Title
Brief Report: Behavior Disorders and Social Skills in Adolescents with Autism Spectrum Disorder: Does IQ Matter?

Permalink
https://escholarship.org/uc/item/0p77x84b

Journal
Journal of Autism and Developmental Disorders, 50(6)

ISSN
0162-3257

Authors
Baker, Bruce L
Blacher, Jan

Publication Date
2020-06-01

DOI
10.1007/s10803-019-03954-w

Peer reviewed

Brief Report. Behavior disorders and social skills in adolescents with autism spectrum disorder: Does IQ matter?

Bruce L. Baker, Ph.D.[1], **Jan Blacher, Ph.D.**[1,2]

[1]Distinguished Research Professor, Department of Psychology, UCLA, U.S.A.

[2]Distinguished Professor, Graduate School of Education, University of California, Riverside, U.S.A.

Abstract

Disruptive behavior disorders and social skills were assessed in 187 youth aged 13 years, with typical cognitive development (TD n= 98), intellectual disability (ID n = 37), autism spectrum disorder (ASD, IQ >=85, n = 26), or Autism Spectrum Disorder with ID (ASD/ID; IQ<85, n = 26). The primary question was whether youth with ASD and co-morbid ID had greater associated adjustment problems than youth with ASD-only. Youth with ASD, with or without ID, had significantly higher behavior problems and lower social skills than their TD peers. However, youth with ASD and co-morbid ID did not differ from youth with ASD-only on any variable assessed, including behavior problems, behavior disorders, social acceptance, social skills, and student teacher relationships.

Keywords

Major challenges faced by parents and professionals in the lives of youth and adults with ASD are the behavioral and mental health problems that accompany ASD, ranging from mild behavior problems and social skills deficits to psychiatric disorders. While it is well established that behavior/psychiatric disorders are more likely in children and youth with

ASD or ID than in those with typical cognitive development (Baker and Blacher, 2015; Gjevik, Eldevik et al., 2011; Lake et al., 2014; Rosa et al., 2016; Strang et al., 2012), the extent and nature of behavior disorders are not well known when a youth with ASD also has an IQ in the ID range.

The present study addressed this more differentiated question, asking whether youth with co-morbid ASD and ID are at even greater risk for behavior disorders and/or social skill deficits than those with high-functioning ASD. The U.S. Centers for Disease Control and Prevention reported in 2018 that 1 in 59 eight-year-old children in the 11 states surveyed meet diagnostic criteria for Autism Spectrum Disorder (ASD) (CDC, 2018). About a third (31%) of these children also met criteria for an intellectual disability (IQ<=70). While this cut-off is the most commonly used for ID, some researchers and services include borderline intellectual functioning (IQ 71–84) in the definition, as we have done herein.

There are two primary ways that this question of how IQ affects the rate of disorders in youth with ASD has been approached (Lecavalier et al., 2010). One is to study a single ASD sample across the IQ spectrum, examining the correlation of IQ primarily with behavior disorders (Gjevik et al. 2011; Simonoff et al. 2008). The other is to compare rates of behavior disorders and social skills in two groups, one with ASD and typical cognitive development and the other with ASD and concomitant ID, or ASD/ID (Goldin et al. 2014; Simonoff et al. 2008; Totsika et al. 2011; Witwer and Lecavalier 2010). An advantage of the second approach is that the ASD/ID group can be defined according to standard definitions of ID (IQ<70) or borderline ID (IQ 70–84), or both, and thus map onto distinctions made in studies of ID as well as criteria for accessing some special services.

The first approach, examining correlations between IQ and behavior disorders, is illustrated by the considerable attention to how internalizing disorders (anxiety, depression) relate to intellectual level. In a sample of children with ASD, the highest co-morbidity found was with anxiety disorders (41%) and ADHD (31%); neither, however, was significantly correlated with IQ (Gjevik et al, 2011). Other investigators have found a negative relationship between IQ and anxiety (Mazurek and Kanne 2010; White and Roberson-Nay 2009), though the evidence is stronger that increasing IQ is associated with increased levels of internalizing disorders, especially anxiety (Estes et al. 2007; Eussen 2013; Mayes et al. 2011; Sukhodolsky et al. 2008; Williams et al. 2015). Estes and co-authors (2007), who found a positive relationship between IQ at age 6 and internalizing disorders at age 9, hypothesized that some anxiety symptoms may require levels of cognition, social awareness, and self-perception that are not present in lower functioning persons with ASD.

The second approach, comparing groups comprised of ASD without cognitive impairment vs. ASD/ID, whether defining ID as IQ < 70 or IQ < 85, has generally found few or no significant group differences (Goldin et al. 2014; Simonoff et al. 2008; Totsika et al. 2011). However, Witwer and Lecavalier (2010) found higher symptoms of anxiety in the ASD only group, consistent with the correlational studies cited above.

As youth with ASD only vs. ASD/ID are likely to be in different school placements, it seems valuable to educators to have a better understanding of whether, and if so, how the two

groups differ, beyond intelligence and related academic abilities. Thus, we examined a wide set of variables, contrasting youth with high-functioning ASD vs. youth with ASD/ID, on the rates and types of (1) behavior/mental disorders, (2) social skills as assessed by mothers and teachers, (3) teacher-student relationships, and (4) mothers' well-being. We also considered these within-ASD group differences in relation to scores of youth with typical cognitive development (TD) or intellectual disability (ID).

Method

Participants

Participants were 187 adolescents (all age 13 years), their parents, and their teachers. They were participating in (blinded for review), a longitudinal study focused on behavior problems and/or mental disorders in youth from age 3 to 13 years (references blinded for review). Families of children with typical development (TD, n=98) were recruited primarily through preschools and daycare programs. Criteria were that the child have typical cognitive development, not have been born prematurely, nor have any form of developmental disability.

Families of children with intellectual disability (ID, n = 37) were recruited primarily through schools or agencies that provided diagnostic and intervention services for children with developmental disabilities. At the age 13 assessment, youth with ID were all in the moderate to borderline range of cognitive delay (WISC IQ 45–84), had Vineland Adaptive Behavior scores at least one standard deviation below the standardization mean (e.g. <.85), and met the exclusion criteria of no diagnosis of autism or any neuro-developmental disorder. Youth ASD (n = 52) were primarily referred through schools. Many (n = 25) were in a large private nonprofit organization of schools for children with autism, or in programs associated with this organization, where they had received comprehensive evaluation of autism. Others were referred from school programs for youth with ASD; all had been diagnosed professionally. Youth classification in the ASD group was based primarily on diagnostic history and psychoeducational assessment of autism, and current school designation. There was a wide range of IQ within the ASD group, from ID (<70, n = 13) and borderline ID (70–84, n = 13), to typical intellectual development (85+, n = 26).

In recruiting all study participants, school and agency personnel mailed brochures describing the study to families who met selection criteria, and interested parents contacted the research center. At age 13 center-based assessments, all mothers received the comprehensive interview form of the Vineland Adaptive Behavior Scales (Sparrow et al. 2005) and youth were administered subtests of the Wechsler Intelligence Scales for Children (Wechsler, 2003).

Table 1 shows demographic characteristics obtained from mothers at child age 13. The socioeconomic status was generally middle class; 67% of families had an annual income above $50,000, and 53% of mothers were college graduates. Groups did not differ significantly in child race/ethnicity, mother's age, marital status, and family income. Mother's highest grade in school differed significantly across groups, and was covaried in analyses when it related to the dependent variable. Child sex differed by sample was not

covaried in cross-group analyses given the high, and expected, percentage of males in the ASD group.

Measures

Demographic information was obtained by an interview with the mother. In addition, we analyzed 10 measures in order to cover multiple domains where youth with ASD and ASD/ID might differ. Youth diagnostic groups were determined from two measures:

Wechsler Intelligence Scale for Children, 4th Edition (WISC-IV; Wechsler, 2003). Each youth's Full-Scale IQ at age 13 years was estimated using three subtests (Vocabulary, Matrix Reasoning, and Arithmetic). Sattler and Dumont (2004) reported that this prorated IQ correlated highly (r = .91) with the WISC-IV FSIQ. While they did not specify if this correlation was consistent across all levels of cognitive functioning, their normative sample included a substantial number of children with mild and moderate ID, learning disabilities, ADHD, and other childhood disorders.

Vineland Scales of Adaptive Behavior-II (VABS, Sparrow et al. 2005). The VABS is a widely used semi-structured interview where the caregiver reports on the child's age-appropriate adaptive behaviors. The standardized composite score (communication, daily living skills, socialization) was used, which has a mean of 100 and a SD of 15. The VABS has excellent validity and reliability, with alpha = .99 (de Bildt et al. 2005).

Youth behavior problems and mental health were determined from two measures. Child Behavior Checklist for Ages 6–18 (CBCL; Achenbach and Rescorla, 2001). Child behavior problems were assessed with the widely used CBCL, completed by mothers. They rated each of 120 youth problems as "not true," "somewhat or sometimes true," or "very true or often true." The CBCL yields a total score, two broadband scales (externalizing and internalizing), eight narrow-band scales, and six clinical scales that map onto specific diagnoses. The CBCL has good validity (Achenbach and Rescorla, 2001) and the total behavior problems internal reliability in our sample was alpha = .97.

Youth social skills and relationships were reported by mothers and/or teachers on three measures. NIMH Diagnostic Interview Schedule for Children, Version IV (Shaffer et al. 2007). The DISC, administered to mothers, is a structured diagnostic interview covering DSM-IV criteria for youth psychiatric disorders (American Psychological Association, 2000). We administered only the ADHD and ODD modules to every parent. Other DISC disorders were endorsed by too few parents to conduct analyses. Responses are entered into a computerized scoring program that determines a positive diagnosis with an algorithm that considers three criteria: age of onset, symptom count, and level of impairment. The DISC has shown good test-retest reliability, as well as concurrent and predictive validity (Friman et al. 2000).

Parents' Rating Scale of Social Acceptance, adapted version (Harter and Pike, 1984). The PRS is a 3-item parent-report measure of the youth's social acceptance. The items ask about having friends, difficulty making friends, and popularity. Each item is endorsed on a four-

point scale. The total social acceptance score (sum of the three items) can range from 3 to 12, with reported internal consistency of alpha = .87 (Harter and Pike 1984).

Social Skills Rating System (Gresham and Elliot 1990). The SSRS is a widely used questionnaire for parents and teachers to rate dimensions of youths' social skills. The parent version has 55 items, each rated 0-1-2; the present study examined the SSRS cooperation, assertion, responsibility, and self-control domains. Gresham and Elliot (1990) reported high parent internal consistency (r = .87) and test-retest reliability (r = .85). The teacher version is the same, minus the responsibility scale.

Student-Teacher Relationship Scale (STRS. Pianta 2001). The STRS is a teacher-completed measure of his/her relationship with the youth. The 28 items assess Conflict (12 items), Closeness (11), and Dependency (5); we did not include dependency as it was less appropriate for adolescents. The response scale ranges from 1 (definitely does not apply) to 5 (definitely applies). Pianta (2001) reported high reliability for conflict (alpha = .92) and closeness (.86). In the present sample, alphas = .88 and .85.

Mothers' well-being was self-reported on three measures. Family Impact Questionnaire (FIQ, Donenberg and Baker 1993). The FIQ is a 50-item parent questionnaire that asks about the "youth's impact on the family compared to the impact other children his/her age have on their families" (e.g. Item 1: My child is more stressful than other youth his or her age"). Parents endorse items on a 4-point scale ranging from (1) not at all to (4) very much. The scales used were the composite 20-item negative impact score and the 7-item positive impact score. Alphas in this sample = 0.94 and 0.84.

Center for Epidemiological Studies Depression Scale (CES-D, Radloff 1977). This 20-item self-report scale asks mothers to rate each item on how often it applied to them within the last week, from 0 (rarely) to 3 (most of the time). Scores of 16 or above indicates degrees of depression. Alpha in the present sample = .92.

Symptom Checklist (SCL, Derogatis & Coons 1993). This 35-item version of the longer SCL assesses dimensions of adult mental health. Item responses range from 0 (not at all) to 4 (extremely). In the present sample, the total score alpha = 0.95.

Procedures.

The Institutional Review Boards of the participating universities approved all procedures. Mothers and youth at age 13 came to the center for an assessment session lasting 2– 3 hours. Procedures were reviewed with parents and youth, and informed consent obtained. Youth gave their informed assent. Center visit measures of relevance to the present study included assessments of youth intelligence, youth adaptive behavior, youth mental health, family demographics and maternal well-being. Questionnaire measures of youth behavior problems and social skills were obtained in separate batteries from mothers and teachers. Families were paid $75 for their participation in the assessment and teachers were paid $25.

Results

Mother ratings of youth behavior problems and mental disorder by diagnostic group

One way ANOVAs by status group (TD, ID, ASD/no ID, ASD/ ID) were run on 17 CBCL scores (broad bands; narrow bands, and clinical scales), and 2 DISC variables. Table 2 shows mean scores across the four status groups. Of the 19 four diagnostic group comparisons, 18 differed significantly by at least p <.01. These 19 analyses were followed by two-group t-tests conducted on the three comparisons of interest: TD vs. ASD; TD vs. ASD/ID, and, especially, ASD vs. ASD/ID

While the ASD vs. ASD/ID comparison is the focus of this study, other comparisons are included to provide a broader context. Youth with TD were scored significantly lower than those with ASD on every scale. Youth with TD also scored significantly lower than those with ASD/ID on every CBCL and DISC scale, except for the two that measured somatic problems.

By contrast, none of the 19 comparisons of the ASD group (IQ>84) scores to the ASD/ID group (IQ<85) scores shown in Table 2 was statistically significant. It is interesting to note further that the scores for ASD/ID youth were actually lower than those for the ASD youth with typical IQs on 15 of the 19 comparisons, though no difference was significant.

Mother's rating of individual CBCL Items

Despite no significant CBCL scale score differences between the high-functioning ASD and the ASD/ID groups, co-morbid ID could result in significant differences in areas indicated by particular CBCL items. These would be overlooked by only comparing scale scores. To more closely examine whether mother ratings of ASD vs ASD+ID youth differed on specific behaviors, we ran t tests on each of the 120 CBCL items (112 items and 8 sub-questions on item 56). The ASD vs. ASD/ID groups differed at p <.05 on only one item (#71: Self-conscious or easily embarrassed, with ASD higher, p = .004). While with 120 comparisons we would expect six to be significant at <.05 by chance, we found only one.

Mother and teacher ratings of youth social skills, by diagnostic group

Table 3 shows mothers' ratings of social acceptance (one scale), and social skills (four scales: Cooperation, Assertion, Responsibility, and Self-Control. All scores differed significantly by diagnostic group. In two-group comparisons, mothers of TD youth gave significantly higher ratings (more skills) on all five scales than mothers of youth with ASD (all p<.001) or ASD/ID group (four <.001, one at .05). However, the ASD vs. ASD/ID group scores did not approach significance on any social skills domain.

Teachers' ratings of the child's social skills differed significantly across the four conditions, but showed fewer pairwise differences within diagnostic groups. The TD group was significantly higher than ASD in Self-Control, and higher than ASD/ID in Assertion and Self-Control. No ASD vs. ASD/ID comparison approached significance. Teachers scores on the Student Teacher Relationship Scale were mixed. Closeness did not differ across the four diagnostic groups, and no pair-wise comparison was significant. Conflict scores, however,

were lowest for TD children. The four conditions differed significantly, with the pairwise TD vs. ASD comparison significant. The ASD sub-groups did not differ.

Mother's ratings of her own well-being

Table 4 shows mothers' ratings of the child's positive and negative impact on the family (FIQ), mothers' own depression (CES-D), and their psychological symptoms (SCL). In sum, there were four primary measures, and five sub-scales of the SCL. Mothers of TD children reported better well-being than mothers of youth with ID, ASD, or ASD/ID; the overall F was significant in all but one sub-domain (somatization). Scores of TD group mothers were significantly more positive than scores of high-functioning ASD group mothers and scores of ASD/ID group mothers, each in 8 of 9 analyses. However, mothers' reports of their own and family's well-being did not differ significantly on any of the nine ASD vs. ASD/ID comparisons.

To summarize our primary comparison of youth with high-functioning ASD vs. youth with ASD and ID, we examined mother survey and interview reports of youth behavior disorders, mother and teacher reports of youth social skills, teacher reports of their relationship with the youth, and mother reports of her own well-being. There was no significant difference (even $p<.10$) in any of these 39 ASD vs. ASD/ID comparisons, and fewer than chance differences on 120 CBC items.

Mother and teacher ratings of youth with TD vs. ID

TD vs. ID group scores are also shown in Tables 2, 3, and 4. While these differences were not central to the focus of this paper, we include them to add perspective to the TD vs. ASD comparisons. In every one of the 39 TD vs. ID comparisons, mothers' or teachers' scored TD youth more positively than ID youth. Mothers' ratings of youth behavior disorders (Table 2) were significantly (at least $p<.05$) higher, and of social skills (Table 3) significantly lower in 18 of the 24 comparisons. However, mothers' ratings of their own well-being differed significantly in only 1 of 9 TD vs. ID comparisons, and teachers' ratings of the youth in class differed significantly in only 2 of six TD vs. ID comparisons.

Discussion

With the increasing incidence of Autism Spectrum Disorder has also come increasing interest in the characteristics of youth with ASD beyond the core defining features. Many studies have documented, relative to youth with typical cognitive development, a heightened presence in youth with ASD of co-existing behavior problems and psychiatric disorders, most notably anxiety, depression, and attention-deficit hyperactivity disorder. In the present study we addressed a further question: Are these psychological, behavioral, and interpersonal challenges that accompany ASD heightened in the presence of intellectual disability (ID)?

Within the non-ASD population, youth with ID have greatly increased rates of a range of psychological disorders relative to youth with typical intelligence. There is a growing research literature addressing the combined effect of ASD and ID when they occur together, though often focused on a specific domain. We sought to look more broadly at whether, and

in what ways, youth with ASD/ID differ from those with ASD only. ID exacerbates problems in youth with ASD. We approached this not only by examining youth behavior disorders, but also by looking more broadly at whether co-morbid ID relates to adverse effects on youth social skills, friendships, impacts on mothers, and relationships with teachers.

To summarize, in our sample of 13-year-old youth, there is clear evidence that either ID or ASD relate to behavior problems and social skill difficulties relative to TD peers. However, through multiple measures, completed by parents and teachers, we did not find any significant differences between youth with ASD only vs. those with ASD/ID.

Though not the focus of this study, we should also note that youth with ID only (no ASD) were also at greatly heightened risk in many of the domains assessed. Obviously, youth with ID are more challenged in academic and social domains than their TD peers. Beyond this, many studies in recent decades have found that youth with ID have heighted behavior problems and mental disorders relative to those with higher IQs, however assessed (c.f. Dekker et al. 2002; Dykens 2000; Eisenhower et al. 2007). Our findings are consistent with these.

As with any study, there are limitations to this one that should be considered. One is that while the variables examined purport to measure different constructs, many of them are interrelated to some degree. Another limitation is the smaller sample size in the ASD vs. ASD/ID analyses, making them relatively underpowered. While a much larger sample might have shown differences that reached statistical significance, we would make two points. First, we reported all results for the ASD vs. ASD/ID analyses with p <.10, and even then, there were only a few marginal differences, and fewer than would be expected by chance. Therefore, it would take a much larger sample to reveal small differences that might not be clinically important. Second, these, as well as the other non-significant differences in the ASD vs ASD/ID comparisons, actually showed the ASD group with higher intellectual functioning scoring worse (higher behavior problems, lower social skills) than the ASD group with intellectual disability in most of the comparisons. It has been suggested that in some areas ID may be a buffer against psychological difficulties, as in the studies we referenced herein that found anxiety in ASD associated with higher cognitive abilities.

We have seen that youth with ASD, regardless of IQ, present heightened challenges for parents and teachers. A related but different question for future study is whether, given the similarity in behavior problems and social skills, the same interventions are effective for ASD youth with or without ID. While there are interventions where effectiveness would be linked with IQ (e.g. cognitive behavior therapy), this question of selecting and adapting services for youth with ASD to their intellectual capabilities will be an important focus for continuing study.

Acknowledgements:

References

Achenbach TM, & Rescorla LA (2001). Manual for the ASEBA school-age forms and profiles. Research Center for Children, Youth, and Families, University of Vermont.

American Psychiatric Association (2000). Diagnostic and statistical manual of mental disorders IV-text revision. Washington, DC: American Psychiatric Publishing.

Baker BL, & Blacher J (2015). Disruptive behavior disorders in adolescents with ASD: Comparisons to youth with intellectual disability or typical cognitive development. Journal of Mental Health Research in Intellectual Disabilities, 8, 98–116.

Blacher J, & Baker BL (2017). 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, Published early online.

Blacher J, Howell E, Lauderdale-Littin S, DiGennaro Reed FD, & Laugeson EA (2014). Autism spectrum disorder and the student teacher relationship: A comparison study with peers with intellectual disability and typical development. Research in Autism Spectrum Disorders, 8, 324–333. DOI: 10.1016/j.rask.2013.12.008.

Centers for Disease Control and Prevention (2018). Prevalence of Autism Spectrum Disorder among children aged 8 years - Autism and Developmental Disabilities Monitoring Network. Morbidity and Mortality Weekly Report, 67 (6), 1–23. [PubMed: 29324727]

de Bildt A, Kraijer D, Sytema S, & Minderaa R (2005). The psychometric properties of the Vineland Adaptive Behavior Scales in children and adolescents with mental retardation. Journal of Autism and Developmental Disorders, 35, 53–62. [PubMed: 15796122]

Dekker MC, Koot HM, van der Ende J, & Verhulst FC (2002). Emotional and behavioral problems in children and adolescents with and without intellectual disability. Journal of Child Psychology and Psychiatry, 43, 1087–1098. [PubMed: 12455929]

Derogatis LR, & Coons HL (1993). Self-report measures of stress In Goldberger L & Breznitz S (Eds.), Handbook of stress: Theoretical and clinical aspects (2nd ed., pp. 200–233). New York: Free Press.

Donenberg G, & Baker BL (1993). The impact of young children with externalizing behaviors on their families. Journal of Abnormal Child Psychology, 21, 179–198. [PubMed: 8491931]

Dykens EM (2000). Psychopathology in children with intellectual disability. Journal of Child Psychology and Psychiatry, 41, 407–417. [PubMed: 10836671]

Eisenhower AS, Baker BL, & Blacher J (2007). Early student-teacher relationships of children with and without intellectual disability: Contributions of behavioral, social, and self-regulatory competence. Journal of School Psychology, 45, 363–383. [PubMed: 21490876]

Estes AM, Dawson G, Sterling L, Munson J, (2007). Level of intellectual functioning predicts patterns of associated symptoms in school-age children with autism spectrum disorder. American Journal on Mental Retardation, 112, 439–449. [PubMed: 17963435]

Eussen M, Van Gool A, Verheij F, DeNijs P, Verhulst F, Greaves-Lord K, (2012 The association of quality of social relations, symptom severity and intelligence with anxiety in children with autism spectrum disorders. Autism, 16, 723–735.

Friman PC, Handwerk ML, Smith GL, Larzelere RE, Lucas CP, & Shaffer DM (2000). External validity of conduct and oppositional defiant disorders determined by the NIMH diagnostic interview schedule for children. Journal of Abnormal Child Psychology, 28, 277–286. [PubMed: 10885685]

Gjevik E, Eldevik S, Fjaeran-Granum T, & Sponheim E (2011). Kiddie-SADS reveals high rates of DSM-IV disorders in children and adolescents with autism spectrum disorders. Journal of Autism and Developmental Disorders, 41, 761–769. [PubMed: 20824493]

Goldin RL, Matson JL, & Cervantes PE (2014). The effect of intellectual disability on the presence of comorbid symptoms in children and adolescents with autism spectrum disorder. Research in Autism Spectrum Disorders, 8, 1552–1556.

Gresham FM, & Elliot SN (1990). Social Skills Rating System. Circle Pines, MN: American Guidance Service, Inc.

Harter S & Pike R (1984). The pictorial scale of perceived competence and social acceptance for young children. Child Development, 55, 1969–1982. [PubMed: 6525886]

Lake JD, Perry A, & Lunsky Y (2014). Mental health services for individuals with high-functioning Autism Spectrum Disorder. Autism Research and Treatment, 1–9.

Lecavalier L, Snow AV & Norris M (2011). Autism spectrum disorders and intellectual disability In Matson JL, Sturmey P (Eds.)., International handbook of autism and pervasive developmental disorders, Autism and Child Psychopathology Series. NY: Springer.

Mayes SD, Calhoun SL, Murray MJ, & Zahid J (2011). Variables associated with anxiety and depression in children with autism. Journal of Developmental and Physical Disabilities, 23, 325–337.

Mazurek MO, & Kanne SM (2010). Friendship and internalizing symptoms among children and adolescents with ASD. Journal of Autism and Developmental Disorders, 40, 1512–1520. [PubMed: 20405193]

Pianta RC (2001). The Student-Teacher Relationship Scale. Charlottesville, VA: University of Virginia.

Radloff LS (1977). The CES-D Scale: A self-report depressions scale for research in the general population. Applied Psychological Measurement, 1, 385–401.

Rosa M, Puig O, Lazaro L, & Calvo R (2016). Socioeconomic status and intelligence quotient as predictors of psychiatric disorders in children and adolescents with high-functioning autism spectrum disorder and in their siblings. Autism, 20, 963–972. [PubMed: 26851231]

Shaffer D, Fisher P, Lucas CP, Dulcan MK, & Schwab-Stone ME (2000). NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): description, differences from previous versions, and reliability of some common diagnoses. Journal of the American Academy of Child and Adolescent Psychiatry, 39, 28–38. [PubMed: 10638065]

Sparrow SS, Cicchetti DV, & Balla BA (2005). Vineland Scales of Adaptive Behavior (2nd ed.). Circle Pine, MN: American Guidance Service.

Simonoff E, Pickles A, Charman T, Chandler S, Loucas T,…& Baird G (2008). Psychiatric disorders in children with autism spectrum disorders: Prevalence, comorbidity, and associated factors in a population-derived sample. Journal of the American Academy of Child and Adolescent Psychiatry, 47, 921–929. [PubMed: 18645422]

Strang JF, Kenworthy L, Daniolos P, Case L, Wills MC ….Wallace GL (2012). Depression and anxiety symptoms in children and adolescents with autism spectrum disorders without intellectual disability. Research in Autism Spectrum Disorders, 6, 406–412. [PubMed: 22615713]

Sukhodolsky D, Scahill L, Gadow K, Arnold L, Aman M, McDougle C, et al. (2008). Parent-rated anxiety symptoms in children with pervasive developmental disorders: Frequency and association with core autism symptoms and cognitive functioning. Journal of Abnormal Child Psychology, 36(1), 117–128 [PubMed: 17674186]

Totsika V, Hastings RP, Emerson E, Lancaster G, & Berridge DM (2011). A population-based investigation of behavioural and emotional problems and maternal mental health: Associations with autism spectrum disorder and intellectual disability. Journal of Child Psychology and Psychiatry, 52, 91–99. [PubMed: 20649912]

Wechsler D (2003). Wechsler Intelligence Scale for Children (4th ed.). San Antonio, TX: Harcourt Assessments.

White SW, & Roberson-Nay R (2009). Anxiety, social deficits, and loneliness in youth with autism spectrum disorders. Journal of Autism and Developmental Disorders, 39, 1006–1013. [PubMed: 19259802]

Williams S, Leader G, Mannion A, & Chen J (2015). An investigation of anxiety in children and adolescents with autism spectrum disorder. Research in Autism Spectrum Disorders, 10, 30–40.

Witwer AN, & Lecavalier L (2010). Validity of comorbid psychiatric disorders in youngsters with autism spectrum disorders. Journal of Developmental and Physical Disabilities, 22, 367–380.

Table 1.

Child, Parent, and Family Demographics (N=187)

Demographics	TD n = 98	ID n = 37	ASD n = 26	ASD/ID n=26	F or chi-square
Child sex: % male	51	54	88	69	$X^2 = 13.44$, p = .004
Child race/ethnicity: % White, non-Hispanic	60.2	45.9	65.4	52.0	$X^2 = 3.26$, ns
Child IQ, mean	108.2	61.9	109,0	70.1	F = 149.42, p < .001
Mother age: years (SD)	45.6	42.9	47.5	43.3	F = 2.41, ns
Mother education: % college graduate+	61.2	27.0	42.3	53.8	$X^2 = 13.47$, p= .004
Mother marital status (% married)	75.5	67.6	65.4	64.0	$X^2 = 2.17$, ns
Family income (% >$50K)	72.9	59.5	76.9	52.0	$X^2 = 6.19$, ns

Table 2.

Mother ratings of behavior disorders scales by youth diagnostic group (N=187)

VARIABLE	TD n=98	ID n-37	ASD n=26	ASD/ID n=26	F	P	TD vs. ID	TD v. ASD	TD v. ASD+ID	ASD v, ASD +ID
CBCL Broad band										
*Total	47.8	58.5	64.6	62.4	28.84	<.001	<.001	<001	<.001	ns
*Externalizing	47.6	54.3	56.5	56.0	10.30	<.001	<.001	<.001	<.001	ns
*Internalizing	48.6	53.8	63.7	59.7	16.83	<.001	.014	<.001	<.001	ns
CBCL Narrow band										
Anxious-Dep	53.6	56.8	60.0	60.8	15.39	<.001	<.05	<001	<.001	.09
Withdrawn	53.8	56.3	61.1	61.9	11.86	<.001	.09	<.001	<.001	ns
Somatic	54.9	56.8	61.4	57.5	4.47	.005	ns	<.001	ns	.09
Social Problem	54.6	63.8	68.5	65.5	33.76	<.001	<.001	<.001	<.001	ns
Thought Problems	54.1	61.4	67.7	66.0	32.44	<.001	<.001	<.001	<.001	ns
Attention Problem	54.0	63.3	66.2	66.3	27.73	<.001	<.001	<.001	<.001	ns
Rule-breaking	52.5	55.4	55.4	55.2	5.16	.002	<.01	<.01	.015	ns
Aggression	53.4	57.4	60.0	59.2	8.03	<.001	<.01	<.001	.001	ns
CBCL DSM scales										
ADHD	54.0	60.4	63.7	62.8	22.31	<.001	<.001	<.001	<.001	ns
ODD	54.5	58.2	59.0	58.9	5.65	.001	.006	.004	.004	ns
ANX	53.6	60.0	63.6	63.0	21.89	<.001	<.001	<001	<.001	ns
Affective	53.9	56.5	63.5	59.6	12.15	<.001	.09	<.001	.001	.08
Somatic	54.6	56.3	59.5	56.6	2.49	.06	ns	<.01	ns	ns
Conduct	52.9	56.3	57.2	57.0	7.10	<.001	<.01	.001	.001	ns
DISC Interview										
*DISC ADHD	.14	.50	.54	.58	12.90	<.001	<.001	<.001	<.001	ns
*DISC ODD	.14	.28	.38	.27	2.93	<.05	.09	<01	ns	ns

*
previously reported in (masked for review).

Table 3.

Mother and Teacher ratings of youth social skills by youth diagnostic group.

VARIABLE	TD	ID	ASD	ASD/ID	F	P	TD v. ID	TD v. ASD	TD v. ASD +ID	ASD v, ASD+ID
(Mother) Social Acceptance (N=164)	9.2	8.0	5.3	6.0	21.18	<001	<.05	<.001	<.001	ns
(Mother) Social Skills Rating Scale (N=175)										
Cooperation	11.8	10.6	8.6	10.1	5.33	.002	ns	<.001	.05	ns
Assertion	14.6	11.4	9.9	12.8	18.28	<.001	<.001	<.001	<.001	ns
Responsibility	16.6	14.6	13.0	13.6	12.57	<.001	.002	<.001	<.001	ns
Self-Control	14.2	11.1	10.1	10.8	12.23	<.001	<.001	<.001	<.001	ns
(Teacher) Social Skills Rating System (N=94)										
Cooperation	15.9	12.9	14.7	13.9	2.78	<.05	.008	ns	ns	ns
Assertion	11.9	10.1	10.4	7.7	3.08	<.05	ns	ns	.005	ns
Self-Control	15.0	12.1	11.1	11.6	6.37	.001	.005	.003	.005	ns
(Teacher) Student Teacher Relationship Scale. (N=98)										
Closeness	40.2	42.2	42.8	40.4	0.67	ns	ns	ns	ns	ns
Conflict	17.2	18.0	26.7	21.0	5.67	.001	ns	<.001	.08	.06
Total	116.1	114.1	105.0	109.1	2.81	.04	ns	.01	.08	ns

Table 4.

Mother report of her own well-being, by youth diagnostic group.

VARIABLE	TD	ID	ASD	ASD/ID	F	P	TD v. ID	TD v. ASD	TD v. ASD +ID	ASD v. ASD+ID
Negative Impact of youth on family (FIQ). N=166	10.0	22.2	22.9	24.7	19.05	<.001	<.001	<.001	<.001	ns
Positive Impact of youth on family (FIQ). N=166	15.3	13.2	12.9	13.1	2.38	.07	.08	.05	.08	ns
Depression (CESD) N=167	8.8	12.4	13.5	16.3	3.90	.01	ns	.05	<.01	ns
Symptom Checklist (SCL) Total (all N=166)	15.8	21.5	30.8	34.1	7.13	<.001	ns	.001	<.001	ns
SCL Anxiety	2.2	2.6	4.3	6.1	5.40	.001	ns	<.05	<.001	ns
SCL Depression	5.3	6.9	10.5	10.5	7.39	<.001	ns	<.001	<.001	ns
SCL Hostility	2.0	2.2	3.6	4.4	5.21	.002	ns	<.05	.001	ns
SCL Interpersonal Sensitivity	1.5	2.4	3.5	4.0	6.22	.001	ns	.003	<.001	ns
SCL Somatization	2.9	3.6	4.7	5.8	2.10	ns	ns	ns	.03	ns