BRIEF REPORT

Brief Report: Social Responsiveness and Parenting Stress as Predictors of Social Skills Outcomes in Autistic Children Following the PEERS® for Preschoolers Program

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Abstract

Purpose PEERS® for Preschoolers (P4P) is a parent-assisted social skills program for young autistic children, which has shown benefits for child and family functioning (Park et al. in Focus Autism Other Dev Disabil 38(2):80–89, 2023; Tripathi et al. in J Autism Dev Disord 52:2610–2626, 2022; Tripathi et al. in Autism 28(2):390–402, 2024). However, investigation into predictors of P4P program response have yet to be thoroughly explored. The current study aimed to explore the impact of parenting stress and social responsiveness on program outcomes in P4P.

Methods Participants included 74 preschool-aged children with historical autism diagnoses and their parents who enrolled in the 16-week P4P program. Predictors of interest were assessed through the Parenting Stress Inventory, 4th Edition, Short Form (PSI-4 SF; Abidin, in Parenting stress index. Psychological Assessment Resources, 2012) and Social Responsiveness Scale, 2nd Edition (SRS-2; Constantino & Gruber, in Social responsiveness scale, second edition (SRS-2). Western Psychological Services, 2008).

Results Results indicated significant improvements on all outcomes following P4P, including child social skills, problem behaviors, social engagement, social responsiveness, and parenting stress. Baseline parenting stress and child social responsiveness did not predict program completion. In regression models controlling for pre-scores on the respective outcomes, neither PSI-4 SF nor SRS-2 scores predicted post-scores.

Conclusion Overall, results are encouraging in its implication that the P4P can benefit autistic preschoolers and their parents with varying degrees of social responsiveness and parenting stress, respectively, upon entry.

Keywords Autism · Preschoolers · PEERS® · Parenting stress · Social skills · Social responsiveness

Introduction

Autism is characterized by differences in social communication and restrictive or repetitive behaviors (American Psychiatric Association, 2013). Previous research has found that social communication differences are apparent in early childhood and can impact outcomes through adulthood (Fuller & Kaiser, 2019). Additionally, previous findings indicate increased parenting stress among parents of autistic children (Hayes & Watson, 2013), which can further contribute to child behavioral and parent–child relationship challenges (Long et al., 2024; Miranda et al., 2019; Rodriguez

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et al., 2019). Given the sequelae of early social communication differences and parenting stress, services in early childhood have the potential to foster more positive outcomes and developmental trajectories.

One such program for young autistic children and their families is PEERS® for Preschoolers (P4P; Laugeson et al., 2025), a 16-week parent-assisted social skills group centered around skills for making and keeping friends. Previous research evidence suggests that P4P produces immediate and long-term benefits to child social functioning (Park et al., 2022; Tripathi et al., 2024; Factor et al., 2022). Further, parents also report reductions in parenting stress, a stronger sense of community, better understanding of both developmental needs and of their autistic child, and, overall, a more positive perspective (Antezana et al., 2022; Tripathi et al., 2024). These benefits are consistent with recent recommendations for early interventions to better align with the neurodiversity movement, in that effective programs should promote an understanding of autism in people in the child's world (Leadbitter et al., 2021).

However, like all programs and services, there is variability in the reported benefits and response to P4P. This variability may be explained by a number of factors, such as engagement (e.g., attendance, homework compliance) and skills use. Indeed, data from a recent mixed methods study suggest that ongoing parent utilization of PEERS® social coaching strategies was associated with maintenance of benefits after P4P (Tripathi et al., 2024), further highlighting the important role of parent social coaching in the program. In considering these findings, parenting stress may be another relevant factor as it may impede a parent's ability to adequately apply didactic instruction or serve as a motivator for program compliance and completion (Rostad et al., 2018). In studies of other programs for young autistic children, there have been inconsistent findings related to if and how parenting stress predicts program outcome (Fu et al., 2020; Rollins et al., 2019; Strauss et al., 2012). This is similarly echoed in the broader literature, where parenting stress and parenting behavior show consistent relationships cross-sectionally, though the directional influences and relationship with child behavior is less clear (de Maat et al., 2021; Mackler et al., 2015). The role of parenting stress has yet to be explored in predicting response to P4P.

Child characteristics may also explain differences in response to P4P. Given the well-established and significant heterogeneity in autism, it is also important to determine child factors that may impact program outcomes to inform referrals and planning of supportive services. Although all P4P participants have spontaneous sentence-level speech, there is a wide range in social communication and behavioral presentations, with some children demonstrating more significant differences in social awareness and responsiveness. Previous research has demonstrated that the degree of autism-related social communication and behavioral differences, as measured at baseline by the SRS-2 (SRS-2; Constantino & Gruber, 2012), predicted post-P4P outcome (Antezana et al., 2022). Specifically, parents of children with less significant autism-related social communication and behavioral differences also reported higher social skills and lower problem behaviors after P4P (Antezana et al., 2022). However, this study is significantly limited in that the analyses did not control for baseline differences in the measured outcomes. Further, in other studies of PEERS® social skills programs for different age groups, social responsiveness has not been predictive of outcomes (McLeod & McCrimmon, 2022). More research is needed to determine the specific impact of baseline social responsiveness on P4P efficacy.

Overall, investigation into predictors of treatment response in otherwise well-studied programs for autistic youth is limited and a much-needed direction for future research (Klinger et al., 2021; Stahmer et al., 2011). Moreover, as parent-mediated early interventions continue to gain prominence (Green, et al., 2024), examining factors that predict outcomes will enable participants to select interventions that align with their specific needs, ultimately leading to more effective and meaningful engagement. The current study aimed to explore the impact of parenting stress and social responsiveness on outcomes in the P4P social skills program.

Methods

Participants

Participants in the present study included children aged 3–6 years old ($N = 74$) and their parents (59 mothers, 14 fathers) enrolled in the PEERS® for Preschoolers (P4P) social skills program delivered in-person at the UCLA PEERS Clinic from 2015 to 2019. Eligibility for participation in P4P was determined via clinician judgment assessing the following: (1) social skills programming being a good fit given family current needs and priorities, (2) child adequate verbal skills (e.g., spontaneous sentence-level speech) and cognitive skills (e.g., absence of intellectual disability), (3) child capability to participate in circle-time, (4) absence of other conditions or behaviors that would interfere with program participation (e.g., severe aggression), (5) child being toilet trained, and (6) a parent fluent in English who was able to attend program sessions. Data were drawn from an archival clinical database with university Institutional Review Board (IRB) approval. Participants for the current study were selected from the larger database based on the presence of a historical diagnosis of autism, meaning they had been previously diagnosed with autism by a professional prior to enrolling in P4P.

Selected participants included 57 male children (77%) and 17 female children (23%) of the following ethnoracial backgrounds: White ($n=27$, 26.5%), Asian ($n=12$, 16.2%), Hispanic ($n=4$, 5.4%), Black ($n=3$, 4.1%), and Multiracial/Other ($n=28$, 37.9%). The participating parents included 59 mothers (79.7%) and 14 fathers (18.9%). Parents identified their ethnoracial identities as: White ($n=28$, 37.8%), Asian ($n=16$, 21.6%), Hispanic ($n=4$, 5.4%), and Multiracial/Other ($n=26$, 35.1%). Parents were highly educated, with the majority of the parents reaching an educational attainment of a bachelor's degree or higher ($n=69$, 93.2%). Child and parent demographic information is shown in Table 1.

Procedures

All participants completed a 30-minute phone screening to determine basic eligibility for the program followed by a 90-minute in-person intake with a licensed clinical psychologist or postdoctoral fellow. The intake procedure included a semi-structured parent interview and child play interaction with a team member. Parents completed all pre-forms for the program during the intake appointment. Caregivers later completed post-forms during session 16 of P4P.

PEERS® for Preschoolers (P4P)

P4P is a 16-week program which includes separate child and parent components, each led by a clinical psychologist, postdoctoral fellow, or pre-doctoral intern. In each weekly 90-minute lesson, the children received developmentally appropriate didactic lessons and role play demonstrations via puppet shows, as well as behavioral rehearsal skills practice via common games (e.g., Duck Duck Goose, Musical Chairs) modified to target the practicing of newly learned skills. Curriculum skills include listening and following directions, meeting and greeting friends, sharing and turn-taking, initiating and joining play, keeping cool, being flexible, being a good sport, transitioning to new play activities, asking and giving help, using volume control, and maintaining body boundaries.

Separately, parents also received didactic lessons in the child skills and additional social coaching skills, such as finding playgroups, arranging playdates, priming and

Table 1 Demographic characteristics

Child characteristics	
Child Gender	
Male	77.0% ($n=57$)
Female	23.0% ($n=17$)
Child Race/Ethnicity	
White	36.5% ($n=27$)
Hispanic	5.4% ($n=4$)
Black/African American	4.1% ($n=3$)
Asian	16.2% ($n=12$)
Multiracial/Other	37.9% ($n=28$)
Child Age	4.7 years old ($SD=.82$)
SRS-2 Total T-score	72.7 ($SD=10.1$)
Participating parent characteristics	
Relationship to Child	
Mother	79.7% ($n=59$)
Father	18.9% ($n=14$)
Parent Race/Ethnicity	
White	37.8% ($n=28$)
Hispanic	5.4% ($n=4$)
Black/African American	0% ($n=0$)
Asian	21.6% ($n=16$)
Multiracial/Other	35.1% ($n=26$)
Less than Bachelor's Degree	1.4% ($n=1$)
Bachelor's Degree or Higher	93.2% ($n=69$)
PSI-4 SF Total T-Score	56.1 ($SD=7.4$)

Percentages do not add to 100% for some demographic variables to account for minimal missing data

preparing children for social interactions, praising, prompting, and providing corrective feedback. The emphasis of these parent lessons is on drawing upon strengths, setting the child up for success, and maximizing person-environment fit, consistent with neurodiversity affirming recommendations for early intervention (Leadbitter et al., 2021). For example, parents are encouraged to utilize the child's interests to identify playgroups, identify potential playmates and parents of playmates who are accepting of differences, facilitate environments that will support the child's regulation and joint engagement (e.g., sensory needs, choice of toys, degree of structure), and advocate for their child's strengths and differences as appropriate.
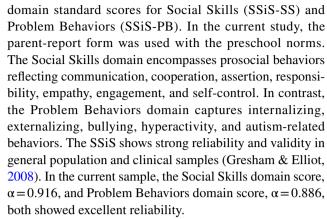
Parents reported on homework completion outside of sessions, during which the group leader provided individualized feedback and troubleshooting related to the targeted skills. During the final 30 minutes of sessions, parents reunified with children for mock playdates where children were placed into dyads to play and facilitate skills generalization while parents social coached with support and feedback from the clinical team (Factor et al., 2022). For a thorough description of the parent and child curriculum broken down by session, please see Tripathi et al. (2024).

In order to promote appreciation and respect for neurodiversity, the strategies in P4P are taught through a neuroaffirming lens. Like other PEERS® programs, our pledge to neurodiversity includes the following concepts, which are now explicitly stated at the beginning of each session: (1) we value neurodiversity, acceptance, and authenticity; (2) we honor the diverse ways people experience the world; (3) we respect each person's unique perspectives and communication styles; (4) we recognize there is no one right way to connect with others; (5) if using the strategies taught in PEERS® feels like camouflaging or masking, and/or they don't align with your goals, then you do not have to use them; and (6) learning and using the skills taught in PEERS® is a PERSONAL CHOICE.

Measures

Social Responsiveness Scale, Second Edition (SRS-2; Constantino & Gruber, 2012*).* The SRS-2 assesses the presence of social communication and behavioral differences commonly associated with autism. In the current study, the parent-report form total T-score was utilized, with scores greater than or equal to 60 indicating elevated autism-related social communication and behavioral differences. Previous research supports the validity and reliability of SRS-2 as a quantitative measure of autistic traits (Constantino & Gruber, 2012). The SRS-2 Total T-score showed strong reliability, $\alpha = 0.934$.

Social Skills Improvement System (SSiS; Gresham & Elliot, 2008*).* The SSiS is a questionnaire that produces domain standard scores for Social Skills (SSiS-SS) and Problem Behaviors (SSiS-PB). In the current study, the parent-report form was used with the preschool norms. The Social Skills domain encompasses prosocial behaviors reflecting communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. In contrast, the Problem Behaviors domain captures internalizing, externalizing, bullying, hyperactivity, and autism-related behaviors. The SSiS shows strong reliability and validity in general population and clinical samples (Gresham & Elliot, 2008). In the current sample, the Social Skills domain score, $\alpha = 0.916$, and Problem Behaviors domain score, $\alpha = 0.886$, both showed excellent reliability.

Parenting Stress Inventory, Fourth Edition, Short-Form (PSI-SF-4; Abidin, 2012*).* The PSI-4 SF is a 36-item measure that assesses parents' stress levels in relation to their role as caregivers of children aged 0–12 years old. A total parenting stress T-score is produced, with T-scores above 62, corresponding to 85th percentile and above, considered elevated. The PSI-4 Short Form was derived from factor analyses, traditionally producing three factors (Parental Distress, Parent–Child Dysfunctional Interaction, and Difficult Child), and is highly correlated with the full length, 120-question PSI-4 (Abidin, 2012). However, some research has indicated that specific items or subscales may operate differently in parents of autistic children or children with other disabilities (Zaidman-Zait et al., 2011; Dardas & Ahmad, 2013; Aubé et al., 2020); however, consensus has not emerged regarding the best item and factor structure. Given this, the total T-score was utilized rather than specific factors, which in our sample had excellent internal consistency, $\alpha = 0.914$.

Quality of Play Questionnaire (QPQ; Frankel & Mintz, 2011*).* The QPQ measured the frequency of playdates in the previous month and quality of interaction during the most recent playdate. Frequency of social engagement through playdates can be considered a concrete and ecologically valid outcome measure in social skills programming (Moody et al., 2022). Data indicates that frequency of playdates can differentiate between clinic-referred and community samples, such that children who are struggling socially have fewer than 2.5 playdates per month (Frankel & Mintz, 2011).

Data Analytic Plan

To assess our first aim, a binary logistic regression was modeled by entering baseline social responsiveness and parenting stress as predictors of a binary attrition variable. Planned preliminary analyses for the second aim included testing for changes in assessed outcomes following the P4P program using paired sample t-tests. To assess baseline social responsiveness and parenting stress as predictors of response to the program, five linear regression models were planned. For each of the five primary outcomes, post-scores were entered

as the dependent variable, with pre-scores included as a predictor to control for differences at baseline. In the models for SSIS-SS, SSIS-PB, and QPQ Total Playdates, baseline social responsiveness and parenting stress were both entered to assess their unique explanatory power in predicting outcome over and above baseline scores. For the models in which social responsiveness and parenting stress were the outcomes of interest, only the alternate predictor was evaluated over and above the respective measures' baseline. For all analyses, listwise deletion was used when missing data was present. As an exploratory analysis of archival clinical data, results were intended to be hypothesis generating (Streiner, 2015; Althouse, 2019). Given the six models for each outcome of interest, a Bonferroni correction indicated an alpha level of 0.008, which was used as a conservative benchmark of significance.

Results

In a sample of 74 families with autistic children who enrolled in P4P, 49 completed the program, with 25 families discontinuing prior to completing the 16-week curriculum. This 33.8% attrition rate is consistent with those seen in child mental health programs, with estimates between 28 and 47% when using a similar attrition definition (de Haan et al., 2013). Families who dropped from the program had significantly older children (Completers: $M_{age} = 4.6$, $SD = 0.8$; Drops: $M_{age} = 5.1$, $SD = 0.8$), $t(72) = -2.8$, $p = 0.007$); however, there were no other significant differences when comparing those who did and did not complete P4P across baseline outcomes, gender, and ethnicity. The binary logistic regression model predicting attrition from the variables of interest was nonsignificant, $\chi^2(2) = 1.60$, $p = 0.450$, indicating that baseline social responsiveness and parenting stress did not significantly relate to likelihood of attrition.

In paired samples t-tests assessing change following the P4P program, significant improvements were observed on all child outcomes, with moderate to large effect sizes. There was a significant decrease in the SRS-2 Total t-score from baseline ($M_{pre} = 73.4$, $SD = 9.7$) to after the program ($M_{post} = 66.6$, $SD = 9.4$), such that parents reported significantly fewer autism-related social communication and behavioral differences after the program, $t(44) = 5.33$, $p < 0.001$, $d = 0.79$. Parents also reported a significant increase in their children's overall social skills ($M_{pre} = 83.0$, $SD = 11.0$; $M_{post} = 88.5$, $SD = 9.8$), $t(45) = -3.09$, $p = 0.003$, $d = -0.46$, and decreases in problem behaviors on the SSIS ($M_{pre} = 114.7$, $SD = 11.6$; $M_{post} = 108.5$, $SD = 12.0$), $t(40) = 3.5$, $p = 0.001$, $d = 0.55$. Following P4P, families were having significantly more playdates, averaging 3.9 playdates per month ($SD = 2.6$), almost twice as many as when starting the program ($M_{pre} = 2.3$, $SD = 2.3$), $t(41) = -5.6$, $p < 0.001$,

$d = -0.86$. Finally, in relation to parent outcomes, there was also a significant reduction in PSI-4 SF t-scores from pre-($M_{pre} = 55.9$, $SD = 6.7$) to post-P4P ($M_{post} = 53.3$, $SD = 2.6$), $t(44) = 2.5$, $p = 0.015$, $d = 0.38$.

When conducting the five regression models testing child social responsiveness and parenting stress at baseline as predictors of outcome, assumptions of normality, homoscedasticity, linearity and absence of multicollinearity were visually checked via predicted probability plots, scatterplots of the residuals, and variance inflation factors (VIF). No violations of these assumptions emerged, with all VIFs under 5, indicating minimal concern of multicollinearity. Regression models testing child social responsiveness and parenting stress at baseline as predictors of outcome consistently revealed nonsignificant results. While the overall models were often significant, this was driven solely by the expected significant effect of baseline scores on the respective measure in predicting post-scores. With respect to the SSIS-Social Skills domain, neither baseline social responsiveness ($t(40) = -0.95$, $p = 0.348$) nor parenting stress ($t(40) = 0.28$, $p = 0.780$) significantly predicted SSIS-SS outcome over and above baseline SSIS-SS. Similar results were observed for the SSIS-Problem Behaviors domain (SRS-2: $t(35) = 1.14$, $p = 0.260$; PSI-4 SF: $t(35) = -0.35$, $p = 0.726$) and QPQ Total playdates (SRS-2: $t(37) = 1.18$, $p = 0.247$; PSI-4 SF: $t(37) = -1.43$, $p = 0.162$). In predicting SRS-2 Total T-scores after P4P, PSI-4 SF T-scores did not emerge as a significant predictor when controlling for baseline SRS-2, $t(41) = -0.40$, $p = 0.693$. Likewise, SRS-2 Total T-scores did not significantly predict parenting stress outcome over and above the explanatory power of baseline parenting stress, $t(41) = -0.49$, $p = 0.629$.

Discussion

In the current study, continued support for the positive benefits of P4P were observed, with parent-reported improvements in all outcomes assessed. This study evaluated the impacts of baseline parenting stress and social responsiveness on program attrition and outcomes, with results indicating that neither construct significantly predicted attrition rates nor any primary outcome. Overall, this finding is encouraging in its implication that P4P can benefit autistic preschoolers and their parents with varying degrees of social responsiveness and parenting stress, respectively, upon entry.
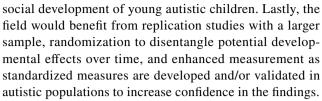
With respect to social responsiveness, these findings indicate that P4P produces similar benefits to social skills, problem behaviors, and social engagement across a range of autism-related social communication and behavioral differences in participating autistic preschoolers. The skills covered in P4P range from foundational, such as greeting peers, to more complex, such as transitioning play activities.

This range may lend itself to supporting autistic children at different starting points in relation to social communication skills. Further, program outcomes are bolstered by the individualization provided by parent social coaches. While the P4P curriculum is standardized, parents are encouraged to emphasize and tailor their coaching to their child's unique needs, with the guidance and support of the P4P clinical team. Indeed, some data suggest that programs that incorporate such individualization (e.g., increasing or decreasing structure) based on child needs and response to strategies are effective (Brown et al., 2021).

In considering the null findings related to parenting stress as a predictor of outcomes, it is possible that parents were able to effectively engage regardless of stress levels. Research supports that parents' ability to implement strategies with fidelity relates to the complexity and facilitation strategies, specifically that more concrete programs with direct instruction and high levels of support lead to enhanced implementation fidelity (Wainer & Ingersoll, 2013). Comparatively to other autism parent-assisted and parent-mediated programs, the skills taught in P4P are well-defined and specific, with each week focusing on one targeted skill. Parents were taught using similar strategies for youth participants, including didactic lessons with social skills broken into rules and steps, behavioral rehearsals with performance feedback (e.g., mock playdate social coaching during sessions), and parent homework assignments and handouts to further reinforce and apply the information. The step-by-step instruction provided to social coaches may be less susceptible to impacts stemming from parenting stress.

However, the current results need to be interpreted in the context of study limitations. Parents participating in P4P via outpatient services in the current study were highly educated, with 98.6% of parents having a bachelor's degree as compared to 47% in a national sample of families with children under 18 (National Center for Education Statistics, 2024), likely impacting the generalizability of our findings. Attending the program in person, weekly at UCLA may also have been more accessible to families with additional support (e.g., childcare for siblings, transportation, flexible work schedules). Relatedly, participating parents generally presented with average levels of parenting stress, which contrasts with the wide literature supporting that parents of autistic children often experience elevated parenting stress (Barroso et al., 2018; Hayes & Watson, 2013). Given the restricted range of participants' parenting stress, it is essential that the above findings are replicated in a higher stress sample to fully evaluate the impact of parenting stress on engagement in and response to P4P. Furthermore, future studies should investigate other factors in relation to attrition and outcome in P4P to enable enhanced program completion rates, increased opportunities for access, and support the social development of young autistic children. Lastly, the field would benefit from replication studies with a larger sample, randomization to disentangle potential developmental effects over time, and enhanced measurement as standardized measures are developed and/or validated in autistic populations to increase confidence in the findings.

Overall, findings support the potential of PEERS® for Preschoolers to enhance outcomes for autistic children, via social skills instruction and parent psychoeducation, with preliminary evidence that the program response is not predicted by child social responsiveness nor parenting stress. P4P may enable autistic children to better connect with peers and form friendships, a goal that has been articulated by autistic children and adolescents (Cresswell et al., 2019; Fox & Asbury, 2024) and is intricately tied to mental health (Schiltz et al., 2021) – a treatment priority in the autism community (Benevides et al., 2021). However, it is also essential that autism research continue to develop, test, and disseminate supportive interventions that do not target autistic differences, but instead aim to intervene on the societal attitudes and norms that perpetuate ableism, discrimination, and the exclusion of autistic people (Pellicano & den Houting, 2022). This balanced perspective acknowledges the need for greater acceptance of neurodiversity and its benefits to society, while also understanding that some autistic people may benefit from and desire targeted supports– just like every person who has their own profile of strengths and challenges (Leadbitter et al., 2021).

Declarations

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