**Title:** Social skills in adolescent females with autism with and without co-occurring attention-deficit/hyperactivity disorder

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**Introduction**: Autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) frequently co-occur and both include differences in social skills over the course of childhood and adolescence. Because both ASD and ADHD are diagnosed more frequently in males, girls and women are often underrepresented in research samples, particularly in work exploring the co-occurrence of these conditions. The primary goal of this study was to examine social functioning among adolescent females with ASD with regard to the presence or absence of co-occurring ADHD. As a secondary goal, we considered associations between social functioning and internalizing/externalizing difficulties in relation to ADHD. Previous literature has suggested largely comparable social skills across ASD versus ASD+ADHD1,2, but few studies have examined nuanced social skills among females.

**Method**: Participants were drawn from the phenotypic dataset created through SPARK (Simons Powering Autism Research and Knowledge), a national network of clinical sites serving individuals with autism. On the basis of available data, the current sample comprised 1120 adolescent females (ages 12-18:11 years old, *M* = 14.17, *SD* = 1.83) with professional diagnoses of ASD, of whom 52% had co-occurring ADHD (ASD+ADHD). Social skills were assessed via caregiver-report with the Vineland Adaptive Behavior Scales, 3rd Ed.3 For a subset of participants, caregiver-reported mental health symptoms were available via the Child Behavior Checklist (CBCL)4. General linear models were computed to examine the effect of ADHD on overall social skills, as well as on profiles of finer-grained social skills (Coping Skills, Interpersonal Relationships, and Play/Leisure subscales). Logistic regression was conducted to determine whether social skill subscales could distinguish between ASD versus ASD+ADHD groups, and correlations were computed to consider relationships between social skills and mental health symptoms.

**Results:** Although there were no differences in overall social skills between adolescent females with ASD only versus ASD+ADHD (*F*(1,1118)=0.01, *p*=.01, a Group x Subscale interaction indicated that profiles of specific subscales within the Vineland-3 differed across the groups, *F*(1.96, 2236)=16.20, *p*<.001. Co-occurring ADHD was associated with weaker skills in the Coping Skills subscale only, *F*(1,1118)=8.72, *p*=.003. Significant logistic regression results, *χ*2(3)=28.58, *p*<.001, Nagelkerke *R*2=.03, indicated that group membership in the ASD+ADHD group was predicted by Coping Skills, *p*<.001, and Play/Leisure, *p*=.002, such that co-occurring ADHD corresponded to poorer coping but stronger play/leisure skills relative to ASD only. For the full sample, social skills across all Vineland-3 metrics were negatively associated with CBCL Externalizing T-scores, such that fewer externalizing difficulties were associated with stronger social skills overall (*r*=-.32, *p*<.001), and in the domains of Coping Skills (*r*=-.45, *p*<.001), Interpersonal relationships (*r*=-.21, *p*<.001), and Play/Leisure (*r*=-.20, *p*<.001). Associations were similar when considered specifically within the ASD only group and within the ASD+ADHD group. Across the full sample and ASD+ADHD group, Coping Skills was the social subscale most strongly associated with externalizing behaviors (Fisher *r*-to-*z* tests > 3.0, *p*s < .002).

**Discussion**: Utilizing a large national dataset with substantial representation of females, we find evidence that co-occurring ADHD is selectively associated with social difficulties related to coping skills, over and above the presence of ASD. Because the coping subscale of the Vineland-3 indexes socially-relevant emotional and behavioral control, findings suggest that social difficulties may be secondary to emotion dysregulation, particularly given associations with externalizing concerns. Results highlight that adolescent females with ASD and ADHD may be at heightened risk of externalizing concerns relative to those with ASD only, with corresponding detrimental impact on social functioning. As a result, the presence of ADHD may indicate the need to bolster ASD-oriented social skills supports with emotion regulation approaches, and more nuanced understanding of the social skills and needs of this group may offer pathways to more tailored and effective supports and interventions.

**References**:

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