviors that the children can earn and lose points for respectively. The remaining columns of the point sheet are divided into six blocks corresponding to each interval. Each of these blocks is divided into four columns. At the top of each of the six blocks, staff will record the interval (e.g., SIG 1, TA 1A, etc.) and the first names of each of the four children in the group in one of the four columns. The first block is for the first interval (SIG 1), the second block is for the second interval (TA 1A), and so on (see Figure 1).

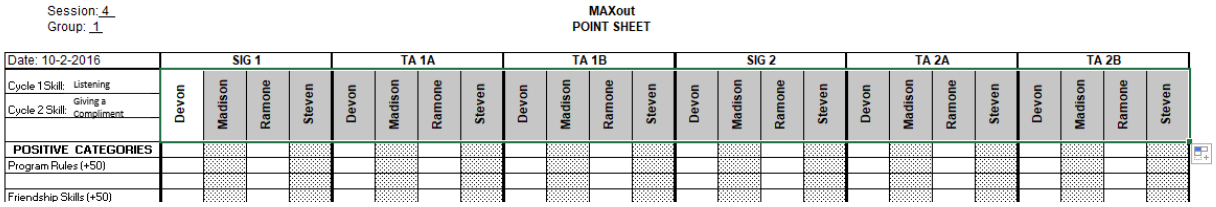

Figure 1. Completing point sheet session info, interval headers, and child participants

During the interval, the clinician records tallies to designate each instance a child exhibited the specific positive or negative category behaviors during that interval. For example, during SIG A, if a clinician informs Ramone that he lost 10 points for interrupting, then the clinician recording the points earned and lost, would record a tally in Ramone's column in the cell corresponding to interrupting (see Figure 2).

Whenever a staff clinician informs the child of his/her earning or losing points, the staff clinician must make sure the behaviors are tallied on the point sheet. The clinician not leading the SIGs or the TAs, is responsible for recording points earned and lost for each interval on the MAXout point sheet.

Note that for the positive categories of Adhering to Program Rules and Exhibits Friendship Skills, instead of a tally, staff would record a "+50" or a "0" if the child met or failed to meet respectively, the criteria for those two behaviors at the end of the interval. For example, to earn the Friendship Skills Bonus of 50 points, the child has to have at least three instances of displaying a taught skill from a SIG and cannot have lost points for the display of any Poor Friendship Behaviors. If a child has four instances of using

taught skills but lost points for a poor social behavior (e.g., run-on communication) during the interval, then this child could not earn the 50 points for the Friendship Skills Bonus for that interval. Staff would record a "0" in the child's Friendship Skill Bonus cell. Even though the child fails to earn the bonus during that interval, he/she still receives 40 points (4 instances x 10 pts./each) that he/she earned for exhibiting four SIG skills during the interval.

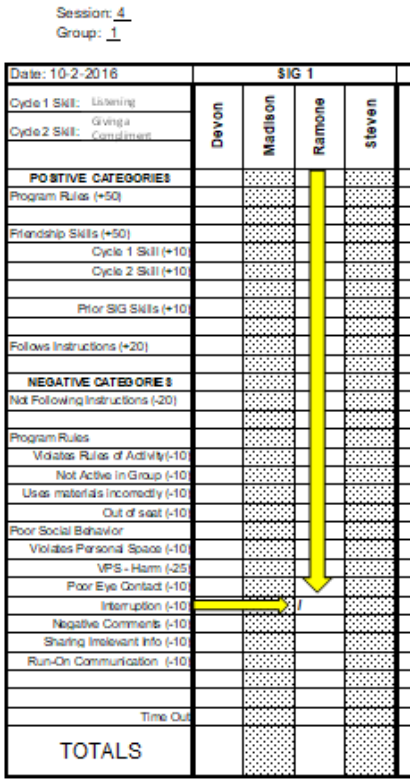

Figure 2. Recording tally for point loss example.

Point Reviews

Each child's points earned and lost in an interval are recorded on the session point sheet. At the end of each interval, the clinician responsible for recording the points for the interval announces a point review. When a point review is called, the staff and the children must stop what they are doing and attend to the clinician on the point sheet. This clinician will quickly add up all the points each child earned and lost for that interval (see Figure 3). This clinician will state one child's name and announce his/her points earned and lost for that interval. For each child's review, the clinician will do the following (in this order):

1. State whether the child earned the 50 point bonus for Following Program Rules. If the child earned the 50 points (no rule violations that point interval, he/she would be told that he/she earned 50 point bonus for Following Activity Rules. If the child did not earn the 50 points for Following Program Rules that interval, the clinician informs the child that "he/she did not earn 50 points for Following Program Rules, because he/she lost points for _____." Here the clinician would identify what specific rules were violated. For example, "Madison, you did not

earn 50 point bonus for Following Program Rules, because you lost 10 points for not being actively involved and 10 points for not using materials correctly."

2. State whether the child earned 50 points for the Friendship Skill Bonus. If the child earned the 50 points (at least three instances of using SIG skills and no displays of poor social behavior) for that point interval. The child will be told that he/she earned 50 points for the Friendship Skills bonus. If the child did not earn the 50-point bonus for Friendship Skills that interval, the clinician informs the child that "he/she did not earn 50 points for Friendship Skills, because he/she lost points for _____." Here the clinician would identify what specific poor social behaviors were exhibited. For example, "Ramone, you did not earn 50 point bonus for Friendship Skills, because you lost 10 points for interrupting" or "Steven, you did not earn 50 point bonus for Friendship Skills, because you lost 10 points for not making eye contact and you only used two taught social skills this interval."

3. Disclose how many points lost and earned for following instructions. For example, "Steven you lost 20 points for not following instructions but you earned 120 points for following instructions."

4. Report on points earned that interval for exhibiting Cycle 1 skill of the session, Cycle 2 skill of the session, and any prior taught Skill Instruction Group Skills. For example, "Madison you earned 20 points for using today's first skill we learned of listening and you earned another 40 points for using prior social skills. That's 60 points for using social skills! Nice work."

Session: 4
Group: 1

Date: 10-2-2016	SIG 1			
Cycle 1 Skill: Listening Cycle 2 Skill: Giving a Compliment	Devon	Madison	Ramone	Steven
POSITIVE CATEGORIES				
Program Rules (+50)	50	0	50	50
Friendship Skills (+50)	50	50	0	0
Cycle 1 Skill (+10)	I	II	II	
Cycle 2 Skill (+10)				
Prior SIG Skills (+10)	III	IIII	II	0
Follows Instructions (+20)	III	IIII	III	0
NEGATIVE CATEGORIES				
Not Following Instructions (-20)				0
Program Rules				
Violates Rules of Activity (-10)				
Not Active in Group (-10)		I		
Uses materials incorrectly (-10)		I		
Out of seat (-10)				
Poor Social Behavior				
Violates Personal Space (-10)				
VPS - Harm (-25)				
Poor Eye Contact (-10)				0
Interruption (-10)			I	
Negative Comments (-10)				
Sharing Irrelevant Info (-10)				
Run-On Communication (-10)				
Time Out				
TOTALS	220	170	140	160

Figure 3. Adding up point sheet for an interval

After completing one child's points earned and loss for the interval, the staff member would announce another child's name in the group and report his/her point totals for the interval. Note that the clinician reviewing the points will place themselves in front of the group where he/she can see all the children. When a child's name is called for the point review, if that child fails to look at the clinician, then he/she would lose 10 points for not making eye contact. Note that any points earned or lost after a point review is called would be recorded on the next interval. The other clinician who is not reviewing point totals would record these new points earned and lost on either the whiteboard/chalkboard or a sheet. At the end of the point review, these new points are recorded in the interval starting after the point review.

The point review for each child should be quick and not last more than 3 minutes total. If a child disagrees with a point review call or total, the staff clinician should not get into a discussion about the point totals. If a clinician makes an error, they can correct it and inform the child at an appropriate time after the review. The clinician reviewing point totals, should end each child's point review on the positive social behaviors and points each child earned.

Monitoring Ongoing Point System Progress across Weeks

In order to evaluate each child's progress with the point system across sessions, the group clinicians complete the MAXout Point Sheet Weekly Summary Form (see Appendix H) for each child. This form summarizes session point totals for both positive and negative category behaviors and session point totals as well as weekly point totals for each child. The MAXout supervisor in collaboration with the two clinicians in a group review and compare each child's weekly point totals to the previous week's totals to determine if the child is making progress and earns the weekly reward (see Weekly Reward section below). This summary sheet also provides information that will help the MAXout supervisor and group clinicians determine possible IDN targets (see IDN section below).

For the 18-week program, each child will have one MAXout Point Sheet Weekly Summary Form for each week of the program. Within each week, there are two sessions held. At the end of each session that week (1st weekly session or 2nd weekly session), one of the group clinicians enters session points earned and lost onto this summary form. To complete a MAXout Point Sheet Weekly Summary Form, the group clinicians do the following:

1. Enter the child's name, his/her group, and the week of the program.

2. Calculate how many points the child earned and lost for each positive and negative category behavior per interval (i.e., SIG 1, TA IA, TA 1B, etc.) for the weekly session.

3. Transfer these specific positive and negative category behavior point totals to the summary form in the corresponding intervals of the specific weekly session that they were earned or lost. For example, for exhibiting Cycle 1 Skill, Mason earned 10 points in SIG 1, 20 points in TA 1A, 20 points in TA 1B, 20 points in SIG 2, 20 points in TA 2A, 20 points in TA 2B (see Figure 4).

4. Calculate the session total for each positive and negative category behavior across all six intervals of that session. For example, as seen in Figure 4, across all intervals of the session, for positive category behaviors, Mason earned 200 for program rules, 250 points for Friendship Skills, 100 points for Cycle 1 Skill, no points for Cycle 2 skill (it had not been taught yet), 180

points for prior social skills and 420 points for following instructions. This would be done in the same way for the negative category behaviors.

5. Calculate the positive category total (cell A on the sheet) by adding up the positive session point totals for each positive category behavior. In the example in Figure 4, this total would be 1,150 points.

6. Calculate the negative category total (cell C on the sheet) by adding up the negative session point totals for each positive category behavior. In the example in Figure 4, this total would be negative 120 points.

MAXout Point Sheet Weekly Summary

Child: Mason Group: Minecrafters Week #: 3

	1st Weekly Session							2nd Weekly Session							Weekly Totals
	BIO 1	TA 1A	TA 1B	BIO 2	TA 2A	TA 2B	Session Total	BIO 1	TA 1A	TA 1B	BIO 2	TA 2A	TA 2B	Session Total	
POSITIVE															
Program Rules	50	50	0	50	0	50	200								
Friendship Skills	50	50	50	50	0	50	250								
Cycle 1 Skill	10	20	10	20	20	20	100								
Cycle 2 Skill	0	0	0	0	0	0	0								
Prior Taught Skills	20	30	40	10	30	50	180								
Follows Instructions	60	80	100	40	60	80	420								
							Positive Category Total (A) 1150							Positive Category Total (B)	Wkly Positive Category (A+B)
NEGATIVE															
Not Following Instructions	0	0	-20	0	0	-20	-40								
Program Rules															
Violates Rules of Activity	0	0	-10	0	0	0	-10								
Not Active in Group	0	0	-10	0	0	0	-10								
Uses Materials Incorrectly	0	0	0	0	-20	0	-20								
Out of seat	0	0	0	0	0	0	0								
Poor Social Behaviors															
Violates Persona; Space	0	0	0	0	0	0	0								
VPS - Harm	0	0	0	0	0	0	0								
Poor Eye Contact	0	0	0	0	0	0	0								
Interruption	0	0	0	0	0	0	0								
Negative Comments	0	0	0	0	0	0	0								
Sharing Irrelevant Info	0	0	0	0	-30	0	-30								
Run-On Communication	0	0	0	0	-10	0	-10								
							Negative Category Total (C) -120							Negative Category Total (D)	Wkly Negative Category (C+D)
							1st Weekly Session Total (A+C) 1030							2nd Weekly Session Total (B+D)	Weekly Grand Total (A+C)+(B+D)

Figure 4. MAXout Point Sheet Weekly Summary Example

7. Sum the positive and negative category point totals for the sessions (cell A = cell C) to determine the overall total for that session. In the example in Figure 4, this point total would be 1,030 points ([1,150] + [-120] = 1030).

8. Repeat steps 1-7 for entering the data for the second weekly session held that week.

9. Calculate the weekly totals by adding the session totals for each positive and negative category behaviors.

10. Calculate the Weekly Positive Category point total by adding the Positive Category Total for the first weekly session (cell A) and the Positive Category Total for the second weekly session (cell B).

11. Calculate the weekly Negative Category point total by adding the Negative Category Total for the first weekly session (cell C) and the Negative Category Total for the second weekly session (cell D).

12. Calculate the Weekly Grand Total by adding the 1st Weekly Session Total (cell A+C) and the 2nd Weekly Session Total (cell B+D).

This summary sheet allows the supervisor and the group clinicians to examine how each child is doing across all positive and negative category behaviors each week and to determine if a child earns the weekly reward.

Weekly Reward

The points a child earns in the program determine whether the child earns a weekly home reward from his/her parent/caregiver. Specifically, each week the total number of points the child earns during the two weekly sessions are compared to the number of points the child earned in the previous week's two sessions. To earn the weekly reward, the child must have demonstrated a 2.5% improvement in his/her point totals for the two sessions that week compared to the point totals for the two sessions held during the previous week. The group clinicians use the MAXout Point Sheet Weekly Summary form to determine if a child demonstrates the 2.5% improvement by comparing the Weekly Grand Totals from the current week to the previous week.

For the first week of the program, the children automatically receive the weekly reward in order to show the children the points they earn allows them to access a preferred item or activity from their parents/caregivers at home. Note during the first week, the children are not told that they will earn the home reward that week. Instead, they are told (when the point system is described to them during the first session) that the more points they earn each week (in two sessions), the better their chances are to earn a weekly reward.

Regarding the 2.5% improvement required to earn the weekly reward, it is possible in some weeks that a child just misses the cut-off point but upon review of the child's points earned that week, the clinicians see a decreased number of negative category behaviors that coincide with stable levels of prosocial behaviors. In these cases, the clinicians with the supervisor may make the clinical decision to allow the child that just missed the 2.5% criteria to be allowed to earn the weekly reward that week. The team may have determined that the child was trying to engage in the skills but the newer skills were harder for the child to grasp and the child needs more time and practice to use the new skills. When these decisions are made, the clinicians should document such decisions. Clinicians should be wary of making this exception over consecutive weeks for one child as the program is set up to provide children support, prompts, and practice for newly taught skills that may be difficult for the child initially.

To help the children visualize how the points they earn may give them access to a weekly reward and how close they are to reaching their reward, a weekly point thermometer (see Appendix I) for each child is hung on the wall in the classroom. Each point thermometer has that child's unique point expectation for the week written at the top along with the point expectation for the first program session of the week written at the halfway point. (Note that the value of the point total written at the top of the point thermometer should be 2.5% higher than the previous week's total, and the point total written at the half-point of the point thermometer should be equal to half of that value.) At the end of the first session of the week, the clinicians color in each child's point thermometer to best approximate the total number of points that child earned for the session. For example, if a child needed to earn 800 points for the first session of the week, and he earned 760, the clinician would color in the point thermometer for that child until just shy of the halfway total. Note that if a child exceeds his/her point expectation for the session, the clinicians should not color in the point thermometer beyond the halfway total. This is to prevent the child from using less social skills the next session because he sees that he is ahead of expectations. Prior to the start of the second session each week, each child should be shown his/her point thermometer to help them see how close they are to reaching their reward and to motivate them to earn points for that session. At the conclusion of the second session, if the child has reached his/her goal, the clinicians should fill in the remainder of the point thermometer and praise the child for reaching his/her goal. If a child did not reach his/her goal, the point thermometer should be filled short of the target goal and used to help explain why the child did not earn his/her weekly reward. To help increase children's' motivation and excitement about filling their point thermometer, clinicians are encouraged to decorate each child's point thermometer with drawings or stickers related to the classroom theme or the child's unique interests. The reward the child is working to earn could also be drawn or written at the top of the thermometer.

The weekly reward is given by the child's parents or caregiver after the second session of the week. The reinforcer provided by the parents/caregivers should consist of something the child does not have access to unless he/she meets the weekly criteria. Examples of possible reinforcers include but are not limited to child receiving 45-90 minutes screen time (e.g., smartphone, iPad, Xbox) over weekend, picking movie (family activity), getting extra hour bedtime, picking family dinner, or earning points for game or app. For any reinforcer to be influential and have value, the child must not have access to it unless he/she earns reaches his/her point goal for the week. Parents learn how to pick and implement weekly reinforcers in the parent education sessions. The parents/caregivers are responsible for notifying their child's clinicians what their child is working for his/her weekly reward.

If the child does not earn the weekly reward, the clinician would matter-of-factly tell the child that they did not earn the weekly reward for that week and remind him/her that he/she can try again for next week. The child would also not receive his weekly home reward.

Use of Time-Out

In addition to the token system and response cost procedures, MAXout employs time-out procedures whenever a child engages in one of the following two behaviors:

1. Failing to follow an adult instruction after the instruction has been issued two times in a row.

2. Violating Space of Others that constrains a person's movement and/or causes harm or injury to the person

The purpose of time-out for these two behaviors is to further increase the children's instruction following and reduce or eliminate incidents of not following instructions and a child harming another peer/adult when frustrated or angry. As per time-out procedures, when not engaging in these two behaviors, the children are able to participate in program activities and access reinforcement (time-in). The procedures for implementing time-out for each of these two behaviors are as follows:

A. Time-out for Not Following Adult Instructions

1. Whenever a staff clinician issues an instruction, that clinician must monitor the child to ensure the child follows the instruction within 5-10 seconds or time designated by the clinician.

2. If the child follows the instruction, then the staff member should verbally acknowledge the child's following instructions and give the child 20 points for following instructions.

3. If the child does not follow the instruction, then staff should inform the child that he/she did not follow directions and lost 20 points and if he/she does not follow the instruction, he/she will receive a time-out. Staff must reissue the original instruction. For example, "Mason you lose 20 points for not doing what I asked. If you do not put your markers away, you will get a time-out. Mason, put your markers away."

4. If the child complies with the second issuance of the instruction, then staff should verbally acknowledge the child's following instructions and tell the child that he/she earns 20 points.

5. If the child still does not complete the task instructed within the time specified, then staff would tell the child that he/she has lost another 20 points for failing to follow the staff's instruction and that he/she now has a time-out for failing to follow a repeated instruction. For example, if Mason again fails to put the markers away, then the clinician would state, "Mason you lose another 20 points for not doing what I asked, you now have a time-out." The clinician would then tell the child where he/she would serve the time-out. The time-out area will be off to the side of the activity being conducted by the group. All time-outs are for 2 minutes.

6. The child's time-out does not start until the child is in the designated time-out area, quiet and not exhibiting any negative category behaviors.

7. Once the staff member states that a child is to receive a time-out, the child must serve the time even if the child suddenly starts to complete the action or says that he/she will do it.

8. Once the child is in the time-out area and quiet, the clinician would tell the child, his/her time starts now and would start the timer.

9. If the child exhibits any negative category behavior when given a time-out, staff should ignore such behavior. The child's time-out does not start until the child is quiet and not exhibiting any negative category behavior. Note that it may take a child more than two minutes to be quiet and in the time-out area. The clinician does not add time to a child who is noncompliant or disruptive; instead, the clinician does not start the time-out timer. The clinician would only remind the child that his/her time-out does not start until he/she is in the time-out area, quiet and following the rules.

10. Likewise, if the child displays a negative category behavior after time-out has started then his/her time-out would start over again. Staff would inform the child one time that his time will not start until he is quiet and following the rules. Staff should keep all other communication with the child to a minimum. Staff should always be monitoring the child in time-out.

11. While time-out is only for two minutes, it may take the child more than two minutes to serve 2 minutes due to his/her disruptive behaviors.

12. When a child is serving a time-out, the staff who issued the time-out should still attend to other children engaged in the activity while remaining aware of the child in time-out.

13. When the child has finished serving his/her time-out, the clinician will approach the child and tell him/her that his/her time-out is over. Staff informs the child very matter-of-factly, why he/she was in time-out.

14. Upon the completion of all time-outs issued for not following repeated instructions, the clinician must reissue the original instruction. The clinician would follow the steps beginning with step 1 above.

    a) If the child completes this reissued instruction, then staff should give the child 20 points for following instructions and then he/she should be told to join the group.

    b) If the child fails to comply with the repeated instruction, then staff would tell the child that they lose another 20 points for not following directions and then the clinician would reissue the instruction as per step 3 above. If the child follows this repeated instruction, then staff should give the child 20 points for following instructions and then he/she should be told to join the ongoing activity. If the child fails to comply then the staff would issue a time-out as described above.

B. Time-out for Violating Space of Others that Results in Harm

1. Whenever a child <u>violates space of others that results in harm</u> (as per operational definition above) the child will immediately be told that he/she loses 25 points for violating space that causes harm and that he/she has a time-out.

2. The time-out area will be off to the side of the activity being conducted by the group. All time-outs are for 2 minutes.

3. If the child exhibits any negative category behavior when given a time-out, staff should ignore such behavior. The child's time-out does not start until the child is quiet and not exhibiting any negative category behavior. Note that it may take a child more than two minutes to be quiet and in the time-out area. The clinician does not add time to a child who is noncompliant or disruptive; instead, the clinician does not start the time-out timer. The clinician would only remind the child that his/her time-out does not start until he/she is in the time-out area, quiet and following the rules.

4. Likewise, if the child displays a negative category behavior after time-out has started then his/her time-out would start over again. Staff would inform the child one time that his time will not start until he is quiet and following the rules. Staff should keep all other communication with the child to a minimum. Staff should always be monitoring the child in time-out.

5. While time-out is only for two minutes, it may take the child more than two minutes to serve 2 minutes due to his/her disruptive behaviors.

6. When a child is serving a time-out, the staff who issued the time-out should still attend to other children engaged in the activity while remaining aware of the child in time-out.

7. When the child has finished serving his/her time-out, the clinician will approach the child and tell him/her that his/her time-out is over. Staff informs the child very matter-of-factly, why he/she was in time-out and tells him/her to rejoin the ongoing activity. If the child fails to rejoin the ongoing activity, staff will follow the protocol for issuing instructions.

Any time-out a child receives during an interval is recorded with a tally in the corresponding interval on the MAXout point sheet. Additionally, all time-outs given in the program are documented on the Master Time-out Log Sheet (see Appendix J).

<u>First Session: Introduction of MAXout Program and the Point System and Time-out to the Children</u>

On the first day of the program, during the first cycle, the lead clinician running the first SIG will introduce the token economy and response cost system and the use of time-out. Specifically the lead clinician will do the following:

1. Introduces him/herself and his/her co-clinician to the group.

2. Welcomes everyone to MAXout. He/she explains that in MAXout the children will be engaging in many fun activities that include games, computer tasks, art activities and other cooperative activities. Additionally the children are told that they will learn and practice ways to make friends and will get many opportunities to act out and practice using these skills.

3. Explains that throughout MAXout, the children earn and lose points. Note that as the clinician introduces positive and negative category behaviors, the clinicians can begin to give and take away points.

4. Tells the children the following: Children will earn ten points for using social skills that they are taught in the program. Every session the children will learn two skills. They will earn 10 points for using the skills taught during a session as well as 10 points every time they use skills that have already been taught in prior sessions (known as “prior social skills”).

5. Informs the children that each session is divided into 15-minute blocks and the children will earn a 50-point bonus each interval for following the program rules and not having any program rule violations. The clinician then reviews and demonstrates the specific violations of the program rules and the point loss for each.

6. Informs the children that they will earn a 50-point bonus each interval for displaying at least 3 new or prior taught skills and not having any display of poor friendship skills. The clinician reviews each of the poor friendship skills and the corresponding point loss for displaying a poor friendship skills.

7. Tells the children that they get 20 points every time they follow an instruction from one of the clinicians. They children are then told that they will lose 20 points if they do not follow instructions.

8. Explains the two behaviors that a child will receive a time-out: 1) Not following an adult instruction after the instruction has been given 2 times; and 2) Violating someone's space with intent to harm or intimidate/block them. The clinician will provide a quick demonstration of how time-out will be implemented (see time-out section below). The children are told that the staff will assign where the time-out area is located. Additionally, the clinician tells the children that while the length of time-out is only 2 minutes, it will not start until the child is in the assigned time-out area and quiet.

9. Informs the children that their points are very important and they will be working toward an end of week home reward that their parents will provide each week of the program. They are told that to earn the weekly home reward they have to demonstrate improvement in their point totals from the previous week. The lead clinician shows the weekly thermometer that will be used for each child during the week to show they how they are doing each week toward earning the home reward. Additionally, the children are told that they will have point reviews every 15 minutes during the sessions, to let each child know how they are doing.

Note that this review might take up most of the first SIG of the first cycle and so staff may have to use some of the time of the first TA to run the SIG of introducing yourself.

<u>Daily Review of Child's Session Performance with Child and Parent/Caregiver</u>

At the end of each session, the lead clinician meets with each child and his/her parent/caregiver, one at a time. The children stay in the treatment room with the other group clinician, while the lead clinician calls out one child at a time to conduct this review. The parents/caregivers are instructed in parent training that at dismissal each session they will receive feedback from the lead clinician and their child as to how he/she did that session. Parents are instructed to line up in a designated location outside the treatment room and they will have this feedback session one at a time. Additionally, the parents/caregivers are told that this feedback session will take from 3-5 minutes per child.

For this dismissal review, the lead clinician does the following:

1. Identifies who the first child/parent is to do the review. The clinician calls the child to join him/her and quickly reviews with the child what skills he/she worked on, activities he/she participated in, what he/she did well and what he/she needs to work on. This is a very brief review.

2. Go outside the group room with the child to meet with his/her parent. The clinician ensure the child stands between the clinician and his/her parent when reviewing the child's day.

3. Praise the child for making good eye contact or remind child about eye contact if it is poor during session review.

4. Have the child tell his/her parent/caregiver the skills he/she learned/practiced that session and what activities they did.

5. Starting after the third session, review the child's performance on his/her IDN that session (Note see Page 44 on how the IDN is reviewed with the parent and child).

6. Have the child identify one thing the child did well and one thing the child can work on for next session.

7. Provide the child his/her reward if he/she earns one. Depending upon the session, the reward could be a daily reward, an IDN reward, or a weekly reward.

8. Verbally praise what the child did and does well throughout this discussion and end this child-parent review on something positive.

Individual Daily Note

Given the common problems children with ASD without ID have with generalization and maintenance of skills/behaviors, the IDN is used to prompt, increase, and reinforce newly learned skills, as well as reduce ASD symptoms and problem behaviors across the sessions. The IDN allows the group clinicians to focus on and individualize specific skills and behaviors for each child in their group. Each child's IDN sets performance requirements/criteria specific to the child and identifies how performance feedback is provided. It also promotes shared understanding and communication between the clinicians and home on targeted skills and the system of reinforcement. Lastly, the IDN is used to monitor the child's performance toward skills and behavioral goals.

The IDN consists of two to four operationally defined targets to be monitored across the six intervals of each session. The children are reinforced with tokens/points for meeting specific criteria for each target within each interval of each the session. For example, if the child brings up irrelevant information on average, three times an interval, his target on the IDN would seek to reduce this number to no more than two instances of bringing up irrelevant information during an interval. If the child interrupts two times or less in the interval then he/she would get reinforced with a token/point. Thus the goal in implementing the IDN is to gradually teach the child to exhibit less of the challenging behavior and more pro-social behaviors by reinforcing his/her gradual improvement in meeting the specific targets.

<u>IDN Creation</u>

The procedures for creating an IDN are as follows:

1. **Identify Targets for the IDN.**

   The group clinicians in consultation with the MAXout supervisor determine the specific targets for a child based on observations of the child over the first week of the program and a review of his performance on the token economy and response cost system. The clinicians identify skill

and/or behavioral areas of concern (i.e., skills deficits and behavioral challenges) for each child in the group. After the first two sessions, the clinicians meet to discuss their observations and decide what specific behaviors they want to target. Each target is then operationally defined so they are clear on what behaviors they are monitoring and tracking.

Targets may include behavioral goals (e.g., "Keeps hands and feet to self," "Stays in seat") but at least one of the IDN targets must include social behaviors that are taught in MAXout curriculum (e.g., "Uses self-control," "Has at least 2 conversations," or "Makes eye contact with person talking to").

2. **Establish IDN Intervals to Monitor IDN Targets**.

The two to four targets chosen for each child are monitored during each of the six 15 minute intervals of each session. In addition to targets monitored during each interval of each session, targets may also be added to the IDN that monitor the child's behavior during a specific period of the session such as program arrival, transition, or end of session routine. Examples include "Joins group immediately upon arrival," "Contributes an example during an SIG," or "Participates in end of day review."

3. **Determine Target Baseline Rates**.

With the targets and intervals identified, the team determines the baseline rate at which the targeted behaviors occur across the session as per the following steps:

a) Collect data on the frequency the child engages in the operationally defined target behaviors across the session for the first two sessions of the program.

b) Calculate how often each target behavior occurs per session and the average rate it occurs in a 15-minute interval. For example, the clinicians have identified "staying on topic" as a behavior they want to target. After observing and reviewing the point system data of the child for the first two program days, the clinicians determine that the child was off topic 12 times on the first session and 14 times the second session. This is a total of 26 reminders over the first two session days which averages to 13 reminders per session (i.e. 26 incidents divided by 2 sessions).

c) Calculate the average rate per interval. Divide the average number of incidents per session by the number of intervals per session. Using the example in a) and b) respectively, staff would divide 13 (average number of incidents per session of bringing up irrelevant information) by 6 (number of intervals) to get an average of 2.5 incidents of being off topic during a period.

d) Set performance criteria for each target on IDN. Based on the average rate each behavior occurs per interval, the staff will set the performance criteria for how many reminders the child is allowed per interval for failing to exhibit the target behavior or how many times the child should exhibit the target behavior.

1) For behaviors the clinicians are seeking to reduce, the team should set the criteria as slightly less than the average rate the child presently exhibits the behavior at per interval. For example, if the child averages 2.5 off topic statements per interval, the clinicians would set the criteria for the target "Stays on Topic" to "no more than 2 off topic comments per interval."

2) Similarly, for behaviors the clinicians are is seeking to increase across the session, the team would set the criteria at a slightly higher rate per period. For example, if the child rarely talks to his/her peers, then the criteria could be set as 'having one conversation per interval."

3) If the child exhibits a high rate of an inappropriate behavior across the day during baseline observations such that the average rate of a behavior is over 5 incidents per 15 minute interval, then clinicians may need to consider reducing the length of the interval or breaking the interval into two. For example, clinicians may need to set the interval length to 7½ minutes. In this case, instead of having performance criteria that the child has "no more than 5 interruptions per 15 minute period," the performance criteria would become "no more than 2 interruptions per 7½ minute interval."

Note that the supervisor can assist clinicians in generating operational definitions of the target behaviors/skills, assess baseline rates, and determine appropriate criteria for goals. All targets chosen should be clearly stated in language the clinicians and the child understand and include clearly delineated performance criteria. See Appendix K for IDN examples and Appendix L for IDN Blank Templates.

Clinicians should be vigilant for opportunities for the child to engage in the desired social behavior in every interval. If there is not an opportunity, the child should not be penalized for failure to exhibit a behavior he/she does not have the opportunity to engage in. In these instances, staff will record "not applicable" for that specific interval.

After the IDN is finalized, the lead clinician shares the IDN with the parents/caregivers of the child. The clinician will review how each child did with his/her parents/caregivers at the end of each session and the parent/caregiver will be responsible for providing a home reinforcer if the child earns at least 70% of his/her YESES. The specifics for the parents' responsibilities are covered in the Parent Education Section below.

<u>IDN Implementation</u>

On the first session that the IDN is introduced, one of the group clinicians reviews with each child his/her IDN. This should be done when the children arrive for the program and before the session starts if possible. The IDN is first implemented in the third session of the MAXout program.

The procedures for implementing the IDN during MAXout are as follows:

1. **Review IDN: Targets, Rewards, and Criteria.**

At the beginning of the first interval of each session, a clinician shows each child his/her IDN, quickly reviews the targets, asks the children what home reward the child is working for that day, and reminds him/her what he/she needs to do to earn that home reward. This should be brief and in language that the child understands. Once the targets are reviewed, the clinician tells the child the interval starts now.

2. Monitor the Child's Performance on the IDN.

Throughout the first interval and all subsequent intervals in the session, in addition to implementing the token and response cost system, the clinicians should also reinforce each child for his/her exhibition of IDN targeted behavior and give warnings whenever he/she violates an IDN target. Additionally, staff should provide frequent verbal and non-verbal praise and encouragement for all appropriate efforts throughout each interval. The performance criteria (i.e., number of warnings or prompts the child is allowed for each target) is noted on his/her IDN. If the child violates any of the IDN targets during an interval, the staff should immediately inform the child in a matter-of-fact neutral tone of voice that he/she violated the specific target. For example, if a child brings up irrelevant information, the clinician would inform the child of his point loss (as noted in the Response Cost System instructions above) and inform the child that he/she also received a warning on his IDN. This feedback should be very brief and specific. Staff should not dialogue with the child as to why the target was missed or violated. Staff should then record a tally for the corresponding target on the child's IDN to indicate a warning was given.

At the end of each interval, if the child has more warnings or prompts than is specified by the target performance criteria during the interval, he/she receives a "NO" for the specific target for that interval. For example, a child has the target, "Stays on Topic" and is allowed no more than two reminders to stay on topic during the interval; if, during a group discussion, the child brings up unrelated information, a warning would be given. If, during that same interval, the child brings up more unrelated information, then the staff member would issue another warning and inform him/her that if he/she continues to not stay on topic, he/she will not earn a "YES." If the child brings up unrelated information again (for the third time) then he/she would fail to earn a "YES" for the "Stays on Topic" target for that interval. The child would be told, "You failed to earn your "YES" for staying on topic for this period."

At the end of each interval, the clinician circles "YES" on the IDN if the child is <u>not</u> given more than the allowed warnings or prompts for a particular target. The clinician circles "NO" on the IDN whenever the child exceeds the number of warnings/prompts allowed for the respective target.

3. Review "YESES" Earned at End of Each Interval.

At the end of each interval throughout the session, after the point review, the <u>clinicians will conduct an IDN review with the child as to how he/she performed on each IDN target</u>. Note that if the child is exhibiting disruptive behaviors during an IDN review, then his/her performance is not reviewed until he/she is calm. The child should be verbally praised for each "YES" he/she earns and reminded matter-of-factly what he/she failed to earn a "YES" for the interval. If the child does not earn any "YESES" for an interval, the clinician should state in a neutral voice that he/she failed to meet his/her targets but that he/she will have another

opportunity to meet his/her targets during the next interval. At the end of each IDN review, after all "YESES" earned have been reviewed with the child, the staff member tells the child that a new interval is starting and reminds the child what he/she is working to earn at home for reinforcement. Any violations of targets after an IDN review has started would be documented on the new interval.

For video-taped demonstrations of an IDN Review go to www.canisius.edu/MAXout.

4. Calculate IDN Daily Percentage.

At the end of the session, one of the group clinicians calculates the overall percentage of "YESES" the child earned on the IDN. The clinician adds up the number or "YESES" earned and the number of "NOS" received. Note that if the child missed a period or was not observed during a period, staff would record a "NA" which stands for Not Applicable (N/A).

The percentage is calculated by dividing the total number of "YESES" by the total number of "YESES" and "NOS" and then multiplying this quotient by 100. The formula is as follows:

$$\frac{\text{(Total \# of YESES)}}{\text{(Total \# of YESES) + (Total \# of NOS)}} \text{ X } 100 = \underline{\quad\quad}\%$$

For example, if the child earned a total of 14 "YESES" and 4 "NOS" then using the formula above, the number 14 would be divided by 18 (i.e., 14+4) and then multiplied by 100 to get 0.777 which can be rounded up to 78%.

Note that N/As are not used in computing the percentage.

5. Review "YESES" and Overall Percentage Earned at End of Session.

At the end of each session, a designated clinician provides a quick review with each child in the group on how the child did on his/her IDN for that session, what percentage the child earned, and whether or not he/she earns a home reward (see below). The child should be verbally praised for the targets he/she did well on, the times of session he/she did well, and what he/she might need to work on.

6. Review IDN with Parent and Child at Dismissal and Parent provides reward (if earned).

At dismissal, during the daily review (see p. 40) with each child and his/her parent/caregiver, the lead clinician reviews each child's IDN with each child and his/her parent/caregiver. The clinician conducts a quick review of how the child did on his/her IDN for that session. The focus of this review is to socially reinforce what the child did well on (earned "YESES" for) and to matter-of-factly identify targets the child had difficulty with and to briefly discuss how the child could improve the next day (if necessary). The clinician, child, and parent then check the IDN percentage for the session. If the child earned 70% or greater of his/her YESES then the child is given a little snack (e.g. little bag of fruit snacks) by the clinician. The clinician asks the child and parent what the child will earn at home from his/her reward chart (see Appendix M) for earning 70% or greater on his/her IDN. As with the weekly reward described above, the home reward must be something the child finds reinforcing and which he/she does not have access to or

would want more access to. Examples for IDN performance reinforcers could include but are not limited to access to an electronic device (e.g., smartphone, iPad, Xbox), watching a preferred television show, or playing a game. For any reinforcer to be influential and have value, the child must not have access to it unless he/she earns enough "YESES" on his/her IDN. Note that the higher percentage the child earns, the better the reinforce he/she earns. For example, if the child earns between 70-80% of his "YESES" on his/her IDN then he/she may receive 10 minutes of screen time, but if he/she earns between 81-90% of his/her "YESES", then he/she may earn 20 minutes of screen time. Likewise, if he/she earns between 91-100% of his/her "YESES", then he/she may earn 30 minutes of screen time. Parents are instructed in how to review their child's IDN performance and provide reinforcement to their children in the parent education sessions. Like with the weekly reward, the parents/caregivers are responsible for notifying their child's clinicians what their child is working for each session for his/her IDN performance.

If the child does not meet the 70% criteria to earn a reinforcer for that session, then the clinician would matter-of-factly tell the child that they did not earn the daily reward for that session and remind him/her that he/she can try again the next session. The child would also not receive his IDN home reward.

7. Conduct Ongoing Monitoring of IDN Progress.

The MAXout supervisor in collaboration with the two clinicians in a group are responsible for reviewing the child's progress in meeting each of his/her IDN targets each session.

In order to assist the supervisor and the clinicians in monitoring how the child is doing on each target, the MAXout supervisor or IDN point person would use the MAXout IDN Tracking Form (see Appendix N). The IDN Tracking Form tracks the child's percentage for each IDN target each session of the program. This allows the team to evaluate each child's performance on his/her targets and to determine if modification or changes need to be made for any or all of the targets.

At least every four sessions, the designated staff should review the IDN Tracking Form and the percentage of "YESES" the child earned for individual target behaviors across each session. If a child is consistently earning 90% or better on a specific target behavior for at least two weeks (4 sessions), then the staff would consider the following modifications:

a) Reduce the number of warnings allowed for all target behaviors or for a specific target behavior.

b) Increase the number of incidents a target behavior should be exhibited.

c) Replace the target behavior that is successful with a new target the child needs to work on. Note that the team may consider still keeping a met target on the child's IDN by making it an "all session target." For example, if the child consistently meets the criteria for "Waiting turn to speak," but the staff want to make sure he/she maintains this behavior, they could add it on the bottom of the IDN as an 'all session' target behavior. The target would become, "Waits turn to speak – No more than 2 reminders across the session to not interrupt."

d) Increase the length of the intervals on the IDN.

Likewise if the child is not exhibiting success in meeting his/her targets (averaging less than 70% on his/her IDN over the four sessions), then the following remedies should be considered:

a) Review fidelity data to make sure staff are accurately monitoring the target(s).

b) Make sure all clinicians who work with the child are in agreement about what the target behavior should be and how they are monitoring it.

c) Confirm that the child is being reinforced for meeting performance criteria at home. If the child's family or caregiver reports an inability to provide a home reward, staff should consider adding a program-based reward.

d) Reevaluate each target behavior that is not meeting criteria to make sure it is appropriate for the child, and consider altering the behavior to better reflect what the child needs to do.

e) Break down the target behavior into one of its component parts that is a precursor behavior to the original target.

f) Add additional reinforcement periods during the session. For example, provide a session-based reinforcer if the children earns at least 70% of his/her "YESES" during the first half (at the 45 minute mark) and the second half (90 minute mark).

Additionally, as a child is successful, the percentage of "YESES" needed to earn a reinforcer (i.e., the daily percentage) could also be increased. For example, to earn a home reinforcer, the child would have to earn at least 80% of his/her "YESES" across the session.

Throughout the implementation of the IDN, the child's parent or caregiver should be updated on progress and any changes with IDN targets and criteria for goal attainment by the lead clinician.

PARENT EDUCATION/TRAINING

Frequency and duration of groups: Six parent education/training groups are held once every three weeks across the 18 weeks of the program. Each session is 60-75 minutes in length.

Facilitator(s): Parent education/training groups are facilitated by the MAXout supervisor or designated clinical staff.

Group composition: Participants consist of parents or caregivers of children participating in MAXout.

Outcomes: MAXout supervisor collects information on parent attendance for each session held on the Parent Training Attendance Sheet (see Appendix A). Parents complete a Reward Chart (see Appendix M) that they will use to provide reinforcement for child's performance on his/her IDN and his/her weekly performance.

Six parent education/training (PT) sessions occur once every three weeks of the 18-week program by the MAXout supervisor or a designated clinical staff member. PT sessions promote home-program communication and integration through greater interaction between parents and program staff. Training sessions focus on increasing parent knowledge on program components and use of strategies to increase skills, reduce challenging or inappropriate behaviors and parental stress. Additionally PT sessions address strategies to increase generalization of skills beyond MAXout and parental advocacy in school and/or community. Content of the sessions was informed by research reviews (i.e., White et al., 2007; Lopata, Volker, Toomey, Chow, & Thomeer, 2008) and diagnostic criteria.

Implementing Parent Education Sessions

Parent training facilitators are required to view each recorded parent education/training session (see www.canisius.edu/MAXout) to ensure that the specific manualized content for each session is presented in the corresponding PT sessions. Facilitators then have the option to present the content live or show the recorded parent education/training session. Presentation slides for each parent education/training education session are available on www.canisius.edu/MAXout.

Each session is structured as follows:

1. Provide brief updates on MAXout and PT session agenda;
2. For PT sessions 2-6, review parent's/caregiver's use of strategies covered in prior sessions;
3. Delivery of lesson content (delivered live or via video recording of session content)
4. Discussion of content and integration of content into daily routine;
5. Review of session content and implementation procedures. Sessions are generally 60-75 minutes.

The topics covered during the MAXout program are as follows:

Session	Topic
1	Overview of Program/Individual Daily Note Procedures
2	Social Skills and Therapeutic Activities
3	Teaching Social Skills in the Home
4	Managing Behavior in the Home and Community
5	Managing Parental Stress and Anxiety
6	Generalization of Program Skills to Home and School Environments

Missed/Makeup Sessions

If a parent is unable to attend a given session, he/she are provided with the handouts of the content covered in the session and are offered an individual meeting to review the content.

CONSULTATION

Format of consultation: Consultation support is provided to each MAXout group team in individual or group sessions.

Consultation parameters: Consultation can be provided to any individual clinical team member or group of clinicians. At a minimum, group clinicians meet with the MAXout supervisor once every week throughout the program. The supervisors conduct observations to collect information on implementation adherence for SIGS and TAs. Consultants also review each child's progress with the token economy/response cost system and the IDN and assist the group clinicians in making modifications or adjustments on the IDN based on each child's performance and needs.

Consultant: The MAXout supervisor is designated by the agency/clinic implementing the MAXout program and is responsible for overseeing the overall implementation of the MAXout components. This person runs MAXout team meetings, conducts fidelity monitoring, and assumes primary consultation responsibilities with the clinicians implementing MAXout components.

Outcomes: The consultant collect fidelity sheets monitoring dosage and adherence as prescribed for each MAXout component (see Treatment Fidelity chapter below). Consultants also log their contacts with staff on the Consultant Contact Log (see Appendix O)

In MAXout, consultation serves a variety of purposes. One of the central purposes is to provide support and solutions to common and unforeseen challenges. The consultant supports the clinicians' implementation of the various MAXout components, particularly in the early stages of the program when clinicians are initiating implementation. Consultants assist with setting up and modifying IDN targets and monitoring IDN progress. Consultants also collect and monitor intervention fidelity and work with the group clinicians to ensure accurate implementation of the MAXout components. Note that it is possible for the duties of the consultant to be shared by more than one staff member.

The specific duties of the MAXout supervisor consultant are as follows:

1. Coordinate and conduct training of clinical staff in MAXout protocol.

2. Ensure all clinicians pass MAXout proficiency exam (100%) and achieve scores of 90% or greater on the corresponding component fidelity sheet for running an SIG and running a TA.

3. Review the MAXout scheduled with clinicians from each MAXout group.

4. Prior to startup of MAXout, create a master schedule for the 18 weeks of the program (See Appendix P). The master schedule identifies the week, date, day, of each of the sessions. Two

sessions are conducted per week for 18 weeks. On the master schedule, each session is further divided into the two cycles that are held each session. There are a total of 36 sessions and 72 cycles in the MAXout program. Each cycle consists of an SIG and a TA. On the master schedule, the skill to be taught in the SIG and the corresponding TA is identified for each cycle. As noted in the SIG section, 60 of the SIGs teach 30 social skills (each skill is taught twice), six of the SIGs teach emotion recognition, and six teach the interpretation of nonliteral language.

The MAXout master schedule, without the dates and days noted, is in Appendix P. This schedule contains the recommended order of skills to be taught and the corresponding TA for each SIG as taught in the original MAXout program. The MAXout supervisor and clinic/agency may change the TA to be conducted with a particular SIG if necessary. See Appendix E for suggestions of TAs to be used with each social skill taught. While the program is 18 weeks (two 90-minute sessions per week), adjustments to the schedule may have to be made due to holidays or school vacations/off days. A MAXout site may still choose to hold on the holiday/school off day or hold the missed session on another day of the week or extend the 18-week program.

5. Ensure the two group clinicians have identified who will be the lead and who will assist the leader for each SIG and TA.

6. During the first two sessions of MAXout, help group clinicians identify IDN targets, generate operational definitions for the IDN targets, and review baseline data for setting IDN goals.

7. After the first group PT session, ensure the parents/caregivers of each child has identified what rewards they will give their child if he/she meets IDN criteria each day and weekly point improvement criteria. The supervisor should review the reward chart (see Appendix M) the parents are given to complete in the first PT session.

8. Conduct fidelity observations of treatment adherence for SIGs and TAs as prescribed by the MAXout protocol (once every 5 sessions for SIGs and for TAs).

9. Conduct observations of the clinicians' correct implementation of the token system and response cost procedures as well as time-out procedures.

10. Review completed fidelity observations of adherence with group clinicians during weekly supervision sessions.

11. Record adherence fidelity data on fidelity tracking forms (see Treatment Fidelity chapter for procedures).

12. Hold weekly meetings with group clinicians to assess implementation and resolve any challenges. The agenda for the team meetings includes the following:

    a) Review each child's progress using point system data via the MAXout Point Sheet Weekly Summary form and IDN data via the MAXout IDN Tracking Form. Make adjustments/modification to the IDN as needed based on this data review.

b) Review data on participant roles in SIGs to make sure all children in a group are a main actor for one of the role-plays and a co-actor in another role-play conducted during each SIG teaching social skills.

c) Review treatment fidelity data on adherence for SIGs and TAs and problem-solve any issues to ensure effective implementation.

d) Review upcoming schedule and problem-solve any issues or needs.

e) Discuss aspects of the intervention that are successful as well as any difficulties that have arisen that require resolution.

f) Complete Consultant Contact Log documenting issues discussed, actions taken, and items needing further follow-up.

TREATMENT FIDELITY

Format of treatment fidelity: Attendance is collected to ensure treatment elements are received by participants. SIGs and TAs are monitored via component-specific standardized checklists that track adherence to the manualized protocol.

Fidelity parameters: Attendance is collected each session. Treatment adherence is monitored at least once every five SIGs and every five TAs. Results of fidelity monitoring are reviewed with the group clinicians as needed and during weekly consultation meetings.

Fidelity monitors: The group clinicians are responsible for collecting child attendance each session. The MAXout supervisor is responsible for conducting fidelity monitoring of component implementation. Additionally, other clinical staff may assist in collecting fidelity forms on MAXout components.

Outcomes: Attendance rates and treatment adherence rates are collected and reported for the MAXout program. Consultant Contact Logs document meetings and consultations with group clinicians and parents/caregivers.

Durlak and DuPre (2008) found a strong relationship between psychosocial intervention outcomes and intervention fidelity. The authors found that programs with high intervention fidelity demonstrated two-to-three times the effectiveness compared to programs that did not reliably or systematically assess treatment fidelity. To maximize the effectiveness of the MAXout protocol, it is important that each targeted student receives the SIG and TA components as prescribed by this manual. To this end, treatment fidelity data is collected that tracks the amount of each treatment component the children receive (dosage) and documents that all procedures for SIGs and TAs are adhered to as delineated in this manual (adherence). Fidelity sheets have been created to monitor dosage and adherence for the SIG and TA components. The lead clinician for each treatment group is responsible for recording attendance (dosage) to each session and the MAXout supervisor completes the checklists assessing treatment adherence. As needed, other members of the clinical staff can complete fidelity monitoring observations. Results of the fidelity monitoring are shared with the facilitators of the components as needed and during weekly consultation meetings. During these meetings, the MAXout team members discuss and resolve any deviations from the procedures.

The specific fidelity sheets (see Appendix A) and procedures for collecting attendance (dosage) and adherence during MAXout as well as the procedures for summarizing this fidelity data are as follows :

<u>MAXout Attendance</u>

The group clinicians record each child's attendance for each session of MAXout via the Master Attendance Sheet. The group clinician will note if a child misses any part of a session (e.g. arrives late, leaves early).

Skill Instruction Groups (SIGs)

The MAXout supervisor documents the lead clinician's adherence to the step-by-step procedures required to conduct the social skills, emotion recognition, and interpretation of nonliteral language SIGs via the Social Instruction Group Fidelity Sheet specific to each. This includes monitoring the clinician's reviewing the rules for the group, conducting the SIG as per the steps delineated in the intensive SIGs section above (social skill, emotion recognition, interpretation of non-literal language) and leading the group wrap-up discussion. Fidelity observations are conducted for one SIG session per every five SIG sessions. The SIG fidelity form to use is dependent upon whether the SIG is teaching social skills, emotion recognition, or interpretation of non-literal language. Since the majority of SIGs are teaching social skills, most of the fidelity observations will be monitoring social skills instruction.

Therapeutic Activities (TA)

The MAXout supervisor documents the lead clinician's reviewing the activity rules, describing the activity, running the activity, and conducting a group wrap-up discussion via the Therapeutic Activity Fidelity Sheet. Fidelity observations are conducted for one TA session per every five TA sessions.

Parent Training Attendance

The MAXout supervisor or designated parent trainer records parent/caregiver/guardian attendance to each of the six parent training sessions on the Parent Training Attendance Sheet and documents if makeup sessions are conducted.

Fidelity Tracking

The Treatment Component Fidelity Tracking Sheet (see Appendix Q) summarizes adherence fidelity percentages from the fidelity observations of the SIGs and TAs across the MAXout program. This allows the supervisor and the group clinicians to monitor that the facilitators are consistently delivering the components as manualized.

The procedures for completing the Treatment Component Fidelity Tracking Sheet are as follows:

1. The MAXout supervisor collects the treatment fidelity sheets assessing adherence for each of the MAXout components conducted each week.

2. For each MAXout component (SIG-Social skills, SIG-Emotion recognition, SIG-Nonliteral language Iinterpretation, and TA) a separate Treatment Component Fidelity Tracking Sheet is used.

3. The consultant records the date of the fidelity observation, the initials of the observer, and the treatment fidelity percentage.

Fidelity Sheet Storage

All fidelity sheets are collected each week by the designated consultant and stored in a binder or file that is kept in a predetermined location for all MAXout team members to access as needed. Program sites could also store the data electronically.

Scoring Fidelity Observations of SIGs and TAs

On the bottom of each fidelity sheet that tracks adherence, the observer records the total number of "YESES" and "NOS" circled. To calculate the overall fidelity score (i.e., percentage of manualized items/steps that the clinician adhered to), divide the total number of "YESES" by the total number of "YESES" and "NOS" and then multiply this quotient by 100. The formula is as follows:

$$\frac{\text{(Total \# of YESES)}}{\text{(Total \# of YESES) + (Total \# of NOS)}} \text{ X 100 = } \underline{\quad\quad\%}$$

For example, after an observation of a SIG session, if the total number of "YESES" is 44 and the total number of "NOS" is 3, then using the formula above, 44 would be divided by 47 (i.e., 44+3) to get .9361 which is then multiplied by 100 to get 93.61%.

$$\frac{(44)}{(44) + (3)} \text{ X 100 = } \underline{93.61\%}$$

This reveals that the facilitator adhered to the manualized protocol for running the MAXout social skills protocol 93.61% of the time.

All fidelity observations should be reviewed with the clinicians who ran the component observed. The date of this review and the consultant's initials should be documented on the bottom of the fidelity sheet when this completed. It is recommended that fidelity percentage scores should be 85% or greater. If a percentage score is lower than 85%, the consultant should discuss with the facilitator what is not being adhered to and problem-solve strategies to ensure missing steps/procedures are followed in the future. Additionally, if fidelity percentage scores remain on average below 85% over a three week period, then further training and/or support should be provided to improve treatment adherence.

Reviewing Fidelity Tracking Sheets

The Master Attendance Tracking Sheet provide an ongoing record of each child's attendance across the program. This attendance data should be reviewed in the weekly team meetings so that the consultant and team can discuss what to do if makeup sessions or schedule modifications are needed.

The Treatment Component Fidelity Tracking Sheet of each component collectively provides an ongoing record of adherence to the manualized protocol across the program. This summary data on adherence should be reviewed in the weekly team meetings. At these meetings, the consultant and team discuss and problem-solve what to do if fidelity percentages are below 85%. As noted above, if fidelity percentage scores remain on average below 85% over a three week period, then further training and/or support should be provided to improve treatment adherence.

Consultant Contact Log

Consultation meetings are tracked via the Consultant Contact Log (see Appendix O). The purpose of this log is to document what is discussed in consultant meetings held across the program as well as any individual parent meetings. The MAXout supervisor should review these logs every three to four weeks to ensure that there is follow-through and/or closure on items discussed.

STAFF TRAINING

Format of staff training: Manual review, video modules, and component practice

Facilitator(s): The MAXout supervisor and other designated clinic/agency staff coordinate and schedule the manual distribution, video-module training, and component practice sessions.

Outcomes: Training attendance is recorded for all staff involved in MAXout implementation. Group clinicians must pass proficiency exam on their knowledge of the manual and the operational definitions of the positive and negative category behaviors of the token economy and response cost system. Treatment adherence is collected on the group clinicians during their practice sessions run during training (see specific treatment fidelity tracking forms in Appendix A).

At least a month prior to implementing the MAXout program, all group clinicians will receive the MAXout manual and be trained in its implementation via video-taped MAXout component training modules. The slides corresponding to the training modules presented will also be distributed.

In addition to watching the training videos, all group clinicians will practice implementing the specific MAXout components after completing the video-module training sessions. It is recommended that other agency/clinic staff act like children during these practice sessions. Any staff actors may present behaviors displayed by children with ASD without ID (e.g., run-on communication, poor eye contact, etc.); however, these staff actors should keep behaviors to a minimum so that staff can focus on the component and become fluent in the step-by step procedures. Initially, it is expected that the person practicing running a component will need prompts and feedback to guide their ability to implement the component as manualized. Additionally, the point person practicing could use the component fidelity sheet as a cheat sheet to provide further assistance. During the practice sessions, the MAXout supervisor monitors the practice sessions and gives feedback as to what went well and what was missing or needs adjustment. These component fidelity sheet observations should be scored as described in the fidelity chapter. Once a point person scores 90% or greater on the corresponding component fidelity sheet, then the practice sessions can end.

The MAX component training modules cover the following areas:

1. Autism Spectrum Disorder without ID and MAXout Overview and Structure
2. Intensive Skill Instruction Groups
    a. Social Skills
    b. Emotion Recognition
    c. Interpretation of Nonliteral Language
3. Therapeutic Activities
4. Behavioral System

a. Token economy and response cost system

b. Time-out

c. IDN

5. Parent Education/Training Groups
6. Consultation
7. Fidelity Monitoring

Video-taped MAXout component modules and their corresponding training slides are available at www.canisius.edu/MAXout.

STAFF PROFESSIONALISM

All MAXout clinicians are required and expected to demonstrate the highest level of professionalism and respect for participants and colleagues. This includes all facets of personal presentation (e.g., dress, hygiene, language, etc.), as well as interactions. Clinicians must demonstrate sensitivity toward the difficulties of participants and seek to promote more adaptive functioning, regardless of the behaviors sometimes demonstrated by participants.

Of critical importance is the maintenance of confidentiality. All clinicians are required to maintain confidentiality regarding information involving participants and their families. Should issues of safety of participants and/or their families emerge, clinicians will inform the MAXout Supervisor, whom will contact and consult with program directors to determine the appropriate course of action. Ensuring the safety of participants and their family remains paramount to program staff.

Clinicians are expected to refrain from disclosing personal issues/information with participants and/or their families unless directly applicable to treatment (i.e., would be therapeutically beneficial). As such, interactions with participants and families are expected to be treatment related and consistent with program procedures. All activities and interactions should be therapeutically oriented, with the intent of improving and facilitating the social development of program participants.

Language and tone of interactions are expected to respectful, as well as reflect professional objectivity. Clinicians will refer to participants by their first names, and avoid nicknames. Verbal interactions will consist of professional language that is developmentally appropriate (i.e., consistent with participant's developmental level). Clinicians will not demonstrate sarcasm in verbal (i.e., comments) or non-verbal (e.g., eye-rolling, shaking head from side-to-side, etc.) forms. Feedback must reflect objective consideration and seek to promote learning and acquisition of new social skills/behaviors, as well as eliminate problem behaviors.

Clinicians strictly adhere to the program procedures, methodology, schedule, and data collection system. Deviation from the preset program weakens treatment integrity, can reduce treatment effectiveness, and seriously compromises research efforts. As such, clinicians must be completely familiar with, and competent in administering the program.

While participants are in the program, clinician attention is directed toward participants. Clinicians will refrain from non-program related discussion until participants have departed. Clinicians are expected to be treatment related and participant focused.

Clinicians are expected to dress in conservative casual attire. Many activities in the program require physical activity so comfort is important.

Clinicians are expected to arrive 30 minutes prior to participants' arrival and remain on site with the program until at least 30 minutes after all participants depart.

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Appendices

Appendix A

MAXout Fidelity Forms

MAXout

Master Attendance

(Record 'X" for each child to denote if child attended corresponding session. Note if child was late or left ealy)

				Child (Initials):			
Week	Date	Day	Session				
1			1				
			2				
2			3				
			4				
3			5				
			6				
4			7				
			8				
5			9				
			10				
6			11				
			12				
7			13				
			14				
8			15				
			16				
9			17				
			18				
10			19				
			20				
11			21				
			22				
12			23				
			24				
13			25				
			26				
14			27				
			28				
15			29				
			30				
16			31				
			32				
17			33				
			34				
18			35				
			36				

MAXout

Skill Instruction Group Fidelity Sheet: SOCIAL SKILLS

Skill: _____ Date: _____ OBS: _____

Official Time Start _____ Activity: _____

Official Time End _____ Dose: _____ mins. Lead: _____

Y N **Starts on time (Actual Time Started:_____)**

Review program rules

Y N Be actively involved

Y N Stay in seat/area

Y N Use the materials correctly

Follow Specific Rules (Social Skills Group)

Y N Speak so others can hear you

Y N Raise your hand to speak

Define the skill

Y N Facilitator provides brief Introduction

Y N Facilitator asks children to define

Y N Facilitator reviews *Skillstreaming* steps

Model the skill

Y N Facilitator gives two examples

Y N Situations relevant to children's lives

Y N Facilitator ortrays self as similar age to the children

Y N Portrayal reflects positive outcome

Y N Model skill in correct sequence

Establish trainee skill needed

Y N Each child describes where, when, and with whom she/he will use the skill OR Use previously given examples

Select role player

Y N Child 1

Y N Child 2

Set up the roleplay

Ch 1	Ch 2	
Y N	Y N	Selects another child/staff as co-actor for role-play
Y N	Y N	Sets up role-play in an engaging way (Describes scene/setting)

Comments: _____

_____

_____

_____

_____

Conduct the role play

Ch 1	Ch 2	
Y N	Y N	Facilitator assigns each child a skill to watch for
Y N	Y N	Facilitator reminds actors of their roles (i.e., who are they role-playing)
Y N	Y N	Facilitator restates steps in sequence for the actors. Go through the steps quickly, "Remember…"
Y N	Y N	Facilitator positions her/himself near the flip chart to point out the steps as they are performed

Provide performance feedback

Ch 1	Ch 2	
Y N	Y N	Follows correct order of feedback (co-actor, group members, facilitator, then the main actor)
Y N	Y N	Feedback involves adherence to behavioral steps

Assign homework to child to use skill in next activity

Ch 1	Ch 2	
Y N	Y N	How are we going to use this skill in the _____ activity?

Provide quick summary at end of session

Y N Discuss positive events of group: "What went well?"

Y N Discuss negative events of group: "What can we work on?"

Y N What was worked on: "What did we learn?"

Y N How will we use in upcoming therapeutic activity (Specific examples)

Overall staff Implementation review

Y N Staff kept children engaged in skill group

Y N Staff reinforce appropriate contributions

Y N Staff respond appropriately and assigns points for negative category behaviors

SS Endpoint Point Review

Y N Provided at End of SS session

Y N Reviewed All Areas of Point Sheet Individually

Y N Staff provided specific behavior examples

Y N Ends on time (Ended:_____)

TOTAL # Yes: _____

 # No: _____

Percentage _____

Date Reviewed: _____

MAXout

Skill Instruction Group Fidelity Sheet: EMOTION RECOGNITION

Date: _____ OBS: _____

Official Time Start _____ Activity: _____

Official Time End _____ Dose: _____ mins. Lead: _____

Group: _____

Y N **Starts on time (Actual Time Started:_____)**

Review program rules

Y N Be actively involved

Y N Stay in seat/area

Y N Use the materials correctly

Follow Specific Rules (SIG):

Y N Speak so others can hear you

Y N Raise your hand to speak

Conduct lesson

Y N Facilitator provides brief discussion of what facial expressions and body language reveal about person's emotinal state

Y N Facilitator models different facial expressions

Y N Facilitator describes emotions impact on body externally and internally

Y N Facilitator has children (one at a time) model emotion and discuss emotion's impact on body externally and internally

Set up exercise

Y N Feelings board displayed (including feeling, when/where feeling happenned, what happens to face/body, and negative and positive behaivors that may occur)

Run exercise

Y N Facilitator has children identify feelings and writes on board

Y N Participants describe when and where feeling could happen

Y N Participants describe physiological reactions that accompany the feelings

Y N Participants describe types of behaviors that occur with identified feelings

Y N Facilitator guides discussion about positive and negative emotional states

Y N Facilitator summarizes completed feelings/emotions chart

Provide quick summary at end of session

Y N Discuss positive events "What went well?"

Y N Discuss negative events "What can we work on?"

Y N Discuss some emotions that came up in the practice

Y N Discuss how can recognize/display emotions emotions in upcoming therapeutic activity

Overall staff Implementation review

Y N Staff kept children engaged

Y N Staff reinforce appropriate contributions

Y N Staff respond appropriately and assigns points for positive and negative category behaviors

SIG Endpoint Point Review

Y N Provided at End of SIG session

Y N Reviewed All Areas of Point Sheet Individually

Y N Staff provided specific behavior examples

Y N Ends on time (Ended:_____)

TOTAL # Yes: _____

 # No: _____

Percentage _____

Date Reviewed: _____

Comments _____

MAXout

Skill Instruction Group Fidelity Sheet: INTERPRETATION OF NONLITERAL LANGUAGE

Date: _____ OBS: _____

Official Time Start _____ Activity: _____

Official Time End _____ Dose: _____ mins. Lead: _____

Group: _____

Y N **Starts on time (Actual Time Started:_____)**

Review program rules

Y N Be actively involved

Y N Stay in seat/area

Y N Use the materials correctly

Follow Specific Rules (SIG):

Y N Speak so others can hear you

Y N Raise your hand to speak

Conduct lesson

Y N Facilitator provides brief introduction of how language/phrases can have different meanings

Y N Facilitator reviews/models how to respond to phrase that doesn't make sense

Y N Facilitator presents an idiom and has children define the idiom

Y N Facilitator introduces idom examples and their meaning

Set up exercise

Y N Idiom cards and game board set up

Y N Facilitator splits children into teams

Y N Facilitator has children negotiate team names

Y N Game rules/procedures reviewed

Run exercise

Y N Facilitator provides age-appropriate idioms

Y N Group play Idiom Jepordy

Y N Facilitator prompts all children to contribute to discussion of idioms with teammates

Y N Facilitator prompts other team(s) to discuss idioms even if not their turn

Y N Facilitator allows other team to "steal" if the team got idiom wrong

Y N Facilitator provides age-appropriate definition of idioms

Y N Points awarded to team for accurate ID of idioms

Provide quick summary at end of session

Y N Discuss positive events "What went well?"

Y N Discuss negative events "What can we work on?"

Y N Discuss some idioms that came up in the game

Y N Discuss how idioms can be used in the next activity

Overall staff Implementation review

Y N Staff kept children engaged

Y N Staff reinforce appropriate contributions

Y N Staff respond appropriately and assigns points for positive and negative category behaviors

SIG Endpoint Point Review

Y N Provided at End of SIG session

Y N Reviewed All Areas of Point Sheet Individually

Y N Staff provided specific behavior examples

Y N Ends on time (Ended:_____)

TOTAL # Yes: _____

 # No: _____

Percentage _____

Date Reviewed: _____

Comments _____

MAXout
Therapeutic Activity Fidelity Sheet

Skill: _____ Date: _____

Activity: _____ Time Start: _____

Lead: _____ Time End: _____

OBS: _____ **Dose:** _____

Y N Starts on time (Started:_____)

Review Program Rules

Y N Be actively involved
Y N Stay in seat/area
Y N Use the materials correctly
Y N Follows rules of specific TA activity
Y N Speak so others can hear you clearly
Y N Raise your hand to speak

Discuss Therapeutic Activity

Y N Review group meeting rules
Y N Review specific rules of TA
Y N Review object of activity
Y N Identifies social skills of the day
Y N Discuss how will use social skill in activity
Y N Staff reinforces appropriate contributions

Set up Therapeutic Activity

Y N Area identified
Y N Assign specific areas/positions
Y N Area of activity is set up as needed
Y N Have all materials needed for activity
Y N Staff distributed equally about area of activity

Run TA 1st Half

Y N All staff actively engaged in activity
Y N Facilitator directs activity
Y N Staff provided teaching/prompts appropriately
Y N Staff reinforces appropriate behaviors/social skills
Y N Staff respond matter-of-factly to inappropriate behaviors

TA Midpoint Point Review

Y N Provided at 15 min. after TA start
Y N Reviewed All Areas of Point Sheet Individually
Y N Staff provided specific behavior examples

Run TA 2nd Half

Y N Staff actively engaged in activity
Y N Facilitator directs activity
Y N Staff provided teaching/prompts appropriately
Y N Staff reinforces appropirate behaviors/social skills
Y N Staff respond matter-of-factly to inappropriate behaviors

Process Therapeutic Activity

Review rules for group meeting

Y N Speak so others can hear you clearly
Y N Raise your hand to speak
Y N Discuss positive events of activity: "What went well?"
Y N Discuss negative events of activity: "What can we work on?"
Y N Discuss how used skill(s)
Y N Discuss what need to practice more
Y N Facilitator reinforces appropriate contributions
Y N Staff keep children engaged

TA Endpoint Point Review

Y N Provided at end of TA session
Y N Reviewed All Areas of Point Sheet Individually
Y N Staff provided specific behavior examples

Y N Ends on time (Ended:_____)

TOTALS

Y	N

Percentage: _____

Date Reviewed: _____

Comments: _____

MAXout

Parent Training Attendance Sheet

Session #:	1	2	3	4	5	6
Date:						
Facilitator (1st Initial):						
Time Start:						
Time End:						
Total Time:						

Initials	Attendee Codes (see below)					

Report code associated with the parent or caregivers in attendance for each target child using the identifiers: 1 = Mother, 2 = Father, 3 = Grandparent, 4 = Other, 5 = None

Session	Topic
1	Overview of Program/Individual Daily Note Procedures
2	Social Skills and Therapeutic Activities
3	Teaching Social Skills in the Home
4	Managing Behavior in the Home and Community
5	Managing Parental Stress and Anxiety
6	Generalization of Program Skills to Home and School Environments

Appendix B

SIG-Social Skill Participant Roles Tracking Sheet Sample

SIG-Social Skill Participant Roles

(Mark when child is a Main Actor [1^0] or a Co-actor [CA] for each session. Note each child should be main actor for one of the role-plays and a co-actor in another role-play conducted during each SIG teaching social

Week	Session	Cycle	Skill	Social Skill		Child (Initials):			
1	1	1	1A	Introducing yourself	1^0				
					CA				
		2	2A	Contributing to discussions	1^0				
					CA				
	2	1	1B	Introducing yourself	1^0				
					CA				
		2	2B	Contributing to discussions	1^0				
					CA				
2	3	1	3A	Listening	1^0				
					CA				
		2		Non-literal language interpretation					
	4	1	3B	Listening	1^0				
					CA				
		2	4A	Giving a Compliment	1^0				
					CA				
3	5	1	5A	Being a good sport	1^0				
					CA				
		2	4B	Giving a Compliment	1^0				
					CA				
	6	1	5B	Being a good sport	1^0				
					CA				
				Face and emotion recognition					
4	7	1	6A	Giving instructions	1^0				
					CA				
		2	7A	Having a conversation	1^0				
					CA				
	8	1	6B	Giving instructions	1^0				
					CA				
		2	7B	Having a conversation	1^0				
					CA				
5	9	1	8A	Asking a question	1^0				
					CA				
		2		Non-literal language interpretation					
	10	1	8B	Asking a question	1^0				
					CA				
		2	9A	Asking for help	1^0				
					CA				

Appendix C

MAXout Idiom List

MAXout
Idiom List

Idiom	Idiom Meaning
A blessing in disguise	Something good that isn't recognized at first
A chip on your shoulder	Being upset for something that happened in the past
A dime a dozen	Anything that is common and easy to get
A fool and his money are soon parted	If you don't think about what you are buying, you will lose it or waste your money
A penny saved is a penny earned	By not spending money, you are saving money (little by little)
A piece of cake	A task that can be accomplished very easily
A rule of thumb	An estimate
A toss-up	A result that is still unclear and can go either way
Actions speak louder than words	It's better to actually do something than just talk about it
Add fuel to the fire	Whenever something is done to make a bad situation worse than it is
Against the clock	Rushed and short on time
All bark And no bite	When someone is threatening and/or aggressive but not willing to engage in a fight
All in the same boat	Everyone is facing the same challenge
All that glitters is not gold	Things that look shiny and appealing but are not as beautiful or valuable as they seem
Back to square one	Having to start all over again
Ball is in your court	It's time for you to act/decide
Beating around the bush	Avoiding the main topic Not speaking directly about the issue
Bend over backwards	Do whatever it takes to help Willing to do anything
Between a rock and a hard place	Stuck between two very bad options
Bite off more than you can chew	To take on a task that is way to big
Born with a silver spoon in your mouth	Born into a wealthy family of high social standing.
Break a leg	Wishing that someone does well
Burning a candle on both ends	To do tasks from early in the morning until late at night and get very little rest
Burns a hole in my pocket	Wanting to spend money
Chip on your shoulder	Bothered by something that happenned and can't let it go
Cool as a cucumber	Handles pressure very well
Crack someone up	To make someone laugh
Cross the bridge when you get to it	Deal with a situation when have to and not any earlier

Idiom	Idiom Meaning
Cross your fingers	To hope that something happens the way you want it to
Cut to the chase	Get to the point
Dead in the water	Unable to function
Don't add insult to injury	Don't make things worse then they already are
Don't count your chickens before they hatch	Don't rely on it until your sure of it
Don't cry over spilt milk	Don't complain about a loss from the past
Don't judge a book by its cover	Don't judge the worth/value of something by its outward appearance alone
Don't look a gift horse in the mouth	When someone gives you a gift or does something for you, don't be ungrateful
Don't make a mountain out of a molehill	don't make something small into a big deal/problem
Don't put all your eggs in one basket	Do not put all your resources in one possibility
Don't spill the beans	Keep a secret
Down to the wire	Something that ends at the last minute or last few seconds
Dressed to kill	Very well-dressed and fashionable so as to impress other people
Drive someone up the wall	To irritate and/or annoy very much
Easy as pie	That's very easy to do
Every cloud has a silver lining	Be optimistic, even difficult times will lead to better days
Everything but the kitchen sink	Almost everything and anything has been included
Fish or cut bait	Do something or step aside and stop wasting time
Fit as a fiddle	In good shape
Fits him/her to a glove	Is perfect size and shape for person
Get over it	To move beyond something that is bothering you
Gets under your skin	Bothers you
Give a piece of my mind	Telling someone what you think
Go fly a kite	Go away and leave you alone
Go the extra mile	Going above and beyond whatever is required for the task at hand
Great minds think alike	Intelligent people think like each other
Gut feeling	A personal intuition you get when you feel something may not be right
Hit the hay	Go to bed or go to sleep

MAXout
Idiom List

Idiom	Idiom Meaning
Hit the nail on the head	Do something exactly right or say something exactly right
Hold your horses	Be patient
In the bag	To have something secured
In the nick of time	Finished something just in time
It's raining cats and dogs	Its raining incredibly hard
Keep your chin up	To remain joyful in a tough situation
Know the ropes	To understand the details
Learn the ropes	Learn how to do something
Lend me your ear	To politely ask for someone's full attention
Let sleeping dogs lie	Leave things as they are and avoid restarting an old argument
Let the cat out of the bag	To share a secret that wasn't supposed to be shared
Light as a feather	Does not weigh anything
Make a silk purse ourt of a pig's ear	Unable to turn something ugly or inferior into something attractive or valuable
More bang for our buck	Get more out of something then you put into it
Mum's the word	To keep quiet To say nothing
Nip and tuck	Even or almost tied outcome
On pins and needles	Anxious or nervous, especially in anticipation of something
On the fence	Undecided
On the same page	When multiple people all agree on the same thing
On thin ice	About to get into trouble
Once in a blue moon	A rare event or occurrence
Out of the blue	Something that suddenly and unexpectedly occurs
Place is a distance away as the crow flies	The distance away measured in a straight line
Practice makes perfect	By constantly practicing, you will become better
Pull the plug	To stop something To bring something to an end
Pulling your leg	Tricking someone as a joke
Putting your foot in your mouth	Saying something embarassing
Rise and shine	Time to get up and start your day

MAXout
Idiom List

Idiom	Idiom Meaning
Shape up or ship out	Improve your performance or get out
Short end of the stick	Get the bad side/outcome of a deal
Start from scratch	To do it all over again from the beginning
Start off on the wrong foot	Getting a bad start on a relationship or task
Still waters run deep	A quiet person can have interesting, profound, or complex thoughts
Swallowed it hook line and sinker	person believed the tale/story that may not be true
Take a rain check	Do something later
Talked till he was blue in the face	Talked for a long time
That costs an arm and a leg	Very expensive A large amount of money
That's up my alley	That's something I'm familiar with or have the skills to do
The ball is in your court	It is your decision this time
The best of both worlds	There are two choices and you have them both
The early bird gets the worm	The person that gets up earliest or arrives first has the best chance for success
Up to my eyeballs	Very busy
Walking on eggshells	Being very careful
Woke up on the wrong side of the bed	Started the day in a bad mood and it made you grouchy and irritable the rest of day

Appendix D

Therapeutic Activities

THERAPEUTIC ACTIVITIES

Therapeutic activities in MAXout have been specifically designed to develop and maintain skills known to be deficient in children with ASD without ID. Specifically, therapeutic activities promote social interaction skills through cooperative social activities, face-emotion recognition activities, interest expansion activities, and interpretation of non-literal language activities.

Each of the activities includes:

1. Title of the activity
2. Characteristic addressed (specific diagnostic and/or associated feature addressed)
3. Purpose of the activity (goal)
4. Target skill
5. Objectives (of the activity)
6. Materials needed
7. Activity description
8. Procedures (detailed description of how to conduct the activity)

Therapeutic Activities

Title of Activity:	BALLOON VOLLEYBALL
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	6 foot rope to serve as net (tie two together if more is needed), balloon (to serve as volleyball)

Activity Description:

Participants will work as a team to get the balloon over the net. Each member of a team MUST hit the balloon at least once before his/her team is able to hit the balloon over the net.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations.

2. The group facilitator divides the participants into two teams.

3. The field of play is sectioned off into as many sections as needed to accommodate the number of players so as to keep players from intruding and colliding. Each participant is assigned to a section on his/her team's side of the net.

4. Participants are instructed that they must remain in their assigned section during the game. Players can be rotated to different positions/sections if desired.

5. The group facilitator instructs the participants to play from a seated position or on their knees.

6. The group facilitator explains that the activity requires teamwork and cooperation – and that everyone MUST hit the balloon at least once before a given team can hit the balloon over the net (i.e., rope). Specifically, when the balloon is hit into a team's side, all team members for that side must hit the balloon at least once before the balloon can be hit over the net to the other team's side. Teammates should hit the balloon to each other until hitting the ball to the other side.

7. A team earns a point if all members of the team hit the balloon at least once before hitting the balloon to the other team's side and if the balloon travels over the net and hits the floor on the opponent's side.

8. Facilitators have the option of introducing two balloons onto the field of play at the same time if the group members demonstrate mastery in playing one balloon.

PRACTICE SET:

Practice sets should be conducted prior to beginning the game to ensure that all participants understand and can perform the skills.

Participants should practice hitting the balloon to their own team members while sitting in their assigned area on the court. The facilitator(s) should provide skill instruction as needed and reinforce successful use of the skills needed for the activity.

Group facilitators should participate in the game as a team member.

Therapeutic Activities

Title of Activity:	BLINDFOLD AND OBSTACLE LANDING
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social cooperation and trust
Target Skill:	Social Interaction
Objectives:	Increase trust and social awareness through social reliance
Materials Needed:	Bandanas to serve as blindfolds, objects to serve as obstacles (i.e., hula hoops, rope, cones, etc.)

Activity Description:

Blindfolded participants will rely on a partner to lead them around the environment while verbally describing what is in the area. Participants will also guide one another through a human obstacle course in an attempt to "land" the blindfolded person (who is designated as an airplane).

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations.

2. Participants are informed that they will be working in pairs of two. The group facilitator can allow participants to select partners or staff can create pairings.

3. The group facilitator directs one member of each pair to place a blindfold over her/his eyes and instructs the partner to lead the blindfolded partner around the room (and hallway if possible). The participant leading should describe the environment as they move around so the blindfolded participant is aware of the surroundings and does not collide with objects.

4. Once both participants have played the role of the leader and the blindfolded person, the group discusses what it was like being led around and having to trust another person.

5. Next, the group facilitator informs the participants that they are going to become an airplane and will be trying to land in heavy fog. Two group members will be selected; one will be designated as the "airplane" (individual blindfolded) and the other as the control tower.

6. A runway is designated within the room, and the group facilitator instructs the group members to position themselves on the runway as obstacles. Additionally, cones, ropes, and hula hoops, etc. can be used as obstacles.

7. The “airplane” (individual blindfolded) is instructed to land without hitting any of the obstacles, but must rely on the control tower person to guide her/him down the runway.

8. The airplane landing activity can be conducted in two ways:

    a. Option I – Have the control tower person stand behind the blindfolded participant with one hand on each shoulder. The guide/tower person steers the participant through the obstacles without talking (i.e., no verbal direction).

    b. Option II – Have the control tower person be the only one allowed to talk while the airplane moves down the runway. It might be helpful to have the “airplane” person hold out her/his arms similar to an airplane and hold an object in one hand and nothing in the other hand so there is no confusion as the control tower gives direction. Instead of giving right-left commands, the “control tower” person can state which way to turn based on what is in the “airplane” person’s hand. For example, turn to the hand holding the cup.

9. The group facilitator leaves approximately 4-5 minutes at the end of the activity to review the activity.

Group facilitators should participate as blindfolded members and guide members, as well as the “airplane” and “control tower.”

Therapeutic Activities

Title of Activity:	BOARD GAMES
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction, Social Communication
Objectives:	Foster social cooperation, skills, reciprocity, negotiation, and frustration tolerance
Materials Needed:	Any board game requiring 2 or more participants and social interaction/social communication

Activity Description:

Participants will participate in a board game requiring 2 or more participants.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator also introduces which board games are to be played and reviews the specific rules for each board game being played.

2. The group facilitator divides the participants into groups to play the board games. The group size is dependent upon the board games being played.

3. The group facilitator instructs the children to begin the game, supervises the game, and provides reinforcement for use of social skills and corrective feedback (including identification of a replacement skill) when necessary.

Therapeutic Activities

Title of Activity:	CATCH ME IF YOU CAN
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	Ball, cones (to designate the field of play). Lines can be drawn if possible

Activity Description:

Participants will work as a team to complete several consecutive catches. Each member of the team can make only one catch up to the designated number needed to score a point. If the designated number of catches needed to score a point is greater than the number of players on a team, the number of catches allowed per player should be increased but still require equitable numbers across players.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator then explains that the activity requires all participants work together and cooperate. Specifically, the group is given a designated number of catches that the group has to make without the ball hitting the ground. Every participant must catch and throw the ball at least once to reach the designated number of consecutive catches. As the catches are made, the participants state the catch number.

2. Teams will receive a point if the designated number of consecutive passes has been achieved.

3. After catching the ball, the individual with the ball can take only three steps before making her/his pass.

4. The facilitator should begin with fewer catches needed for a point and increase the number of catches that have to be made as proficiency improves.

5. The field of play is set up in one of two ways:

    a. Option I - The field of play is sectioned off into as many sections as needed to accommodate the number of players so as to keep players from intruding and

colliding. If using a sectioned field, participants will be instructed that they must remain in their section during the game (players can be rotated to different sections, if desired, over the course of the activity).

b. Option II - The field of play is not sectioned off and players are allowed to move anywhere on the field of play. In this option, after catching the ball, the individual with the ball can take only three steps before making her/his pass.

6. Over the course of the activity, the group facilitator can introduce small variations in the activity such as having each participant state a favorite item (e.g., favorite movie, color, computer game, etc.) or state and display an emotion before he/she throws the ball.

Group facilitators should participate in the game as a team member.

PRACTICE SET:

Practice sets should be conducted prior to beginning the game to ensure that all participants understand and can perform the skills.

Participants should practice throwing and catching the ball and counting aloud. The facilitator(s) should provide skill instruction as needed and reinforce successful use of the skills needed for the activity.

Therapeutic Activities

Title of Activity:	COMPUTER GRABBAG (TEAM)
Characteristic Addressed:	Restricted/repetitive pattern of interest; Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Expose participants to a range of topics and foster social interaction
Target Skill:	Interest Expansion and Social Interaction
Objectives:	Have participants cooperatively research a topic on the computer
Materials Needed:	List of topics, computer with internet access, construction paper, and markers/crayons

Activity Description:

Over two sessions, participants will work in small groups to research and gather as much information as possible on a given topic using the computer.

Procedures:

SESSION ONE

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they are going to work in small groups to gather information on a given topic.

2. The group facilitator informs participants that they will be working in pairs. The group facilitator can allow participants to select partners or staff can create groupings.

3. One participant from each team draws a topic from a "hat" containing a range of topics (e.g., sharks, dinosaurs, etc.).

4. The group facilitator tells participants to locate as much information as possible on the topic via a computer search. All participants in the group must be actively involved in the computer search.

5. If more than one computer is used by a group, the participants must share their findings with one another during the activity to avoid collecting duplicate information.

6. Participants will print out the information they find in this first session. In session two, they will use these printouts to create a short book of information about the topic.

SESSION TWO

1. The group facilitator begins the activity by reminding the participants about the program rules, the activity they are working on, and what they will be doing in session two.

2. Participants are allowed to search and compile any final information for the initial 5-10 minutes of the activity.

3. Next, participants will work with their group to organize and collate a book. The group will also create a cover page.

4. For the final 5-10 minutes of the activity, each group will present their book to the whole group. Note that all members of a group should present information about their book.

Therapeutic Activities

Title of Activity:	COMPUTER SELF-PEER (BOOK)
Characteristic Addressed:	Restricted/repetitive pattern of interest; Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Expose participants to a range of topics and foster social interaction
Target Skill:	Interest Expansion and Social Interaction
Objectives:	Participants research peer and self-directed topics on the computer
Materials Needed:	Computer with internet access, construction paper, and markers/crayons

Activity Description:

Over two sessions, participants will work independently and in pairs to research and gather as much information as possible on themselves and a peer.

Procedures:

SESSION ONE

1. The group facilitator begins the activity by reiterating the program rules and expectations.

2. The group facilitator informs participants that they will be working in pairs. The group facilitator can allow participants to select partners or staff can create groupings.

3. The group facilitator directs the participants to ask each member in their group to identify some area of self-interest on which to do computer research.

4. The group facilitator tells participants to conduct a computer search on each peer's topic. The group should work on researching one peer's topic at a time. All participants in the group must be actively involved in the computer search.

5. If more than one computer is used by a group, the participants must share their findings with one another during the activity to avoid collecting duplicate information.

6. Participants will print out the information they find in this first session. In session two, they will use these printouts to create a short book of information about each peer's topic

SESSION TWO

1. The group facilitator begins the activity by reminding the participants about the program rules, the activity they are working on, and what they will be doing in session two.

2. Participants are allowed to search and compile any final information on each peer's interest for the initial 5-10 minutes of the activity.

3. Next, participants will work with their group to organize and collate a book of the interest of each peer in their small group. The group will also create a cover page.

4. For the final 5-10 minutes of the activity, each group will present their book to the whole group. Note that all members of a group should present information about their book.

Therapeutic Activities

Title of Activity:	CRAB SOCCER
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social interactions and social cooperation
Target Skill:	Social Interaction
Objectives:	Increase social cooperation and interactions toward a group goal and to foster cooperation among participants
Materials Needed:	Ball, cones (as goal posts)

Activity Description:

Participants will work as a team to move the balloon/ball toward the opposing team's goal. Each member of the team MUST kick the ball at least once before the team is able to kick the ball over the other team's end line.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations and telling the participants that they must remain in the "crab position" during the game. To get into a crab position:

    a. Have the participants sit on the ground with their knees bent and their feet flat on the ground.

    b. Next have the participant place the palms of their hands behind their hips on the ground.

    c. The participant then pushes his/her mid-body area upward while keeping his/her feet and palms flat on the ground. The participant's weight is balanced on his/her hands and feet.

    d. The participant moves by simultaneously taking a step with the right foot and left hand or the left foot and right hand.

2. The group facilitator demonstrates the "crab position" and how to pass and kick the ball in a "crab position."

3. The group facilitator describes the field of play for the setting/room. The field of play is divided into halves. Each half is sectioned off into as many sections as needed to accommodate the number of players on a team and to keep players from colliding.

4. The group facilitator divides the participants into two teams.

5. Each participant is assigned to a section on his/her team's half of the field. Participants will be instructed that they must remain in their section during the game.

6. The group facilitator explains that the activity requires teammates to work together and cooperate. Specifically, the facilitator explains that all players on a team must pass the ball at least once before their team can kick the ball over their opponent's end and at their opponent's goal.

7. Teams will receive a point if all members of the team kick the ball at least once and the ball is then kicked into their opponent's goal.

8. Facilitators have the option of introducing two balls onto the field of play at the same time if the group members demonstrate mastery in playing one ball.

PRACTICE SET:

Practice sets will likely be needed prior to beginning the game to ensure that all participants can get into a "crab position," and move and kick/pass the ball when in a "crab position." Additionally, the facilitator must make sure participants understand where their designated positions are.

Therapeutic Activities

Title of Activity:	DON'T BREAK THE EGG
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Foster social attention, interaction, and cooperation
Target Skill:	Social Interaction
Objectives:	Have participants work collaboratively to complete a project
Materials Needed:	Boiled eggs, construction paper, glue, Popsicle sticks, cotton balls, markers, tape

Activity Description:

Participants will work in small groups to create a container that allows an egg to be dropped without breaking. Participants will develop and build the container using provided materials and then drop the container from increasing heights until the egg eventually cracks. This activity may take more than one session.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs participants that they will be designing and building a box to hold and protect an egg when it is dropped from differing heights using construction paper, Popsicle sticks, tape, glue, and cotton balls.

2. The group facilitator informs participants that they will be working in pairs. The group facilitator can allow participants to select group members or staff can create groupings.

3. The participants are directed to work with their teammates to create a plan before building their protective box. The group facilitator provides support to the participants during development of the plan and subsequent building of the protective box. The facilitator also makes sure that each group member actively participates throughout the development and building.

4. Once built, participants decorate the boxes. After their boxes are decorated, the facilitator will have participants sit in a half circle. Then the facilitator will drop each group's box one at a time from different heights.

5. After each team's box has been dropped, they will check to see if their egg cracked. Each group's egg that did not crack will be dropped again in their protective box from a higher level. This continues until all the eggs are cracked or the greatest drop height is achieved.

Therapeutic Activities

Title of Activity:	DOUBLES FOUR SQUARE (COOPERATIVE)
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	Ball

Activity Description:

Participants will work cooperatively to have all members of the group catch and throw or hit the ball between squares without the ball bouncing more than one time in a square before the ball is hit or caught. Participants will work in pairs within each of the four squares and alternate who catches, throws, or hits the ball. This version is NON-COMPETITIVE.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator explains that the activity requires all participants work together and cooperate to have as many successful passes (hits or throws) without the ball bouncing more than once in a square before it is passed or hit to another square.

2. The participants are divided into pairs. The group facilitator can select the pairings or allow the participants to choose who their partner is. Each pair will be assigned to a square. Each pair will alternate who catches and throws or hits the ball to another other square.

3. The group facilitator describes the layout of the large square equally divided up into four smaller squares (quadrants).

4. Prior to starting the game, the group facilitator tells the participants how many successful passes (i.e., where the ball does not bounce more than once in a quadrant) must be made between quadrants.

5. To start the game, the facilitator designates one of the pairs to serve the ball to another quadrant. To serve, the participant hits or throws the ball into another quadrant. The ball must bounce once in this quadrant before a player in that quadrant can catch or hit the ball. The receiver of the serve must hit or throw the ball to another quadrant. Again the ball must bounce once before the receiving team can catch and throw or hit the ball in their quadrant to another quadrant. This continues until the predetermined number

of successful passes has been made or all participants have caught and thrown or hit the ball to another quadrant.

6. Once a player has hit (or caught and thrown) the ball, he/she must quickly leave the quadrant and have her/his partner get into the quadrant to take the next volley (or throw).

7. Participants will count aloud each successful pass and catch or hit to track the group's ability to reach the designated number of successful passes. The designated number of passes needed should be low in the beginning and progressively increased as the group participants' proficiency improves. The whole group could receive a point if they reach or exceed the designated number of passes.

PRACTICE SET:

Practice sets should be conducted prior to beginning the game to ensure that all participants understand and can catch and throw or hit the ball to another quadrant and can rotate with their quadrant partner.

Participants should practice hitting (or catching and throwing) the ball to one another, followed by practice hitting (catching and throwing) the ball into a designated quadrant. Participants should then practice rotating in and out of quadrants. Facilitators will provide skill instruction as needed and reinforce successful use of skill(s).

Staff should participate in the game as a team member.

Therapeutic Activities

Title of Activity:	EXPRESSION PAINTINGS
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase awareness of facial expression and affect
Target Skill:	Social Interaction, Facial Recognition, and Affect Recognition
Objectives:	Increase recognition of the facial expressions that represent various emotional states
Materials Needed:	Construction paper, mirror, and markers, crayons, or watercolor paints

Activity Description:

Participants will work to create pictures of faces that represent emotional states.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. Participants are informed that they will be creating drawings/paintings of different faces and emotional expressions.

2. The group facilitator places pieces of paper indicating emotional states in a hat and has participants draw two slips of differing emotional states.

3. Participants are directed to draw/paint a face that depicts the emotions on the pieces of paper.

4. The group facilitator has participants look into a mirror and attempt to make the face identified on the slip of paper.

5. Participants are encouraged to use the mirror to help them draw/paint the faces.

6. The group facilitator uses use the last 5-7 minutes of the activity to review the drawings/paintings of the emotional states. The facilitator can have other group members attempt to identify the feeling for each drawing/painting.

Therapeutic Activities

Title of Activity:	FACES COLLAGE
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase participant's ability to interpret and infer affective states
Target Skill:	Facial Affect Recognition
Objectives:	Have participants locate, collect, and display faces that reflect a range of emotional states
Materials Needed:	Magazines, construction paper, scissors, glue/tape, and master list of emotional states

Activity Description:

Participants will work in pairs (or individually if directed by staff) to locate pictures of faces that represent the emotions identified on the master list distributed at the start of the activity. Each will be required to locate, cut out, and paste the pictures on a large poster board.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. Participants are informed that they will be working in pairs of two (or individually if directed by staff). If working in pairs, the group facilitator can allow participants to select their partner or the facilitator can assign the pairings.

2. The group facilitator presents the following list of emotional states on a sheet to each participant (Note that other emotions can be added to this list):

HAPPY	*CONFUSED*	*MAD*
EXCITED	*SAD*	*SURPRISED*
NERVOUS	*TIRED*	*SCARED*

3. The group facilitator directs the participants to see in magazines how many pictures of faces the participants can find that display these emotions.

4. Participants create a collage of these faces. Participants cut out and paste the pictures of faces they find in the magazines on construction paper.

5. Participants cross out the emotional state from the master list once a picture or face has been located and pasted on the construction paper.

6. The group facilitator uses use the last 7-10 minutes of the activity to review the collages and have participants identify each face and the corresponding emotional state.

Therapeutic Activities

Title of Activity:	FACIAL CONCENTRATION
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase understanding of facial expression and affect
Target Skill:	Emotion recognition
Objectives:	Increase awareness and understanding of facial expression and affect
Materials Needed:	18 pairs of emotion cards (Pairs must be identical emotions).

Activity Description:

Participants will seek to find matching emotions from an array (6X6 grid) of face down emotion cards. Participants will take turns turning over two cards at a time to find and identify matching emotions. The participant continues to pick cards if the two cards chosen on his/her turn match. If the two cards picked do not match, then the next participant goes. Even if a participant is not successful in finding a match in his/her turn, he/she will need to remember where emotion cards are located from his/her own turns and that of his/her peers turns to help him/her in his/her next turn. The participant that collects the most matches wins.

Procedures:

1. The facilitator shuffles the 36 emotion cards (18 pairs of emotions) and lays the cards face down (emotion picture side down) in a 6 by 6 grid.

2. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator explains that the game requires participants to pick two cards at a time and find a match of emotions. The child who collects the most matches wins. The children are reminded that they need to pay attention to where the different emotions are located as each child turns over cards during their turns. Cards must be left in their positon on the grid unless they match. If a child finds a match, he/she removes the match from the grid.

3. The facilitator identifies who goes first. This child turns two cards in the grid so that the emotions displayed on the card are face up. The child can pick two cards from anywhere in the grid. If the child finds a match of emotion cards, he/she removes the matched pair and then picks two more cards from the grid. If the child picks two cards that don't match, he/she turns the cards back over (face down) and his/her turn is over.

4. After the first child completes his turn, the child to his/her left takes his/her turn and so on.

5. Note that when a child turns over two cards, he/she must turn the cards face up so that all participants can see the cards.

6. The facilitator reminds the children to pay attention to which cards are turned over to help them find future matches.

7. The game ends when all the emotion cards have been matched and removed from the grid. All players then count up their matching pairs.

8. Throughout the game, the facilitator will ask questions such as “what kind of face is that” or “tell me a time that you felt that emotion.”

Variation:

1. Bonus points could be given to children who correctly answers the follow-up questions.

Therapeutic Activities

Title of Activity:	FACIAL EMOTION BINGO
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase understanding of facial expression and affect
Target Skill:	Social Interaction
Objectives:	Increase understanding of facial expression and affect
Materials Needed:	Set of cards display a range of facial emotions, bingo cards (that display a collection of some of these emotions), small pieces of paper or chips

Activity Description:

Participants will locate facial expressions on their "bingo" cards as staff calls out facial expressions from a deck of facial emotion cards. The game follows general bingo procedures as participants attempt to get vertical, horizontal, diagonal, or full card sequences covered on their cards.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they must cover any facial expression image on their bingo card that matches the facial emotion called out and/or displayed by the facilitator. The group facilitator tells the participants that the goal of the game is to cover a vertical, horizontal, diagonal row of faces or all the faces on their card before the other participants.

2. The group facilitator hands out the "bingo" cards, as well as small pieces of paper or chips for participants to use to cover facial expression images on their "bingo" card that matches what emotion is called out/shown by the facilitator.

3. Participants can work alone or in pairs. If working in pairs, the group facilitator can either assign partners or allow the participants to choose their partner.

4. The group facilitator selects a facial expression card from the deck and then announces and shows the expression on the card. If a participant has that facial expression, then he/she covers the matching expression on their card with a small piece of paper or a chip.

5. The facilitator will continue to call out and show facial emotion cards from the deck until a participant has covered a vertical, horizontal, diagonal row of faces or all the faces on

his/her card. When a participant does cover a vertical, horizontal, diagonal row of faces or all the faces on his/her card, he/she says “bingo.”

6. The game then stops. The participant who said “bingo” removes each chip or paper one at a time from her/his card while calling out the emotion that was covered so as to confirm it matches what the facilitator called out.

7. After several rounds of play, the group facilitator may alter the game at step 4 above. Instead of calling out and showing the emotion/feeling displayed by the picture on the card, the facilitator only calls out the emotion and does not show the picture of the emotion to the participants. The participants have to determine the facial expression that represents the feeling called by the bingo leader without seeing it. The rest of the game follows steps 5 and 6 above.

Therapeutic Activities

Title of Activity:	FACIAL PICTIONARY
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase understanding of facial expression and affect
Target Skill:	Social Interaction
Objectives:	Increase social interaction and cooperation and understanding of facial expression and affect
Materials Needed:	Dry erase board or chalkboard, marker(s)/chalk, erase, index cards

Activity Description:

Participants will select index cards from a stack of emotion cards and attempt to draw a facial expression reflecting the emotion on the index card. The other participants will seek to guess the emotion depicted in the drawing.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator explains that the game requires individuals to draw a facial emotion and the other participants trying to guess what is drawn. The group will be divided into teams with the goal to earn points for successfully guessing what is drawn.

2. The group facilitator divides the participants into pairs and directs the teams to sit together in a half circle around the dry-erase or chalk board.

3. The group facilitator selects a participant to come to the board and randomly selects an index card identifying an emotion from the emotion cards.

4. The group facilitator tells the drawer that he/she has two minutes to draw a facial expression depicting the emotion on the card. The drawer could include the action or event that caused the emotion. The facilitator sets the timer for two minutes and states "Begin drawing."

5. The group facilitator has five options regarding how the teams guess what the emotion depicted is:

    a. Option I – Allow the partner of the drawer to make guesses as to the emotion depicted during the two-minute period. If he/she correctly identify the emotion before the timer goes off, the drawing team gets a point. If the guesser is not correct or the time expires, then the other team gets to make a guess. If they are

correct, their team gets a point. If wrong, the first team gets to guess again and so on until a team correctly guesses or the facilitator stops the guessing and has the drawer tell the participants what he/she was drawing.

b. Option II – Don't allow any guesses while the participant is drawing the image. Once the drawer is finished or his/her two minutes are up, the team whose member is drawing gets to guess what emotion is depicted. If he/she are correct, then his/her team gets a point. If he/she are not correct, then the other team gets to guess. If the other team is correct, they get the point. If they are wrong, the first team gets to guess again and so on until a team correctly guesses or the facilitator stops the guessing and has the drawer tell the participants what he/she was drawing. This second option ensures that no one individual or team monopolizes the game.

c. Option III – Instead of having participants blurt out their guess, the group facilitator gives each participant slips of paper and a pencil. Each team member writes down what they think the object, item, or action is depicted in the picture. Once all observers have written a response, the participant who completed the drawing is asked to identify what he/she drew. Each participant who guessed correctly gets a point for his/her team.

d. Option IV – Follow option III except once the participants have written out their choice, have each team hold a brief 30-second discussion to review what each member thinks the drawing is and then for the team to come to a consensus on what their whole team's guess will be. Note since the drawer cannot discuss his drawing with his/her partner, a staff member will pair with the partner of the teammate that drew the picture. Once the team discussion is completed, the participant who completed the drawing identifies what he/she drew. Each team that guessed correctly gets a point.

e. Option V – Follow option I or II but allow for a team to get an additional point if they can describe a feature in the drawn expression that supports their guess. For example, if the drawer was drawing an angry face, the guesser would state that the eyes in the drawing were squinting or the lips as if the person was biting their lips. Accept all reasonable explanations.

Therapeutic Activities

Title of Activity:	FOUR SQUARE (COOPERATIVE)
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	Ball

Activity Description:

Participants will work cooperatively to see how many consecutive times the group members can catch and throw or hit the ball between squares without the ball bouncing more than one time in a square before the ball is hit or caught. This version is NON-COMPETITIVE.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator then explains that the activity requires all participants work together and cooperate to have as many successful passes (hits or throws) without the ball bouncing more than once in a square before it is passed or hit to another square.

2. The group facilitator describes the layout of the large square equally divided up into 4 smaller squares (quadrants). Each participant is assigned a quadrant that he/she must remain in during game play. The facilitator can reassign participant positions after a point is earned.

3. Prior to starting the game, the group facilitator tells the participants how many successful passes (i.e., where the ball does not bounce more than once in a quadrant) must be made between quadrants.

4. To start the game, the facilitator designates one participant to serve the ball to another quadrant. To serve, the participant hits or throws the ball into another quadrant. The ball must bounce once in this quadrant before a player in that quadrant can catch or hit the ball. The receiver of the serve must hit or throw the ball to another quadrant. Again, the ball must bounce once before the receiving participant can catch and throw or hit the ball in his/her quadrant to another quadrant. This continues until the predetermined number of successful passes has been made or all participants have caught and thrown or hit the ball to another quadrant.

5. Participants will count aloud each successful pass and catch or hit to track the group's ability to reach the designated number of successful passes. The designated number of passes needed should be low in the beginning and progressively increased as the group participants' proficiency improves. The whole group could receive a point if they reach or exceed the designated number of passes and all participants have hit the ball at least once.

PRACTICE SET:

Practice sets should be conducted prior to beginning the game to ensure that all participants understand and can catch and throw or hit the ball to another quadrant.

Participants should practice hitting (or catching and throwing) the ball to one another, followed by practice hitting (catching and throwing) the ball into a designated quadrant. Facilitators will provide skill instruction as needed and reinforce successful use of skill(s).

Staff should participate in the game as a team member.

Therapeutic Activities

Title of Activity:	FREEZE TAG EMOTIONS
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase awareness of facial expression and affect
Target Skill:	Social Interaction, Facial Emotion Recognition and Expression
Objectives:	Increase recognition and display of the facial expressions that represent various emotional states
Materials Needed:	Cones (to set boundaries)

Activity Description:

At least one identified participant is designated as "IT" and he/she will attempt to tag all remaining participants. Every time "IT" tags a participant, they are "frozen" and cannot move. Participants who are not "frozen" can "unfreeze" their peers by touching them. Depending upon the variation played, the participants who are frozen will have to either display an emotion or identify an emotion to be unfrozen. If all participants are tagged and have not been unfrozen, then the game is over.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator informs the participants that they must try to avoid being tagged by the participant(s) identified as "IT" in the designated area. Additionally, the participants are told that the activity requires participants to be able to display an emotion with one's face and to identify emotions so that participants can become "unfrozen" or can "unfreeze" participants.

2. The group facilitator identifies who will be the participant(s), the "IT," who try to tag the other participants. The number of participants identified as "IT" is dependent upon number of participants participating in the activity.

3. The group facilitator defines the area of play and informs the participants that they must stay in this area as they try to avoid being tagged.

4. If a participant is tagged by "IT," they are "frozen" and cannot move. Additionally, when "IT" tags someone, he/she will also tell the tagged participant to display a specific emotion while they are "frozen."

5. The participant "frozen" must continue to display the emotion until they are "unfrozen" or the game is over.

6. A “frozen” participant can only be “unfrozen” if both of the following two things happen:

    a. They are tagged by a person who is not “frozen;”

    b. The participant who tags them correctly identifies the emotion the participant is displaying while “frozen.”

7. Game ends when all participants are frozen.

8. Another person(s) is/are then chosen to be “IT” and the game is started over.

Variations

Variation I:

Instead of the “frozen” participants having to display an emotion identified by “IT,” the “frozen” participants don’t have to display any emotions until they are approached by a facilitator who tells them to display a specific emotion. If the participant correctly displays the facilitator requested emotion, then the facilitator tags the “frozen” participant and he/she is “unfrozen.”

Variation II

Instead of the “frozen” participants having to display an emotion identified by “IT,” the “frozen” participants don’t have to display any emotions until they are approached by a facilitator who tells them to identify what emotion the facilitator is displaying. If the participant correctly identifies the emotion displayed by the facilitator, then the facilitator tags the “frozen” participant and he/she is “unfrozen.”

Therapeutic Activities

Title of Activity:	GROUP ISLAND
Characteristic Addressed:	Qualitative impairment in social interaction/social communication; Restricted/repetitive patterns of interests
Purpose of Activity (Goal):	Increase social interaction, cooperation, and interest expansion
Target Skill:	Social Interaction and Interest Expansion
Objectives:	Have participants collectively identify and categorize needed supplies
Materials Needed:	Large sheets of paper, smaller sheets of paper, markers/crayons, magazines, scissors, and glue

Activity Description:

Initially, participants identify five items they would need to survive if stranded on a deserted island. Participants then independently find magazine pictures or draw pictures of these items. The participants are then divided into small groups (4-6 participants) that work together to identify which of the items they found fall into similar categories (e.g., cooking items, fishing/hunting items, sleep items, etc.). The participants create "common areas" on the island where they paste similar items (i.e., kitchen area for cooking or food items; camping area for sleep items; transportation area for cars and bikes, etc.). Once completed, each group presents the common areas of their island to the other groups and describes the reasons they chose their items and common areas.

Procedures:

1. Prior to the group, the group facilitator draws one island on each large sheet of paper. The number of sheets needed is dependent upon the group size. Generally, one sheet for each group of six participants.

2. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator informs the participants that they will each identify five items they would need to survive on a deserted island. The participants will then work in small groups to identify which items fall into similar categories (e.g., cooking items, fishing/hunting items, sleep items, etc.) and then identify "common areas" on the island for items that are similar.

3. The group facilitator instructs the participants to identify five items they would want on a deserted island.

4. The group facilitator instructs the participants to search through magazines for pictures of the five items they identified and then to cut the pictures out. If any of the participants cannot find the item in a magazine, they can draw it.

5. After the participants have the pictures or drawings of their items, the group facilitator divides the participants into groups of 4-6 participants. Each group will receive a sheet with an island drawn on it.

6. Each group then examines the items each member has chosen and then works together to identify items that are similar. The group then categorizes similar items (e.g., cooking items, fishing/hunting items, sleep items, etc.).

7. The group then draws common areas on the island where similar items can be grouped together (e.g., cooking area for kitchen and food items, camping quarters for sleep items). The similar items are glued in their corresponding "common area." For example, if participants were to bring a pot, a pan, utensils, food and bottled water to the island, those items could be grouped into a "kitchen" or "food prep" area, which would then be drawn on the island. Once that area is drawn, the pictures and/or drawings of the pot, pan, utensils, and bottled water would be glued onto the island in that area.

8. Once completed, participants present the common areas of their island to the other group(s) and describe why they chose those areas and which items are in those areas. All participants should participate in their group's presentation.

Therapeutic Activities

Title of Activity:	GROUP LOOP
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	15-20 ft. rope (tie additional ropes together if more length is needed)

Activity Description:

Participants will work as a team to keep a length of rope with its ends tied together (i.e., a circle) from falling to the floor using only their bodies (no hands). Participants will arrange themselves in a circle and with their hands over their heads holding up the rope using only their torsos. Next, selected participants will change positions around the circle while the remaining group members work to keep the rope from falling to the floor. Participants will have to create tension to hold the rope up when selected members change positions.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator informs the participants that they must work together to keep the rope from falling to the floor,

2. The group facilitator leads a discussion on how group participants will be able to hold up the rope using only their torsos and not their hands.

3. The facilitator sets the rope (with the ends tied together) on the ground in the shape of a circle.

4. The facilitator then directs group participants to position themselves inside the rope circle. The facilitator tells participants to position themselves equal distant from each other in the circle. Participants can face inward or outward of the circle.

5. Participants are directed to pick up the rope and place it against their torso.

6. Participants hold their hands over their heads while keeping the rope from dropping to the floor.

7. The facilitator directs the participants to slowly roll (spin) in one direction, then reverse and roll in the opposite direction.

8. Once participants have successfully completed this task of spinning in different directions, the facilitator asks the participants how they will keep the rope tight and from falling if one of the participants moves. After this discussion, the facilitator directs one participant to move to another area in the circle.

9. Once all participants have successfully moved to a new area, the group facilitator tells the participants that he/she is now going to have more than one person move to a different area in the circle at the same time. The facilitator reminds the participants to use similar strategies to keep the rope tight and from falling to the ground. The facilitator directs two members to change areas at the same time.

10. The group facilitator increases the number of participants moving simultaneously to make the task increasingly challenging.

11. The group facilitator leaves 3-5 minutes at the end of the activity to discuss the activity, including the benefits and problems that sometimes accompany working on a team.

Staff should participate in the game as a team member.

Therapeutic Activities

Title of Activity:	HULA HOOP RELAY
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	Hula Hoops

Activity Description:

The participants hold hands to form a circle. A hula hoop is placed on the arm of two of the participants whose hands are joined. This will leave the hula hoop hanging on their joined arms. The participants then work together to pass the hula hoop around the circle without letting go of each other's hands and by moving their arms, legs, and heads through the hula hoop so as to pass it to the next participant.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator informs the participants that they must work together in a circle holding hands to pass the hula hoop around this circle without letting go of each other's hands and by moving their arms, legs, and heads through the hula hoop so as to pass it to the next participant.

2. The group facilitator has all the participants hold hands to form a circle. The facilitator instructs two of the participants to release their hand grasps and then places a hula hoop between them and then has the two participants hold hands again inside the circle of the hula hoop. This will leave the hula hoop hanging on their joined arms.

3. The group facilitator instructs the participants that they will work to move the hula hoop around the circle by stepping through the hoop (i.e., moving their arms, legs, and heads through the hula hoop) so as to pass it to the next participant.

4. The group facilitator tells the participants that they must not let go of each other's hands at any point while the hula hoop is moved around the circle. The facilitator tells the group that he/she will indicate when they can release their hands.

5. Participants can assist one another by holding a hand up high so that the hula hoop moves toward the next participant.

6. The group must get the hula hoop all the way around to the starting point. If anyone releases his/her partner's hand, the hula hoop must go back to the starting point and the group must try again.

Staff should participate in the game as a team member.

Variations

Variation I:

1. Follow steps 1-7 above but inform the participants that they will be timed.

2. The group facilitator records the time it takes for the group to move the hula hoop around the circle and writes the time on the board.

3. The group facilitator informs the group that they can repeat the task again while trying to beat their previous time.

4. This can be repeated additional times as the facilitator challenges the group to beat their best time.

Variation II:

1. Follow steps 1-7 above and procedures in Variation II (timing the group) while adding a second hula hoop to the circle.

2. Participants will be challenged to move both hula hoops around the circle to their starting points.

Variation III:

1. The facilitator will break the group into two groups.

2. Each group follow steps 1-7 above while competing with each other to see which group move the hula hoop around the circle first.

PRACTICE SET

The facilitator will have participants break into pairs and join hands. Participants are directed to practice moving the hula hoop from one person to the other. Participants will practice stepping through the hoop (by moving their arms, legs, and heads through the hula hoop) as they move the hula hoop back and forth to their partner.

Therapeutic Activities

Title of Activity:	HUMAN WAGON TRAIN
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	Cones

Activity Description:

Participants will work as a team to see how fast they can race around an obstacle course of cones to the finish line while holding hands in the shape of a wagon train with a driver and two other participants.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. Participants are informed that the activity requires teamwork and cooperation and that everyone must hold hands without breaking the "wagon train" as they move around the obstacle course of cones to the finish lines.

2. The group facilitator reviews the course and the obstacles the participants have to go around and identifies the start and finish lines. The facilitator demonstrates how the teams will complete the course.

3. The group facilitator instructs three group members to create a "wagon train" by having the three members stand together in a triangle with two members facing outward and one member facing the other two members. All three members hold hands. The two members facing outward are the front of the "wagon train." The individual facing the inside is the rear of the "wagon train" and serves as the "driver."

4. The group facilitator instructs the "wagon trains" that they cannot let go of each other's hands until they cross the finishing line.

5. The group facilitator has all the "wagon train" teams practice completing the race course and navigating around the cones. The facilitator should have the teams practice at a slow pace initially to ensure success. If necessary, the facilitator can serve as one of the members of a "wagon train" team.

6. Once the "wagon train" teams are somewhat competent, staff will have the groups try to finish the race as quickly as possible.

7. The group facilitator will announce when each “wagon train” team starts and will time each team. The facilitator awards points for successful completion as well as extra points for beating their previous attempts or a preset time.

8. All participants should serve as the “driver” of a “wagon train” at some point during the activity.

9. The group facilitator has the option of having participants changing the participant of a “wagon train” team to give participants the opportunity to work with different members.

10. The group facilitator leaves approximately five minutes at the end of the activity to discuss the challenges that were encountered during the activity.

Therapeutic Activities

Title of Activity:	IF MY FRIENDS AND I WERE ANIMALS
Characteristic Addressed:	Restricted/repetitive patterns of interests; Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase participant's self-understanding and awareness of others
Target Skill:	Self-Awareness and Awareness of Others
Objectives:	Have participants draw the animal they perceive themselves most like, the animal which they would like to be like, and animals which their peers are most like. The number of peer's animals they draw is dependent upon the amount of time available.
Materials Needed:	Construction paper, markers, crayons (this activity can also be done as a collage - if doing as a collage, materials will include paper, magazines, scissors, and glue sticks)

Activity Description:

Participants will work to create drawings depicting the animal that they are most like and the animal that they would like to be like, as well as drawings of animals that their peers are most like. Note that the animals chosen should be based on personal characteristics (e.g., being kind, loyal, smart, etc.) and NOT based on physical traits (e.g., big, short, fast, etc.).

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. Participants are informed that they will be drawing animals that they are most like and would most like to be like and then drawing animals that their peers are most like. The facilitator tells the group members that their animals should be based on personal characteristics that don't include physical traits. The group facilitator informs participants that they will have to describe their drawings at the end of the activity.

2. The group facilitator directs participants to first draw the animal that they are most like.

3. After completing this first drawing, the facilitator directs participants to draw the animal they would most like to be like.

4. Lastly, participants are directed to select one to two peers (more if time permitting) and draw the animal that each of these peers is most like.

5. Note that if doing a collage instead of drawing, the participants will search magazines for pictures of the animals in items 2-4 and then glue these pictures on paper.

6. The group facilitator will leave approximately 5 minutes at the end of the activity to have each participant present his/her drawings to the group (or collages if collages were created).

Therapeutic Activities

Title of Activity:	MOTHER MAY I?
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, social intentionality (giving/following instructions), and social reciprocity
Target Skill:	Giving/Following Instructions, Asking a Question
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	Cones or tape to mark start and end lines

Activity Description:

One participant takes the role of "mother" (leader) at the end line. All other participants begin at the start line with the goal to be the first one to cross the end line. The "mother" has her back to the participants. The only way for the participants to move towards the end line is to ask the "mother" for permission (i.e., "Mother may I…") to take a certain number of steps toward the end line. The "mother" either grants permission to the participant's request or tells his/her some other way to move toward the end line. The first participant to cross the end line wins. The participants will take turns in being the "mother."

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will play a game in which the object is to be the first one to reach the "mother" at the end line. The facilitator notes that to move from the start line to the end line, the participants will have to ask for and receive permission by the "mother" regarding specific steps they can make (i.e., jump three hops, take two large steps, etc.). The facilitator notes that all participants will take the role of the "mother."

2. The group facilitator chooses a participant to become the "mother" and has this participant stand at the end line with his/her back to the other participants.

3. The participants stand on the start line.

4. The participants take turns asking the "mother" if they can perform some steps that will position them closer to the end line. The participants must start his/her request with the phrase, "Mother, may I" followed by some type of steps they want to perform. For example, the participant may say, "Mother, may I take 4 large steps forward?"

5. The "mother" either answers, "Yes, you may" or offers a different suggestion, such as, "No, but you may take five baby steps." The participant then makes the move approved

or instructed by the “mother.” The facilitator monitors the instructions given by the “mother” to ensure that all participants have a chance to move to the end line.

6. This continues until one of the participants reaches the “mother. This person taps the “mother” on his/her shoulder.

7. The winner can become the “mother” for the next round or the group facilitator choose who the next “mother” for the next round. Note that a participant can play the “mother” role only once until all the participants have had a chance to play the “mother” role.

8. Participants can be creative with the type of steps they request, however, the facilitator should monitor for appropriateness. Suggested steps the participants can ask of the “mother” include the following:

    a. Regular steps
    b. Giant steps
    c. Baby steps
    d. Hopping steps
    e. Scissor steps (stepping sideways with arms and legs opening like scissors as steps are taken)
    f. Frog steps (hopping like a frog)
    g. Crabwalk steps
    h. Cinderella steps (twirling forward with finger on top of head)
    i. Tiptoe steps

Therapeutic Activities

Title of Activity:	ONE-HANDED CONSTRUCTION
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Foster social attention, interaction, and cooperation
Target Skill:	Social Interaction
Objectives:	Have participants work collaboratively to complete a project
Materials Needed:	Glue and Popsicle sticks (construction paper and other art materials can be used to decorate the constructed objects if time permits)

Activity Description:

Participants will work in pairs to construct an object (e.g., building, boat, car, castle, etc.) out of Popsicle sticks. Participants can only use one hand when building and, therefore, must rely on their partner to complete their object.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. Participants are informed that they will be working in pairs to build an object however each partner can only use one hand.

2. The participants are divided into pairs. The group facilitator can select the pairing or allow the participants to choose who their partner is.

3. The group facilitator informs participants that they will be constructing an object of their choice out of glue and Popsicle sticks.

4. The group facilitator informs participants that each individual can only use one hand to work with. The facilitator suggests that participants place one of their hands behind their back, in a pocket, or sit on the unused hand.

5. The group facilitator directs the pairs to develop a plan before beginning to build their object. The pairs can use scrap paper and pencils can be used to design the object.

6. The facilitator supports participants during development and building of their objects.

7. If time permits, participants can decorate their constructed object.

8. The group facilitator will leave approximately 5 minutes at the end of the activity to have each participant pairing present their constructed object. The pairings should

describe their object and the process of designing and constructing the object, and relying on another person (challenges and successes).

Therapeutic Activities

Title of Activity:	PEER COLLAGE
Characteristic Addressed:	Restricted/repetitive patterns of interests; Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Expose participant to interests of others through social interaction
Target Skill:	Interest Expansion and Social Interaction
Objectives:	Have participants locate, collect, and display items of interest to others
Materials Needed:	Magazines, construction paper, scissors, and tape or glue

Activity Description:

Participants will work in pairs and locate pictures of items/objects that represent the peer with which they are working. Participants will ask one another to identify things they like and/or facets of their lives. Each will then locate, cut out, and paste pictures on separate poster boards that reflects their peer partner. Participants will then present the pictures and describe the interests and characteristics of their partner.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be working in pairs to identify and collect information and interests of their partner, and then they are going to create a collage of their partner's information and interests.

2. The group facilitator informs participants that they will be working in pairs. The group facilitator can allow participants to select partners or the facilitator can create pairings.

3. The group facilitator directs the participants to ask their partner questions about aspects of her/his life such as what they like to eat, favorite school subject, hobbies, interests, etc.

4. The group facilitator directs the participants to find as many pictures of their partner's objects, items, and concepts in magazines and catalogs. Participants cut out pictures and paste them on a poster or paper to create a collage.

5. The group facilitator leaves approximately 7-10 minutes at the end of the activity to review the collages and have participants identify each object, item, and/or concept as characteristic of their partner. The facilitator encourages, prompts, and reinforces each participant's appropriate presentation of their collage they created on their partner.

Therapeutic Activities

Title of Activity:	PEOPLE BUILDER
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	Index Cards (listing different items, shapes, or objects)

Activity Description:

A participant will pick an index card that identifies an item, shape, or object (e.g., the letter "A", a stick house, the number "8", an airplane, etc.). This participant will direct the other participants to make the item, shape, or object while lying on the ground using their bodies to represent various sides of the item, shape, or object. The group facilitator will assist this participant in giving clear directions as to where each participant should lie to recreate a representation of the item, shape, or object.

Procedures:

1. Prior to the activity, the group facilitator creates a list of items, shapes, or objects and then makes a sketch of each item and its name/descriptor on an index card. One item, shape, or object per card. He/she then places the index cards into a container.

2. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be directed by one of the participants to use and position their bodies to make an item, shape, or object while lying on the ground. The group facilitator tells the participants that they have to listen and do exactly what the participant leader directs them to do.

3. The group facilitator picks one of the participants to direct his/her peers to make the item, shape, or object. The chosen participant picks one index card from the container.

4. The identified participant draws an index card with an item, shape, or object drawn on it. He/she shows the index card to the group facilitator but does not reveal what is on the card to the other participants.

5. The participant directs the other participants one at a time into various positions/ locations on the ground so as to recreate a representation of the item, shape, or object using their bodies. The participant leader must be sure to be very specific as to how and where each participant is to use and position their body to represent a part of the item being represented on the ground.

6. When the item, shape, or object is successfully created, another participant is selected, and the whole process is repeated from step 3 above. To ensure that more than more than one person takes the role of participant leader and that more than one item is recreated, the group facilitator will provide guidance to the participant leader as necessary.

7. The group facilitator will leave 3-5 minutes at the end of the activity to discuss the activity, including the benefits and problems that sometimes accompany working on a team and in giving and receiving instructions.

Staff should participate in the game as a team member.

Variation I

1. Instead of identifying one person to lead the other participants in depicting an item with their bodies, all the members of the group will look at one of the index cards. The whole group will them spend 2-4 minutes talking about how each of the members can position themselves to make a representation of the item, shape, or object.

2. To assist the group discussion, one group member can lead the group discussion and draw the other group members' suggestions on the board.

3. After deciding on how to represent the specific item, the group will then have 3-5 minutes (if necessary) to position themselves and depict the item/object.

4. After the group creates the item, then another index card is chosen and again the group would have a discussion on how to position themselves to create a representation of the item. Note another group participant should lead this next group discussion. This would be repeated until as many people can go during the allotted activity group time.

5. The group facilitator will leave 3-5 minutes at the end of the activity to discuss the activity, including the benefits and problems that sometimes accompany working on a team and in giving and receiving instructions.

Therapeutic Activities

Title of Activity:	SCAVENGER HUNT COLLAGE
Characteristic Addressed:	Restricted/repetitive patterns of interests
Purpose of Activity (Goal):	Expose participant to items, objects, and concepts identified by others
Target Skill:	Interest Expansion
Objectives:	Have participants locate, collect, and display items identified by others
Materials Needed:	Magazines, construction paper, scissors, adhesive, master list of objects

Activity Description:

Participants will work in pairs to locate as many items from a master list of objects, in magazines, and catalogs. Each will be required to locate, cut out, and paste the pictures on a large poster board. Participants will attempts to identify as many objects, items, and concepts from the master list as possible.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be working in pairs to identify and collect images of objects, items, and concepts from a master list. The partners will create a collage of these collected images and then share what they collected with the whole group.

2. The group facilitator informs participants that they will be working in pairs. The group facilitator can allow participants to select partners or the facilitator can create pairings.

3. The group facilitator gives each team with a list of items, objects, or concepts and tells the pairings that they must find as many images of the objects, items, and concepts as possible in the magazines and catalogs. The partners will get a point for each image they collect however, only two pictures per item, object, or concept are allowed.

4. Partners cut out the pictures they find and paste them on construction paper to create a collage.

5. The group facilitator leaves approximately 5-7 minutes at the end of the activity to review the collages and have participants identify the objects, items, and/or concepts on their collage. Both partners should report on their collage.

SCAVENGER HUNT COLLAGE – MASTER LIST

Tree	Music	Heavy
Sky	Singing	Light
House	Sleeping	Tall
Car	Running	Short
Fence	Walking	Fast
Book	Reading	Slow
Radio	Listening	Bright
Insect	Crawling	Dark
Bird	Flying	Sharp
Fish	Swimming	Dull

Therapeutic Activities

Title of Activity:	SELF-COLLAGE
Characteristic Addressed:	Qualitative impairment in social interaction/social communication; Restricted/repetitive patterns of interests
Purpose of Activity (Goal):	Foster self-awareness, presentation, and communication skills
Target Skill:	Appropriate Self-Presentation and Social Communication
Objectives:	Have participants locate, collect, and display items that reflects themselves
Materials Needed:	Magazines, construction paper, scissors, and adhesive

Activity Description:

Participants will locate pictures in magazines and catalogs that represent facets of their lives and areas of interest. Each will locate, cut out, and paste pictures on construction paper. Participants will be directed to identify a range of self-reflective pictures and avoid collecting just images within their restricted range of interests. Participants present their collages to the group at the end of the activity.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will collect images that reflect a range of facets about them (e.g., family, where they live, areas of interest, hobbies, etc.) and then create a collage of their images that they will then share with the group.

2. The group facilitator instructs participants to identify a range of pictures in magazines that describe the many characteristics and features about themselves. The facilitator tells the participants to find images that describe who they are, their interests, their family, their house/neighborhood, their school, etc. The group facilitator reminds the participants that they should not just collect pictures on their restricted or repetitive areas of interest.

3. Participants will cut out and paste as many self-reflective pictures as possible.

4. Throughout the activity, the group facilitator supports and bridges discussions between participants. For example, the facilitator may verbally reinforce similarities between participants to create social interaction and dialogue between the participants.

5. The group facilitator leaves approximately 5-7 minutes at the end of the activity to review each participant's collage and has each participant identify the pictures in his/her collage and what it reveals about him/her.

6. During the presentations, the group facilitator identifies similarities between the presenter and his/her peers. The facilitator encourages participants to talk about their commonalities.

Therapeutic Activities

Title of Activity:	SELF PORTRAIT
Characteristic Addressed:	Qualitative impairment in social interaction/social communication; Restricted/repetitive patterns of interests
Purpose of Activity (Goal):	Foster self-awareness, presentation, and communication skills
Target Skill:	Appropriate Self-Presentation and Social Communication
Objectives:	Have participants draw, decorate, and describe how they see themselves
Materials Needed:	Butcher Paper (5-6 foot length sheets), markers

Activity Description:

Participants will have their bodies traced on butcher paper and then will decorate their face and body to reflect their perceptions of themselves. Participants present their self-portraits to the group at the end of the activity.

Procedures

1. Staff cut out large pieces of butcher paper prior to the TA session. Each piece should be approximately 5 feet tall each – large enough so that each sheet is roughly the length of the child who will be using it.

2. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be divided up into pairs and each partner will trace his/her partner's body on a sheet of butcher paper. The facilitator demonstrates how the children will trace a person's body.

3. One child from each pair is instructed to lie down on one of the pieces of butcher paper while the other child, with adult assistance, traces the outline of that child's body on the paper. This will result in a full-length outline of the child. The pairings are then instructed to switch positions and using a new sheet of butcher paper, the second child will have his/her body traced.

4. The facilitator instructs the children to decorate his/her self-portrait in a way that best describes him/herself. The children are told to first work on drawing their face (drawing a particular facial expression is encouraged) before filling in the rest of their outline (e.g., shirts, jeans, sneakers, etc.).

5. The group facilitator leaves approximately 8 minutes at the end of the activity (2 minutes per child) to review each participant's decorated self-portrait. Each child is instructed to describe how they decorated their portrait and what it reveals about him/her.

6. During the presentations, the group facilitator identifies similarities between the portraits of the presenter and his/her peers. The facilitator encourages participants to talk about their commonalities.

Therapeutic Activities

Title of Activity:	SHORE TO SHORE
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Develop social cooperation and skills for a group challenge
Target Skill:	Social Interaction
Objectives:	Increase social skills and cooperation by having participants collectively examine and solve a group challenge
Materials Needed:	Six 6-foot ropes with washers tied at each end, hula hoops or tape (to designate an island or shoreline)

Activity Description:

Participants will work as a group to solve a series of increasingly difficult challenges that involve crossing a make-believe "rushing river." Participants must collectively develop and execute a plan to get all participants across the "rushing river" using varying numbers of ropes and encountering varying number of islands/rocks to visit while crossing the "rushing river."

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will have to work to together to get everyone across a "rushing river" using ropes. The facilitator should verbally create an image of a "rushing river." The facilitator tells the participants that the group will be presented with different challenges on crossing the "rushing river."

2. Prior to each challenge, the facilitator identifies the shorelines and any islands/rocks that are in the middle of the river. The shorelines and islands/rocks are represented by rope, hula hoops, and/or tape.

3. All participants should contribute to the problem solving discussions about how the participants will use the ropes to cross the "rushing river."

Challenge I

1. The group facilitator points out the shorelines they start at and end at as well as the island/rock in the middle of the river that they will use to help them cross the "rushing river."

2. The group facilitator informs the group that their challenge will be to cross the river by going from one shoreline to the island/rock to the other shoreline using two ropes. The participants will have to go the island/rock first because the ropes are not long enough

to go from shore to shore. The facilitator will remind the participants to first create a plan as a group as to how the group will cross the "rushing river." The plan should include what rope(s) to use and when, who will anchor the ropes to the shore or islands, and how they will cross (e.g., do they all go to the island first or do some go to the island and then continue on to the shore before other participants even leave the shore).

3. Before crossing, one of the group members would throw a rope from the shore to the island/rock. The facilitator can help the group get the rope to reach and "connect" with the island. One of the group members should monitor the rope to make sure it stays "connected" to the shore or island/rock while participants are walking on the rope.

4. The participants begin crossing the "rushing river" once a rope "connects" the shoreline to the island/rock.

5. To cross the river, each participant must walk on the rope to the island or shore. If a participant falls off the rope while crossing, the participant has to restart his/her crossing.

Challenge II

1. Follow steps 1-5 in Challenge I, but only allow the group one rope. This means that all participants must get to the island/rock before anyone can move on to cross the second half of the "rushing river."

Challenge III

1. The group facilitator adds two additional islands/rocks that the participants must visit on their crossing of the "rushing river." The group facilitator allows the group to use four ropes. The group facilitator reminds the group on how to use the ropes to cross to the islands and the shore and that any participant has to start over if he/she falls off the rope while crossing it.

2. The group facilitator reminds the participants to first create a plan as a group as to how the group will cross the "rushing river" while visiting all three islands.

3. As the group is successful, the group facilitator reduces the number of ropes the participants can use from four to three and then to two.

Challenge IV

1. Follow steps 1-3 of Challenge III but add stipulation that each participant can only visit two of the three islands/rocks as they cross the "racing river." The group will be allowed to use four ropes. The group facilitator will remind the participants to work together to determine which group members will cross which island, how and when. Note that the distance between the islands/rocks should be no longer than the length of the rope.

2. As group is successful, the group facilitator reduces the number of ropes the participants can use.

Challenge V

1. Follow steps 1-3 of Challenge III but have limits on some of the islands/rocks as to how many participants can be on the island at the same time. The facilitator would make two of the islands smaller in diameter. The group will be allowed to use four ropes. The group facilitator will remind the participants to work together to determine which group members will cross which island, how and when. Note that the distance between the islands/rocks should be no longer than the length of the rope.

Therapeutic Activities

Title of Activity:	SPORTS GAMES
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction, Social Communication
Objectives:	Foster social cooperation, skills, reciprocity, negotiation, and frustration tolerance
Materials Needed:	Any sports game requiring 2 or more participants and social interaction/social communication (e.g., soccer, kickball, etc.), and the specific equipment for that activity (e.g., ball, cones, bases, etc.)

Activity Description:

Participants will participate in a sports game (e.g. kickball, basketball, soccer) requiring 2 or more participants.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations for the particular sports game being played (e.g. kickball, basketball, soccer, etc.). The rules of the particular sport being played are reviewed.

2. The group facilitator may choose to do skill drills/practice trials prior to starting the game to be sure the children understand and can exhibit the skills needed for game play.

3. The group facilitator divides the participants into two teams.

4. The group facilitator reviews the field of play for the sport being played (e.g., inbounds/out of bounds, fair ball/foul ball, etc.) and assigns players to specific positions as defined by the sport being played.

5. If necessary, the group facilitator sections off the field of play into as many sections as needed to accommodate the number of players so as to keep players from intruding and colliding. If sectioning the field, each participant is assigned to a section and cannot go into another teammate's section.

6. Participants are instructed that they must remain in their assigned position or section during the game. Players can be rotated to different positions/sections if desired as the game progresses.

7. The group facilitator instructs the children to begin the game, supervises the game, and provide reinforcement for use of social skills and corrective feedback (including identification of a replacement skill) when necessary.

Therapeutic Activities

Title of Activity:	STEAL AND TRANSLATE THE BACON
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Improve social interaction and increase pragmatic language skills
Target Skill:	Social Interaction and Language Pragmatics
Objectives:	Foster social cooperation and increase language pragmatics
Materials Needed:	Dry-erase or chalkboard erase/marker (or similar small object), index cards containing one idiom on each card, tape

Activity Description:

Participants will work as a team to earn a point by getting the "bacon" from the center point of the field back across their team's line without being tagged. Additionally, the team can earn another point for successfully deciphering an idiom. The opposing team (that was unable to get the "bacon" to their side), can steal this extra point if the first team incorrectly deciphers the idiom and they correctly decipher the idiom.

Procedures:

1. Prior to the activity, the group facilitator places two parallel lines on the floor with tape approximately 15-20 feet apart. Each team will start behind one of these lines. The facilitator then places an "X" in the midpoint between these two lines; this will be the center point of the field of play. A dry-erase or chalkboard eraser will serve as the "bacon."

2. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be working as a team to compete against another team to get the "bacon" from the center point (marked with an "X") and return it to their side without the other team getting it. Whichever team brings the "bacon" to their side will get a chance to receive a point for correctly deciphering an idiom stated by the group facilitator. If the team is incorrect in their translation, then the opposing team gets the chance to decipher the idiom. If the opposing team is correct then they earn the point.

3. The group facilitator divides the participants into two teams.

4. The group facilitator assigns a number or has participants of each team count off such that one member of one team has the same number as one member of the other team.

5. The group facilitator reviews the field of play, where the center point is (that the "bacon" is placed), and where each team line is (one of the parallel lines). Each team must remain behind their team's line unless they are called to get the "bacon."

6. To start play, the group facilitator places the "bacon" on the center point and then calls out one of the numbers he/she assigned to the participants. The participant on each team with that number will attempt to get the "bacon" and return it across her/his team's line without being tagged.

7. If a player is tagged, the two players return to their sides, the bacon is returned to the center spot, and another number is called.

8. If a team is successful in getting the "bacon" across their team line without being tagged, they earn a point. Then the group facilitator picks an index card and reads the idiom. The team works collectively to provide the meaning of this idiom. If the team is correct, they earn another point. If incorrect, the other team has a chance to steal the point by correctly providing the meaning of the idiom.

9. After a few rounds of the teams trying to get the "bacon," the group facilitator has the option of calling two numbers at the same time. The two team members called out can throw the "bacon" to one another to avoid being tagged and to get across their team's line. If a participant with the "bacon" is tagged, he/she must drop the "bacon" and cannot pick it up again. It is then up to the remaining players on the field to get it across the line.

Group facilitators should participate in the game as team members.

PRACTICE SET:

Participants should practice picking up the bacon and running across the line, as well as passing the bacon to one another

Therapeutic Activities

Title of Activity:	STRANDED ON AN ISLAND
Characteristic Addressed:	Qualitative impairment in social interaction/social communication; Restricted/repetitive patterns of interests
Purpose of Activity (Goal):	Increase awareness of the interests of peers, foster social interaction, and expand area of interest
Target Skill:	Increase awareness of the interests of peers, foster social interaction, and expand area of self-interest
Objectives:	Have participants imagine they were stranded on an island with their peers. Participants will draw the things one of their peers would need and like to have on the island.
Materials Needed:	Large sheets of paper, smaller sheets of paper, or dry erase/chalk board, board markers/crayons, magazines, scissors, and glue
Activity Description:	Participants will interview a peer and make of list of the things their peer would need to have and like to have if stranded on an island in the middle of the ocean.

Procedures:

1. Prior to the group, the group facilitator draws one island on each large sheet of paper. The number of sheets needed is dependent upon the number of pairs in the group.

2. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator informs the participants that they will be stranded on an island in the middle of the ocean and need to determine what things their peers would need and like to have on the island.

3. The group facilitator informs participants that they will be working in pairs. The group facilitator can allow participants to select their partner or he/she can create groupings.

4. Each participant interviews his/her partner to determine the things the partner needs and wants to have on the deserted island.

5. Once the partner interviews are completed, the facilitator directs the participants to search and cut out images of their partner's desired items from magazines. If they cannot find an image, they can draw it. The participants will paste the cut-out images or draw the images on the island.

6. The group facilitator leaves approximately 5 minutes at the end of the activity so that each pair can present the images of items each partner wanted or needed for the island. Each partner should present the items of their partner.

Therapeutic Activities

Title of Activity:	TEAM PICTIONARY
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social interaction and cooperation
Target Skill:	Social Interaction
Objectives:	Increase social interaction and cooperation
Materials Needed:	Dry erase board or chalkboard, marker(s)/chalk, erase, index cards

Activity Description:

Participants will select index cards from box and attempt to draw a picture reflecting the object/item on the index card. The other participants will seek to guess the object, item, or action depicted in the drawing.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator explains that the game requires individuals drawing an object, item, or action and the other participants trying to guess what is drawn. The group will be divided into teams with the goal to earn points for successfully guessing what is drawn.

2. The group facilitator divides the participants into two groups and directs the teams to sit together in a half circle around the dry-erase or chalk board.

3. The group facilitator selects a participant to come to the board and randomly select an index card identifying an object, item, or action from the game box.

4. The group facilitator tells the drawer that he/she has two minutes to draw the image on the card. The facilitator sets the timer for two minutes and states “Begin drawing.”

5. The group facilitator has four options regarding how the teams guess what the image is:

    a. Option I – The partner of the drawer makes guesses as to what is drawn during the two-minute period. If he/she correctly identifies the drawing before the timer goes off, the drawing team gets a point. The guesser can make multiple guesses during the allotted time. After, the two minutes are up, the drawer cannot add anything more to his/her drawing. If the guesser is not correct or the time expires, then the other team gets to make a guess. If they are correct, their team gets a point. If wrong, the first team gets to guess again and so on until a team correctly guesses or

the facilitator stops the guessing and has the drawer tell the participants what he/she was drawing.

b. Option II – Don't allow any guesses while the participant is drawing the image. Once the drawer is finished or his/her two minutes are up, the team whose member is drawing gets to guess what the drawing depicts. If they are correct, then his/her team gets a point. If they are not correct, then the other team gets to guess. If the other team is correct, they get the point. If they are wrong, the first team gets to guess again and so on until a team correctly guesses or the facilitator stops the guessing and has the drawer tell the participants what he/she was drawing. This second option ensures that no one individual or team monopolizes the game.

c. Option III – Instead of having participants blurt out their guess, the group facilitator gives each participant slips of paper and a pencil. Each team member writes down what they think the object, item, or action is depicted in the picture. Once all observers have written a response, the participant who completed the drawing is asked to identify what he/she drew. Each participant who guessed correctly gets a point for his/her team.

d. Option IV – Follow option III except once the participants have written out their choice, have each team hold a brief 30-second discussion to review what each member thinks the drawing is and then for the team to come to a consensus on what their whole team's guess will be. Note since the drawer cannot discuss his drawing with his/her partner, a staff member will pair with the partner of the teammate that drew the picture. Once the team discussion is completed, the participant who completed the drawing identifies what he/she drew. Each team that guessed correctly gets a point.

Therapeutic Activities

Title of Activity:	THREE-LEGGED RACE
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills and reciprocity
Materials Needed:	Sections of cloth or rope (for attaching legs together) and cones or tape to mark start and finish lines

Activity Description:

Participants will work with a partner to run a designated length while one of their legs is attached to their partner's leg. The partners will strive to beat their fastest time.

Procedures:

1. Prior to the activity, the group facilitator places cones or tape to identify the start and finish lines for the races.

2. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be work with a partner to run from start to finish while one of their legs is attached to their partner's leg. The facilitator tells the partners that they must communicate with their partner to coordinate how they will step (i.e., which leg goes first) and at what pace.

3. The group facilitator pairs up with one of the participants to demonstrate how to attach their legs and move in a coordinated manner. The group facilitator stands side-by-side to the demonstration participant and then ties their legs that are touching together (in the middle) using the cloth or rope. The facilitator and the participant then walk the course by alternating taking a step with their outer legs (untied) and then their middle "leg" (i.e., tied legs).

4. The group facilitator divides the participants into pairs. The group facilitator can allow participants to select their partner or the facilitator can create pairings.

5. Participants stand side-by-side with their partner, tie their legs (that are touching) together and then practice moving (i.e., alternating taking a step with their outer untied legs and then their middle "tied leg"). Participants should begin with a slow walk and then gradually increase their pace as they become more proficient.

6. The group facilitator instructs participants that they must maintain their legs being tied until across the finish line.

7. Once the participants are somewhat competent, staff will have the partners try to move as quickly as possible. A point will be given for each partnership that successfully goes from the starting line to the finish line. An additional point can be earned for partners that beat previous race times or a present time.

8. Group facilitators have the option of having participants change partners to further practice coordinating movements and pace with another partner.

Therapeutic Activities

Title of Activity: TRUST FALL

Characteristic Addressed: SOCIAL INTERACTION

Purpose of Activity (Goal): Increase social cooperation and trust

Target Skill: Social Interaction

Objectives: Increase trust and social awareness through social reliance

Materials Needed: Blindfolds

Activity Description:

Participants will stand on a chair or box, free-fall backwards, and be caught by peers. Each participant will fall backward with her/his arms at her/his sides. The catch group will form two lines with their arms in a "zipper" pattern (do not join arms) to prevent injury.

Procedures:

Staff will begin the activity by reiterating the program rules and expectations.

Next staff will describe the activity to participants:

1. Participants will be informed that the activity requires trust, participation, and cooperation to ensure that the falling member is kept safe – staff will discuss the topic of trust, why it is important, and how each member can work to ensure her/his peers trust her/him.

2. Staff will create two lines of participants facing one another (AT LEAST TWO STAFF MUST PARTICIPATE AS MEMBERS OF THE CATCHING GROUP – AND MUST POSITION THEMSELVES OPPOSITE ONE ANOTHER).

3. Staff will direct participants to hold out their arms in a "zipper" pattern such that the participant opposite them places one arm between theirs, and one arm between them and the next person creating a zig-zag pattern with the arms (DO NOT ALLOW PARTICIPANTS TO JOIN HANDS).

4. STAFF MUST POSITION THEMSELVES IN A LOCATION THAT WILL ALLOW THEM TO INDEPENDENTLY CATCH THE PARTICIPANT IF NEEDED.

5. Staff will explain that each member of the group will step up onto a chair/object, facing away from the group, and fall backward with her/his hands at her/his sides – staff must emphasize the need for arms to be at the sides to prevent injury to the catching group – A STAFF MEMBER MUST HOLD THE CHAIR AS THE FALLING OCCURS TO PREVENT SLIPPING.

6. Staff will have all participants fall backward, as well as serve on the catch team.

7. Staff will then take approximately 5 minutes to debrief the most difficult part of the activity for each participant – participants will be prompted to explain what it felt like to fall and have to trust that her/his peers would keep her/him safe.

Advanced Option

1. Once participants have completed the above exercise, staff can repeat the activity having participants fall backward blindfolded.

2. Staff will follow the SAME PROCEDURES TO ENSURE SAFETY.

3. Staff will then take approximately 5 minutes to debrief the most difficult part of the activity for each participant – participants will be prompted to explain what it felt like to fall blindfolded and have to trust that her/his peers would keep her/him safe – staff will then relate this to issues of trust in friendships and relationships.

Staff should participate and demonstrate falling if participants are initially apprehensive.

Therapeutic Activities

Title of Activity:	TRUTH?
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, interaction, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social recall, attention, skills and reciprocity
Materials Needed:	Index cards with "T" for truth written on half the cards and "F" for false written on other half of cards

Activity Description:

Participants will sit in a circle. Participants attempt to tell a true story that sounds false or a false story that sounds true. Participants take turns telling stories about themselves and/or their families while the remaining group members listen carefully. Group members then attempt to determine whether the story is true or false.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they must listen to the story being told by each member. The group facilitator encourages participants to use what they know about one another to try and determine whether each story they hear is true or false. After a story is told, each participant will indicate whether or not they believe the story.

2. The group facilitator emphasizes that overly unrealistic stories will be easy to identify as false (e.g., "I saw a 400' yellow elephant") and overly simple stories will be easily identified as true (e.g., "I have a mom"). The storytellers are encouraged to try to fool the group members.

3. The facilitator gives each participant two index cards - one containing a "T" for true and one containing an "F" for false.

4. After the story teller finishes her/his tale, group members will place either the "T" or "F" card face down in front of them. Participants should not let other members see their card.

5. After everyone has voted, the group facilitator then has all members turn over their cards simultaneously. Participants cannot change their minds after their vote has been revealed.

6. After votes have been shared, the storyteller indicates whether his/her story was true or false. The staff facilitator can keep track of the number of correct identifications by each group member on the board, as well as the number of people the storyteller "tricked"

7. The group facilitator leaves 3-5 minutes at the end of the activity to discuss the activity and the problems sometimes encountered when attempting to determine "fact or fiction."

Staff should participate in the game as a team member.

Therapeutic Activities

Title of Activity:	T-SHIRT ART
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase participants' self-expression toward peers
Target Skill:	Self-Awareness and Awareness of Others
Objectives:	Increase participants' self-expression toward peers
Materials Needed:	T-shirts (white or light color), fabric markers

Activity Description:

Participants will create a design or image on their own t-shirt that reflects something of interest to them. Once this is completed, participants will pass their t-shirt to each member of the group and have their peers write or draw something on the t-shirt about their "friendship" or something he/she has in common with the t-shirt owner.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be creating special t-shirts about themselves, as well as sending a message to each of their "friends" in the group by writing/drawing something on their peers' t-shirts. This project will likely require two days.

2. The group facilitator informs participants that they will begin by drawing something of interest or something that reflects themselves on the t-shirt.

3. Once all participants have completed drawing a self-reflective image, staff will have each participant hold up her/his t-shirt and describe what he/she drew about her/himself.

4. After all members have described their t-shirt, the group facilitator will instruct all group members to hand their t-shirt to the peer or staff member sitting to their right.

5. Participants are then directed to write a message to the t-shirt owner about their time together in the group. The message can be short and can contain an image.

6. The group facilitator allows 3-5 minutes for the message/image to be completed, and then the facilitator will direct the participants to take the t-shirt and pass it along to the person to their right.

7. This process will be continued until all members of the group have had the opportunity to create a message and/or image to each t-shirt owner.

8. The facilitator will leave approximately 3-5 minutes at the end of the activity to discuss the friendships that were made during the group/program as well as allow participants to talk about their friendships.

Therapeutic Activities

Title of Activity:	VIDEO FACIAL RECOGNITION
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase understanding of facial expression and affect
Target Skill:	Social Interaction
Objectives:	Increase understanding of facial expression and affect
Materials Needed:	Video containing a range of facial expressions and emotions

Activity Description:

Participants will identify the feelings/emotions portrayed by actors in a movie.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be identifying different emotions and feelings portrayed by actors in a movie. The group facilitator tells the participants that they will be looking for facial expressions, body language, and the context to help them determine what emotion/feeling is being displayed.

2. Prior to starting the movie, the group facilitator has participants suggest as many emotions/feelings as possible and writes these feelings/emotions on the board.

3. The group facilitator informs the participants that he/she will be randomly pausing the movie and asking participants to identify the feeling being displayed/experienced by specific characters/actors at that point in the movie.

4. The group facilitator then plays a movie of interest to the participants. The movie must contain human actors (no animated characters).

5. The group facilitator pauses the movie at various points to expose the participants to a range of feelings/emotions. At each pause, the facilitator asks a participant to identify the emotion being displayed and how he/she knows that this is the feeling/emotion that the character is experiencing. The facilitator may prompt the participant to identify the facial features or body language displayed that support his/her answer. Participants can be directed to use the list on the board if they are having trouble identifying the feeling/emotion.

6. The group facilitator should call on different participants so that no one participant provides an unequal number of responses. The facilitator can also ask other participants to help a participant identify the emotion.

7. Once the participant identifies the emotion, the group facilitator asks the entire group if they agree with the answer and can ask group participants for further support of why they identified the particular emotion/feeling. The facilitator then resumes the movie and repeats steps 5-7.

8. The group facilitator leaves 3-5 minutes at the end of the activity to discuss what feelings/emotions were easy and difficult to identify.

Therapeutic Activities

Title of Activity:	WHAT DOES JACK LIKE?
Characteristic Addressed:	Qualitative impairment in social interaction/social communication
Purpose of Activity (Goal):	Increase social attention, skills, and reciprocity
Target Skill:	Social Interaction
Objectives:	Foster social cooperation, skills, and reciprocity
Materials Needed:	Bin of mixed objects that can be grouped (i.e. soft objects, objects that are all green, etc.). Bin can include stuffed animals, writing utensils, toys, and other miscellaneous objects.

Activity Description:

An assortment of small objects, toys, and materials are in a bin ("Jack's" bin). Prior to the game, the facilitator and one group member given the name "Jack" will identify a common characteristic (e.g., color, shape, texture, etc.) of some of the items in the bin. The facilitator and "Jack" do not tell the participants what the common characteristic is. The participants will take turns picking an object from "Jack's" bin and asking, "Does Jack like this?" "Jack" will say "yes" to any object chosen that has the chosen characteristic. After each participant has asked about an item and they have collected enough items to make a guess, the group participants will engage in a discussion about the similar features of the category of objects that "Jack" likes. Once all participants have contributed to the discussion and the group is ready to guess, then one member will be chosen to give the group's guess as to what the common characteristic is. "Jack" will confirm if the group is correct.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The facilitator explains that he/she and one of the group participants called "Jack" have identified a common characteristic for some of the items in "Jack's bin" and that the group must work together to determine what the common characteristic is. One by one, group members will pick an item from "Jack's bin" and ask "Does Jack like this?" Then after the group members have collected enough items that "Jack" likes, they will hold a group discussion to discuss what each member thinks the common characteristic is and then make a guess. "Jack" will then reveal the characteristic. The group gets a point if they are correct.

2. "Jack's bin" of small objects and items is placed in the center of the room and the participants sit in a semi-circle around the bin.

3. The group facilitator chooses one of the participants to be "Jack." The facilitator and "Jack" identify a common characteristic (big, red, things that go into the water, etc.) of

some of the items in the bin but they do not tell the other participants what the characteristic is.

4. To start the game, the group facilitator or "Jack" pulls two objects from the bin. The first object represents/demonstrates the characteristic chosen. The facilitator or "Jack" holds the first object up and says, "Jack likes this" and puts it in a designated "LIKES" pile on the ground to the left of the bin. The second object does not represent/demonstrate the chosen characteristic. The facilitator or "Jack" holds up the second object and says, "Jack doesn't like this" and places it in a "DOES NOT LIKE" pile on the ground to the right of the bin.

5. Taking turns, each participant then picks an object from "Jack's bin" and asks, "Does Jack like this?" Each participant can only pick one item from the bin per turn.

6. If the object consists of or demonstrates the identified characteristic, "Jack" answers "yes" and the item is placed in a "LIKES" pile. If the item does not, "Jack" says "no" and the item is placed in a "DOES NOT LIKE" pile.

7. The participants are not to reveal what they think the common characteristic is until all participants have picked an object and contributed in the discussion.

8. After all the group participants have asked about an item and the group members have collected enough items that "Jack" likes, then the group facilitator prompts the participants to have a discussion about the differences between the two piles and similarities within the "LIKE" pile. All participants must contribute to this discussion.

9. The group or the facilitator chooses one member to reveal what they think is the common characteristic of the items that "Jack likes."

10. "Jack" identifies the common characteristic chosen and if the group is correct. If the group is correct, then the group receives a point. If the answer it not correct, participants can re-group and talk about another possibility.

11. The group facilitator then picks another participant to be "Jack" and has the new "Jack" identify a different characteristic common to some of the items in the bin. The group repeats steps 4-10.

Therapeutic Activities

Title of Activity:	WHO ARE YOU?
Characteristic Addressed:	Qualitative impairment in social interaction/social communication; Restricted/repetitive patterns of interests
Purpose of Activity (Goal):	Increase participants' awareness of the background and interests of peers. Activity also requires social attention, interaction, and reciprocity.
Target Skill:	Social Interaction
Objectives:	Foster social awareness and interest toward peers and others, as well as facilitate social skills and reciprocity
Materials Needed:	QUESTION SET #1, QUESTION SET #2, paper and writing utensils

Activity Description:

Participants interview a peer in the group in order to gather information about the peer (e.g., age, family, where lives, school attends, preferred foods, etc.). Following the peer interviews, each participant will then introduce the peer he/she interviewed to the group and present the information they learned about the peer to the group.

Procedures:

1. The group facilitator begins the activity by reiterating the program rules and expectations. The group facilitator informs the participants that they will be interviewing a peer in the group in order to get to know the peer.

2. The group facilitator gives each participant QUESTION SET #1.

3. The group facilitator directs participants to conduct this interview with someone in the group. The group facilitator can assign who the participants interview or let the participants choose their interviewee on their own.

4. The group facilitator tells each participant that the interviews should take about three minutes to complete. Once the interview is completed, then pairs switch roles, and the interviewer becomes the interviewee and interviews the former interviewer for three minutes.

5. The participants are directed to get as much information as possible for each of the questions however they are also told to only get information related to the question and not get information unrelated to the question.

6. After the interviews are complete, the group facilitator directs the participants to return to a semi-circle around the facilitator but that they are not to sit next to the peer they interviewed.

7. One pair at a time, the group facilitator has the partners who interviewed each other stand and introduce/describe the information they gathered regarding their partner. The group facilitator directs the partners to being the introduction by saying, “I’m proud to present…” followed by the name of the partner and the information they gathered.

8. After all members have presented their partners, the group facilitator directs the participants to get a different partner to do another interview with a different set of questions. The facilitator gives each participant QUESTION SET #2 and the process is repeated from step 3 – 7 using this second set of questions.

WHO ARE YOU? – QUESTION SET #1

Other Person's Name: _____

Other Person's Age: _____

Who is in your family and what are their names? _____

_____

_____

_____

What is your favorite food? _____

_____

What food do you not like? _____

_____

What is your favorite animal? _____

_____

What is your favorite hobby (thing to do)? _____

_____

_____

What is the best thing about your mom or dad or person who takes care of you?

_____

_____

_____

_____

WHO ARE YOU? – QUESTION SET #2

Other Person's Name: _____

Other Person's Age: _____

What school do you go to? _____

What grade are you in? _____

What is your teacher's name? _____

How many friends do you have in school? _____

What are some of your friends' names? _____

_____

_____

What are your favorite subjects in school?

_____

_____

_____

What subjects do you not like?

_____

_____

What is your favorite part of school?

_____

_____

_____

Appendix E

MAXout Skill Instruction Groups and Therapeutic Activity Options

MAXout SIGs and TA Options

SIG: SOCIAL SKILLS

Accepting a Compliment
Peer Collage
Self-Collage
Board Games
Balloon Volleyball
Hula Hoop Relay
Sports Games

Accepting Consequences
Board Games
Four Square (Cooperative)
If My Friends and I Were Animals
Group Island
Hula Hoop Relay
People Builder
Sports Games

Apologizing
Computer Self-Peer Book
Catch Me if You Can
One-Handed Construction
Sports Games

Asking a Question
Shore to Shore
Group Loop
Who Are You?
Group Island
Stranded on an Island
Truth?
What Does Jack Like?

Asking for Help
Hula Hoop Relay
Blindfold and Obstacle Landing
Crab Soccer
Doubles Four Square (Cooperative)
Four Square (Cooperative)

Asking Permission
People Builder
Board Games
Mother May I
Shore to Shore

Avoiding Trouble with Others
Crab Soccer
Shore to Shore
Three-Legged Race
Balloon Volleyball

Being a Good Sport
Balloon Volleyball
Catch Me if You Can
Crab Soccer
Don't Break the Egg
Doubles Four Square (Cooperative)
Sports Games

Contributing to Discussion
Balloon Volleyball
Faces Collage
Computer Grab bag (Team)
Truth?
Scavenger Hunt Collage
Steal and Translate the Bacon

Dealing with Another's Anger
Don't Break the Egg
Hula Hoop Relay
Doubles Four Square (Cooperative)
Sport Game

Dealing with Being Left Out
Board Games
Doubles Four Square (Cooperative)
Catch Me if You Can
Freeze Tag Emotions
Hula Hoop Relay
Four Square (Cooperative)
Shore to Shore
Sports Games

Ending a Conversation
Computer Grab bag (Team)
Peer Collage
Group Island

SIG: SOCIAL SKILLS (Cont.)

Expressing Concern for Another
Charades
Human Wagon Train
Crab Soccer
Don't Break the Egg
Hula Hoop Relay
Team Pictionary

Expressing Your Feelings
Freeze Tag Emotions
Expression Paintings
Faces Collage
Team Pictionary
If My Friends and I Were Animals
Video Facial Recognition

Following Instructions
Human Wagon Train
Computer Self Peer Book
Group Island
Shore to Shore
Four Square

Giving Compliments
Peer Collage
Self-Collage
Board Games
Balloon Volleyball
Hula Hoop Relay
Sports Games

Giving Instructions
Blindfold and Obstacle Landing
Shore to Shore
Three-Legged Race
People Builder

Having a Conversation
Board Games
Balloon Volleyball
Computer Grab bag (Team)
Don't Break the Egg
Group Island
One-Handed Construction
Shore to Shore

Ignoring Distractions
Catch Me if You Can
Crab Soccer
Scavenger Hunt Collage
Truth?
Who Are You?

Introducing Yourself
Who Are You?
Computer Self Peer Book
If My Friends and I Were Animals
Peer Collage

Joining In
Balloon Volleyball
Crab Soccer
Don't Break the Egg
Doubles Four Square (Cooperative)
Sports Games
Steal and Translate the Bacon

Listening
Catch Me If You Can
Don't Break the Egg
Truth?
Shore to Shore
Group Island
People Builder
What Does Jack Like?
Who Are You?

Negotiating
Computer Grab bag (Team)
Crab Soccer
Group Island
Shore to Shore
Steal and Translate the Bacon
Stranded on an Island
Three-Legged Race
What Does Jack Like?

Offering to Help Adult
Freeze Tag Emotions
Steal and Translate the Bacon
Human Wagon Train
Crab Soccer
People Builder

SIG: SOCIAL SKILLS (Cont.)

Offering to Help Classmate
Freeze Tag Emotions
Steal and Translate the Bacon
Human Wagon Train
Crab Soccer
People Builder

Sharing
Don't Break the Egg
Four Square (Cooperative)
One-Handed Construction
Scavenger Hunt
Self-Collage

Recognizing Another's Feeling
Freeze Tag Emotions
Expression Paintings
Faces Collage
Team Pictionary
If My Friends and I Were Animals
Video Facial Recognition
Board Games

Showing Understanding of Another's Feeling
Freeze Tag Emotions
Expression Paintings
Faces Collage
Team Pictionary
If My Friends and I Were Animals
Video Facial Recognition
Board Games

Responding to Teasing
Balloon Volleyball
Crab Soccer
If My Friends and I Were Animals
One-Handed Construction
Shore to Shore
Sports Games

Using Self Control
Board Games
Human Wagon Train
Group Loop
Truth?
Hula Hoop Relay

SIG: EMOTION RECOGNITION

Expression Paining
Faces Collage
Facial Concentration
Facial Emotion Bingo
Facial Pictionary
Freeze Tag Emotions
Video Facial Recognition

SIG: INTERPRETATION OF NONLITERAL LANGUAGE

Steal and Translate the Bacon
Truth?
Video Facial Recognition

Appendix F

MAXout Therapeutic Activity Materials

MAXout Therapeutic Activity Materials

Therapeutic Activity	Materials Needed
Balloon Volleyball	Rope (to serve as net) Balloon (to serve as volleyball)
Blindfold and Obstacle Landing	Bandanas (to serve as blindfolds) Obstacles (e.g. Hula Hoops, cones, rope, etc.)
Board Games	Any board game requiring one more participants and social interaction/communication
Catch Me if You Can	Ball Cones (to designate the field of play)
Computer Grabbag (Team)	List of topics (photocopied) Computer with Internet Access Construction Paper Markers/Crayons
Computer Self-Peer (Book)	Computer with Internet Access Construction Paper Markers/Crayons
Crab Soccer	Ball Cones (as goal posts)
Don't Break the Egg	Hard-boiled eggs Construction Paper Glue Popsicle sticks Cotton balls Markers Tape
Doubles 4-Square (Cooperative)	Ball
Expression Paintings	Construction Paper Mirror Markers/crayons/watercolor paints
Faces Collage	Magazines Construction Paper Scissors Glue/tape Master list of emotion states
Facial Concentration	Pairs of identical facial emotion pictures on cards (18 pairs needed)
Facial Emotion Bingo	Set of cards display a range of facial emotions Bingo cards (that display a collection of some of these emotions) Small pieces of paper or chips
Facial Pictionary	Dry erase board or chalkboard Marker(s)/chalk Erase Index cards with one emotion written on each card
4-Square (Cooperative)	Ball
Freeze Tag Emotions	Cones (to set boundaries)

MAXout Therapeutic Activity Materials

Therapeutic Activity	Materials Needed
Group Island	Large sheets of paper Small sheets of paper Markers/crayons Magazines Scissors Glue
Group Loop	15-20 ft. rope (tie additional ropes together if more length is needed)
Hula Hoop Relay	Hula Hoops
Human Wagon Train	Cones
If My Friends and I Were Animals	Construction paper Markers, crayons (This activity can also be done as a collage - if doing as a collage, materials will include paper, magazines, scissors, and glue sticks)
Mother May	Cones or tape to mark start and end lines
One-Handed Construction	Glue Popsicle Sticks Construction Paper and other materials to decorate
Peer Collage	Magazines Construction Paper Scissors Glue or tape
People Builder	Index Cards (listing different items, shapes, or objects)
Scavenger Hunt College	Master list of Objects (in manual or create own) Magazines Construction Paper Scissors Glue or tape
Self-Collage	Magazines Construction Paper Scissors Glue or tape
Self Portrait	Butcher Paper (5-6 foot length sheets) Markers
Shore to Shore	Six 6 foot lengths of rope with washers tied at each end Tape (to designate an island and shoreline)
Sports Games	Any sports game requiring 2 or more participants and social interaction/communication (e.g. soccer & kickball), and the specific equipment for the activity (e.g., ball, cones, bases)
Steal & Translate the Bacon	Dry-erase or chalkboard Eraser/marker (or similar small object) Index cards containing one idiom on each card Tape

MAXout Therapeutic Activity Materials

Therapeutic Activity	Materials Needed
Stranded on an Island	Large sheets of paper, smaller sheets of paper, or dry erase/chalk board Board markers/crayons Magazines Scissors Glue
Team Pictionary	Dry erase board or chalkboard Marker(s)/chalk Eraser Index cards
Three-Legged Race	Sections of cloth or rope (for attaching legs together) Cones or tape to mark start and finish lines
Trust Fall	Blindfolds
Truth?	Index cards with "T" for truth written on half the cards and "F" for false written on other half of cards
T-Shirt Art	T-Shirts (White or light color) Fabric markers
Video Facial Recognition	Video containing a range of facial expressions and emotions
What Does Jack Like?	Bin of mixed objects that can be grouped (i.e. soft objects, objects that are all green, etc.) Bin can include stuffed animals, writing utensils, toys, and other miscellaneous objects
Who Are You?	Copies of Question Sets from manual Writing utensils for each group member

Appendix G

Behavioral System Point Sheet

MAXout Point Sheet

Date:	SIG A				TA A1				TA A2				SIG B				TA B1				TA B2			
Cycle 1 Skill:																								
Cycle 2 Skill:																								
POSITIVE CATEGORIES																								
Program Rules (+50)																								
Friendship Skills (+50)																								
Cycle 1 Skill (+10)																								
Cycle 2 Skill (+10)																								
Prior SIG Skills (+10)																								
Follows Instructions (+20)																								
NEGATIVE CATEGORIES																								
Not Following Instructions (-20)																								
Program Rules																								
Violates Rules of Activity(-10)																								
Not Active in Group (-10)																								
Uses materials incorrectly (-10)																								
Out of seat (-10)																								
Poor Social Behavior																								
Violates Personal Space (-10)																								
VPS - Harm (-25)																								
Poor Eye Contact (-10)																								
Interruption (-10)																								
Negative Comments (-10)																								
Sharing Irrelevant Info (-10)																								
Run-On Communication (-10)																								
Time Out																								
TOTALS																								

Appendix H

Point Sheet Weekly Summary Form

MAXout
Point Sheet Weekly Summary Form

Child _____ Group: _____ Week #: _____

	1st Weekly Session							2nd Weekly Session							Weekly Totals
	SIG 1	TA 1A	TA 1B	SIG 2	TA 2A	TA 2B	Session Total	SIG 1	TA 1A	TA 1B	SIG 2	TA 2A	TA 2B	Session Total	
POSITIVE															
Program Rules															
Friendship Skills															
Cycle 1 Skill															
Cycle 2 Skill															
Prior Taught Skills															
Follows Instructions															
						Positive Category Total (A)								Positive Category Total (B)		Wkly Positive Category (A+B)
NEGATIVE															
Not Following Instructions															
Program Rules															
Violates Rules of Activity															
Not Active in Group															
Uses Materials incorrectly															
Out of seat															
Poor Social Behaviors															
Violates Persona; Space															
VPS - Harm															
Poor Eye Contact															
Interruption															
Negative Comments															
Sharing Irrelevant Info															
Run-On Communication															
						Negative Category Total (C)								Negative Category Total (D)		Wkly Negative Category (C+D)

1st Weekly Session Total (A+C) _____

2nd Weekly Session Total (B+D) _____

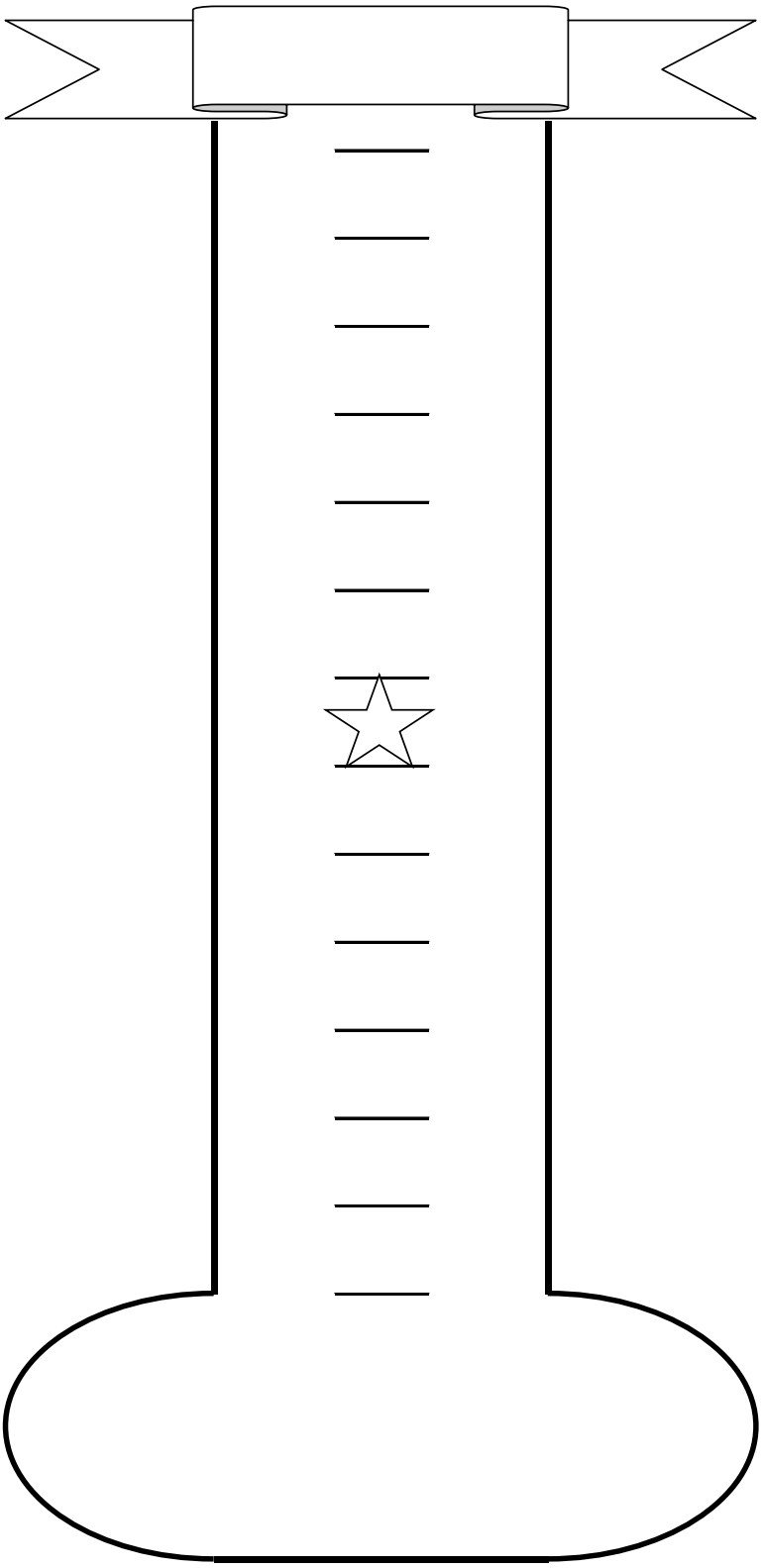
Weekly Grand Total *(A+C)+(B+D)* _____

Appendix I

Weekly Point Thermometer

MAXout

Weekly Point Thermometer



Appendix J

Master Time-out Log Sheet

MAXout

Master Time-out Log

Group: _____

Date	Name	Reason for TO (NFD or Harm)	Time Started	Time Ended	Total Time	Comments

Appendix K

Individual Daily Note Examples

max out

Individual Daily Note

Name: _____ **Date:** _____

	Actively Involved: No more than **1** reminder to be actively involved in the ongoing activity	**Maintains Eye Contact:** No more than 1 reminder to maintain eye contact when speaking or when being spoken to	**Uses Social Skills:** At least **1** instance of using a social skill of the day per activity (Must be **unprompted**)
SIG 1	**YES NO NA**	**YES NO NA**	
TA 1A	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 1B	**YES NO NA**	**YES NO NA**	**YES NO NA**
SIG 2	**YES NO NA**	**YES NO NA**	
TA 2A	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 2B	**YES NO NA**	**YES NO NA**	**YES NO NA**

Total # of Yes		**Total # of No**	
Earned Home Reward		**YES NO**	

70-79%	**80-89%**	**90-100%**

max^out

Individual Daily Note

Name: _____ **Date:** _____

	Uses Materials Correctly: No more than 2 reminders to use materials as they are intended to be used per interval	**Stays on Topic:** No more than 2 reminders to not bring up irrelevant information per interval	**Has a Conversation:** At least 1 instance of having a conversation *with a peer* per activity. Must *initiate* the conversation to earn a yes (must be **unprompted)**
SIG 1	**YES NO NA**	**YES NO NA**	
TA 1A	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 1B	**YES NO NA**	**YES NO NA**	**YES NO NA**
SIG 2	**YES NO NA**	**YES NO NA**	
TA 2A	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 2B	**YES NO NA**	**YES NO NA**	**YES NO NA**

Stays in area (No more than 2 reminders to stay in assigned area during the program)	**YES NO NA**

Total # of Yes		**Total # of No**	
Earned Home Reward		**YES NO**	

70-79%	**80-89%**	**90-100%**

Appendix L

IDN Blank Templates

max out

Individual Daily Note

Name: _____ **Date:** _____

SIG 1	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 1A	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 1B	**YES NO NA**	**YES NO NA**	**YES NO NA**
SIG 2	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 2A	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 2B	**YES NO NA**	**YES NO NA**	**YES NO NA**

Total # of Yes		**Total # of No**	
	Earned Reward	**YES NO**	

70-79%	**80-89%**	**90-100%**

max out

Individual Daily Note

Name: _____ **Date:** _____

SIG 1	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 1A	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 1B	**YES NO NA**	**YES NO NA**	**YES NO NA**
SIG 2	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 2A	**YES NO NA**	**YES NO NA**	**YES NO NA**
TA 2B	**YES NO NA**	**YES NO NA**	**YES NO NA**

	YES NO NA

Total # of Yes		**Total # of No**	
	Earned Reward	**YES NO**	

70-79% **80-89%** **90-100%**

Appendix M

IDN Parent Reward Chart Template

IDN Parent Reward Chart

Name:_____

DAILY REWARDS

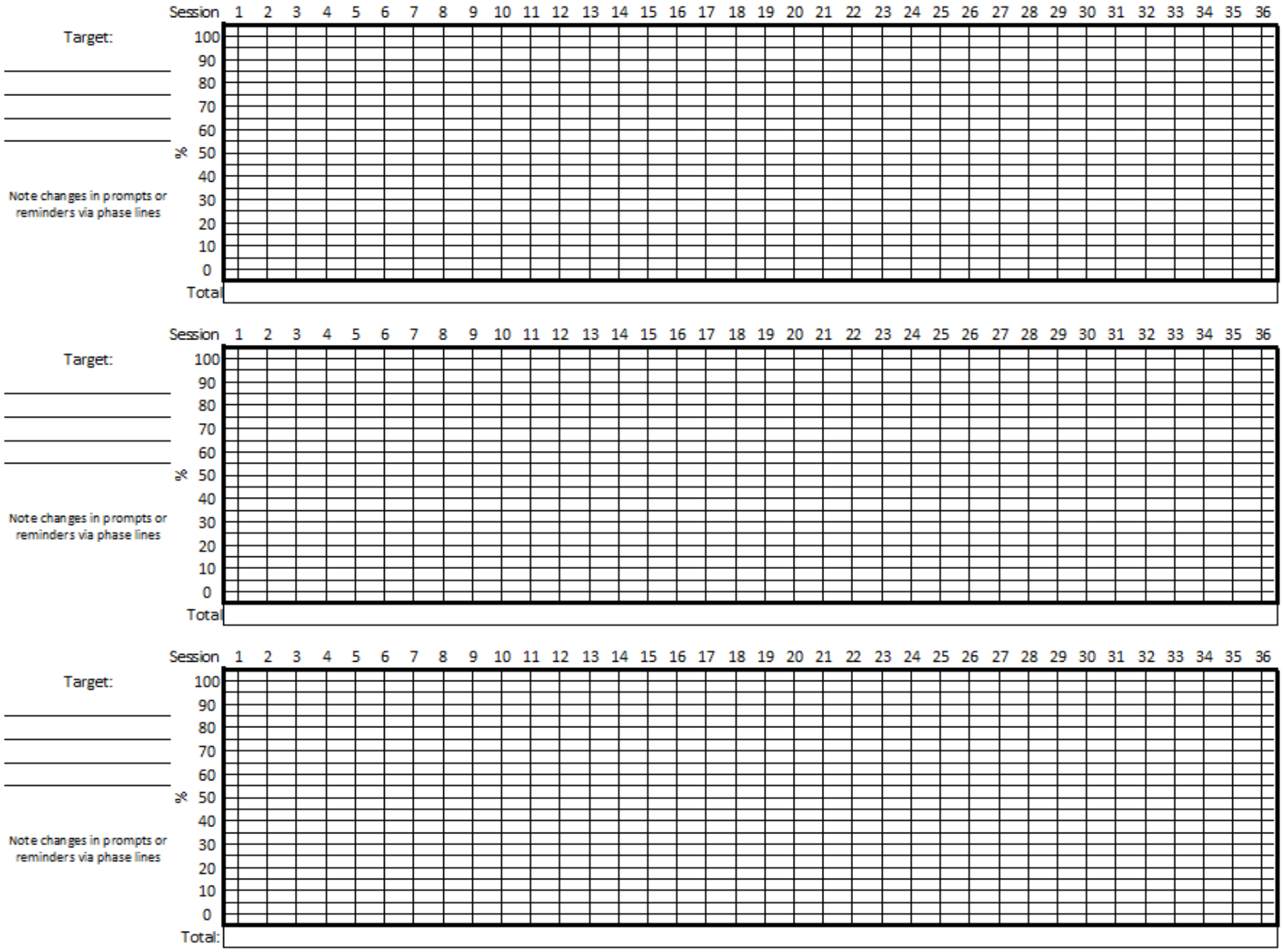
70-79%	80-89%	90-100%

WEEKLY REWARDS

Appendix N

MAXout IDN Tracking Form

Name:_____ **MAXout IDN Tracking** Start of Program: _____



Appendix O

MAXout Consultant Contact Log

Consultant Contact Log

Record any substantive contact with staff or parents (e.g., discussion of treatment elements, adherence to the manual, individual child progress, treatment acceptability, etc.) and following staff team meetings.

Staff /Parent(s): (Initials) _____ **Date:** _____

Consultant: _____

Consult Start: _____ **Consult End:** _____ **Total Time:** _____

General Topic(s): (number each topic discussed) _____

Outcome(s): (number each outcome by topic) _____

Staff /Parent(s): (Initials) _____ **Date:** _____

Consultant: _____

Consult Start: _____ **Consult End:** _____ **Total Time:** _____

General Topic(s): (number each topic discussed) _____

Outcome(s): (number each outcome by topic) _____

Appendix P

MAXout Master Schedule Template

MAXout Master Schedule Template

Week	Date	Day	Session	Cycle	Skill	Social Skill	Therapeutic Activity
1			1	1	1A	Introducing yourself	Proudly Presenting
				2	2A	Contributing to discussions	Collage-Scavenger hunt
			2	1	1B	Introducing yourself	Collage-Other
				2	2B	Contributing to discussions	Board Games
2			3	1	3A	Listening	Five Catches
				2		Non-literal language interpretation	Steal and Translate the Bacon
			4	1	3B	Listening	Collage Other
				2	4A	Giving a compliment	Self Portrait
3			5	1	5A	Being a good sport	Balloon Volleyball
				2	4B	Giving a compliment	Board Games
			6	1	5B	Being a good sport	Crab Soccer
				2		Face and emotion recognition	Faces Collage
4			7	1	6A	Giving instructions	Transformations
				2	7A	Having a conversation	Art-Computer Grabbag Book
			8	1	6B	Giving instructions	Transformations
				2	7B	Having a conversation	Board Games
5			9	1	8A	Asking a question	Blindfold and Obstacle Landing
				2		Non-literal language interpretation	Steal and Translate the Bacon
			10	1	8B	Asking a question	Art-Computer Grabbag Book
				2	9A	Asking for help	Group Loop
6			11	1	10A	Following instructions	Blindfold and Obstacle Landing
				2	9B	Asking for help	Board Games
			12	1	10B	Following instructions	Five Catches
				2		Face and emotion recognition	Expression Paintings
7			13	1	11A	Joining in	Art-Computer Grabbag Book
				2	12A	Offering to help an adult	Four Square
			14	1	11B	Joining in	River Crossing
				2	12B	Offering to help an adult	Board Games
8			15	1	13A	Ending a conversation	Art-Computer Grabbag Book
				2		Non-literal language interpretation	Steal and Translate the Bacon
			16	1	13B	Ending a conversation	Hula Hoop Circle Relay
				2	14A	Offering to help a classmate	Team Pictionary
9			17	1	15A	Accepting a compliment	Four Square
				2	14B	Offering to help a classmate	Board Games
			18	1	15B	Accepting a compliment	Art-Computer Self Interest Book
				2		Face and emotion recognition	Facial Concentration

MAXout Master Schedule Template

Week	Date	Day	Session	Cycle	Skill	Social Skill	Therapeutic Activity
10			19	1	16A	Sharing	Problem Solve Game
				2	17A	Expressing your feelings	Face Pictionary
			20	1	16B	Sharing	Art Computer Self Interest Book
				2	17B	Expressing your feelings	Board Games
11			21	1	18A	Apologizing	Crab Soccer
				2		Non-literal language interpretation	Truth?
			22	1	18B	Apologizing	Balloon Volleyball
				2	19A	Ignoring distractions	If my friends and I were animals
12			23	1	20A	Using self control	One-handed construction
				2	19B	Ignoring distractions	Board Games
			24	1	20B	Using self control	Chariots of Fire and Three-legged race
				2		Face and emotion recognition	Video Facial Recognition
13			25	1	21A	Recognizing another's feelings	Freeze Tag Emotions
				2	22A	Showing understanding of another's feelings	Stranded on an Island
			26	1	21B	Recognizing another's feelings	Trust Fall
				2	23A	Responding to teasing	Board Games
14			27	1	22B	Showing understanding of another's feelings	Art Computer Peer Topic
				2		Non-literal language interpretation	Truth?
			28	1	23B	Responding to teasing	Art Conputer Peer Topic
				2	24A	Asking permission	Charades
15			29	1	25A	Accepting consequences	Don't Break the Egg
				2	24B	Asking permission	Board Games
			30	1	25B	Accepting consequences	Don't Break the Egg
				2		Face and emotion recognition	Video Facial Recognition
16			31	1	26A	Avoiding trouble	Balloon Volleyball
				2	27A	Dealing with another's anger	Freeze Tag Emotions
			32	1	26B	Avoiding trouble	Truth?
				2	27B	Dealing with another's anger	Board Games
17			33	1	28A	Negotiating	Group Island
				2		Non-literal language interpretation	Steal and Translate the Bacon
			34	1	28B	Negotiating	One-handed construction
				2	29A	Expressing concern for another	Facial Concentration
18			35	1	30A	Dealing with being left out	What Does Jack Like
				2	29B	Expressing concern for another	Board Games
			36	1	30B	Dealing with being left out	T-shirt Art
				2		Face and emotion recognition	Face Pictionary

Appendix Q

MAXout Fidelity Tracking Form

MAXout
Treatment Component Fidelity Tracking

MAXout Component: ______________________________

Date of Fidelity Observation	Observer (initials)	%		Date of Fidelity Observation	Observer (initials)	%