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Insight into Informant Discrepancies Regarding Psychosexual Functioning of Adolescents with and without Autism Spectrum Disorder

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The private nature of psychosexual functioning leads adolescents and their parents to have different perspectives, which highlights studying parent–child informant discrepancies in this domain. We investigated informant discrepancy in psychosexual functioning, using the self-report and parent report versions of the Teen Transition Inventory (TTI), of adolescents with autism spectrum disorder (ASD; 136 parent–child dyads) compared to adolescents from the general population (GP; 70 parent–child dyads). Significantly larger informant discrepancies exist in ASD dyads than GP dyads in most domains of psychosexual functioning, except for Body image, Sexual behavior, and Confidence in the future. It is important to use and pay attention to both informants, as discrepancies are relevant for both research and clinical practice regarding psychosexual functioning.

INTRODUCTION

Psychosexual functioning consists of three elements: psychosexual behavior, psychosexual selfhood (i.e., intrapersonal aspects), and psychosexual socialization (i.e., interpersonal aspects) (Dewinter, Vermeiren, Vanwesenbeeck, & Nieuwenhuizen, 2013) and entails both the absence of problems and presence of satisfaction with one's psychosexual life. A growing interest in the psychosexual functioning of adolescents with autism spectrum disorder (ASD) has led to an increase in research. Adolescents and adults with ASD are shown to have a desire for intimate and sexual relations (Dewinter, Vermeiren, Vanwesenbeeck, Lobbestael, & Van Nieuwenhuizen, 2015; Gilmour, Schalomon, & Smith, 2012; Hénault, 2006; Stokes, Newton, & Kaur, 2007) and have similar experiences and behaviors compared to typically developing adolescents (Dewinter et al., 2015). Previous research into the psychosexual functioning of adolescents with ASD reports higher levels of difficulties, such as the portrayal of inappropriate Sexual behaviors (Dekker et al., 2015; Hellemans, Colson, Verbraeken, Vermeiren, & Deboutte, 2007; Sevlever, Roth, & Gillis, 2013; Stokes et al., 2007); fewer appropriate Sexual behaviors (Mehzabin & Stokes, 2011) and less psychosexual knowledge (e.g., Dekker et al., 2017; Ginevra, Nota, & Stokes, 2016; Hellemans et al., 2007; Stokes & Kaur, 2005). However, in regard to inappropriate Sexual behavior, most research con-

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cerning inappropriate Sexual behavior or sexual problems in adolescents with ASD consists of case studies. Therefore, more empirical investigation is needed in this field (Sevlever et al., 2013).

The use of multiple informants has been emphasized in clinical practice and research—especially with children and adolescents—as all informants contribute unique information regarding the symptoms, problems, feelings, and functioning of the child (De Los Reyes & Kazdin, 2005; Nicpon, Doobay, & Assouline, 2010; van der Ende, Verhulst, & Tiemeier, 2012). However, in research on the psychosexual functioning of general population (GP) adolescents, generally self-report is used (Schrimshaw, Rosario, Meyer-Bahlburg, & Scharf-Matlick, 2006). In contrast, in research on psychosexual functioning of adolescents with ASD, the parents or caregivers are generally used as informants, and self-report is used limitedly (Byers, Nichols, & Voyer, 2013; Byers, Nichols, Voyer, & Reilly, 2013; Dewinter et al., 2013; Gilmour et al., 2012; Hénault, 2006; Kuo, Orsmond, Cohn, & Coster, 2013; Mehzabin & Stokes, 2011). Parent report has been favored as it is often thought that individuals with ASD have limited insight into their own functioning (Cederlund, Hagberg, & Gillberg, 2010; Urbano, Hartmann, Deutsch, Polychronopoulos, & Dorbin, 2013). Therefore, most of the results found in the literature mainly reflects the parent or caregivers' assessment of the psychosexual functioning of adolescents with ASD.

Even on overt topics such as Sexual behavior, low correlations were found between parents and adolescents with ASD (Dewinter et al., 2015). This implies that results and conclusions found in various studies depend on the informant.

Since both parent and child contribute valuable information, it would be prudent to include both perspectives when researching psychosexual functioning. Therefore, enhancing research by including self-report from adolescents with ASD and parent report from the GP adolescents will increase our total knowledge on perspective of the adolescents themselves (Lerner, Calhoun, Mikami, & De Los Reyes, 2012).

However, when multiple informants are employed in research, informant discrepancies will occur. Therefore, research can indicate what may be expected regarding informant discrepancy on psychosexual functioning. Generally, parent–child informant discrepancies are larger for internalizing than externalizing themes (Barker, Bornstein, Putnick, Hendricks, & Suwalsky, 2007; Van der Meer, Dixon, & Rose, 2008; Verhulst & Ende, 1992) and larger parent–child informant discrepancies are found in ratings of adolescents than in ratings of children (Renk & Phares, 2004). Although there is research indicating agreement between informants on topics such as personality (Vazire, 2006), several studies regarding social functioning, behavioral problems, and internalizing problems in general populations showed a generally low correlation between different informant reports (Achenbach, McConaughy, & Howell, 1987; De Los Reyes & Kazdin, 2005; Duhig, Renk, Epstein, & Phares, 2000; Jensen et al., 1999; Renk, 2005). As psychosexuality is a private, and thus potentially more intrapersonal, topic informant discrepancies are to be expected. As children enter adolescence, the parent–child relationship changes, which may be reflected in, for instance, seeking more privacy and less disclosure to one´s parents (Skilling, Doiron, & Seto, 2011) and adolescents spending more time with peers (Collins & Laursen, 2004). Additionally, this relationship can be characterized by an increased negative affect associated with more parent–child conflict. These changes can limit the communication between the adolescent and their parents, especially regarding intimate topics. Research has demonstrated that adolescents preferably discuss intimate topics with their friends rather than with their parents (De Graaf, van den Borne, Nikkelen, Twisk, & Meijer, 2017). Due to the private nature of several aspects of psychosexual functioning (e.g., intimate and Sexual behavior), adolescents and their parents may have different perceptions which could influence their reporting.

Regarding possible differences in informant discrepancies between dyads with adolescents with ASD and dyads with adolescents from the general population (GP), Dewinter, Vermeiren, Vanwesenbeeck, and Van Nieuwenhuizen (2016) reported lower levels of parental awareness concerning the Sexual behavior for adolescents with ASD than the parental awareness for GP adolescents. Previous research also showed, adolescents with ASD to report lesser autistic traits, more empathic capabilities, and better social skills compared to their parents (Johnson, Filliter, & Murphy, 2009), while parents of GP adolescents attribute higher social skills to their children than the adolescents attribute to themselves (Gresham, Elliott, Cook, Vance, & Kettler, 2010). A recent publication found significant informant differences between adolescents with ASD and their parents, but not between GP adolescent and their parents (Stokes, Kornienko, Scheeren, Koot, & Begeer, 2017). This concerned reports on quality of life, and the authors suggest that this might be due to adolescents with ASD sharing fewer personal information with their parents. The previous research does not only highlight the importance of using multiple informants, but

also highlights the importance of studying the differences between these informants (i.e., informant discrepancies).

Except for Sexual behavior, informant discrepancies on psychosexual functioning have, to our knowledge, not yet been studied, neither in general population samples nor in ASD samples. In the current study, we aimed to get more insight into parent–child informant discrepancies regarding the psychosexual functioning of the adolescents, by (1) investigating discrepancy between self-reported and parent reported psychosexual functioning of adolescents with ASD and GP adolescents and (2) comparing the parent–child informant discrepancy of reported psychosexual functioning between ASD dyads (i.e., adolescents with ASD and their parents) and GP dyads (i.e., adolescents from the general population and their parents). We investigated the three domains of psychosexual functioning: psychosexual socialization, selfhood, and sexual/intimate behavior (see measures for more information). We hypothesized to find informant discrepancies in both ASD dyads and GP dyads in their reports regarding sexual socialization (e.g., Social acceptance and Friendship skills). Sexual selfhood (e.g., bodily perception) is generally understudied (Dewinter et al., 2013), but following the suggestion that adolescents with ASD share less personal information with their parents (Stokes et al., 2017), we hypothesized to find bigger informant discrepancies in ASD dyads regarding sexual selfhood. Regarding Sexual behavior, we hypothesize that in our sample the adolescents with ASD will report more Sexual behavior than their parents attribute to them, similar to Dewinter et al. (2016).

More insight into parent–child informant discrepancy is a valuable contribution to the existing literature on ASD and psychosexual functioning, because it can put previous findings, measured using either parent, clinician or self-reports, in a clearer perspective. It may inform future research in terms of which informant might be chosen and how that may influence the findings in the domain of psychosexual functioning. In addition, it may inform policies in clinical practice regarding the assessment of psychosexual functioning and treatment of problematic Sexual behavior.

METHODS

Participants and Procedure

In this study, 136 dyads with adolescents with autism spectrum disorder (ASD) and their primary caregivers participated, labeled as the ASD group. In addition, 70 dyads with adolescents from the general population and their parents participated in this study, labeled as the GP group. The required sample size for this study was determined in advance by power calculations; in order to detect differences on the outcome measures of large to medium effect size between the groups with 80% power ($\alpha = .05$; two-sided, number of predictors 6), 56 to 117 adolescents are required per condition. The groups have been derived from larger samples. The ASD group was derived from two samples that have been extensively described elsewhere (Dekker et al., 2017; Visser et al., 2017).

In the first ASD sample, the questionnaire measuring psychosexual functioning, the Teen Transition Inventory (TTI, Dekker et al., 2017, for more information see measures) was administered in 178 parent–adolescent dyads as part of the baseline measure for a Randomized Controlled Trial (RCT) to investigate the effects of a psychosexual training program for adolescents with ASD (Visser, et al., 2017). The adolescents who participated in the RCT were between 12 and 18 years old and had an intelligence quotient (IQ) score in the normal range (full IQ $\geq$ 85) and a total score of 51 or above on the Social Responsiveness Scale (SRS; Constantino & Gruber, 2002; Roeyers, Thys, Druart, De Schryver, & Schittekatte, 2011). An SRS total score of 51 or higher was used because this is the preferred cutoff point based on research among clinical referrals as well as children from the Dutch general population (Roeyers et al., 2011). In addition, all participants in the RCT were previously diagnosed with ASD following DSM-IV criteria by a licensed psychiatrist or psychologist, and ASD severity was further determined using the ADOS. However, meeting the ADOS cutoff was not a prerequisite for participation, given that the sensitivity of the ADOS for detecting high-functioning ASD, especially in females, is not optimal (Lai, Lombardo, & Baron-Cohen, 2014).

The second ASD sample came from a larger clinical sample, participating in a follow-up epidemiological study at the Erasmus Medical Centre—Sophia's Children's Hospital in Rotterdam, the Netherlands (de Bruin, Ferdinand, Meester, de Nijs, & Verheij, 2007; Louwerse et al., 2015). The majority of both ASD samples did not actively seek treatment regarding psychosexual functioning. The TTI was returned by 58 parent–adolescent dyads (more information on the sample see Dekker et al., 2017), of which all the adolescents received a best-estimate ASD diagnosis. The best-estimate ASD

diagnosis was based on the Autism Interview-Revised (ADI-R; Rutter, Le Couteur, & Lord, 2003) and the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2000). Both the ADI-R and ADOS were administered by a small team of certified clinical child and adolescent psychologists who completed research training for both ADI-R and ADOS and who had achieved sufficient reliability for administration and coding. A consensus diagnosis was reached together (Falkmer, Anderson, Falkmer, & Horlin, 2013), and to ensure reliability, the lead examiner was the same for all cases. The examiners reviewed the DSM-IV-TR criteria of ASD (i.e., Pervasive Developmental Disorders) as the DSM 5 was not yet available at the time of the approval of the study by the medical ethical committee. The two ASD samples combined resulted in 236 parent–adolescent' dyads with ASD. As the ASD sample was merged, we investigated whether the two samples were comparable. No significant differences were found on intelligence, the calibrated severity score on the ADOS (Lord et al., 2000), and gender between the two ASD groups. There was a significant difference in age ($p < .001$), with sample 1 being younger (mean age = 15.8) than sample 2 (mean age = 16.9). However, as we matched the ASD and GP group on age, we did not consider this a problem. In addition, we checked whether the two ASD groups differed on any of our outcome measures. There were significant differences on two scales (see measures for a full description of the scales): parent reported Inappropriate sexualized behavior ($t(125.39) = -3.22$, $p = .002$) and adolescent-reported Inappropriate sexualized behavior ($t(131.99) = -2.16$, $p = .03$) and Confidence in the future ($t(133) = 2.33$, $p = .02$). The ASD sample who participated in the RCT reported more Inappropriate sexualized behaviors and less Confidence in the future. In the main analyses, we checked whether these differences also led to informant discrepancy differences.

The GP sample was drawn from a Dutch general population study ($N = 1{,}710$) (Evans et al., 2012; Tick, van der Ende, & Verhulst, 2008). From this sample, all adolescents between the ages 12 and 21 years old and their parents were contacted to fill out the TTI ($n = 326$). We assessed with the Autism Quotient (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001) the level of autistic traits. Of those who returned the questionnaires ($n = 153$=47%), we excluded adolescents with elevated autistic traits (i.e., scores >110 on the AQ). This criterion was based on a study investigating the AQ in a Dutch sample that found that individuals with autism conditions (e.g., PDD-NOS) scored 111 or higher (Hoekstra, Bartels, Cath, & Boomsma, 2008). This criterion resulted in a GP sample of 91 parent–adolescent dyads (more information on the sample see Dekker et al., 2017).

Informed consent was obtained from all adolescents and their parents. This study was approved by the medical ethical commission of the Erasmus Medical Center, Rotterdam (MEC-2013-040).

As several studies have shown that age may be an influential characteristic on informant discrepancies (De Los Reyes & Kazdin, 2005), and we aimed to compare informant discrepancies between the ASD and GP group, we matched the two groups based on age with maximum of half a year variation in age (i.e., 6 months fuzz in matching procedure). Due to matching the samples (ratio ASD: GP = 2:1), the final ASD sample consisted of 136 adolescents with ASD and the final GP sample consisted of 70 parent–adolescent dyads of whom both a self-report and parent reported TTI were available. After matching the samples, the mean age of the adolescents in the combined ASD group was 16.20 years (range 13.86–20.25, $SD = 1.54$) and the mean age of the adolescents in the GP group was 16.29 years (range 13.92–20.00, $SD = 1.55$). The adolescents in both groups did not differ in full IQ; however, there were some missing data on full IQ score (in both groups 7 missing), but as at least 90% was available we did not exclude or impute the data, but rather used the available data in all the analyses (Allison, 2001). The two groups did differ in gender, with significantly more boys in the ASD group (83.8%) than the GP group (41.4%) (see Table 1). This discrepancy regarding gender in the two groups suits the consistent predominance of males diagnosed with ASD (e.g., Fombonne, 2003).

Measures

The Teen Transition Inventory (TTI; Dekker et al., 2017) measures psychosexual functioning, covering psychosexual socialization (i.e., the context in which psychosexual development takes place, such as friends, family and the Internet), psychosexual selfhood (i.e., the internal functioning of people, for example, sexual knowledge and self-esteem), and sexual/intimate behavior (i.e., behaviors and experiences with sexuality). The TTI consists of a self-report (205 items) and parent report version (148 items), which have considerable overlap. In the current study, only the scales of the TTI data that are similar in the parent report and self-report

TABLE 1
Demographics

	*ASD Group*n = *136*	*GP Group*n = *70*	χ^2/t *Value*
Gender, male, *N* (%)	114 (83.8%)	29 (41.4%)	$\chi^2(1, N = 206) = 39.13, p < .001$**
Age (years), *M* ± *SD* (range)	16.20 ± 1.54 (13.86–20.25)	16.29 ± 1.55 (13.92–20.00)	$t(204) = .40, p = .69$
Total intelligence (TIQ), *M* ± *SD* (range)	103.90 ± 12.82 (71.00–140.00)	101.53 ± 15.52 (64.19–151.59)	$t(190) = -1.12, p = .26$

Note. ASD, autism spectrum disorder; GP, general population; for TIQ: ASD group $n = 129$ and GP group $n = 63$; *M* = mean; *SD* = standard deviation.

version concerning psychosexual functioning and Confidence in the future were used. The content of the scales was the same for both informants, although the scales could vary in the number of items, which is why in all the analyses the summated item scores divided by the number of items in the scales were used (see Table S1 for an overview of the items per scale). We used seven scales: Friendship skills, Social acceptance by peers, Body image, Sexual behavior, Inappropriate sexualized behavior, Online sexual activity, and Confidence in the future. Although some scales may appear to be not directly related to sexual functioning, they are foundational to healthy psychosexual functioning. For example, developing a bond with someone and feeling confident about your body may be the basis for partnered Sexual behaviors (O'Sullivan, Cheng, Harris, & Brooks-Gunn, 2007). In a previous study (Dekker et al., 2017), these scales have shown moderate (>.55) to good (>.70) (Kline, 1999; Ponterotto & Ruckdeschel, 2007) internal consistency. The exception being the scale Inappropriate sexualized behavior which had low (<.50) internal consistency. The low internal consistency is in line with previous research (Ginevra et al., 2016; Stokes & Kaur, 2005) and may be related to a relative limited endorsement of items, leading to low variances, which in turn could lead to low internal consistency.

The Friendship skills scale (five items; e.g., child is good at making friends) measured the ability of the adolescents to make and maintain friendships. Scores for these scales ranged from 0 to 2 (higher scores indicating higher abilities), and internal consistency was $\alpha = .69$ (parent report) and $\alpha = .86$ (self-report). The Social acceptance by peers scale (parent version 3 items and self-report version 5 items; e.g., child is part of a group of friends) measured how the adolescents were socially accepted by peers. Scores for these scales ranged from 0 to 2 (higher scores indicating higher acceptance), and internal consistency was $\alpha = .60$ (parent report) and $\alpha = .79$ (self-report). Based on our hypotheses stated in the introduction, we expected larger discrepancies in the ASD dyads than in the GP dyads on these two scales. The Body image scale (parent version 3 items and self-report version 5 items; e.g., I am satisfied with the way I look) measured the bodily perception of the adolescents. Scores for these scales ranged from 0 to 2 (higher scores indicating higher confidence) and internal consistency was $\alpha = .60$ (parent report) and $\alpha = .67$ (self-report). The Sexual behavior scale (parent version 3 items and self-report version 5 items; e.g., I have had intercourse) measured the amount of sexual and intimate behavior experienced by the adolescent. Scores for these scales ranged from 0 to 1 (higher scores indicating more experience with Sexual behavior) and the internal consistency was $\alpha = .29$ (parent report) and $\alpha = .75$ (self-report). The Inappropriate sexualized behavior scale (parent version 6 items and self-report version 3 items) measured the amount of Inappropriate sexualized behavior (e.g., inappropriate touching of others and continuously seeking contact with someone who does not want it) portrayed by the adolescent. Scores for these scales ranged from 0 to 1 (higher scores indicating more Inappropriate sexualized behavior), and the internal consistency was $\alpha = .56$ (parent report) and $\alpha = .54$ (self-report). The Online sexual activity scale (parent version 3 items and self-report version 7 items, e.g., visits websites that give information about sex) measured the amount of online sexual and intimate activity experienced by the adolescent. Scores for these scales ranged from 0 to 1 (higher scores indicating more experiences with Online sexual activity), and the internal consistency was $\alpha = .66$ (parent report) and $\alpha = .58$ (self-report). For all of the behavioral scales, we expected larger discrepancies in the ASD dyads than GP dyads. Finally, the Confidence in the future scale (7 items; e.g., I believe that my child will be married) measured the level of confidence that the adolescent will find a job, live independently, and will have a relationship. Scores for these scales ranged from 0 to 2 (higher scores

indicating higher confidence) and internal consistency was $\alpha = .94$ (parent report) and $\alpha = .86$ (self-report). Following the hypotheses in the introduction, we expected to find larger informant discrepancies for the ASD dyads than the GP dyads on the Sexual behavior scales.

Putative Factors of Influence

Possible factors of influence that were found in earlier research into the discrepancy between parent report and self-report are gender, age, and intelligence (Blakeley-Smith, Reaven, Ridge, & Hepburn, 2012; Johnson et al., 2009; Renk & Phares, 2004; Stratis & Lecavalier, 2015; van der Ende & Verhulst, 2005). Age and gender (coded 1 for males, 2 for females) of the participants were taken from the medical file of the adolescent, and to assess intelligence, we used the Wechsler intelligence scales or abbreviated versions. Full IQ was also taken from the file and used whether the assessment was not older than two years old and whether a valid and reliable instrument was used (i.e., WISC of WAIS). When no recent IQ measurement was available, in the ASD sample, full IQ was assessed using the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) and in the GP sample, two subtests of the Wechsler Intelligence Scale for Children were used, namely vocabulary and block design.

Data Analyses

We conducted multilevel analyses with unstructured covariance matrices using SPSS version 21 (Nie, Bent, & Hull, 1975) to investigate the parent–child informant discrepancy. Multilevel analyses were chosen because both informants report about the same child, which means the measurements are nested within individuals. To investigate the parent–child informant discrepancy between adolescents with ASD and their parents and GP adolescents and their parents (aim 1), we ran several multilevel analyses for the ASD and GP group. We were interested in the fixed effect of informant, which was coded 1 for parent reports and 2 for self-reports. To investigate the differences in parent–child informant discrepancy between the ASD group and the GP group (aim 2), we included group membership (either ASD or GP) as a factor, to investigate whether discrepancy was related to group membership. We were mainly interested in the interaction between the fixed effects of group (coded 1 for ASD and 0 for GP) and informant (coded 1 for parent report and 2 for self-report), to investigate whether there is a difference in informant discrepancies between the two groups. Because of the known influence of gender, age, and intelligence on informant discrepancy, we added gender, age, and full IQ as overall covariates in all analyses. Out of precaution for type I errors in light of the multiple testing, we adjusted the p-value using the Bonferroni correction resulting in a *p*-value of .004 (is .05/12).

RESULTS

Mean scores on the scales of the TTI are shown in Table 2.

Informant Discrepancies in ASD and GP

The results of the multilevel analyses regarding the informant discrepancies between the adolescents with and without ASD, and their parents are portrayed in Table 3.

In the ASD dyads (model 1a), significant informant discrepancies were found on five of the seven scales: Friendship skills, Social acceptance, Body image, Inappropriate sexualized behavior, and Online sexual activity. Parents of adolescents with ASD reported their children to have lower Friendship skills, less positive bodily perception, and less acceptance by peers than the adolescents with ASD

TABLE 2
Scales of the Teen Transition Inventory (TTI)

	*ASD Group*n = *136*	*GP Group*n = *70*
Friendship skills, *M* ± *SD* (range)		
Self-report	1.33 ± 0.45 (0–2)	1.68 ± 0.30 (0.2–2)
Parent report	0.88 ± 0.53 (0–2)	1.72 ± 0.33 (0.3–2)
Social acceptance by peers, *M* ± *SD* (range)		
Self-report	1.16 ± 0.47 (0–2)	1.57 ± 0.37 (0.2–2)
Parent report	0.64 ± 0.51 (0–2)	1.60 ± 0.48 (0–2)
Body image, *M* ± *SD* (range)		
Self-report	1.32 ± 0.37 (0.3–2)	1.47 ± 0.37 (0.3–2)
Parent report	1.05 ± 0.48 (0–2)	1.42 ± 0.42 (0.3–2)
Sexual behavior, *M* ± *SD* (range)		
Self-report	0.35 ± 0.32 (0–1)	0.48 ± 0.38 (0–1)
Parent report	0.35 ± 0.32 (0–1)	0.43 ± 0.37 (0–1)
Inappropriate sexualized behavior, M ± SD (range)		
Self-report	0.09 ± 0.21 (0–1)	0.05 ± 0.12 (0–0.5)
Parent report	0.29 ± 0.25 (0–1)	0.06 ± 0.11 (0–0.5)
Online sexual activity, *M* ± *SD* (range)		
Self-report	0.15 ± 0.17 (0–0.9)	0.08 ± 0.13 (0–0.7)
Parent report	0.36 ± 0.36 (0–1)	0.21 ± 0.27 (0–1)
Confidence in the future, *M* ± *SD* (range)		
Self-report	1.32 ± 0.43 (0–2)	1.58 ± 0.45 (0–2)
Parent report	1.23 ± 0.46 (0–2)	1.90 ± 0.17 (1.3–2)

reported themselves. Additionally, parents of adolescents with ASD reported to their children to experience more Online sexual activity and more Inappropriate sexualized behavior than the adolescents themselves. As our ASD samples significantly differed on the outcome Inappropriate sexualized behavior, we also investigated whether the discrepancy occurred in both groups. A significant discrepancy was found in the same direction in both ASD samples. Thus, overall, parents reported their children with ASD to have lower skills and competence and higher levels of portrayed inappropriate behaviors than the adolescents themselves reported.

In the GP dyads (model 1b), significant informant discrepancies were only found on two scales: Online sexual activity and Confidence in the future. Parents reported more experience with Online sexual activity and more Confidence in the future than their GP children.

Comparison of Informant Discrepancies between ASD and GP

Considering the interaction effects between group (ASD vs. GP; model 2) and informant (self-report vs. parent report), we found significant interaction effects on Friendship skills, Social acceptance, and Inappropriate sexualized behavior, indicating a significant difference in informant discrepancies between adolescents with ASD and their parents versus GP adolescents and their parents. Regarding all of these scales, the informant discrepancies were larger in the ASD dyads than in the GP dyads. The adolescents with ASD reported higher Friendship skills and more acceptance by peers than their parents attributed to their children, while the reports of the GP adolescents and their parents did not significantly differ. Also, the adolescents with ASD reported to experience less Inappropriate sexualized behavior than their parents reported, while the reports of the GP adolescents and their parents did not significantly differ.

No significant interaction effect was found between group and informant for Body Image, Sexual behavior, and Online sexual activity, meaning informant discrepancies were not significantly different in the ASD dyads compared to the GP dyads. Covariates had a significant effect in the models pertaining to these three scales. Gender was a significant covariate in the analyses of the scales Body Image ($F(1, 186.59) = 8.32$, $p < .01$) and Online Sexual behavior ($F(1, 186.16) = 12.04$, $p = .001$). Age was only a significant covariate ($F(1, 186.77) = 9.39$, $p < .01$) in the model pertaining to Sexual behavior.

In both dyads, no significant differences were found between parents and their children in the amount of Sexual behaviors of the adolescents. Regarding the Online sexual activity, in both GP and ASD dyads the adolescents reported to experience less Online sexual activity than their parents.

Finally, we found a significant interaction effect between group and informant for Confidence in the future, illustrating differences in informant discrepancies between adolescents with ASD and their parents compared to GP adolescents and their parents. For this scale, the informant discrepancies were larger in the GP dyads than in the ASD dyads. The adolescents with ASD reported slightly higher Confidence in the future than their parents (although not significant, see above), while the GP adolescents reported lower Confidence in the future than their parents.

DISCUSSION

In research into psychosexual functioning often only one informant is used, but it is unclear whether the results show the same picture regardless of the informant. Until now, few studies on psychosexual functioning of adolescents with and without ASD have included self-report and parent report (e.g., Dekker et al., 2017; Deptula, Henry, & Schoeny, 2010; Dewinter, Vermeiren, Vanwesenbeeck, & Van Nieuwenhuizen, 2016). Therefore, the degree of informant discrepancy on psychosexual functioning in parent–adolescent' dyads with and without ASD thus remains unclear. In the current study, we investigated informant discrepancies between adolescents with and without autism spectrum disorders (ASD) and their parents regarding psychosexual functioning of the adolescents. In line with our expectations, we found informant discrepancies between self-report and parent report on psychosexual functioning of the adolescents with ASD in several domains, that is, Friendship skills, Social acceptance, Body image, Inappropriate sexualized behavior, and Online sexual activity. For general population (GP) adolescents and their parents, we found informant discrepancies on the scales Online sexual activity and Confidence in the future. To put these results in better perspective, we also investigated the differences in parent–child informant discrepancies regarding psychosexual functioning between ASD dyads and GP dyads. Results showed that informant discrepancies were significantly different in ASD and GP dyads.

TABLE 3
Multilevel Analyses for the Scales of the TTI

	Model 1a: ASD only				*Model 1b: GP only*				*Model 2: ASD & GP*			
	F	*Denominator DF*	p	*Partial* η^2	F	*Denominator DF*	p	*Partial* η^2	F	*Denominator DF*	p	*Partial* η^2
Friendship skills												
Informant	85.75	126.72	<.001*	.40	1.18	61.65	.282	.02	28.12	188.00	<.001*	.13
Group									93.59	187.31	.00*	.33
Group × informant									42.82	188.00	.00*	.19
Gender	1.27	123.96	.262	.01	2.47	59.10	.121	.04	<.01	186.13	.994	<.01
Age	0.28	127.01	.598	<.01	0.71	58.97	.401	.01	0.11	188.94	.736	<.01
IQ	5.00	124.35	.027	.04	0.48	58.92	.492	.01	2.14	186.14	.146	.01
Social acceptance by peers												
Informant	112.26	126.83	<.001*	.47	0.183	61.09	.671	<.01	42.32	187.50	<.001*	.18
Group									116.64	186.68	<.001*	.39
Group × informant									48.63	187.50	<.001*	.21
Gender	0.34	123.52	.562	<.01	0.063	59.01	.063	<.01	0.12	185.76	.734	<.01
Age	0.11	127.44	.741	<.01	0.350	58.99	.350	.01	0.44	189.36	.508	<.01
IQ	0.27	124.76	.604	<.01	0.055	58.98	0.55	<.01	0.15	186.41	.700	<.01
Body image												
Informant	27.06	126.87	<.001*	.18	0.64	61.15	.428	.01	13.94	187.74	<.001*	.07
Group									35.84	189.20	<.001*	.16
Group × informant									6.62	187.76	.011	.03
Gender	3.84	125.46	.052	.03	3.86	58.57	.054	.06	8.32	186.59	.004	.04
Age	0.02	129.20	.885	<.01	0.01	59.39	.941	<.01	0.01	191.54	.922	<.01
IQ	0.25	123.85	.618	<.01	0.02	59.34	.887	<.01	0.21	186.28	.647	<.01
Sexual behavior												
Informant	0.09	117.76	.764	<.01	0.42	56.75	.519	.01	0.54	174.17	.464	<.01
Group									2.87	184.59	.092	.02
Group × informant									0.14	174.17	.704	<.01
Gender	1.78	124.13	.184	.01	0.55	57.85	.462	.01	0.48	185.02	.488	<.01
Age	3.43	126.24	.066	.03	7.96	57.63	.007	.12	9.39	186.77	.003	.05
IQ	0.19	124.01	.662	<.01	0.98	57.25	.326	.02	0.92	183.81	.339	.01
Inappropriate sexualized behavior												
Informant	68.45	127.65	<.001*	.35	0.38	62.00	.542	.01	32.34	189.05	<.001*	.15
Group									24.55	186.94	<.001*	.12
Group × informant									25.29	189.05	<.001*	.12
Gender	0.44	124.31	.511	<.01	0.66	59.00	.419	.01	0.27	186.10	.603	<.01
Age	1.85	126.86	.176	.01	1.84	59.00	.180	.03	0.72	188.63	.398	<.01
IQ	0.43	124.26	.512	<.01	0.03	59.00	.868	<.01	0.48	185.92	.491	<.01
Online sexual activity												
Informant	45.22	123.50	<.001*	.27	14.11	61.23	<.001*	.19	44.53	184.60	<.001*	.19
Group									4.93	203.01	.028	.02
Group × informant									3.03	184.60	.083	.02
Gender	2.98	124.28	.087	.02	13.11	59.06	.001	.18	12.04	186.16	.001	.06
Age	3.21	124.32	.075	.03	0.50	59.02	.481	.01	3.27	186.24	.072	.02

* (Contd.)
Multilevel Analyses for the Scales of the TTI

	Model 1a: ASD only				*Model 1b: GP only*				*Model 2: ASD & GP*			
	F	*Denominator DF*	p	*Partial* η^2	F	*Denominator DF*	p	*Partial* η^2	F	*Denominator DF*	p	*Partial* η^2
IQ	0.57	124.02	.453	<.01	0.01	59.00	.905	<.01	0.42	185.96	.517	<.01
Confidence in the future												
Informant	2.02	126.87	.157	.02	29.13	62.00	<.001*	.32	7.44	188.01	.007	.04
Group									78.07	185.89	<.001*	.30
Group × informant									20.17	188.01	<.001*	.10
Gender	0.05	123.49	.821	<.01	2.54	59.00	.116	.04	0.17	185.18	.697	<.01
Age	0.18	126.05	.674	<.01	0.10	59.00	.753	<.01	0.04	187.62	.837	<.01
IQ	4.18	123.43	.043	.03	1.82	59.00	.182	.03	4.18	185.01	.042	.02

Note. Numerator DF is 1 in all models.
*$p < .004$ (based on Bonferroni correction). Informant was coded 1 for parent report and 2 for self-report. Group was coded 0 for general population and 1 for autism spectrum disorder. Gender was coded as 1 for males and 2 for females.

Adolescents with ASD and their parents agreed less on Friendship skills, Social acceptance, and Inappropriate sexualized behavior of the adolescents, compared to GP adolescents and their parents.

The results showed that adolescents with ASD reported higher Friendship skills and more acceptance from peers than their parents reported for them. This is in line with previous studies on parent–child informant discrepancies regarding social functioning in ASD, showing a consistent pattern of higher scores on social competence self-report among adolescents with ASD relative to parent report (Lerner et al., 2012; Vickerstaff, Heriot, Wong, Lopes, & Dossetor, 2007). Previous research investigating informant discrepancies in friendship characteristics in adolescents with ASD also found that adolescent with ASD reported to have significantly more friends than their parents reported (Kuo et al., 2013). Contrary to a previous study (Dewinter et al., 2016), no significant informant discrepancy was found in the amount of reported Sexual behaviors of the adolescents with ASD. This might be due to the higher age of the participants in the Dewinter sample, as an older sample may have more sexual experience and more relationships, thus more opportunities for discrepancies to arise.

Parents of adolescents with ASD reported their children to portray more negative (e.g., inappropriate touching, stalking) and risk behaviors (e.g., setting a date with someone met on the Internet or watching pornography). Possibly, because individuals with ASD can have difficulties with discriminating between public and private behavior (Nichols & Blakeley-Smith, 2009), they do not realize their behavior is inappropriate and do not report it as such. Furthermore, parents of adolescents with ASD might have an elevated focus on sexual risks. This is in line with previous research, which found that parents who give more importance to social deficits, also report their children to have more social deficits (Rankin, Weber, Kang, & Lerner, 2016). In families with ASD, there is more parent–child communication in on risk topics such as safety and sexual abuse (Ballan, 2012). In GP populations, also topics like physical changes and romantic relationships are discussed (e.g., De Looze, Constantine, Jerman, Vermeulen-Smit, & ter Bogt, 2015).

Possibly, general differences in communication in families with ASD can also partly explain the found informant discrepancies in ASD dyads. It might be a challenge for parents to understand and

discuss sexuality development in adolescents with ASD and to deal with seemingly inappropriate Sexual behaviors (Dewinter et al., 2016). In addition, it is known that parents have concerns regarding the psychosexual functioning of their children with ASD (Ballan, 2012; Holmes & Himle, 2014). Both these aspects can influence parental communication. Parent–child communication about sexuality in GP adolescents has been associated with reduced or delayed Sexual behavior, including sexual risk behaviors (Jaccard & Dittus, 2012; Jaccard, Dittus, & Gordon, 1998; Somers & Paulson, 2000) and less sexual delinquency (Clark & Shields, 1997). This highlights the importance of stimulating communication between parents and their adolescent children with ASD regarding psychosexual themes, and helping parents to become comfortable about this communication, by means of professional support and reliable information for parents (Dewinter et al., 2016). Simultaneously, it underlines the need for research into communication between parents and adolescents on psychosexual topics and the effects on all psychosexual domains. Predominantly, the effect of communication on Sexual behaviors has been studied in typically developing adolescents (e.g., De Looze et al., 2015; Widman, Choukas-Bradley, Noar, Nesi, & Garrett, 2016).

Regarding Confidence in the future, informant discrepancies were larger in the GP dyads than in the ASD dyads. GP adolescents reported lower Confidence in the future than their parents, while no difference was found between the adolescents with ASD and their parents. This indicates that it cannot simply be stated that larger discrepancies always occur in ASD dyads, and thus, that parents are unreliable proxies for their children (Stokes et al., 2017). Depending on the topic, discrepancy may occur more or less in different samples. Using only one informant could lead to an incomplete or even an incorrect picture, both in research and in clinical settings. Therefore, we underline the importance of using multiple informants, especially when investigating a topic such as psychosexual functioning.

Limitations and Future Directions

This study was the first to study informant discrepancies between parent reported and self-reported psychosexual functioning of adolescents with and without ASD. In addition, it was the first study comparing parent–child informant discrepancy between ASD dyads and GP dyads. Certain difficulties and limitations of the current study can be addressed in future research. First, some of our findings may be influenced by our samples. Because the GP sample was drawn from a larger population study, the limited response rate could indicate selection bias. Possibly, those who did return the TTI and those who did not may significantly differ on demographic information as well as on outcome variables. Previous research identified that for example adolescents that returned self-report questionnaires are generally younger and, in their families, there is more openness about sexuality (Dekker et al., 2017). In addition, for part of our ASD sample we used the baseline measure of an RCT investigating the effects of a psychosexual training program, in which the participants were aware of the possibility of treatment, possibly leading to higher disclosure of inappropriate Sexual behavior scores or inflated scores in hopes of getting treatment. Even though their scores only mildly differed from those of the ASD participants who were not treatment-seeking, readers should be aware of this potential bias. Second, the used measurement—the TTI—was not primarily designed to investigate informant discrepancies and although the content of the scales is the same for both informants, the scales vary in the number of items. In future research, it would be valuable to align the scales more (i.e., the same number of items per scale asking the same information), so only minor necessary formulation (e.g., "I" or "My child") differences would be present. This would allow for a cleaner comparison of informant discrepancies. In addition, some of alphas in the current study population were low. More research into the internal consistencies of the scales could lead to exclusion of some and inclusion of other items which perhaps could increase the internal consistency estimates. Third, in the comparison between adolescents with and without ASD, the groups differed in gender. The ASD group consisted of less girls, comparable to the percentage girls in the whole ASD population (Lai, Lombardo, & Baron-Cohen, 2014). Gender is a known factor of influence for informant discrepancy, with higher informant discrepancies found between parents and sons (Leadbeater et al., 1999). Potentially parents may allow more freedoms for their sons, allowing them to live, to some extent, outside their parent's supervision. This could explain a difference in discrepancies between parent report and self-report for boys and girls. Finally, we do not have information on which parent reported on their child in the current study. Previous research indicates that

mothers and fathers communicate differently about sex and sexuality with their children (DiIorio, Pluhar, & Belcher, 2003), making it an interesting topic for future research.

CONCLUSION AND IMPLICATIONS

In studies on psychosexual functioning in the general population, it is common to ask the adolescents themselves about their emotions and experiences (Daker-White, 2002; De Graaf et al., 2017). In research on the psychosexual functioning of adolescents with ASD, until now, more often parents, caregivers, or teachers are questioned, due to previous reported difficulties adolescents with ASD have with reporting about their feelings and emotions (Mazefsky, Kao, & Oswald, 2011). The current research indicates that both in ASD dyads and in GP dyads informant discrepancies exist in reports on psychosexual functioning, and that the discrepancies are generally larger between adolescents with ASD and their parents. Adolescents with ASD reported more skills, more self-esteem and fewer inappropriate behaviors.

To conclude, using only parent report or only self-report measures provides, at best, an incomplete picture of psychosexual functioning of the adolescents with and without ASD. Especially in adolescence, when peers become increasingly important, but parents still have an influential role (Rose, 2007), using multiple informants and investigating congruency is advised. Congruency between parents and adolescents has been shown to be protective of problematic behavior in GP populations (Lippold, Greenberg, & Feinberg, 2011). Discrepancies in reports may reflect differences in opinion or perception, but also a lack of knowledge or insight. Because of the discrepancies we found between parent report and self-report, we believe it is always important for researchers and clinicians to recognize both parent and self-report as valid perspectives and to include both in their investigations. In addition, it could be valuable to investigate predictors of discrepancy and how discrepancy may influence psychosexual functioning of adolescents in both GP and ASD adolescents. Irrespective of which informant can objectively be considered to be (more) right, awareness that the choice of informant can influence the results of a study or the priorities and topics of treatment is important.

Using multiple informants can shed light on different perspectives, for instance the opinion of parents and adolescents themselves, and allows for multiple perspectives to the current psychosexual functioning of the adolescent with and without ASD. Furthermore, particularly these conflicting reports can expose different beliefs and biases (De Los Reyes & Kazdin, 2005). A parent reporting more Inappropriate sexualized behavior in his/her child, might be more aware to sexual risks and this needs attention from the healthcare practitioners involved. Differences in reports between parent and child on particular topics might be particularly useful to discuss, to investigate the reasons for the discrepancies and to increase congruency by allowing informants to learn from each other's perspectives (De Los Reyes & Kazdin, 2005). Regardless of the actual existence of the behavior, emotional states, thoughts, knowledge, and so on, discrepancies in and on themselves can be meaningful points of departure in treatment. Improving communication and creating convergence between parents and children on the topics of psychosexual functioning may become a salient treatment goal for families to pursue. More research is needed to investigate the differences in discrepancy as well as how these discrepancies may influence psychosexual functioning.

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CONFLICT OF INTEREST

K. Visser, E. van der Vegt, J. van der Ende, and N. Tick declare that they do not have conflict of interest. F. Verhulst publishes the Dutch translations of ASEBA from which he receives remuneration. A. Maras has been a consultant to/member of advisory board of/and/or speaker for Janssen Cilag BV, Eli Lilly, Shire. He is not an employee or a stock shareholder of any of these companies. He has no other financial or material support, including expert testimony, patents, royalties. L. Dekker and K. Greaves-Lord are the developers of the TTI; for this, they do not receive remuneration. Finally, K. Greaves-Lord is the second author on the Dutch ADOS-2 manual, for which Yulius receives remuneration.

ETHICAL STATEMENT

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Written informed consent is obtained from all participating adolescents and their parents. This study was approved by the medical ethical commission of the Erasmus Medical Center, Rotterdam (MEC-2013-040).

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Table S1. Items per scale and informant.