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BRIEF REPORT

Brief Report: Parent–Adolescent Informant Discrepancies of Social Skill Importance and Social Skill Engagement for Higher-Functioning Adolescents with Autism Spectrum Disorder

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Abstract Parent- and adolescent-report of social skill importance and social skill engagement on the Social Skills Rating System (Gresham and Elliott in The social skills rating system, American Guidance Service, Circle Pines, 1990) were assessed in higher-functioning adolescents with Autism Spectrum Disorder (ASD). Compared to parents, adolescents reported that social skills were less important. Additionally, adolescents reported that they engaged in social skills more frequently than parents reported them to be engaging in social skills. Parents, but not adolescents, reported a discrepancy between importance and engagement, such that the importance of social skills was rated higher than the frequency of adolescent engagement in social skills. These results suggest that social skills interventions for individuals with ASD may need to target awareness of social skill importance and accurate monitoring of social skill engagement.

Keywords Autism · Social Skills Rating System · Informant discrepancy · Awareness · Social skill importance · Social skill engagement

Introduction

In recent years, there has been a surge of research on social skills interventions for higher-functioning individuals with Autism Spectrum Disorder (ASD). Yet, despite this recent attention, the results of most social skills interventions are inconclusive, and it remains unclear whether skills learned in interventions are maintained over time and/or generalized across settings (e.g., McMahon et al. 2013a). Teaching participants how to engage in specific social skills (e.g., making eye contact, maintaining conversations) is a focus of many intervention curricula (McMahon et al. 2013a), but mere knowledge of how to engage in these social skills may not be sufficient for intervention efficacy, maintenance, and generalization. If participants are not aware of and do not appreciate the importance of social skills, they may have little motivation to learn and implement these skills in everyday settings. Furthermore, if participants cannot adequately monitor the frequency with which they engage in social skills, they may not recognize when they are not using these social skills or when they are using these social skills less often than same-aged peers. As such, awareness of the importance of social skills and accurate monitoring of social skills may be integral for intervention efficacy. The goal of the current study was to compare parent- and adolescent-report of social skill importance and frequency of social skill engagement to determine whether awareness of these factors is impaired in ASD.

Awareness of Social Skill Importance and Frequency of Social Skill Engagement in ASD

The Social Skills Rating System (SSRS; Gresham and Elliott 1990) is an assessment commonly used to measure social skill importance and frequency of social skill

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engagement in children/adolescents; however, as this assessment only provides standardized scores for frequency ratings, importance ratings are typically not analyzed or discussed in the research literature. Taking into account both the research literature on the SSRS and the larger research literature on social skills in ASD, little is known about the perceived importance of social skills among individuals with ASD. The metacognition literature indicates that individuals who are "unskilled" are often "unaware" of their impairments, as a common knowledge seems to underlie both the skill itself and awareness of that skill (e.g., Kruger and Dunning 1999). In a similar way, as individuals with ASD experience impairments in social skills, they may also not be fully aware of the importance of social skills. For example, individuals with ASD have poorer quality friendships than individuals with typical development; when asked to define or discuss the term friendship, individuals with ASD often show a less complete or different awareness of friendship than individuals with typical development (e.g., Bauminger and Kasari 2000; Calder et al. 2013; Carrington et al. 2003). While research in this area is still in its nascent stage, the current research suggests that individuals with ASD may not have a complete or may have a different understanding of the importance of social skills.

Research has been more widely conducted on awareness of the frequency of social skill engagement in ASD. On the SSRS, a standardized assessment of social skill engagement, informants (children/adolescents, parents, and/or teachers) report frequency of engagement on a 3-point scale: never, sometimes, or very often. Multiple studies have compared parent- and child/adolescent-report of frequency, and children/adolescents with ASD tend to report that they engage in social skills more frequently than parents report them to be engaging in social skills (e.g., Jepsen et al. 2012; Koning and Magill-Evans 2001; Lerner et al. 2012; Vickerstaff et al. 2007). Moreover, a similar pattern is observed when comparing teacher- and child/adolescent-report, such that children/adolescents with ASD also tend to report greater social skill engagement than that reported by their teachers (e.g., Jepsen et al. 2012; Koning and Magill-Evans 2001; Vickerstaff et al. 2007). As individuals with ASD may have impairments in self-awareness (e.g., Williams 2010), their report of social skill engagement may be less accurate than parent- and/or teacher-report of social skill engagement; as such, it appears that individuals with ASD may overestimate the frequency with which they engage in social skills.

The Current Study

The current study examines parent- and adolescent-report of the importance of social skills and the frequency with which adolescents engage in such skills on the SSRS (Gresham and Elliott 1990). To the authors' knowledge, this is the first study in the ASD literature to examine and compare parent- and adolescent-report of social skill importance on the SSRS. As there may be a common knowledge that underlies both social skill success and awareness of social skills (e.g., Kruger and Dunning 1999), we hypothesized that adolescents with ASD would have difficulty recognizing the importance of social skills on the SSRS and would therefore rate social skills as less important than parents. In congruence with the extant literature on informant discrepancies in ASD (e.g., Jepsen et al. 2012; Koning and Magill-Evans 2001; Lerner et al. 2012; Vickerstaff et al. 2007), we also hypothesized that adolescents would report that they engage in social skills more frequently than parents report them to be engaging in social skills.

In addition, to the authors' knowledge, this is the first study in the ASD literature to examine whether adolescents and/or parents report a discrepancy between the importance of social skills and the frequency with which adolescents engage in those skills. We hypothesized that parents would report a discrepancy between importance and engagement, such that the importance of social skills would be rated higher than the frequency of adolescent engagement in those skills. We also hypothesized that adolescents would not report a discrepancy between importance and engagement, such that the importance of social skills would be rated on par with their frequency of engagement.

Methods

Participants and Procedure

Participants in this study were part of a larger research project examining a clinical social skills intervention at the University of California, Davis, M.I.N.D. Institute (McMahon et al. 2013b). While both intervention and control participants were recruited for this larger research project, the current study does not assess intervention efficacy and only utilizes data collected prior to the intervention. As such, the recruitment methods and screening criteria used to enroll intervention and control participants are briefly outlined below, but in the current study, no further distinction is made between these participants.

Intervention participants were recruited from those enrolled in the clinical social skills intervention. To enroll in this intervention, families had to have contacted the clinic to express interest in the intervention and met with a clinician to determine appropriateness for the intervention (children with below average cognitive or language abilities, severe behavioral problems, insufficient insurance or

funds to pay for the intervention, etc., were referred elsewhere). Control participants were recruited from an internal database of families interested in participating in research studies. In an initial phone screening, all families were excluded from participation if their child did not have an ASD diagnosis. Control participants had to meet additional inclusion criteria (between 8 and 16 years old, primarily schooled in a mainstream classroom) and exclusion criteria (significant behavioral problems, below average cognitive abilities, substance abuse problems, minimal language abilities) to approximate inclusion/exclusion criteria used by clinicians for the intervention participants.

In total, 32 participants were recruited for participation in the larger research project. In order to meet eligibility criteria for the current study, participants had to meet 2 of the following 3 diagnostic cut-off scores for ASD: ≥60 on the Social Responsiveness Scale (Constantino and Gruber 2005), ≥15 on the Social Communication Questionnaire (Berument et al. 1999), and ≥15 on the Autism Spectrum Screening Questionnaire (Ehlers et al. 1999). Participants were required to have a verbal IQ ≥65 on the Wechsler Abbreviated Scale of Intelligence (Wechsler 1999). Finally, both the participant and his/her parent needed to complete the SSRS Secondary Level Questionnaire (grades 7–12; Gresham and Elliott 1990). Younger participants who completed the SSRS Elementary Level Questionnaire (grades 3–6) were excluded from participation in the current study, as children do not provide importance ratings on this version of the questionnaire.

Fourteen participants who were recruited for the larger research project were excluded from the current study: 10 younger participants completed the SSRS Elementary Level Questionnaire, 2 participants had missing parent- and/or adolescent-report SSRS data, and 2 participants dropped out of the study. Thus, the final sample size was 18 participants (14 males). See Table 1 for participant characteristics.

Measures

Measure of Theoretical Interest

Social Skills Rating System (SSRS) Secondary Level (Gresham and Elliott 1990): In this questionnaire, adolescents utilize a 3-point scale to respond to 39 questions on social skills, indicating how frequently they engage in each social skill (never, sometimes, or very often) and how important it is for their relationships with others (not important, important, or critical). Parents utilize a 3-point scale to respond to 40 questions on social skills, indicating how frequently their child engages in each social skill (never, sometimes, or very often) and how important it is for their child's development (not important, important, or critical); these questions inquire about social skills that can be reasonably assessed and/or observed by parents, such as helping with household tasks and controlling one's temper. In addition, parents respond to 12 questions on problem behaviors that are not utilized in the current study. The current study analyzes social scales present in both the adolescent- and parent-report versions of the SSRS: the Social Skills Total Scale, the Assertion Subscale (which assesses social initiation behaviors, such as inviting someone over to the house), the Cooperation Subscale (which assesses sharing, helping, and complying behaviors, such as listening to adults), and the Self-Control Subscale (which assesses appropriate responses in conflict situations, such as ending fights calmly). The SSRS shows good internal consistency ($\alpha = 0.83$ for the Social Skills Total on the adolescent-report version and $\alpha = 0.90$ for the Social Skills Total on the parent-report version) and has been validated through correlations with other social skills assessments (Gresham and Elliott 1990).

Table 1 Participant characteristics ($n = 18$)

	M	*SD*	Range
Age (years)	14.71	1.40	12.42–16.89
Verbal IQ	101.00	19.89	65–136
Performance IQ	102.50	14.86	70–123

Screening Measures

Autism Spectrum Screening Questionnaire (ASSQ; Ehlers et al. 1999): In this 28-item questionnaire, parents evaluate the degree to which their child shows behaviors characteristic of higher-functioning individuals with ASD. The ASSQ has excellent test–retest reliability ($r = 0.96$ for questionnaires completed by parents over a 2-week interval) and has been validated by associations with other parent-report measures (Ehlers et al. 1999).

Social Communication Questionnaire (SCQ; Berument et al. 1999): This parent-report questionnaire was developed from the Autism Diagnostic Interview (ADI; Lord et al. 1994) and inquires about the child's current and past autistic symptomology. Correlations between the SCQ and ADI are highly significant, and the SCQ demonstrates excellent reliability ($\alpha = 0.90$ for the SCQ Total; Berument et al. 1999).

Social Responsiveness Scale (SRS; Constantino and Gruber 2005): In this 65-item questionnaire, parents report on their child's current autistic symptomology. The SRS is correlated with the ADI and shows excellent internal consistency ($\alpha = 0.94$ in the male clinical sample and $\alpha = 0.93$ in the female clinical sample for the SRS Total; Constantino and Gruber 2005).

Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler 1999): In this assessment, the Vocabulary and Similarities Subscales are used to index verbal IQ, and the

Block Design and Matrix Reasoning Subscales are used to index performance IQ. The WASI has excellent reliability ($\alpha = 0.93$ for verbal IQ and $\alpha = 0.94$ for performance IQ in the children's sample) and has been validated against other intelligence tests (Wechsler 1999).

Data Analyses

In this study, we calculated both frequency and importance scores for the SSRS scales by summing the responses for the corresponding questions (all social skills questions for the total scale and a subset of social skills questions for each subscale; Gresham and Elliott 1990). Raw scores were used, as standard scores are not available for importance ratings; however, demographics used to determine standard scores (e.g., age/grade, gender) were taken into account in the analyses.

Four preliminary ANCOVAs were performed with Informant (parent vs. adolescent) and Content (frequency vs. importance) as within-subjects variables and age, gender, and verbal IQ as covariates. The dependent variables for these analyses were the Social Skills Total Scale and the Assertion, Cooperation, and Self-Control Subscales. As age and gender did not have significant effects in any of the analyses, these variables were removed from the final models. Verbal IQ had significant or marginally significant effects in the Assertion and Cooperation analyses, so Verbal IQ was retained as a covariate for these final models.[1]

Results

Social Skills Total Scale

The main effect of Content on the Social Skills Total Scale, $F(1, 17) = 14.11$, $p < 0.01$, $\eta_p^2 = 0.45$, was qualified by an interaction between Informant and Content, $F(1, 17) = 23.65$, $p < 0.01$, $\eta_p^2 = 0.58$, see Fig. 1a. Follow-up ANOVAs indicated that adolescents reported that they engaged in social skills more frequently than parents reported them to be engaging in social skills, $F(1, 17) = 5.72$, $p = 0.03$, $\eta_p^2 = 0.25$, and parents rated social skills as more important than adolescents, $F(1, 17) = 9.31$, $p = 0.01$, $\eta_p^2 = 0.35$. In addition, parents reported a discrepancy between importance and engagement, such that the importance of social skills was rated higher than the frequency of adolescent engagement in social skills, $F(1, 17) = 26.50$, $p < 0.01$, $\eta_p^2 = 0.61$, while adolescents did not report this discrepancy, $F(1, 17) = 0.85$, $p = 0.37$, $\eta_p^2 = 0.05$.

[1] Although verbal IQ did not have a significant effect on Cooperation in the final ANCOVA, verbal IQ was retained as a covariate in this model due to its prior significance in the model-building process.

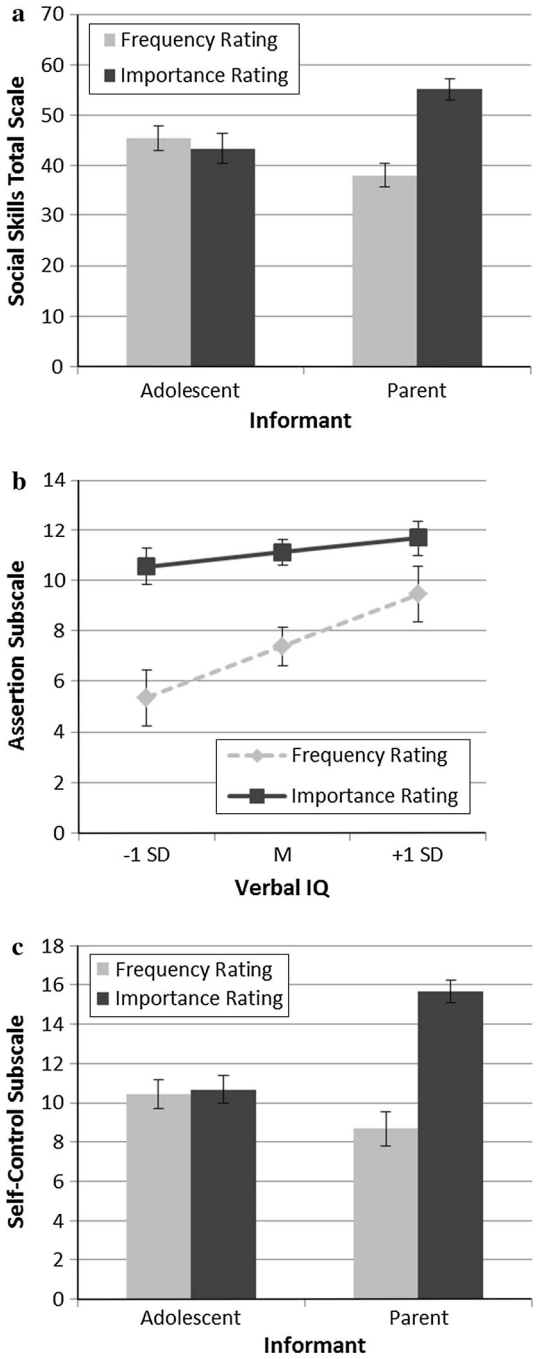

Fig. 1 Interaction between Informant and Content on the Social Skills Total Scale (**a**), interaction between Content and Verbal IQ on the Assertion Subscale (**b**), and interaction between Informant and Content on the Self-Control Subscale (**c**). *Error bars* represent standard error

Assertion Subscale

The main effects of Content, $F(1, 16) = 9.60$, $p = 0.01$, $\eta_p^2 = 0.38$, and Verbal IQ, $F(1, 16) = 5.36$, $p = 0.03$, $\eta_p^2 = 0.25$, on the Assertion Subscale were qualified by a marginal interaction between Content and Verbal IQ, $F(1,$

16) = 4.45, $p = 0.05$, $\eta_p^2 = 0.22$, see Fig. 1b. In order to follow up on this interaction and determine the effect of Content at different levels of Verbal IQ, the marginal means for Content were compared at one standard deviation below the mean Verbal IQ, the mean Verbal IQ, and one standard deviation above the mean Verbal IQ, as recommended by Aiken and West (1991). Importance of assertive skills was rated significantly higher than frequency of adolescent engagement in assertive skills for adolescents with a below average verbal IQ, $F(1, 16) = 28.32$, $p < 0.01$, $\eta_p^2 = 0.64$, an average verbal IQ, $F(1, 16) = 29.89$, $p < 0.01$, $\eta_p^2 = 0.65$, and an above average verbal IQ, $F(1, 16) = 5.28$, $p = 0.04$, $\eta_p^2 = 0.25$; however, the discrepancy between importance and engagement was greatest for those individuals with a below average IQ.

Cooperation Subscale

There were no significant effects on the Cooperation Subscale.

Self-Control Subscale

The main effects of Informant, $F(1, 17) = 6.52$, $p = 0.02$, $\eta_p^2 = 0.28$, and Content, $F(1, 17) = 17.14$, $p < 0.01$, $\eta_p^2 = 0.50$, on the Self-Control Subscale were qualified by an interaction between Informant and Content, $F(1, 17) = 27.08$, $p < 0.01$, $\eta_p^2 = 0.61$, see Fig. 1c. Follow-up ANOVAs indicated that parents and adolescents did not significantly differ in their frequency ratings of self-control skills, $F(1, 17) = 2.85$, $p = 0.11$, $\eta_p^2 = 0.14$, but parents rated self-control skills as more important than adolescents, $F(1, 17) = 46.65$, $p < 0.01$, $\eta_p^2 = 0.73$. In addition, parents reported a discrepancy between importance and engagement, such that the importance of self-control skills was rated higher than the frequency of adolescent engagement in self-control skills, $F(1, 17) = 32.60$, $p < 0.01$, $\eta_p^2 = 0.66$, while adolescents did not report this discrepancy, $F(1, 17) = 0.06$, $p = 0.81$, $\eta_p^2 < 0.01$.

Discussion

In summary, adolescents reported that they engaged in social skills more frequently than parents reported them to be engaging in social skills. Parents rated social and specifically self-control skills as more important than adolescents. Parents, but not adolescents, reported a discrepancy between importance and engagement, such that the importance of social and specifically self-control skills was rated higher than the frequency of adolescent engagement in those skills. Finally, both parents and adolescents rated the importance of assertive skills higher than the frequency of adolescent engagement in those skills, particularly for adolescents with a low verbal IQ.

This study confirmed our hypotheses that adolescents with ASD would report social skills as less important than parents and would report that they engage in social skills more frequently than parents report them to be engaging in social skills. These results suggest that adolescents with ASD may not be fully aware of the importance of social skills and may overestimate the frequency with which they engage in social skills. While previous research on social skill importance in ASD is limited, this study does replicate prior research on parent and child/adolescent informant discrepancies of frequency of social skill engagement in ASD (e.g., Jepsen et al. 2012; Koning and Magill-Evans 2001; Lerner et al. 2012; Vickerstaff et al. 2007). Conversely, in the typical development literature, there appears to be substantial agreement between parents and children/adolescents on frequency of social skill engagement, with parents sometimes even reporting more frequent social skill engagement than children/adolescents (Gresham et al. 2010; Koning and Magill-Evans 2001). As such, it is unlikely that the informant discrepancy in the current sample can be attributed to developmental maturation and/or can be generalized to adolescents with typical development.

Additionally, this study supported our hypothesis that parents would report a discrepancy between importance of social skills (high) and frequency of engagement in social skills (low), while adolescents would not report this same discrepancy. As parents reported a discrepancy between importance and engagement, they may therefore cognitively identify a need for social skills interventions; adolescents, however, may not identify the need for such interventions. Social skills interventions may be less effective if: (1) adolescents do not perceive social skills as important and therefore have little motivation to learn or implement such skills, (2) adolescents do not accurately monitor their engagement in social skills and therefore are not aware when social skills are implemented with low frequency, and/or (3) adolescents do not recognize a discrepancy between importance of and engagement in social skills and therefore do not cognitively identify a need for social skills interventions.

While this general pattern of results was observed for the Social Skills Total Scale of the SSRS, slightly different results were observed for the specific subscales of the SSRS. The Self-Control Subscale showed a similar pattern of results, except adolescents and parents agreed on the frequency with which adolescents engaged in self-control skills. This may indicate that adolescents with ASD have a relative advantage in monitoring self-control skills. Williams (2010) suggests that self-awareness and self-

monitoring in ASD are domain-specific, such that it is easier to develop self-awareness in physical domains (e.g., monitoring one's actions) than psychological domains (e.g., monitoring one's beliefs); similarly, it may be easier for individuals with ASD to monitor and develop self-awareness of self-control skills compared to other social skills (e.g., empathy).

On the Assertion Subscale, both parents and adolescents recognized a discrepancy between the importance of assertive skills and the frequency with which adolescents engaged in assertive skills, suggesting that adolescents with ASD may be cognizant of the need for intervention in this area. This discrepancy was largest for adolescents with a low verbal IQ, which is consistent with past literature suggesting that assertive skills are associated with a higher IQ (Dorman 1973). Assertive social skills (e.g., asking questions) may be more cognitively demanding to plan and execute than other, more passive social skills (e.g., answering questions).

Finally, no significant informant discrepancies were observed on the Cooperation Subscale, indicating that parents and adolescents agreed on the importance of cooperative skills and the frequency with which adolescents engaged in cooperative skills. Additionally, the Cooperation Subscale was the only subscale on which neither parents nor adolescents reported a discrepancy between importance and engagement; as such, cooperative skills may be a relative social strength for individuals with ASD. Downs and Smith (2004) also found cooperation to be a relative social strength for individuals with ASD, and several intervention studies suggest that cooperation is a malleable social skill that is amenable to improvement in ASD (Bauminger 2002, 2007).

Limitations and Future Directions

There are several limitations that affect the conclusions that can be drawn from this study. First, the sample size for this study was small ($n = 18$). Second, this study did not employ a typically developing, control group of participants. While the literature suggests that the informant discrepancy pattern observed in the current study does not generalize to adolescents with typical development (Gresham et al. 2010; Koning and Magill-Evans 2001), it would be useful to have a direct comparison group. As such, future studies should use both a larger sample size and a typically developing control group. Third, while this study suggests that discrepancies in parent- and adolescent-report of social skill engagement are due to impairments in adolescent social self-monitoring, there may be alternative explanations. This study considered parent-report of social skills to be the "gold standard" informant report, given that individuals with ASD have impairments in self-awareness (e.g., Williams 2010). However, parents may not be fully aware of the social lives of their adolescent children (e.g., Darling et al. 2006) and may not have the opportunity to observe social interactions that occur outside of the home setting (e.g., school). Furthermore, parents may not be fully cognizant of adolescent social culture and therefore may have difficulty judging how well their adolescent meets the social expectations and norms of that culture. As such, in the current study, it is quite possible that parents overemphasized the importance of social skills and/or underestimated the social skill engagement of their adolescent children. In addition, inflated adolescent self-report of social skill engagement may be due to factors other than self-monitoring impairments. For example, the ADHD literature suggests that children with ADHD may perceive poor social skills as threatening to their self-esteem and therefore, in a self-protective mechanism, may try to hide their social skill difficulties on self-report questionnaires (Emeh and Mikami 2014); thus, in this study, adolescents with ASD may have overestimated their social skill engagement in an endeavor to protect their self-esteem, rather than due to difficulties with self-monitoring. In future research, these alternative explanations can be teased apart by using more objective assessments of social skills (e.g., behavioral observation, peer-report, teacher-report) and determining whether positive feedback affects adolescent self-report of social skills.

The results of this study suggest that adolescents with ASD view social skills as less important than their parents, which may affect their motivation to learn and implement such skills. However, in future research, it is important to consider whether individuals with ASD are impaired in recognizing the importance of social skills or genuinely attach a different value to social skills (e.g., Calder et al. 2013; Chevallier et al. 2012). Some individuals with ASD may attach less importance to social skills over time as they become more aware of their own social skill limitations and/or experience negative social interactions (e.g., Humphrey and Symes 2011). Given that social skills are integral across multiple domains (e.g., establishing friendships, attaining educational degrees, securing and maintaining employment), it may be helpful for individuals with ASD to be aware of the importance of social skills in mainstream society, even if they personally place a different value on social skills.

Finally, the results of this study suggest that teaching individuals with ASD how to engage in social skills may not be sufficient for intervention efficacy. Social skills interventions may also need to clearly teach why social skills are important and how these skills can be broadly utilized to achieve a variety of goals (e.g., social, educational, vocational) that are meaningful to intervention participants. In addition, motivational behavioral

intervention techniques should be explored as a way of increasing the intrinsic reward value of social interaction for individuals with ASD (Chevallier et al. 2012). For example, some recent social skills interventions use the restricted interests of individuals with ASD to increase participant motivation for social interaction and involvement in the intervention (e.g., Koegel et al. 2012, 2013). Finally, as we have suggested elsewhere (McMahon and Henderson 2014), social skills interventions may need to teach self-monitoring of social skills (e.g., Morrison et al. 2001; Parker and Kamps 2011), such that individuals with ASD can accurately evaluate their social performance and identify when they need to utilize a social skill more frequently or in a different manner.

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

Ethical standard This study was approved by the appropriate ethics committee and was performed in accordance with ethical standards. Participants assented and parents consented to participation in the current study.

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