

# UC Riverside

## UC Riverside Electronic Theses and Dissertations

### Title

PEERS Intervention With Adolescents: Are There Broader Effects on the Family?

### Permalink

<https://escholarship.org/uc/item/2811d8b5>

### Author

Choy, Tricia

### Publication Date

2021

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA  
RIVERSIDE

PEERS Intervention with Adolescents: Are There Broader Effects on the Family?

A Thesis submitted in partial satisfaction  
of the requirements for the degree of

Master of Arts

in

Education

by

Tricia C. Choy

December 2021

Thesis Committee:  
Dr. Katherine Stavropoulos, Chairperson  
Dr. Jan Blacher  
Dr. Stephanie Moore

Copyright by  
Tricia C. Choy  
2021

The Thesis of Tricia C. Choy is approved:

---

---

---

Committee Chairperson

University of California, Riverside

## ABSTRACT OF THE THESIS

PEERS Intervention with Adolescents: Are There Broader Effects on the Family?

by

Tricia C. Choy

Master of Arts, Graduate Program in Education  
University of California, Riverside, December 2021  
Dr. Katherine Stavropoulos, Chairperson

The effectiveness of the Program for the Education and Enrichment of Relational Skills (PEERS) intervention in youth with autism spectrum disorder (ASD) has been well-established; however, there is limited research on the impact of the intervention on family functioning. The purpose of this study was to examine second-hand effects of PEERS on broader family life and what factors may impact parent perceptions of their youth with ASD and family functioning following the intervention. The current study included adolescents with ASD and their caregivers, who all participated in the PEERS intervention, and a comparison group of twenty typically developing (TD) adolescents and their caregivers who did not participate in the PEERS intervention. Caregivers reported on measures of their youth's autism symptom severity, social skills, problem behaviors, and impact of the youth on the family. All measures were assessed at pre- and post- intervention and at four-month follow up. Results supported improvements in ASD

youths' ASD autism symptom severity, social skills, and problem behaviors following the PEERS intervention. There were no changes detected in impact of the ASD youth on the family following the intervention. ASD youth problem behaviors were a driving factor in parent report of negative family impact. These findings highlight the need to further understand the relationships among youth problem behaviors, family perceptions and social skills interventions in designing studies targeting broader parent and family outcomes.

## Table of Contents

<b>Introduction</b> .....	1
Autism Spectrum Disorder (ASD) and Impact on Social Skills.....	1
Parent Perceptions and Family Stress.....	3
Parent Involvement in Intervention.....	4
Current Study.....	5
<b>Methods</b> .....	6
Participants.....	6
Intervention.....	7
Measures.....	8
Procedures.....	11
Statistical Analyses.....	14
<b>Results</b> .....	14
Pre-Post Intervention Results.....	14
Exploratory Analyses.....	18
<b>Discussion</b> .....	19
Limitations.....	23
<b>Conclusion</b> .....	23
<b>References</b> .....	25

## List of Figures

### Methods: PEERS Intervention

Figure 1: Flowchart of PEERS intervention.....13



## List of Tables

### Methods: Participants

Table 1: Descriptive Group Characteristics.....	7
---	---

### Methods: Behavioral Data Across Time

Table 2: Final Data across Time for Groups.....	14
---	----

## **Introduction**

### **Autism Spectrum Disorder (ASD) and Impact on Social Skills**

Youth with autism spectrum disorder (ASD) often struggle with peer relationships and experience peer rejection, feelings of loneliness, and poorer friendship quality compared to typically developing peers (Bauminger & Kasari, 2000; Tobin et al., 2014). Regarding long term outcomes of loneliness, Mazurek (2014) found that loneliness was significantly correlated with increased depression and anxiety, and decreased life satisfaction and self-esteem in adults with ASD; however, increasing one's social network was associated with decreased loneliness. Parents of youth with ASD shared concerns for their children's well-being and consider social skills to be important (Lee et al., 2008; Rankin et al., 2016). Thus, one way to combat loneliness, improve peer relationships, and ameliorate parents' concerns is to teach and promote social skills. One context that has not been explored extensively is how social skill interventions affect the well-being of both youth with ASD and their parents.

One domain that greatly impacts positive social interactions in autistic youth<sup>1</sup> is problem behavior. When compared to their typically developing peers, youth with ASD exhibit significantly greater problem behavior, which adversely affects their social functioning (Elliot & Gresham, 1993; Matson, 2008; Shea et al., 2018). Problem behaviors, such as repetitive behaviors, self-injury, and tantrums, impede youth with

---

<sup>1</sup>Due to a lack of universally accepted terminology for describing autism (e.g., Kenny et al., 2016), we used both person-first language and identity-first language to be inclusive of numerous current perspectives on appropriate terminology

ASD from understanding social expectations or reading social cues (Shea et al., 2018; Volker et al., 2010). Nevertheless, previous studies have shown reductions in problem behaviors following social skills interventions (Tse et al., 2007). This suggests that interventions promoting social skills development not only improve social functioning in autistic youth, but also positively impact other domains of their life. Moreover, researchers have developed and delivered social-communicative interventions in multiple settings. Within the school setting, Kretzmann, Shih, and Kasari (2015) successfully implemented a psychosocial intervention to improve peer engagement in children with ASD between the ages of 6-11 years old. This intervention required paraprofessionals to directly model specific peer engagement strategies during recess, which allowed for the social skills learned during the intervention to generalize to children's natural environments. In contrast to directly intervening in children's natural context, Laugeson et al. (2009) developed and examined the efficacy of the PEERS program in an outpatient clinic setting. The PEERS program is an established social skills intervention focusing on making and keeping friends for slightly older children, such as adolescents with ASD (Laugeson et al., 2009, 2015).

An effective component of PEERS is having caregivers learn and assist their adolescent with social skills strategies acquired. The effectiveness of involving caregivers in the PEERS intervention has been established in multiple clinical trials or educational settings with autistic youth, mainly involving parent reports of the adolescents' progress or improvement in social skills (Laugeson et al., 2009, 2012; Laugeson et al., 2014; Schohl et al., 2014). Nevertheless, the effects of the PEERS intervention on the broader

family context, such as parent-reported levels of positive and negative impact, have not been examined.

### **Parent Perceptions and Family Stress**

Autistic children more often than not exhibit problem behaviors that adversely affect the family unit (Jellett et al., 2015). Such behaviors affect parent perceptions of their child, resulting in reports of negative impact or stress (Raff et al., 2021). For example, parents reported more stress associated with family problems, less personal time, and fewer family opportunities for free time while raising their child with ASD than did parents of typically developing children or parents of children with Down syndrome (Sanders & Morgan, 1997; Meirsschaut et al., 2010). Other studies found that parents of children with high rates of externalizing behaviors tended to perceive their child's behaviors as more problematic than parents of children with lower levels of externalizing behaviors (Sikora et al., 2013). In addition, Plant and Sanders (2007) noted that parents who dedicate time and energy to support their children with severe problem behaviors may experience greater family stress and a decreased sense of family resiliency, which can impact overall family functioning, communication, problem solving, and connectedness (Sanders & Morgan, 1997). Additionally, a significant relationship between parent stress levels and the mental health of parents was found to exist in single time point as well as longitudinal studies, such that higher behavioral problems in autistic youth were associated with heightened parent stress and psychological symptoms (Blacher & Baker, 2019; Yorke et al., 2018). This suggests that parent stress levels and

their mental health symptoms may have long-lasting effects on parents and the family unit.

Others have reported more positive consequences associated with having an autistic youth. Lloyd and Hastings (2009) observed that child behavior problems were negatively predictive of maternal well-being; however, they also found that parents who reported higher levels of hope expressed better psychological well-being. Likewise, Blacher and Baker (2019) also found that mother's well-being was moderated by an optimistic outlook on life, even when examined with the combined impact of both youth disability and disruptive behavior disorders. In this study, optimism buffered the impact of youth with higher rates of externalizing behaviors on maternal psychological distress, such that those mothers who had moderate to high levels of optimism evidenced decreased stress and symptoms of mental health impact. However, this begs the question as to whether an intervention to promote social skills – and the parent's role in such an intervention - might subsequently also affect parents' perception of their youth, both negative and positive, on the family.

### **Parent Involvement in Intervention**

Multiple studies have shown that both parent involvement and parent perceptions of their youth with disabilities improved treatment outcomes and perceptions following intervention. Ronski and colleagues (2011) found that parents' perception of success about how their children were communicating became more positive following a language intervention. Similarly, Kaiser, Hancock, and Hester (1998) also established that parents who acted as co-interventionists enjoyed spending more time with their

children with developmental disabilities, which led to improved quality of parent-child relationships following a language intervention. Karst and van Hecke (2012) noted that following intervention, parents generally benefitted in the following ways: increased ASD-related knowledge and therapeutic skills, improved parent responsiveness and decreased parent over-reactivity, improved mental and physical health, and greater self-efficacy. Thus, parent involvement in other interventions with children with ASD not only benefitted the child and improved treatment outcomes, but also benefitted the parents and the family system as a whole (Dunlap, 1999; Rogers 2000; Schertz & Odom, 2007). In regards to parent and family outcomes specifically in response to the PEERS program, Karst and colleagues (2015) found that the time burden of participating in and completing homework assignments as part of the intervention did not affect family functioning, and parenting self-efficacy, defined as the degree to which the parent feels competent and capable of problem solving, actually improved following the intervention. Additionally, parent depressive symptoms have been found to modestly decrease after participation in PEERS (Schiltz et al., 2018), suggesting that social skills intervention incidentally alleviated depression in parents as a result of the youth's social behavior improvements. Based on these studies, it appears that parent involvement in intervention can improve parents' perceptions of their child, parent's well-being, and improve family functioning.

### **Current Study**

Questions remain regarding how interventions for youth with ASD impact parent perception of youth and overall family well-being, and whether such changes in parental

perception correspond with improvements in youth behaviors. Furthermore, it is not clear what child and parent factors might predict improvements in parent perception of youth after completion of a social skills intervention. Thus, the current study explored the following questions:

- 1) Are there second-hand effects of the PEERS intervention that may impact broader family life?
- 2) Do improvements in social skills coincide with a decrease in parent-reported youth problem behaviors?
- 3) What child and parent factors may impact parent perception of their youth following the PEERS intervention?

## **Method**

### **Participants**

Participants included two cohorts of adolescents with ASD (Cohort 1,  $n=7$ ; Cohort 2,  $n=6$ , Total  $N=13$ ) and one comparison cohort of typically developing (TD) adolescents ( $N=20$ ). As there were no significant differences in age, IQ, or pre-test scores between the two cohorts of adolescents with ASD ( $p's > 0.65$ ), analyses below combine the two cohorts. Demographic information on all participants can be found in Table 1. Household income was missing from one TD participant.

Table 1. Descriptive characteristics of ASD and TD participants

<b>Variable</b>	<b>ASD Participants</b>	<b>TD Participants</b>
Gender	10 males, 3 females	16 males, 4 females
Age in years, <i>M (SD), Range</i>	14.17, (2.09), 11.26-17.05	13.66 (1.83), 11.10-17.10
IQ, <i>M (SD), Range</i>	99.54, (15.62), 77-129	109.50, (14.84), 79-131
White <i>n</i>	4	8
Latino <i>n</i>	9	10
Black <i>n</i>	0	1
Asian <i>n</i>	0	1
<u>Maternal Educational Level</u>		
Less than College	10	7
College and Above	3	13
<u>Household Income</u>		
Up to \$50,000	4	4
\$50,001-\$100,000	5	4
Over \$100,001	4	11

### **Intervention**

The intervention was PEERS (*Program for the Education and Enrichment of Relational Skills, PEERS, Laugeson et al., 2009; 2012*), a 16-week evidence-based social skills intervention designed to teach adolescents how to make and keep friends (see Laugeson et al., 2012). Parents and autistic teens participated in a 16-week, 90-minute group session and each session is paired with a key socialization homework assignment. Parent and adolescent groups were run concurrently each week, during which adolescents were taught specific to-do and not-to do social skills. Parents were taught how to support their adolescent in practicing and maintaining skills outside of the group setting using the socialization homework assignments related to each weekly session.



Social skills taught during sessions included: Using appropriate conversational skills; choosing appropriate friends; using social media and texting appropriately and safely; using humor appropriately; initiating and joining conversations with peers; organizing get-togethers; being a good sport when playing games; handling arguments; and handling rejection, teasing, and bullying (Laugeson et al., 2014).

In this study, portions of the PEERS intervention were translated for Spanish-speaking families, including the parent materials as well as the intervention itself. A bilingual group leader conducted the parent groups where English was spoken first and then translated all statements into Spanish for Spanish-speaking families. For the adolescent groups, sessions were conducted in English. Both parent and adolescent groups were run by PEERS certified providers and supervised by a licensed clinical psychologist.

## **Measures**

### ***Eligibility Measures***

All adolescents completed assessments to confirm cognitive ability. Adolescents with ASD completed assessments to confirm ASD diagnosis and motivation to participate in the PEERS intervention.

*Wechsler Abbreviated Scales of Intelligence (WASI-II, Wechsler, 2011)*: The WASI-II is a brief cognitive assessment for individuals ages 6 to 90. Two subtests, Vocabulary and Matrix Reasoning, were utilized to compute the Full-Scale IQ-2 (FSIQ-2). Inclusionary criteria involved a full-scale IQ of 70 or above.

*Autism Diagnostic Observation Schedule, Second Edition (ADOS-2, Lord, 2012):* The ADOS-2 is an activity- based standardized assessment of communication, social interaction, and play to evaluate individuals suspected, or at risk, of a diagnosis of ASD. Modules 3 and 4 only were administered to ASD participants in this study to confirm the presence of ASD.

*Mental Status Checklist (Laugeson & Frankel, 2010):* This checklist includes questions to assess the adolescents' interest and motivation to learn how to keep and make friends. ASD participants completed this set of questions to determine willingness and interest in the intervention.

### ***Outcome Measures***

Parents completed two questionnaires about adolescent behaviors, and a questionnaire reflecting their perception of family impact. Parents of both TD and ASD adolescents completed the same measures. During the intervention, parent completion of homework assignments was collected as a measure of parent involvement.

*Social Responsiveness Scale, Second Edition (SRS- 2, Constantino & Gruber, 2012):* The SRS is a standardized 65-item parent-report rating scale utilized to assess autism symptoms severity in individuals ages 4 to 18. The SRS-2 is reliable and sensitive to changes in social functioning among adolescents with ASD (Corona et al., 2019), and has also been used with TD individuals (Cholemkery et al., 2014). Parents were asked to indicate how often their child has displayed social behavior characteristics possibly reflective of ASD (e.g., “Has difficulty relating to peers”) in the past six months by rating on a 4-point Likert scale from “not true” to “always true.” The SRS-2 yields T-scores

( $M=50$ ;  $SD=10$ ) that reflect overall social responsiveness. Higher scores represent more autism related symptomology.

*Social Skill Improvement System (SSIS, Gresham and Elliott, 2007)*: The SSIS is a standardized 79- item parent-report questionnaire that assesses child social skills and behavior problems for children ages 3 to 18. Parents were asked to indicate how often their child displays social skills (including communication, cooperation, assertion, responsibility, empathy, engagement, and self-control) and problem behaviors (including externalizing, hyperactivity/inattention, bullying and internalizing, and ASD symptoms) using a 4-point Likert scale of “never”, “seldom”, “often”, or “almost always.” Standard scores of problem behaviors and social skills were used from the SSIS. Higher scores represent better social skills and more problem behaviors. High internal consistency, test-retest reliability, and validity for this measure has been shown (Gresham et al., 2011).

*Family Impact Questionnaire (FIQ, Donenberg and Baker, 1993)*: The FIQ is a 50-item parent-report questionnaire assessing the impact of the child (for individuals ages 3 to 17) on the family; this measure is not disability-specific, so it is equally appropriate for use with parents of TD individuals. Parents were asked to compare the level of impact their child has on the family compared to a child of the same age (e.g., “My child is more stressful”), by rating items on a 4-point Likert scale as “not at all”, “somewhat”, “much”, and “very much.” The FIQ consists of six subscales: (1) impact on social relationships (e.g., “My family avoids social outings more because of his/her behavior”); (2) negative perceptions of their child (e.g., “My child brings out feelings of frustration and more anger”); (3) positive perceptions of their child (e.g., “I enjoy the time I spend with my

child more”); (4) financial impact (e.g., “The cost of raising my child is more”); (5) impact on marriage (e.g., “My spouse and I disagree more about how to raise this child”); and (6) impact on siblings (e.g., “My child is more rejected by his/her siblings”). Test-retest reliability has been found to be high within the normative sample (range 0.43-0.71) and validity was measured by comparison to the Parenting Stress Index (PSI; Abidin, 1990). Subscales of positive parent perceptions and negative family impact (a composite score of negative parent perception and negative impact of the adolescent on family social life) were utilized from the FIQ. Higher scores indicate more positive or more negative impact, respectively.

*Parent Involvement:* Each week parents were assigned to assist their ASD adolescent complete a homework assignment related to the lesson learned each week. Parent homework assigned consisted of step-by-step instructions for parents to complete with their ASD adolescent. A frequency count of completed steps were tallied each week as a measure of completed parent homework assignments. Each homework assignment had a range of steps (from 2 to 11 steps) for parents to follow. A total of 50 steps were possible for completed parent homework assignments. Greater parent completed homework assignments was an indicator of more parent involvement throughout the intervention.

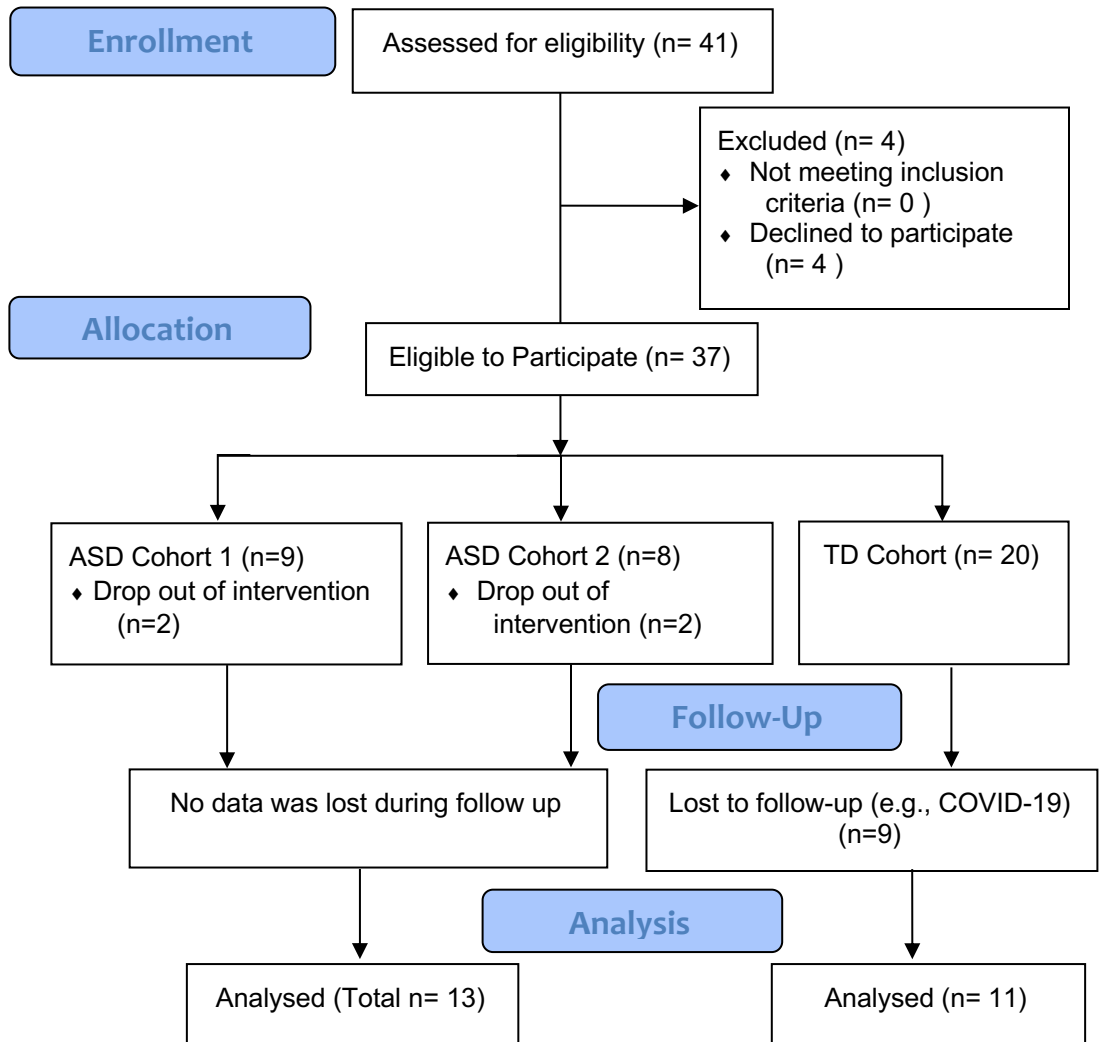
## **Procedures**

Families were recruited via flyers posted online as well as distributed to local community organizations, parent advocacy groups, and local school districts. The study was conducted in Inland Southern California which includes a large Latinx population (U.S. Census Bureau, 2019). When families expressed interest in the study, they were

contacted for an initial phone screen. Informed consent and assent from families were obtained at the initial lab visit before eligibility screening began. This study was approved by the Institutional Review Board at the University of California, Riverside.

Adolescent eligibility criteria included (a) age range from 11 to 18 years and currently in middle or high school; (b) ability to speak and understand English; and (c) willingness to participate. Exclusionary criteria for youth included (a) history of serious psychiatric illness (e.g., schizophrenia, bipolar disorder) or a recent (within 6 months) psychiatric hospitalization, (b) current problems with severely aggressive or oppositional behaviors; (c) history of seizures/ epilepsy, brain injury or disease; and (d) diagnosis of intellectual disability. For ASD participants, commonly co-occurring disorders (e.g., ADHD) were allowed, as they are difficult to separate from the diagnosis itself. On the other hand, for TD participants exclusionary criteria included any mental health condition (e.g., ADHD, anxiety, depression) or immediate family history of ASD or developmental disabilities. See Figure 1 for flowchart of enrollment and participation.

Figure 1. Flowchart of PEERS Intervention



Eligibility measures were completed prior to the intervention and were not repeated at subsequent timepoints. Outcome measures were completed at three time points: Time 1 (pre- intervention), Time 2 (post- intervention), and Time 3 (four months after intervention was completed). Time 3 measures were collected online via Qualtrics due to the COVID-19 pandemic for the majority of participants (all TD participants and 6 ASD participants). Because of this pandemic-induced variability, we consider analyses based on data from Time 3 exploratory. Measures were provided in Spanish for parents who primarily spoke Spanish (n = 3). Due to attrition, TD participant data decreased from Time 1 to Time 3. See Table 2 for more detail.

Table 2. Final data across time for ASD and TD participants

<i>Measures</i>	<i>Time 1</i>		<i>Time 2</i>		<i>Time 3</i>	
	ASD	TD	ASD	TD	ASD	TD
<i>SRS-2 Total</i>	13	18	13	19	13	11
<i>SSIS social skills</i>	13	20	13	19	13	11
<i>SSIS problem behaviors</i>	13	20	13	18	13	11
<i>FIQ total negative impact</i>	13	20	13	19	13	11
<i>FIQ positive perception</i>	13	20	13	19	13	11

### Statistical Analyses

To understand if there were changes in behavioral measures across two time-points and three time-points, multiple repeated measures ANOVAs were conducted on measures of autism symptomatology (SRS-2 T-score), social skills (SSIS social skills standard

score), problem behaviors (SSIS problem behaviors standard score), positive parent perception and negative family impact (FIQ subscales). To understand the relationship between behavioral measures of interest across time, correlation analyses were conducted between (a) problem behaviors at Time 1 and positive parent perceptions at Time 2, (b) problem behaviors at Time 1 and negative family impact at Time 2, (c) problem behaviors at Time 1 and parent involvement, and (d) parent involvement and negative family impact at Time 2. To evaluate predictive properties of parent involvement and problem behaviors at Time 1 on negative family impact at Time 2, a linear regression was conducted. All analyses were conducted using SPSS (version 26, 2019). For all analyses, Bonferroni corrections were used for follow-up tests, and Greenhouse-Geisser corrections were used when the assumption of Sphericity was violated. Cohen's  $d$  was used to measure effect size of correlations.

## **Results**

### **Data Across Two Timepoints: Pre-Post Intervention**

The first set of analyses addressed possible changes in adolescents' social behaviors. For the SRS-2 and SSIS social skills subscale, analyses and findings were also reported in Veytsman et al., under review after revise and resubmit. For the SRS-2, a group by time interaction effect was observed,  $F(1,28)= 4.53, p=.04, \eta_p^2 = .14$ . Bonferroni post hoc tests revealed significant improvements across time on the SRS-2 for ASD participants ( $p=.001$ ), whereas SRS-2 scores remained consistent for TD participants ( $p=.30$ ), as expected. Across groups, post hoc tests evidenced significant differences in SRS-2 scores, such that at both Time 1 and Time 2, SRS-2 scores were



significantly higher (i.e., more severe social impairment) in ASD participants than TD participants ( $p < .001$ ). Lower SRS-2 scores indicated less severe social impairments.

For the SSIS social skills subscale, a significant main effect of time was observed,  $F(1, 30) = 4.64$ ,  $p = .04$ ,  $\eta_p^2 = .13$ , such that SSIS social skill scores increased (i.e., improved) over time. A significant main effect of group was observed,  $F(1, 30) = 17.86$ ,  $p < .001$ ,  $\eta_p^2 = .37$ ; SSIS social skills subscale scores were consistently lower in the ASD participants, but never reached the “normative” level of the TD group.

For the SSIS problem behaviors subscale, a significant group by time interaction effect was observed  $F(1, 29) = 4.14$ ,  $p = .05$ ,  $\eta_p^2 = .13$ . Bonferroni post hoc tests revealed that ASD participants had significantly higher levels of problem behaviors at Time 1 and Time 2 when compared to TD participants ( $p = .001$ ). However, post hoc tests also revealed significant improvements on the SSIS problem behavior subscale for ASD participants across time ( $p = .05$ ); whereas, TD participants showed no difference in problem behaviors across time ( $p = .44$ ). Lower SSIS problem behavior scores indicate fewer problem behaviors.

For FIQ negative family impact scale, a significant main effect of group was observed,  $F(1, 30) = 7.25$ ,  $p = .01$ ,  $\eta_p^2 = .20$ , such that FIQ negative family impact was consistently higher in ASD participants. Higher scores indicate more negative impact, or stress, on the family. No significant main effects of time or group were observed for the FIQ positive parent perception subscale ( $p = \text{n.s.}$ ).

## **Correlation and Regression Analyses**

To understand the relationship between problem behaviors prior to the intervention (Time 1) and positive parent perceptions of their youth following intervention (Time 2), and between problem behaviors prior to the intervention (Time 1) and negative family impact following intervention (Time 2), Pearson correlations were examined independently for TD participants and ASD participants. Because TD participants did not receive intervention, Pearson correlations in this group were conducted to understand potential effects of time and maturation on the aforementioned relationships.

Within the ASD group, correlations between SSIS problem behaviors at Time 1 and FIQ subscales at Time 2 were examined. A significant positive correlation was observed between the SSIS problem behavior subscale at Time 1 and FIQ negative family impact at Time 2 ( $r=.78, p=.002$ ), such that parents who reported that their youth had more behavioral problems prior to the intervention also reported more negative family impact after the intervention. A significant negative correlation was found between the SSIS problem behavior subscale at Time 1 and FIQ positive parent perception of their youth at Time 2 ( $r=-.58, p=.04$ ), such that participants whose parents reported more problem behaviors prior to the intervention also reported lower positive perception of their youth after the intervention. According to Cohen's guidelines (Cohen, 1988), both correlations indicated a large effect size ( $d's > 1.0$ ). No significant correlations were observed for TD participants between measures (all  $p$ 's n.s.).

To examine how parent involvement (measured using homework completion during the intervention) related to youth problem behaviors and negative family impact, Pearson correlations and regression analyses were utilized. These analyses were only conducted with ASD participants because TD participants did not receive intervention. A significant negative correlation was found between parent homework completion during the intervention and SSIS problem behaviors at Time 1 ( $r = -.64, p = .02$ ) and between parent homework completion during intervention and FIQ negative family impact at Time 2 ( $r = -.61, p = .03$ ). That is, parents who reported that their youth engaged in fewer problem behaviors at Time 1 were more involved in the intervention, and parents who were more involved in the intervention reported less negative impact of the youth on the family. In a regression analysis predicting negative family impact at Time 2, problem behaviors as measured by SSIS at Time 1 explained a significant proportion of the variance of FIQ negative family impact at Time 2,  $R^2 = .62, F(2,10) = 8.26, p < .01$ , but parent involvement during intervention did not,  $b = -.21, t(10) = -.78, n.s.$

### **Exploratory Analyses: Data Across Three Timepoints**

The final set of analyses examined data across the three timepoints, pre-intervention, post-intervention, and follow-up. These analyses are considered exploratory due to collection of follow-up data during COVID-19, which may have introduced pandemic-induced variability. In examining SRS-2 scores for the ASD and TD group, a significant main effect of time was observed,  $F(1.56, 34.38) = 3.52, p = .05, \eta_p^2 = .14$ . Follow-up tests using Bonferroni correction revealed a significant difference between Time 1 and Time 2, such that scores decreased over the intervention time-period ( $p = .03$ ). Lower SRS-2

scores indicated less severe social impairments. No significant differences were observed in SRS-2 scores between Time 1 and Time 3 or Time 2 and Time 3; thus, there were no improvements, but also no declines, in the effect of the intervention on autism symptoms between the end of the intervention and the 4- month follow up. A significant main effect of group was observed,  $F(1,22) = 40.98, p = .00, \eta_p^2 = .65$ , such that SRS-2 scores were lower in the TD versus ASD group at each time-point.

For the SSIS social skills subscale, a significant main effect of group was observed,  $F(1,22) = 11.16, p = .003, \eta_p^2 = .34$ , such that SSIS social skills subscale scores were higher in TD participants compared to ASD participants at all time-points. Higher SSIS scores indicate better social skills. For SSIS problem behavior subscale, a significant main effect of group was observed,  $F(1,21) = 12.82, p = .002, \eta_p^2 = .38$ , such that SSIS problem behavior subscale scores were higher in ASD participants compared to TD participants at all time-points.

In terms of negative family impact, a significant main effect of group was observed,  $F(1,22) = 4.32, p = .05, \eta_p^2 = .16$ , such that FIQ negative impact scale scores were higher in ASD participants compared to TD participants at all time-points. No significant main effects of time or group were observed for the FIQ positive parent perception subscale ( $p = n.s.$ ).

## **Discussion**

The purposes of this study were: a) to examine second-hand effects of the PEERS intervention on broader family life; b) to determine whether an increase in social skills coincided with a decrease in youth problem behaviors for youth with ASD; and c) to

explore what child and parent factors impact parent perception of their youth with ASD following the PEERS intervention. Because TD adolescents did not receive intervention, they served as a comparison group to understand the effects of the PEERS intervention on youth with ASD and their caregivers. Thus, when compared to TD youth, three key findings were observed in participants with ASD in the present study. First, there were no significant second-hand effects found on broader family life (i.e., parent report of the impact of their youth on the family) following the PEERS intervention; nevertheless, it was evident that ASD youth had a greater negative impact on their family when compared to TD youth. Second, improvement in social skills coincided with a decrease in problem behaviors in youth with ASD following the intervention. Third, problem behaviors exhibited by autistic youth were a significant factor in predicting total negative impact on the family following intervention. Such problem behaviors appeared to account for the largest amount of variance in the regression model, above and beyond parent involvement in the PEERS program. These results reflected medium to large effect sizes, which were consistent with previous PEERS findings (Laugeson et al., 2015; Rabin et al., 2018; Schohl et al., 2014).

Although results were consistent with previous findings that the PEERS intervention is effective in improving social skills and decreasing autism symptoms (Laugeson et al., 2009), this is the first study to examine parent perceptions of the youth's impact on the family and family functioning following the PEERS intervention. There were no significant second-hand effects of PEERS on broader family life (i.e., parent report of the impact of their youth on the family). However, we found that decreased

problem behaviors coincided with improvements in social skills in youth with ASD following the PEERS intervention. These improvements in social skills and problem behaviors were relative to insignificant changes detected in TD youth social skills and problem behaviors. This finding suggests a positive bi-product following the PEERS intervention- not only do we find an improvement in social skills, but also an improvement in problem behaviors exhibited by youth with ASD. The present results are consistent with the work of Tse et al. (2007) who reported that following a social skills intervention, a reduction in problem behaviors demonstrated by autistic youth was found. Contrary to our hypothesis regarding parent perceptions of their youth following the PEERS intervention, there was no change in positive perceptions of their youth. This may be explained by the lack of curriculum focusing on parent perceptions and how positive perception or reframing of their youth's behaviors may impact treatment outcomes. Previous research reported improvements in parent-child relationships following parents' involvement as co-interventionists (see, Kaiser et al., 1998). Thus, it may be beneficial to pair the PEERS intervention with content explicitly addressing the power of positive parent perceptions and the potential to improve parent-youth relationships.

Another finding in our study was the direct relationship between youth problem behaviors and negative family impact; whereas we found an inverse relationship between youth problem behavior and parent positive perception of their youth from pre- to post-intervention. However, the sample was too small to conduct causal analyses. There is also the potential of parent biases in reporting on both their youth's problem behaviors and in their perceived improvements following the intervention. In line with previous research,

Sikora et al. (2013) found that higher levels of youth problem behaviors were positively associated with negative parent perceptions of their youth. Furthermore, parent positive perception was negatively associated with youth problem behaviors. Studies suggest that positive parental traits, such as hope or optimism, may lead to increased parent well-being and positive interactions with their youth (Blacher & Baker, 2019; Lloyd & Hastings, 2009). Therefore, our results similarly reflect previous research findings regarding the relationship between youth problem behaviors and positive parent perceptions of their youth.

Results of previous research have shown general improvements in parent self-efficacy, parent-child relationships, and ASD-knowledge following interventions (Dunlap, 1999; Karst & van Hecke, 2012; Rogers 2000; Schertz & Odom, 2007) and more specifically, improvements in parent self-efficacy following the PEERS intervention (Karst et al., 2015). The current results suggest that problem behaviors exhibited by youth with ASD may be a driving factor for the lack of improvement in negative impact on the family following intervention. One interpretation of this finding is that youth problem behaviors, such as acting aggressively towards others, talking back to adults, or having temper tantrums, may be difficult for parents to manage and regulate as their child matures into adolescence and adulthood—and managing such behaviors are not part of the PEERS curriculum. Due to parents' inability to regulate and dedicate more time and resources to manage their youths' problem behaviors, parents may continue to feel stressed (Sanders & Morgan, 1997).

## **Limitations**

Certain limitations of this study should be addressed in future research. This study is underpowered due to the small number of participants, thereby impacting our ability to examine possible direction of effects, or test mediation or moderation models necessary to fully understand the relationships among youth behavior problems, parent involvement in intervention, and parent perception of the youth on the family. Moreover, this study did not include a waitlist control group of autistic youth to examine differences in a delayed treatment group in comparison in the current treatment group. It is also important to note that measures completed at a the four-month follow up were distributed online during the COVID-19 pandemic, as opposed to all other measures completed in-person during the course of the intervention, which may have impacted the poorer return of results at the Time 3 data collection period. Additionally, we acknowledge that the measurement of improvement in autistic youth's social functioning following a social skills intervention, to date, have been compared to neurotypical youth's "standard" social behavior, which are not in line current frameworks for viewing and accepting neurodiversity (Kenny et al., 2016).

## **Conclusion**

There are several implications that can be drawn from this study that examined parent perceptions of the impact of their youth on family functioning following the PEERS intervention. First, as expected based on previous literature, the efficacy of the PEERS intervention for adolescents with ASD was demonstrated. Second, the PEERS intervention did not have an effect on parents' views of broader family life despite the



fact that the PEERS intervention did decrease problem behaviors exhibited by youth with ASD. Third, findings indicated that youth problem behaviors predicted negative parent-reported impact of the youth on family life. Thus, another way to potentially improve parent perception of the impact of their youth may be to combine self-regulation strategies and parent emotional and behavioral adaptation strategies with the current social skills intervention. For example, fostering positive cognitions, such as acceptance, in parents through direct intervention (e.g., mindfulness training) may enhance the impact of a social skills intervention (Jones et al., 2014). In conclusion, by including measures of parent and family factors, future studies may achieve a better understanding of potential broader positive and negative effects of parent perceptions and family outcomes following the PEERS interventions.

## References

- Abidin, R. R. (1990). *Parenting Stress Index manual* (3rd ed.). Charlottesville, VA: Pediatric Psychology Press.
- Bauminger, N., & Kasari, C. (2000). Loneliness and friendship in high-functioning children with autism. *Child Development, 71*(2), 447–456. <https://doi.org/10.1111/1467-8624.00156>
- Blacher, J., & Baker, B. L. (2019). Collateral effects of youth disruptive behavior disorders on mothers' psychological distress: Adolescents with autism spectrum disorder, intellectual disability, or typical development. *Journal of Autism and Developmental Disorders, 49*(7), 2810–2821. <https://doi.org/10.1007/s10803-017-3347-2>
- Cholemkey, H., Kitzerow, J., Rohrman, S., & Freitag, C. M. (2014). Validity of the social responsiveness scale to differentiate between autism spectrum disorders and disruptive behaviour disorders. *European Child & Adolescent Psychiatry, 23*(2), 81–93. <https://doi.org/10.1007/s00787-013-0427-5>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Constantino, J., & Gruber, C. (2012). *Social Responsiveness Scale – Second Edition (SRS-2)*. Western Psychological Services: Torrance, CA.
- Corona, L.L., Janicki, C., Milgramm, A. *et al.* (2019). Brief Report: Reductions in parenting stress in the context of PEERS- a social skills intervention for adolescents with autism spectrum disorder. *Journal of Autism Developmental Disorder, 49*, 5073–5077. <https://doi.org/10.1007/s10803-019-04201-y>
- Donenberg, G. & Baker, B. L. (1993). The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology, 21*(2), 179-198. <https://doi.org/10.1007/BF00911315>
- Dunlap, G. (1999). Consensus, engagement, and family involvement for young children with autism. *The Journal of The Association for Persons with Severe Handicaps, 24*(3), 222–225. doi:10.2511/rpsd.24.3.222.
- Elliott, S. N., & Gresham, F. M. (1993). Social skills interventions for children. *Behavior Modification, 17*(3), 287-313.
- Gresham, F., & Elliott, S. N. (2007). *Social Skills Improvement System (SSIS) Rating Scales*. San Antonio, TX: Pearson Education Inc.

- Gresham, F. M., Elliott, S. N., Vance, M. J., & Cook, C. R. (2011). Comparability of the Social Skills Rating System to the Social Skills Improvement System: Content and psychometric comparisons across elementary and secondary age levels. *School Psychology Quarterly*, 26(1), 27–44. <https://doi.org/10.1037/a0022662>
- Lloyd, T.J. & Hastings, R. (2009). Hope as a psychological resilience factor in mothers and fathers of children with intellectual disabilities. *Journal of Intellectual Disability Research: JIDR*, 53(12), 957–968. <https://doi.org/10.1111/j.1365-2788.2009.01206.x>
- Jellett, R., Wood, C. E., Giallo, R., & Seymour, M. (2015). Family functioning and behaviour problems in children with autism spectrum disorders: The mediating role of parent mental health. *Clinical Psychologist*, 19(1), 39–48. <https://doi.org/10.1111/cp.12047>
- Jones, L., Hastings, R. P., Totsika, V., Keane, L., & Rhule, N. (2014). Child behavior problems and parental well-being in families of children with autism: The mediating role of mindfulness and acceptance. *American Journal on Intellectual and Developmental Disabilities*, 119(2), 171–185. <https://doi.org/10.1352/1944-7558-119.2.171>
- Kaiser, A. P., Hancock, T. B., & Hester, P. P. (1998). Parents as cointerventionists: Research on applications of naturalistic language teaching procedures. *Infants & Young Children*, 10(4). [https://journals.lww.com/iyjournal/Fulltext/1998/04000/Parents as Cointerventionists Research on.7.aspx](https://journals.lww.com/iyjournal/Fulltext/1998/04000/Parents_as_Cointerventionists_Research_on.7.aspx)
- Karst, J. S., Carson, A. M., Stevens, S., Schohl, K., & Dolan, B. (2015). Parent and family outcomes of PEERS: A social skills intervention for adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 45(3), 752–765. <https://doi.org/10.1007/s10803-014-2231-6>
- Karst, J. S., & Van Hecke, A. V. (2012). Parent and family impact of autism spectrum disorders: A review and proposed model for intervention evaluation. *Clinical Child and Family Psychology Review*, 15(3), 247–277. <https://doi.org/10.1007/s10567-012-0119-6>
- Kenny, L., Hattersley, C., Molins, B., Buckley, C., Povey, C., & Pellicano, E. (2016). Which terms should be used to describe autism? Perspectives from the UK autism community. *Autism*, 20(4), 442–462. <https://doi.org/10.1177/1362361315588200>
- Kretzmann, M., Shih, W., & Kasari, C. (2015). Improving peer engagement of children with autism on the school playground: A randomized controlled trial. *Behavior Therapy*, 46(1), 20–28. <https://doi.org/10.1016/j.beth.2014.03.006>

- Laugeson, E. A., Ellingsen, R., Sanderson, J., Tucci, L., & Bates, S. (2014). The ABC's of teaching social skills to adolescents with autism spectrum disorder in the classroom: The UCLA PEERS Program. *Journal of Autism and Developmental Disorders*, *44*(9), 2244–2256. <https://doi.org/10.1007/s10803-014-2108-8>
- Laugeson, E. A., & Frankel, F. (2010). *Social skills for teenagers with developmental and autism spectrum disorder: The PEERS treatment manual*. New York: Routledge.
- Laugeson, E. A., Frankel, F., Gantman, A., Dillon, A. R., & Mogil, C. (2012). Evidence-based social skills training for adolescents with autism spectrum disorders: The UCLA PEERS Program. *Journal of Autism and Developmental Disorders*, *42*(6), 1025–1036. <https://doi.org/10.1007/s10803-011-1339-1>
- Laugeson, E. A., Frankel, F., Mogil, C., & Dillon, A. R. (2009). Parent-assisted social skills training to improve friendships in teens with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *39*(4), 596–606. <https://doi.org/10.1007/s10803-008-0664-5>
- Laugeson, E. A., Gantman, A., Kapp, S. K., Orenski, K., & Ellingsen, R. (2015). A randomized controlled trial to improve social skills in young adults with autism spectrum disorder: The UCLA PEERS® Program. *Journal of Autism and Developmental Disorders*, *45*(12), 3978–3989. <https://doi.org/10.1007/s10803-015-2504-8>
- LeBlanc, L. A., & Gillis, J. M. (2012). Behavioral interventions for children with autism spectrum disorders. *Pediatric Clinics*, *59*(1), 147–164. <https://doi.org/10.1016/j.pcl.2011.10.006>
- Lee, L.-C., Harrington, R. A., Louie, B. B., & Newschaffer, C. J. (2008). Children with autism: Quality of life and parental concerns. *Journal of Autism and Developmental Disorders*, *38*, 1147–1160 (2008). <https://doi.org/10.1007/s10803-007-0491-0>
- Lord, C., Rutter, M., DiLavore, P. C., Risi, S., Gotham, K., & Bishop, S. L. (2012). *Autism Diagnostic Observation Schedule* (2nd edition). Torrance, CA: Western Psychological Services.
- Matson, J. L., Wilkins, J., & Macken, J. (2008). The relationship of challenging behaviors to severity and symptoms of autism spectrum disorders. *Journal of Mental Health Research in Intellectual Disabilities*, *2*(1), 29–44. <https://doi.org/10.1080/19315860802611415>
- Mazurek, M. O. (2014). Loneliness, friendship, and well-being in adults with autism spectrum disorders. *Autism*, *18*(3), 223–232. <https://doi.org/10.1177/1362361312474121>

- Meirsschaut, M., Roeyers, H., & Warreyn, P. (2010). Parenting in families with a child with autism spectrum disorder and a typically developing child: Mothers' experiences and cognitions. *Research in Autism Spectrum Disorders*, 4(4), 661-669. <https://doi.org/10.1016/j.rasd.2010.01.002>
- Plant, K. M., & Sanders, M. R. (2007). Reducing problem behavior during care-giving in families of preschool-aged children with developmental disabilities. *Research in Developmental Disabilities*, 28(4), 362-385. <https://doi.org/10.1016/j.ridd.2006.02.009>
- Rabin, S. J., Israel-Yaacov, S., Laugeson, E. A., Mor-Snir, I., & Golan, O. (2018). A randomized controlled trial evaluating the Hebrew adaptation of the PEERS intervention: Behavioral and questionnaire-based outcomes. *Autism Research*, 11(8), 1187-1200. <https://doi.org/10.1002/aur.1974>
- Raff, N. S., Mire, S. S., Frankel, L., McQuillin, S. D., Loveland, K., Daire, A., Grebe, S., & Rosenbrock, G. (2021). Understanding perceptions underlying the self-reported stress among parents of adolescents with autism spectrum disorder: Considerations for supporting families. *Research in Autism Spectrum Disorders*, 84, 101770. <https://doi.org/10.1016/j.rasd.2021.101770>
- Rankin, J. A., Weber, R. J., Kang, E., & Lerner, M. D. (2016). Parent- and self-reported social skills importance in autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 46(1), 273-286. <https://doi.org/10.1007/s10803-015-2574-7>
- Rogers S. J. (2000). Interventions that facilitate socialization in children with autism. *Journal of Autism and Developmental Disorders*, 30(5), 399-409. <https://doi.org/10.1023/a:1005543321840>
- Romski, M., Sevcik, R. A., Adamson, L. B., Smith, A., Cheslock, M., & Bakeman, R. (2011). Parent perceptions of the language development of toddlers with developmental delays before and after participation in parent-coached language interventions. *American Journal of Speech-Language Pathology*, 20(2), 111-118. [https://doi.org/10.1044/1058-0360\(2011/09-0087\)](https://doi.org/10.1044/1058-0360(2011/09-0087))
- Sanders, J.L. & Morgan, S.B. (1997). Family stress and adjustment as perceived by parents of children with autism or Down syndrome: Implications for intervention. *Child & Family Behavior Therapy*, 19(4), 15-32. [https://doi.org/10.1300/J019v19n04\\_02](https://doi.org/10.1300/J019v19n04_02)
- Schertz, H. H., & Odom, S. L. (2007). Promoting joint attention in toddlers with autism: A parent-mediated developmental model. *Journal of Autism and Developmental Disorders*, 37(8), 1562-1575. doi:10.1007/s10803-006-0290-z.

- Schiltz, H. K., McVey, A. J., Magnus, B., Dolan, B. K., Willar, K. S., Pleiss, S., Karst, J., Carson, A. M., Caiozzo, C., Vogt, E., & Van Hecke, A. V. (2018). Examining the links between challenging behaviors in youth with ASD and parental stress, mental health, and involvement: Applying an adaptation of the family stress model to families of youth with ASD. *Journal of Autism and Developmental Disorders*, 48(4), 1169–1180. <https://doi.org/10.1007/s10803-017-3446-0>
- Schohl, K. A., Van Hecke, A. V., Carson, A. M., Dolan, B., Karst, J., & Stevens, S. (2014). A replication and extension of the PEERS intervention: Examining effects on social skills and social anxiety in adolescents with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 44(3), 532–545. <https://doi.org/10.1007/s10803-013-1900-1>
- Shea, N., Payne, E., & Russo, N. (2018). Brief report: Social functioning predicts externalizing problem behaviors in autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 48(6), 2237–2242. <https://doi.org/10.1007/s10803-017-3459-8>
- Sikora, D., Moran, E., Orlich, F., Hall, T. A., Kovacs, E. A., Delahaye, J., Clemons, T. E., & Kuhlthau, K. (2013). The relationship between family functioning and behavior problems in children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 7(2), 307–315. <https://doi.org/10.1016/j.rasd.2012.09.006>
- Tobin, M. C., Drager, K. D. R., & Richardson, L. F. (2014). A systematic review of social participation for adults with autism spectrum disorders: Support, social functioning, and quality of life. *Research in Autism Spectrum Disorders*, 8(3), 214–229. <https://doi.org/10.1016/j.rasd.2013.12.002>
- Tse, J., Strulovitch, J., Tagalakakis, V., Meng, L., & Fombonne, E. (2007). Social skills training for adolescents with Asperger syndrome and high-functioning autism. *Journal of Autism and Developmental Disorders*, 37(10), 1960–1968. <https://doi.org/10.1007/s10803-006-0343-3>
- [United States Census Bureau. \(2019\). Quick Facts: Riverside County, California. Retrieved from https://www.census.gov/quickfacts/riversidecountycalifornia](https://www.census.gov/quickfacts/riversidecountycalifornia)
- Volker, M. A., Lopata, C., Smerbeck, A. M., Knoll, V. A., Thomeer, M. L., Toomey, J. A., & Rodgers, J. D. (2010). BASC-2 PRS Profiles for students with high-functioning autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 40(2), 188–199. <https://doi.org/10.1007/s10803-009-0849-6>
- Wechsler, D. (2011). *Wechsler Abbreviated Scale of Intelligence—Second Edition (WASI-II)*. San Antonio, TX: NCS Pearson.

Yorke, I., White, P., Weston, A., Rafla, M., Charman, T., & Simonoff, E. (2018). The association between emotional and behavioral problems in children with autism spectrum disorder and psychological distress in their parents: A systematic review and meta-analysis. *Journal of Autism and Developmental Disorders*, 48(10), 3393–3415. <https://doi.org/10.1007/s10803-018-3605-y>