
Social Worries and Difficulties: Autism and/or Social Anxiety Disorder?

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Social anxiety disorder (SAD) is the third most common psychiatric disorder (Beidel and Turner 2007), with 2.8% of individuals meeting diagnostic criteria in a 12-month period (Grant et al. 2005) and lifetime prevalence estimated to be between 5.0 and 12.1% among adults (Grant et al. 2005; Kessler et al. 2005). In children, estimated prevalence of SAD is 3–4% (Beidel et al. 1999), and among adolescents, prevalence is approximately 9% (Burstein et al. 2011). While epidemiologic studies tend to find higher rates of SAD in females, the distribution of males and females in treatment-seeking samples is approximately equal (Beidel and Turner 2007).

Most individuals with SAD report onset in late childhood or adolescence. The mean age of onset is between 15.1 and 16.5 years, with a median of 12.5–14 years (Grant et al. 2005; Turner et al. 1986). Furthermore, the distribution of age of onset appears to be bimodal, with peaks at younger than 5 years of age and between the ages of 13 and 15 (Grant et al. 2005; Schneier

et al. 1992), and it appears that very few people develop SAD after the early- to the mid-20s (Grant et al. 2005). Untreated SAD runs a fairly chronic course with some waxing and waning of symptoms over time (Beidel and Turner 2007). In studies, mean duration of lifetime SAD in adults is 16.3 years (Grant et al. 2005), with the mean duration of avoidance being 15.3 years and mean duration of social distress being 20.9 years (Turner et al. 1986). The duration of symptoms is likely related to the fact that most individuals with SAD delay seeking treatment; there was an average of 12 years between mean age of onset and mean age of first treatment (Grant et al. 2005).

Diagnosis

SAD is defined by a marked fear of social situations in which one might be scrutinized by others (APA 2013). Individuals with SAD may fear a number of social situations, including, but not limited to, interacting with other people, giving speeches, maintaining conversations, and even using public restrooms (for fear of evaluation or being heard/observed by others; Beidel and Turner 2007). The anxiety can also occur when a person thinks about or anticipates feared social situations, which likely leads to avoidance behaviors (Beidel and Turner 2007). In addition to the key fear, in order to meet diagnostic criteria for SAD, the social fears need to be excessive relative to any actual threat, persistent over time, and they (or the avoidance that stems from

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the fears) need to cause significant distress or impairment in the person's life (APA 2013). Finally, the symptoms must not be due to the effects of a substance or medical condition or be better accounted by another psychiatric disorder, such as autism spectrum disorder (ASD) or panic disorder (APA 2013).

In the recently released *Diagnostic and Statistical Manual, 5th edition (DSM-5; APA 2013)*, there are several noteworthy changes that should be highlighted when considering the co-occurrence of, and differential diagnosis between, SAD and ASD. First, the common co-occurrence of social anxiety in ASD is, for the first time in the *DSM* nosology, explicitly underscored. ASD is listed as one of the commonly occurring comorbid disorders, along with selective mutism and major depressive disorder. The criterion that the person recognizes the irrationality of their fear was removed and replaced with the requirement that a clinician consider the fears to be excessive. Of particular importance for the diagnosis of SAD in a person with ASD, it is stated, "The fear, anxiety, or avoidance is not better explained by the symptoms of another mental disorder, such as panic disorder, body dysmorphic disorder, or autism spectrum disorder" (APA 2013, p. 203), which differs from the previous criterion that stated, "If a general medical condition or another mental disorder is present, the fear in Criterion A [i.e., the fear of scrutiny] is unrelated to it" (APA 2000, p. 456). The change in this criterion is noteworthy because it better allows for the diagnosis of SAD in ASD. While social anxiety and fear of scrutiny are not included in the diagnostic criteria for ASD, they may be related to a lack of social skills which are frequently characteristic of ASD. Therefore, the previous criterion could be seen as precluding a diagnosis of SAD in individuals with ASD, but the new criterion clearly allows for the comorbid diagnosis.

Phenomenology

Most individuals with SAD report that they fear a number of social situations. In one study, the mean number of social fears endorsed was 7.0, with 93.1% of individuals with SAD endorsing

at least three fears and over half endorsing seven or more fears (Grant et al. 2005). Common fears in adults with SAD are public speaking, informal speaking (e.g., talking to people at a party), and eating in public (Turner et al. 1986). Among adults, SAD results in significant impairment in a number of areas, including school settings (e.g., not wanting to answer questions in class or ask questions, avoidance of participating in extracurricular activities), work environments (e.g., talking to coworkers, giving presentations, sharing opinions during meetings, which can affect likelihood of being promoted), and social relationships, including romantic relationships (Turner et al. 1986). Individuals with SAD also appear to report more chronic stress in their interpersonal relationships due to negative styles of interacting with others (Davila and Beck 2002). Specifically, individuals with SAD reported being afraid of expressing strong emotions, avoiding conflict, being less assertive, being too reliant on others, and worrying about being rejected by others (Davila and Beck 2002).

Some of the situations commonly feared by children with SAD are giving an oral report or reading out loud to others, asking their teacher a question and answering questions in class, attending parties and other social events, starting and joining conversations, speaking to new people, talking to adults, and performing in public (e.g., recitals and athletic games; Beidel et al. 1999; Rao et al. 2007). While adolescents with SAD report many of the same fears as children, they are more likely to endorse fears of attending parties and other social events, working or playing with a group, asking their teacher a question, participating in gym class, walking in hallways, inviting a friend to get together, dating, eating in front of others, writing in front of others, and talking on the telephone than children with SAD (Rao et al. 2007). Cognitively, when asked to predict how well they will do while interacting with a same-age peer, both children and adolescents with SAD expected to perform worse than peers without SAD, and when asked to rate their performance retrospectively, they believed they performed worse (Alfano et al. 2006). Behaviorally, children with SAD often have no friends or at least fewer friends than peers, and they may

not join clubs or groups at school (Beidel et al. 1999). They also may not like school, and some children will refuse to go to school due to their social fears (Beidel et al. 1999). Finally, the presentation can include physiological symptoms such as stomachaches and headaches (Beidel et al. 1999).

While fear of negative evaluation is typically considered the key fear in SAD, fear of positive evaluation is also related to social anxiety (Weeks et al. 2008). In one study, men high in social anxiety who received positive feedback during a social interaction task reported worries and concerns about people expecting more of them in future interactions (Wallace and Alden 1995). Therefore, while negative feedback can be difficult for individuals with SAD to receive, positive evaluation may also be difficult because it can increase anxiety about needing to interact with those individuals or perform in front of those individuals again in the future because they have “raised the bar” for themselves.

Differential Diagnosis and Comorbidity

Formal diagnosis of SAD, like ASD, is made on the basis of observed behaviors and client (or parent, in the case of children)-reported symptoms. This taxonomic rather than functional or etiological nosology is borne of necessity, as neither diagnosis is yet tied to specific biomarkers (e.g., imaging data, genetic tests) that afford sufficient sensitivity and specificity. SAD and ASD can and do occur concurrently in the same individual, but social anxiety is not a universal epiphenomenon of ASD.

Phenotypic overlap makes it challenging at times to determine which condition best explains similar or identical observed symptoms, such as social avoidance and failing to speak in social situations (APA 2013). In a sample of children with anxiety disorder diagnoses, those “with elevated ASD symptoms were significantly more likely to list social/evaluation concerns...among their top three fears” (Settipani et al. 2012, p. 463). In a nonclinical sample of young adults, ASD traits were positively related to social anxiety (White

et al. 2011). Most of the research on prevalence and presentation of anxiety symptoms in people with ASD has used high-functioning samples (i.e., high-functioning autistic spectrum disorder, HFASD), specified in the *DSM-5* (APA 2013) as “ASD without accompanying intellectual impairment.” Nearly half (49%) of adolescents with HFASD exceeded the clinical cutoff on a measure of social anxiety (Bellini 2004). In fact, SAD is, by some reports, the most common co-occurring anxiety disorder in individuals with high-functioning ASD (Kuusikko et al. 2008), with an estimated 17–22% of individuals with ASD meeting criteria for SAD (Lugnegård et al. 2011; van Steensel et al. 2011).

As these findings demonstrate, symptom overlap can complicate differential diagnosis. While social skill deficits are at the core of ASD, they are often also present in individuals with SAD. In fact, adults with SAD but without comorbid ASD self-reported significantly more characteristics of ASD (e.g., problems with attention switching, social skill deficits) than did nonanxious controls. Moreover, with respect to social skills, they were not significantly different from a comparison group with ASD and comorbid SAD or obsessive-compulsive disorder (OCD; Cath et al. 2008). Children with SAD have been found to be less socially skilled based on their self- (Spence et al. 1999), parent (Ginsburg et al. 1998; Spence et al. 1999), and teacher reports (Erath et al. 2007), and by raters during interaction tasks (Alfano et al. 2006; Beidel et al. 1999; Spence et al. 1999). Some specific observed deficits include shorter responses (i.e., using fewer words) during an interaction task, initiating socially with peers less often, and having longer delays before beginning to speak in an interaction task (i.e., longer speech latencies; Alfano et al. 2006; Spence et al. 1999). Wenzel et al. (2005) found that socially anxious college students displayed social skill deficits when interacting with a romantic partner. Specifically, they engaged in significantly fewer positive behaviors (e.g., using feeling statements, complimenting the partner, summarizing the partner’s point) during conversations with their partner and significantly more very negative behaviors (e.g.,

putting down the partner, blaming the partner, summarizing their own statements) when talking about a problem with their partner. Those high in social anxiety also smiled, nodded, gestured, touched their partner, started conversation, made neutral sounds indicating listening (e.g., uh-huh, yeah), and engaged in eye contact less often than their nonanxious peers. Furthermore, they engaged in more fidgeting, they spoke softer, and they “made a less positive overall impression” (Wenzel et al. 2005, p. 515) than participants low in social anxiety.

In individuals with SAD, social skill difficulties may stem from attentional processes. For example, socially anxious persons may not be fully listening to the conversation because they are instead focusing on the other person’s responses to their own behavior and planning their next response (Beidel and Turner 2007). Additionally, socially anxious people tend to lack sufficient opportunity to practice social skills due to social withdrawal (Gensler 2012) and concern about negative evaluation that results in lack of assertiveness and delayed responses, owing partially to careful consideration of the anticipated reaction. The pervasiveness and temporal course of the social skill deficits can be informative. Because individuals with SAD may interact comfortably with certain familiar people (e.g., family members), their social skill deficits may present in more context-specific ways. For instance, a child might seem quite unskilled or even disinterested when in an anxiety-provoking situation, yet communicate easily and without deficit with a parent. Since social skill deficits in SAD are conceptualized as resulting partially from social avoidance, the deficits should begin after the onset of the disorder and may develop gradually over time. In contrast, social skill deficits are a core feature of ASD and will be present from early childhood in most cases (often within the first 3 years of life; White and Schry 2011).

Avoidance of social situations is another symptom that is often present in both conditions (White et al. 2012a). In individuals with SAD, this avoidance is due to fears of evaluation, while in ASD the avoidance may be due to social skill deficits that prevent an individual from knowing

when and how to initiate. Furthermore, individuals with ASD may also attempt to initiate social interactions but do so in ways that are socially inappropriate (White and Schry 2011). The same patterns may be present in social responses as well. Individuals with SAD may be less responsive and less assertive (White and Schry 2011), usually due to the fear of evaluation. In contrast, those with ASD may attempt to respond socially but do so in odd or atypical ways (White and Schry 2011). Therefore, exploration of reasons for social avoidance and assessment of inappropriate, and possibly unsuccessful, attempts can help to differentiate between the two disorders.

Given the overlap in symptoms and the high rates of SAD in ASD, it is important to consider the concepts of true and false comorbidity. False, or inaccurate, comorbidity can occur in cases where disorders are categorical conceptualizations of the same underlying dimensional problem, the diagnostic criteria overlap, one disorder is simply an early presentation of the later disorder, and one disorder is better conceptualized as part of the other, primary disorder (Caron and Rutter 1991). In contrast, true comorbidity is present when two disorders have the same or overlapping risk factors, the two disorders create another meaningful condition when they are comorbid, or one disorder serves as a risk factor for the development of the other (Caron and Rutter 1991). In a study of adolescents with ASD, Renno and Wood (2013) found that anxiety symptoms were distinct and separate from ASD symptom severity. In a factor analytic study of ASD and SAD symptoms among college undergraduates, White et al. (2012a) found statistical support for true comorbidity between the two conditions.

Social Anxiety in ASD: Prevalence and Phenomenology

There are no large-scale epidemiological studies upon which to draw firm estimates of the comorbidity between SAD and ASD. However, based on community-based samples, social anxiety (both diagnosed and subthreshold or continuously presented symptoms) is present in 10.7 (Leyfer

et al. 2006) to 29.2% (Simonoff et al. 2008) of adolescents with ASD. Within clinical samples of higher-functioning individuals with ASD, upwards of half of adolescents are affected by social anxiety (Kuusikko et al. 2008). SAD is more common among adolescents with ASD than it is among neurotypical (i.e., those without ASD) teens, whose lifetime prevalence is about 9% (Burststein et al. 2011). Although we need more research on true prevalence, teens with ASD may face a threefold, or higher, elevated risk of having problems with social anxiety compared to teens without ASD.

Based on multiple lines of research (e.g., psychophysiological, neuroimaging, behavioral), it is plausible that there exists a bidirectional relationship between social impairment and social anxiety in people with ASD (e.g., White et al. 2010). For example, heightened arousal in social situations and behavioral avoidance may limit opportunities to interact appropriately with peers, augment impairments in processing and interpreting social information, and make it harder to fluidly execute learned social skills (e.g., Joseph et al. 2008; Kleinhans et al. 2010), whereas social disability (especially the awareness of such a disability) appears to contribute to emergent social anxiety for some (e.g., Bellini 2006). In addition to exacerbating the core social impairment, social anxiety has been associated with secondary problems in people with ASD such as loneliness (White and Roberson-Nay 2009), aggression (Pugliese et al. 2013), and hostility (White et al. 2012b) among adolescents and adults with ASD and features of ASD.

Cognitive ability is perhaps the primary moderator for the emergence of social anxiety in people with ASD. Individuals with HFASD are particularly likely to experience this bidirectional risk process relative to people with ASD with accompanying intellectual impairment, owing to greater social motivation, along with the awareness (insight) of their social difficulties (Kuusikko et al. 2008; Sukhodolsky et al. 2008). For instance, adolescents with HFASD have been found to place as much emphasis on the importance of approval from their peers as do non-ASD peers, while simultaneously perceiving

themselves as less socially competent and less approved by their peers (Williamson et al. 2008). Age is another factor that likely affects the presence of social anxiety. Problems with social anxiety appear more likely to emerge during mid- to late adolescence, when the social milieu becomes more complex and the teen's awareness of social demands and social differences come to the forefront (Bellini 2004; Kuusikko et al. 2008; White and Roberson-Nay 2009). Social motivation, or the desire to engage with others for purely social reasons, is yet another viable moderator for the experience of social anxiety. Although some individuals with ASD lack interest in socialization (amotivation; Koegel and Mentis 1985) and do not find social stimuli in the environment important or salient (Klin et al. 2003), it is clear that many people with ASD are quite interested in having social relationships. Although interventionists have begun to explore approaches to increase social motivation in people with ASD, at this time we lack sensitive measures or precise biomarkers of social motivation and interest (Lerner et al. 2012).

Theoretical Considerations

Emergence of social anxiety among people on the autism spectrum can be thought of as representing the developmental psychopathology construct of equifinality, in which a range of processes can result in the same outcome. It is likely that multiple processes, including structural and functional neurological anomalies (e.g., Amaral et al. 2003), shared genetic vulnerabilities (e.g., Piven and Palmer 1999), and psychosocial factors (e.g., Attwood 2007), all play a role in the emergence of social anxiety in people with ASD. We do not have a single, unifying, or empirically grounded theoretical explanation for the high rate of co-occurrence. As such, we review research related to social learning, motivational, developmental, and cognitive factors that may be involved.

A host of experiential and cognitive processes may interact to produce social anxiety in young people with ASD. Especially among older children and adolescents with ASD, a history of

rejection and social failures could contribute to the experience of social anxiety (Bellini 2006; Harnum et al. 2007; Shtayermman 2007; Swaim and Morgan 2001). Improved insight into one's own social impairment and differences could also play a role (Kuusikko et al. 2008). The young person recognizes, quite accurately, that attempts to engage with peers are awkward, unskilled, and seen as such by peers. Additional processes, such as a biologically based propensity to experience anxiety (i.e., evidence of greater physiological arousal and metabolic preparedness—stress responses—during social interactions) and age-related increases in motivation to interact socially with peers (Corbett et al. 2010), must also be considered.

There is evidence that social stress and anxiety become more salient during late childhood and adolescence for youth with ASD. In studies on cortisol responsivity during playground interactions with unfamiliar peers, older (though still prepubertal) children with ASD exhibited elevated cortisol levels, indicating that they found even relatively benign social situations more stressful than did peers without ASD (Corbett et al. 2010). Moreover, the older children with ASD were interacting socially more with peers, and avoiding less, compared to younger children with ASD (Corbett et al. 2010). Although neurotypical children, similar to those with ASD, exhibit increased cortisol response upon initial exposure to a social stressor, the stress response of children with ASD tends to be more prolonged (Corbett et al. 2012). Corbett et al. (2012) proposed that, with age, young people with ASD become more motivated to approach others socially, despite their felt biobehavioral stress.

Common triggers for anxiety (not just social anxiety) in children with ASD are changes in routine and social situations. Within the social domain, frequently reported situations that exacerbate anxiety include when one is the center of attention and fears ridicule (Ozsivadjian et al. 2012). Likewise, the unpredictability of the social world likely engenders a fair amount of apprehension and worry about social interactions for people on the spectrum. Similarly, deficient Theory of Mind (ToM) may contribute to social avoidance if, for instance, the young person with

ASD finds other people's behavior confusing and thereby frightening (Baron-Cohen 2008).

Deficits in ToM are commonly reported among children, adolescents, and adults with ASD (Baron-Cohen 1995). ToM deficits are typically expressed as an inability to infer others' points of view and accurately interpret the behavioral intentions of others (Baron-Cohen 1995). It is largely assumed that ToM, and some appreciation for the fact that the internal states of others may differ from one's own, is a precursor for the existence of true social anxiety given the necessity of awareness of others' perceptions for the fear of negative evaluation (as reviewed in Kerns and Kendall 2012). As such, it seems implausible that social anxiety could conceivably arise in a person with severe ToM deficits. On the other hand, it is entirely plausible that difficulty navigating and inferring others' thoughts, feelings, and intentions could engender considerable social distress. In essence, the social world becomes an unpredictable, likely frightening, place and social anxiety develops.

There is a growing scientific literature indicating the existence of atypicalities in how individuals with ASD perceive and process environmental stimuli. Most of this research has focused on social stimuli, which is understandable given that the primary deficit in social interaction defines ASD. Historically, the social disability in ASD has been presumed to be due to indifference or lack of social motivation. In ASD, decreased attending to social cues, and others' eye gaze in particular, is believed to stem from lack of appreciation for the social significance of eye gaze (e.g., Klin et al. 2003), such that social stimuli (e.g., human faces) are not highly and inherently salient, as they are for neurotypical people (e.g., Baron-Cohen 1995). In SAD, in contrast, decreased eye gaze is believed to be more intentional, an aversion to something that is highly socially meaningful albeit anxiety provoking (e.g., Garner et al. 2006).

Emerging evidence from neuroimaging, psychophysiological, and behavioral studies suggests that social disability, in at least a subset of people with ASD, is in fact associated with heightened arousal and intentional avoidance of social stimuli (Dalton et al. 2007; Joseph et al.

2008). Heightened arousal, especially in response to social-emotional information (e.g., Joseph et al. 2008), may impede accurate interpretation of social cues and appropriate responses to others. Recent studies assessing gaze patterns, neural circuitry, and autonomic arousal indicate that, for some adolescents with ASD, aversion and heightened emotional reactivity, both of which are core components of social anxiety, may contribute to the observed lack of attending to others' eye gaze and facial features (e.g., Dalton et al. 2007; Joseph et al. 2008).

On average, people with ASD exhibit a greater negative affect compared to peers without ASD (Schwartz et al. 2009). In addition, children with ASD have been found to display atypical autonomic responses to (nonsocial) anxiety-provoking situations, indicative of sympathetic overarousal and parasympathetic under-arousal, compared to peers without ASD (Kushki et al. 2013). Weaknesses in executive functioning, including inhibitory control and cognitive and behavioral flexibility, among people with ASD are also reported (e.g., D'Cruz et al. 2013). Finally, impoverished emotion regulation, or the ability to intentionally or automatically modify one's own emotional state in the service of goal-directed behavior, may be intrinsic to ASD (Mazefksy et al. 2013). It is plausible, then, that social disability, problems with fairly chronic overarousal and overstimulation, high negative affect, and difficulty managing one's emotional responses when stressed jointly explain the ontology of social anxiety among people on the spectrum. In summary, social anxiety may be conceptualized as multiply determined—a function of social motivation, severe social disability, and a tendency to experience social situations as overarousing and distressing. These theoretical mechanisms are examined through a clinical lens in the next section.

Clinical Considerations

Appreciation of the bidirectional relationship between social anxiety and ASD is imperative in the assessment and successful treatment of

individuals with ASD and co-occurring SAD. Individuals with ASD who also have SAD may not always report feeling anxious in social situations (White and Schry 2011). Many individuals with SAD experience physiological symptoms of anxiety, in some cases resulting in panic attacks, when in feared situations (APA 2013). Physiological symptoms may be helpful in identifying SAD in individuals with ASD. For example, Bellini (2006) found that physical symptoms of anxiety were positively related to social anxiety in adolescents with ASD. While this finding was interpreted as suggesting physical symptoms were a risk factor of SAD in ASD, since data were cross-sectional, it could simply indicate that SAD tends to manifest physically in this population. Individuals with ASD may also show behavioral responses, such as temper tantrums, misbehaving, or engaging in more restricted, repetitive, or stereotyped behaviors, in response to social anxiety (White and Schry 2011).

Additionally, fear of negative evaluation and rejection in social situations may lead to increased repetitive, stereotyped, or rigid behaviors or behavioral problems, such as tantrums and noncompliance, for individuals with ASD (Wood and Gadow 2010). For instance, a person with ASD and social anxiety, in anxiety-provoking social situations, may begin to engage in increased self-stimulatory behavior (e.g., hand flapping) or may exhibit a heightened focus on his or her restricted interests (e.g., increased monologue speech related to interest, fixation on object of interest). Alternatively, a child or adolescent with ASD, when experiencing anxiety in a social situation, may have a "melt down" or tantrum (e.g., exhibit yelling or crying) or flee the situation in escape (e.g., run away or hide). It is important for clinicians to be aware that an increase in severity of such behaviors, often characteristic of or associated with an ASD, may be related to anxiety.

The impact of individual differences among people with ASD on the presentation and quality of social anxiety is also an important clinical consideration, given the heterogeneity inherent in ASD. It is our clinical experience that some individuals with ASD are hyperaware of the reactions from others. Due to the nature of their

social and communication deficits (i.e., deficits in interpreting nonverbal cues, literal interpretation of language), they may inaccurately interpret ambiguous social information as threatening. In this case, the ASD directly increases risk of SAD. In contrast, other individuals with ASD, perhaps those with greater deficits in ToM and with less insight into others' perceptions, may exhibit a general fear of uncertainty of social situations (e.g., "I'm nervous because I don't know what to expect or what will happen when I interact with others") but without specific concerns of the evaluation of others. Still others may perceive social feedback and fear rejection in a very reality-based, almost probabilistic, way given the nature of their social deficits. They may also worry about possible consequences (e.g., bullying and victimization) but have limited insight into the reasons for others' negative evaluations of them (i.e., how their own social behaviors play a role).

Another individual difference of clinical consideration is the degree of insight into one's own emotions, thoughts, and internal states (Berthoz and Hill 2005; Lainhart and Folstein 1994). Poor insight is frequently observed in individuals with ASD. Some individuals with ASD may be unable to recognize and identify their own anxiety spontaneously or when explicitly asked, leading to clinical difficulties in understanding and teasing apart an individual's symptom presentation in understanding whether deficits or potential indicators of anxiety are accounted for by deficits inherent in ASD, more global physiological arousal and anxiety in response to environmental stimuli, or fear of negative evaluation characteristic of social anxiety. Anecdotally, some individuals with ASD might report vague "bad feelings" in social situations ("I don't like it," "I feel bad"), describe physiological arousal (e.g., heart pounding, upset stomach, headache, muscle tension), or describe patterns of avoidance of certain social situations instead of reporting symptoms indicative of the cognitive or emotional components of social anxiety.

Finally, differences in social motivation are an important consideration. In order for social anxiety to be present, it is assumed that an individual must have some level of motivation or desire to

interact with others or to develop social relationships. However, by definition some individuals with ASD lack social reciprocity and lack spontaneous seeking to share enjoyment, interests, or achievement with others (APA 2013). Diagnostically, the most extreme manifestation of deficient social interaction can be thought of as complete absence of interest in peers (APA 2013). Because of the great heterogeneity in symptom presentation, it is important for clinicians to be mindful that while some individuals with ASD lack desire to interact with others, some do indeed exhibit great social motivation and a desire for friendships, and these people struggle with loneliness and isolation (e.g., Locke et al. 2010; White and Roberson-Nay 2009). Clinical observations and anecdotal evidence would also suggest that a subset of people with ASD, through repeated experiences of peer rejection, may present with denial of social interest and lack of desire to develop friendships, although such individuals may have previously exhibited social motivation (e.g., Attwood 2007).

The case of "Dan," a 15-year-old male, is illustrative of clinical considerations such as the unique manifestation of social anxiety in individuals with ASD. Dan, diagnosed with ASD several years prior, presented for treatment due to increasing problems with peer victimization and bullying, tantrums, and "meltdowns" occurring in school and increasing social withdrawal and loneliness. Although Dan experienced some bullying and peer rejection in prior grades, more recently his mother noticed that some of the children with whom he used to socialize outside of school had stopped inviting him out. His mother also reported that Dan had begun having tantrums before going to scouts meetings, crying and saying he did not want to go, and refusing to attend school activity nights, both of which he used to enjoy in prior grades. She reported that he frequently complained he was lonely and bored. Per his teacher's report, Dan rarely interacted with the other students in his class and was at times "picked on" by other kids due to some of his oddities. His teacher said that Dan frequently played with Legos during breaks and often engaged in monologues about his interest in several cartoons, leading some of his

peers to laugh at him. His teacher also noted that, on several occasions, Dan became upset when interacting with other students during free time and had “meltdowns” in which he ran out of the classroom and cried. Based upon his self-report, Dan indicated that he did not like interacting with other students in his classroom because they were mean, and he said he felt bad when talking with other kids or going to boy scouts or school activity nights. He did not present obvious fears of negative evaluation or of embarrassment; but when the therapist asked him follow-up questions regarding what he did not like and what he thought might happen in social situations, he indicated he thought the other students might think he was stupid or would tease him. He indicated that he no longer wanted friends, and that the other kids in his class are “stupid.”

Dan’s case is illustrative of the bidirectional relationship between social deficits and social anxiety; Dan’s social difficulties and immaturity presumably led to negative interactions and rejection from peers, and his awareness of such negative reactions from others exacerbated his deficits and led to increased social avoidance. Though Dan had difficulty articulating a fear of negative evaluation, he described general bad feelings and avoidance of social situations, with some concern of others making fun of him, evidencing that he has some awareness of other’s perspectives. He exhibited several symptoms of anxiety in social situations, which were less typical of a traditional social anxiety presentation, including increased intensity of focus on his interests and monologue speech and, at times, acting-out behavior. Though Dan presented with some hostility to his peers, it was apparent from his history and his mother’s report that he was avoiding social activities and interactions that he used to enjoy, which is perhaps evidence of avoidance due to anxiety in the presence of some social motivation.

Assessment Recommendations

Despite overlap in diagnostic criteria between social anxiety and ASD and the frequency with which social anxiety occurs in adolescents and

adults with ASD, there is limited empirical guidance on how to best assess symptoms of social anxiety in people with ASD. Questionable reliability and validity of currently utilized measures to assess anxiety in individuals with ASD and the need for the development of measures that assess the unique and distinct features of anxiety as manifested in individuals with ASD (Grondhuis and Aman 2012; Ollendick and White 2012; van Steensel et al. 2011) further complicates the assessment of anxiety in this population. In this section, we review the extant research on clinical assessment of social anxiety within ASD. Because of the dearth of research in this area on adults with ASD, we focus our review on the assessment of children and adolescents.

One of the greatest challenges is distinguishing whether some symptoms (e.g., behavioral avoidance) are better accounted for by ASD or are indicative of co-occurring social anxiety. In determining how best to conceptualize a given symptom or behavior, it is important to consider the individual’s social motivation, ToM capabilities, the nature of social fear, the reality-based nature of the fear, and the time course of symptoms.

Questions a clinician may ask her or himself in making this distinction include:

- Does this individual have an awareness of others’ social perceptions, whether accurate or not?
- Does this individual exhibit motivation/desire to interact socially or have friends?
- Does this individual avoid social interactions due to lack of interest in social interaction or due to anxiety in social situations?
- Does this individual experience anxiety in social situations due to fear of negative evaluation or embarrassment or due to some other element toward of social situations (e.g., overarousal, environmental stimulation)?
- Is this individual’s fear reality based and due to imminent threat in the environment (i.e., severe and repeated bullying)?
- Do symptoms represent a change from prior functioning or are they more reflective of chronic and pervasive social deficits related to ASD?

When there is evidence of social motivation, the avoidance seems to be due to aspects of social evaluation/social consequences, and there is evidence of a change in symptom presentation with onset of anxiety, a diagnosis of SAD should be considered. Note, however, that the young person might not be able to report accurately on mechanisms underlying social avoidance and cognitive aspects (e.g., fear of negative evaluation) involved.

A challenge inherent in the assessment of anxiety in individuals with ASD is the questionable ability of individuals with ASD to accurately self-report symptoms due to aforementioned deficits and impairments in insight, emotional awareness (alexithymia), and ability to report on their own and others' thoughts. The utilization of multi-method and multi-informant assessment with this population is strongly suggested (e.g., Kerns and Kendall 2012; Kreiser and White 2014; Mazefsky et al. 2011). Given preliminary evidence suggesting underreporting of co-occurring anxiety disorders among children with ASD (Mazefsky et al. 2011), the use of both self and parent or other report is recommended in conjunction with a semi-structured clinical interview. In our experience, the adaptation of semi-structured interviews may be necessary due to deficits inherent in ASD. Interviews such as the Anxiety Disorders Interview Schedule, Child and Parent Versions (ADIS-C/P; Silverman and Albano 1996) may be administered jointly with both parent and child together to assist with difficulties the individual with ASD may have in reporting, while still obtaining valuable information from multiple perspectives.

The most commonly utilized measures to assess social anxiety among children and adolescents with ASD are self-report questionnaires designed for typically developing child and adolescent populations. Broad multidimensional screening measures of anxiety that contain social anxiety subscales, including the Multidimensional Anxiety Scale for Children (MASC; March 1998), the Self-Report for Childhood Anxiety Related Emotional Disorders (SCARED; Birmaher et al. 1997), and the Spence Children's Anxiety Scale (SCAS; Nauta et al. 2004), and

several self-report measures of social anxiety including the Social Anxiety Scale for Adolescents (SAS-A; La Greca and Lopez 1998), Social Anxiety Scale for Children—Revised (SASC-R; La Greca and Stone 1993), and the Social Worries Questionnaire (SWQ; Spence 1995) have been frequently utilized with this population. Many studies have utilized a combination of parent- and self-report versions of these measures (Kreiser and White 2014). To date, the majority of self-report measures have been administered in their original form, with two exceptions: Kuusikko et al. (2008) removed several items deemed to have overlap with symptoms of ASD in the SAS-A and SASC-R, and there is one measure, the Social Anxiety Scale for People with ASD (SASPA), specifically designed to assess social anxiety as it presents in individuals with ASD without conflation owing to ASD symptoms (Kreiser and White 2011). Original versions of semi-structured interviews, designed for typically functioning populations, including the ADIS-C/P, have also been used to assess for social anxiety in this population, most commonly administered exclusively to parents, or with both parent and child (Kreiser and White 2014). Additionally, one interview, the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime version (K-SADS-PL; Ambrosini 2000), has been modified in order to assist in distinguishing impairment associated with ASD symptoms and impairment associated with anxiety symptoms (Kimmel 2009) and one semi-structured interview, the Autism Comorbidity Interview—Present and Lifetime Version (ACI-PL; Leyfer et al. 2006), has been specifically developed for use with individuals with ASD to assess for comorbid diagnoses.

Across studies, almost without exception, measures used to assess social anxiety in ASD have demonstrated acceptable-to-excellent internal consistency; however, limited data on the sensitivity and validity of such measures exist, aside from evidence of strong concordance among different measures of social anxiety, and evidence of moderate-to-strong relationships with other theoretically related constructs (e.g.,

social deficits, loneliness, restrictive interests, and repetitive behaviors; as reviewed in Kreiser and White 2014). Self-report measures may lack sensitivity in identifying adolescents with ASD and diagnosed SAD (Kreiser 2011). Further, given that the majority of measures utilized with this population have been designed, standardized, and validated with typically functioning populations, the degree to which the measures accurately assess social anxiety as manifested in individuals with ASD is questionable. Some of the items in existing measures may have overlap with symptoms of ASD, leading to conflation on scores, and many of the most commonly utilized measures (i.e., MASC, SCAS, SCARED) only contain items that assess cognitive and emotional components of social anxiety but do not contain items indicative of behavioral avoidance and physiological symptoms (Kreiser and White 2014). The limitations in existing measures underscore the importance of clinicians' awareness of aforementioned clinical considerations with this population and the utilization of a multi-method, multi-informant approach as the field awaits further psychometric evaluation of existing measures and the development and validation of newly designed measures.

Treatment Recommendations

Several cognitive behavioral therapy (CBT) treatments have been specifically developed and modified for children and adolescents with ASD with co-occurring anxiety with promising outcome data (e.g., Reaven et al. 2009; White et al. 2013; Wood et al. 2009); however, at present there has been no treatment-outcome research targeting social anxiety. There have been no treatments developed for social anxiety, or anxiety broadly, in adults with ASD. It is the general consensus among clinicians and researchers that modification of traditional CBT is necessary given some of the unique concerns and deficits in this population. Common CBT modifications include increased structure in session (i.e., utilization of written agenda) to avoid distress with unanticipated changes or novelty, increased fre-

quency of exposures and practice, increased parental involvement to aid in homework compliance and generalization, and increased utilization of visual aids when introducing abstract concepts (e.g., using pictures of bodies to introduce subjective feelings of anxiety; e.g., Lang et al. 2010; White et al. 2010). One goal shared by the available treatment programs is to increase awareness of anxiety, given that many individuals with ASD exhibit difficulties with insight, emotion and thought recognition, and emotion regulation. Because of such difficulties, many individuals with ASD may only recognize more extreme behavioral indicators of anxiety. Explicit instructions related to physiological, emotional, and cognitive (i.e., anxious thoughts) indicators of anxiety and the utilization of visual aids such as anxiety thermometers and cartoons may assist in this regard.

The incorporation of strategies to increase social competence and address problems with loneliness and bullying may be necessary to address in the treatment of social anxiety in adolescents, given the bidirectional and mutually exacerbating relationship between these factors and social anxiety in this population. Concurrent instruction in developmentally appropriate social skills (i.e., psychoeducation, modeling, practice, feedback) may help to reduce social anxiety and loneliness, given the reality-based nature of social fears for many adolescents and adults with ASD. Further, specific coping strategies and skills to handle bullying may be beneficial, particularly in adolescence.

Strong parental (or significant other) involvement in treatment may assist with generalization of skills to real life situations. For instance, parents are provided psychoeducation related to skills the adolescent learns in the individual therapy sessions and are expected to remind their child to use the skills between sessions in the Multimodal Anxiety and Social Skills Intervention, a treatment designed for adolescents with ASD and anxiety disorders (White et al. 2013). Additionally, parental reinforcement of anxiety and issues with overprotection may be important to discuss, as such factors can interfere with treatment compliance and response.

DSM-5: Implications and Thoughts on Changes to ASD and SAD Diagnoses

There is more scientific recognition and clinical appreciation for the possibility of co-occurrence of social anxiety in a person with diagnosed ASD. A *PsycINFO* search (July 16, 2013) using the keywords of “autism” and “social anxiety” yields only 27 peer-reviewed articles; half of these articles, however, were published in just the past 3 years. This zeitgeist is also reflected in changes to the *DSM-5*. In the text description for SAD, ASD is now listed as one of the common comorbid conditions and it is stated that anxiety is common in those with ASD diagnoses. The changes seen in *DSM-5*, notably that the criterion of recognition of the irrationality of one’s social fears has been removed and that it is made explicit that people with ASD can and often do have social anxiety, will likely result in increased identification of social anxiety in people with ASD, and dual diagnosis of SAD and ASD.

As such, the importance of determining how to most sensitively assess for social anxiety in individuals (children as well as adults) with ASD cannot be overstated. There is considerable risk of “double-counting” symptoms (e.g., social avoidance, poor eye contact, few friends) to derive diagnoses of both SAD and ASD. To clarify the construct of social anxiety as it manifests in people with ASD, novel assessment approaches as well as clinical criteria should be explored. Measures of psychophysiological reactivity (e.g., heart rate and heart rate variability) or attention (e.g., reaction time tasks and eye gaze tracking), for instance, might augment more traditional indices of social anxiety such as interviews and questionnaires. Understanding the individual’s ability to hypothesize about others’ thoughts and feelings (theory of mind) and his or her social motivation or need for connectedness may also be useful clinically. We also need to consider intraindividual developmental factors and societal changes in evaluating social anxiety in ASD. In adolescence, for example, there is a heightened focus on social relationships and the feedback of peers. The *DSM-5* emphasizes that ASD can in-

deed be diagnosed later in life, rather than only in early childhood, and the usual age of onset of SAD is mid-adolescence. When assessing and treating adolescent clients presenting with social concerns, it is especially important to consider the history of social concerns (i.e., were deficits present prior to adolescence?) and the presence (or absence) of restricted, repetitive patterns of behavior or interests, as deficits in social communication and interaction alone are not sufficient for the ASD diagnosis. Finally, in the USA, like most other developed countries, we are simultaneously more connected to each other (via instant messaging, texting, and other forms of social media) and yet more disconnected than we have ever been. Young people meet each other and socialize electronically, perhaps more so than in person. The possible societal and clinical ramifications of these changes have yet to be empirically examined. Anecdotally, however, we have seen countless clinical examples of adolescents and young adults with extensive virtual relationships, but nonexistent human socialization.

Conclusions

In conclusion, we suggest that social anxiety is *not* simply epiphenomena associated with above and beyond core ASD symptoms; it is important that social anxiety be recognized as a separable clinical construct and treated as such and that it not be overlooked due to diagnostic overshadowing (cf. Mason and Scior 2004). It is abundantly clear that not everyone with ASD struggles with social anxiety; herein, there is both a scientific challenge and a potential opportunity to better understand the phenotypic diversity of ASD.

Clinical scientists must determine who is more susceptible to experiencing social anxiety, by exploring moderators such as age, verbal ability, and level of insight. We must also develop evidence-based tools with which to assess social anxiety in this clinical population. Social anxiety can be statistically separated from ASD symptom severity (White et al. 2012a), but ability to distinguish social anxiety, distinct from other anxiety constructs, is less clear (Renno and Wood 2013).

Additionally, within the specific anxiety disorders, social anxiety appears to be the hardest to identify clinically, and there is little agreement among raters (Renno and Wood 2013; White et al. 2012c).

Anxiety often amplifies the social impairment that is fundamental to ASD (e.g., Kleinhans et al. 2010; Wood and Gadow 2010). We propose that the presence or absence of social anxiety might be useful clinically and scientifically, as a way to parse phenotypic heterogeneity in ASD. Social anxiety must be considered in its typical form (i.e., as it manifests among people without ASD) as well as in atypical, perhaps ASD-specific, forms (e.g., fears of negative evaluation that are fairly reality-based and inability to report on specific emotions related to social fears; see Kerns and Kendall 2012, for review). Put another way, presence or absence of social anxiety, in the face of the profound social deficits that define ASD, could be both clinically informative and scientifically useful for the study of related constructs (e.g., underlying differences in cognitive processes and social motivation). There may be something both etiologically and phenomenologically unique about people with ASD and social anxiety and those with ASD without social anxiety. Moreover, its presence likely moderates treatment effects and should, therefore, be considered in treatment planning. Left untreated, social anxiety may diminish the potential benefit of interventions that target social skill deficits in isolation and contribute to the emergence of other problem behaviors (e.g., avoidance of school, poor school performance, inattention).

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