Psychopathologies Associated with ASD: Anxiety, OCD, Depression, and ADHD

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General Overview of co-Occurring Psychiatric Disorders in ASD

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social communication and interactions, as well as repetitive behaviors, interests, or activities (APA, 2013). It is now recognized that co-occurring psychiatric disorders are more prevalent in children and adults with ASD than in neurotypical individuals. Youth with ASD exhibit higher rates of psychiatric disorders compared to both the general population (Leyfer et al., 2006; Simonoff et al., 2008) and clinically referred youth without ASD (Joshi et al., 2010; van Steensel et al., 2013). An estimated 60-70% of children with ASD meet criteria for at least one comorbid disorder (Simonoff et al., 2008; van Steensel et al., 2013) and approximately 41% exhibit two or more (Simonoff et al., 2008), with prevalence rates estimated to be even higher in children with ASD referred for psychiatric treatment (Joshi et al., 2010). This is substantially higher than the estimated 13% prevalence of psychiatric disorders in youth without ASD (Costello et al., 2003). The most common co-occurring conditions in youth with ASD are anxiety and mood disorders, attention-deficit/hyperactivity disorder (ADHD), obsessive compulsive disorder (OCD), and oppositional defiant disorder (ODD) (Leyfer et al., 2006; Simonoff et al., 2008). Adults with ASD also exhibit increased vulnerability to lifetime and current mental health comorbidities compared to adults without ASD (Joshi et al., 2013). Approximately 69–79% of adults with ASD meet criteria for a psychiatric disorder at least once in their lives (Buck et al., 2014; Lever & Geurts, 2016), with 57% meeting criteria for two or more psychiatric diagnoses (Lever & Geurts, 2016).

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Anxiety and major depressive disorder (MDD) are the most prevalent comorbidities in adults with ASD (Buck et al., 2014; Joshi et al., 2013; Lever & Geurts, 2016).

This increased vulnerability to psychiatric conditions in ASD may be due to a number of factors, including genetic/biological risk factors (e.g., shared genetic etiology between disorders), environmental risk factors (e.g., prematurity, negative life events such as bullying and discrimination), socio-cognitive risk factors (e.g., impairments in cognitive flexibility, emotion regulation, and/or social and executive functioning), and/or co-occurring medical conditions (Kerns et al., 2015b; Lainhart, 1999; Mazefsky & Herrington, 2014). Furthermore, ASD-specific risk factors, such as social confusion (e.g., theory of mind deficits), peer rejection, and hyper/hyposensitivity to sensory stimuli, also make this population more vulnerable to other comorbid psychological disorders (Wood & Gadow, 2010). Rates of psychiatric disorders have been found to be lower in those with ASD and comorbid intellectual disability (ID; Matson & Cervantes, 2014), though these findings may be attributed to difficulty assessing comorbid diagnoses in this population, which we will discuss further in this chapter.

There are several diagnostic challenges to recognizing and identifying psychiatric disorders in individuals with ASD. First, language and communication problems associated with having ASD make it challenging to describe symptoms related to the psychiatric disorder (Leyfer et al., 2006), particularly for individuals who also have ID and/or minimal verbal ability, making assessment via self-report difficult or even impossible. Even for individuals with ASD who are cognitively able and verbally fluent, they often present with limited emotional insight or alexithymia (which refers to the difficulty "identifying and describing one's own emotional state"; Bird & Cook, 2013). Second, it is often difficult to distinguish between core symptoms of ASD and psychiatric disorders due to symptom overlap between the two conditions (e.g., social avoidance in both ASD and social phobia, repetitive/ritualistic behaviors in both ASD and OCD), making it unclear whether symptoms warrant separate diagnoses or are better accounted for by ASD itself (Matson & Nebel-Schwalm, 2007; White et al., 2009). Third, comorbid psychiatric disorders appear to exacerbate autistic behavior, making it more likely that the symptoms of those comorbid disorders will be attributed to ASD (e.g., Lainhart, 1999). Finally, assessment of comorbidities in this population is limited by a lack of measures adapted specifically for this purpose in individuals with ASD, as well as the time- and resource-intensive nature of the multi-method/multi-rater assessments required for such complex diagnoses (Mazefsky et al., 2011). Diagnostic challenges specific to the most common co-occurring psychiatric disorders—ADHD, anxiety disorders, OCD, and depression—will be discussed in detail in this chapter, as well as assessment and treatment considerations for each disorder.

Attention-Deficit/Hyperactivity Disorder (ADHD)

Prevalence. ADHD is a neurodevelopmental disorder characterized by a persistent pattern of inattention and/or hyperactivity-impulsivity. There are three types of ADHD, including: (1) predominantly inattentive presentation, (2) predominantly hyperactive-impulsive presentation, and (3) combined presentation, characterized by both inattention and hyperactivity (American Psychiatric Association [APA], 2013). As previous versions of the *Diagnostic and Statistical Manual for Mental Disorders* (DSM) did not allow for a dual diagnosis of ASD and ADHD, relatively little was known regarding the co-occurrence of these developmental disorders prior to the DSM-5 (APA, 2013). However, ADHD is now recognized as one of the most researched and most common comorbidities in youth with ASD, with between 40% and 70% of youth with ASD meeting diagnostic criteria for ADHD (Antshel et al., 2016), which is substantially higher than the prevalence of ADHD in the general population (~5%; Polanczyk et al., 2007). Similarly, adults with ASD demonstrate current and lifetime ADHD prevalence rates of 42% and 68%, respectively (Joshi et al., 2013). Intellectual and verbal abilities have been shown to influence comorbidity rates, as youth with ASD who have an IQ <70 have been shown to exhibit fewer ADHD symptoms than youth with an IQ ≥70 (Witwer & Lecavalier, 2010); however the majority of comorbidity research has been conducted on cognitively-able individuals with ASD (Matson & Cervantes, 2014).

Diagnostic Considerations. Combined ASD + ADHD is often associated with greater symptom severity compared to ASD alone. Individuals with co-occurring ASD and ADHD have been shown to exhibit increased severity of ASD symptoms, including increased social deficits (Rao & Landa, 2014), increased internalizing and externalizing behaviors (Jang et al., 2013), decreased adaptive skills (Ashwood et al., 2015), and decreased cognitive flexibility (Antshel & Russo, 2019). Additionally, ASD + ADHD is associated with more severe behavior problems and higher likelihood of an ODD or conduct disorder diagnosis (Mulligan et al., 2009). Taken together, this research emphasizes the need for assessments and interventions tailored specifically to this population due to the unique additive effects of ASD + ADHD.

As youth with ASD commonly display symptoms of inattention and hyperactivity, and youth with ADHD exhibit more ASD traits than neurotypical children (Antshel et al., 2016), differential diagnosis between the two disorders is challenging. In fact, approximately 20% of children later diagnosed with ASD are first diagnosed with ADHD (Miodovnik et al., 2015), delaying appropriate diagnosis and interventions. In addition to inattention and hyperactivity, social skills (McQuade & Hoza, 2008) and executive functioning (Craig et al., 2015) deficits are common in both disorders. Further, hyperactive-impulsive symptoms common in ADHD have been shown to be strongly correlated with restricted and repetitive behaviors (RRBs) characteristic of ASD (Ghirardi et al., 2019).

This significant symptom overlap has led some researchers to conceptualize ASD and ADHD as falling on the same continuum, with shared genetic heritability

(Ghirardi et al., 2019). There is some evidence for shared etiology between the two disorders, with ADHD concerns being three times more likely in children with a sibling with ASD compared to children without a family history of ASD (Miller et al., 2016). However, research generally supports the distinction between ASD and ADHD, as well as co-occurrence of the two (e.g., Ronald et al., 2014). In making a differential diagnosis, clinicians should look for specific social deficits related to ASD, including abnormal eye contact, limited or poor reciprocal social communication, insistence on sameness, and limited direction of facial expression, to distinguish ASD from ADHD (Grzadzinski et al., 2016). A comorbid diagnosis of ADHD should be considered when symptoms of inattention and/or hyperactivity are above and beyond expectations given the individual's mental age (APA, 2013) and if ADHD symptoms persist following interventions that target core ASD features and language and/or cognitive deficits (Mahajan et al., 2012).

Assessment. At present, clinical judgement remains an important factor in deciding which diagnosis/diagnoses are most appropriate (Antshel & Russo, 2019). Patterns of social deficits associated with each disorder should be considered during assessment; while social impairments related to deficits in social knowledge, social motivation/engagement, and difficulty with social cues are characteristic of ASD (APA, 2013; Pedreño et al., 2017), social impairments related to deficits in social performance (e.g., intrusiveness, interrupting, impulsivity) are characteristic of ADHD (Aduen et al., 2018). Additionally, it is important to evaluate whether symptoms of inattention stem from ASD-related behaviors, such as distraction due to circumscribed interests or sensory-seeking behaviors (Mazefsky et al., 2011), and are therefore better accounted for by an ASD diagnosis.

While no measures have been created specifically to differentiate ASD from ADHD or to assess co-occurring ADHD in those with ASD, several ASD-specific instruments, such as The Checklist for Autism Spectrum Disorders (CASD; Mayes et al., 2009), the Autism Spectrum Screening Questionnaire (ASSQ; Ehlers et al., 1999), the Social Communication Questionnaire (SCQ; Rutter et al., 2003), and the Autism Mental Status Exam (AMSE; Grodberg et al., 2012) have shown the ability to differentiate between those with ASD and those with ADHD (Mouti et al., 2019; Norris & Lecavalier, 2010; Øien et al., 2016). On the other hand, ADHD-specific measures, such as the Conners Parent Rating Scale (Conners, 1990) and the ADHD Rating Scale-IV (DuPaul et al., 1998), are generally unable to differentiate between ASD and ADHD groups, with both groups receiving comparably high scores on ADHD symptom scales (Ehlers et al., 1999; Hattori et al., 2006). In addition, ASD-specific observation and interview tools demonstrate a lack of specificity in differentiating those with ADHD; while few children with ADHD (11%) meet criteria for ASD on both the Autism Diagnostic Observation Schedule (ADOS-2; Lord et al., 2012) and the Autism Diagnostic Interview-Revised (ADI-R; Lord et al., 1994), approximately 21% meet diagnostic cutoffs on the ADOS-2 and 30% on the ADI-R (Grzadzinski et al., 2016). Finally, the Developmental Behaviour Checklist – Hyperactivity Index (DBC-HI; Einfeld & Tonge, 2002), a broadband parent-report questionnaire, has demonstrated fair sensitivity and specificity in differentiating ASD from ASD + ADHD (Gargaro et al., 2014). However, further work is needed

to develop questionnaire, interview, and direct observation measures that reliably distinguish between ASD, ADHD, and ASD + ADHD.

Treatment. While evidence-based behavioral interventions exist for individuals with ASD alone and individuals with ADHD alone, much less is known about how to effectively address the unique presentation of those with ASD + ADHD (Antshel & Russo, 2019). For example, although social skills training is recommended for youth with ASD, it has not been shown to be effective for youth with ADHD (for a review, see Antshel & Russo, 2019). Parent training was found to result in much less improvement for children with ASD who exhibited significant ADHD symptoms than those with fewer ADHD symptoms (Lecavalier et al., 2017). Given the increased symptom severity exhibited by those with ASD + ADHD, further research is needed to develop treatments that combine elements of ASD-specific interventions (e.g., social skills training) and ADHD-specific interventions (e.g., organization, impulsivity management). Recent work by Young et al. (2020) used expert consensus to develop guidelines for the assessment and treatment of youth and adults with co-occurring ASD and ADHD. The authors detail clinical practice recommendations, such as tailored psychoeducation, use of Functional Behavior Analysis (FBA), increased number of sessions, and the involvement of parents/caregivers, to support mental health practitioners in providing appropriate care to this complex population (Young et al., 2020).

Anxiety

Prevalence. Anxiety disorders are characterized by excessive fear and/or worry that causes distress and significantly impairs functioning (APA, 2013). There are several categories of anxiety disorders, including generalized anxiety disorder, specific phobia, social anxiety, separation anxiety, panic disorder, and agoraphobia (APA, 2013). Although anxiety is not included in the DSM-5 diagnostic criteria for ASD, it is increasingly being recognized as one of the most common presenting problems for individuals on the autism spectrum (White et al., 2009). Approximately 40% of youth with ASD meet diagnostic criteria for at least one anxiety disorder (van Steensel et al., 2011), which is significantly higher than the prevalence reported for neurotypical youth and those with other developmental disabilities, and up to 84% of children with ASD experience some indications of clinically significant anxiety (White et al., 2009). In adults with ASD, an estimated 42% meet criteria for at least one anxiety disorder during their lifetime (Hollocks et al., 2019). This reported prevalence is likely an underestimate in youth and adults with ASD, given the difficulties assessing anxiety in this population as well as the tendency to attribute the symptoms of anxiety to the ASD itself (White et al., 2009).

Anxiety symptoms affect individuals with ASD both with and without co-occurring ID, but intellectual functioning does appear to impact diagnostic rates and symptom presentation. Research has suggested that individuals with ASD without ID may experience more anxiety than those with comorbid ID (e.g., Witwer &

Lecavalier, 2010), which may be because cognitively able individuals are likely to have a greater understanding of their differences and challenges compared to their neurotypical peers, leading to increased anxiety. However, this finding may also reflect challenges in recognizing comorbid psychopathology, including anxiety, in those with lower cognitive and verbal abilities who often cannot communicate their fear or anxiety and/or may express it in idiosyncratic ways (e.g., increased RRBs, aggression). Further research is needed to clarify the nature of anxiety differences depending on cognitive abilities.

Diagnostic Considerations. There are several characteristics inherent to ASD, such as RRBs and social skills deficits, that make this population more vulnerable to symptoms of anxiety. RRBs, particularly the need to maintain sameness, have been associated with higher levels of anxiety (Rodgers & Ofield, 2018). Social skills deficits, including difficulties in social interactions, forming and sustaining friendships, and understanding others' actions, further contribute to feelings of anxiety by making the world feel more unpredictable (Rodgers, 2018). Related to unpredictability, "intolerance of uncertainty" has been found to mediate the relation between anxiety and ASD, which may explain some of the increased vulnerability to anxiety in those with ASD (Rodgers & Ofield, 2018). Further, individuals with ASD may experience anxiety regarding their own behaviors being in conflict with social norms or expectations (Wood & Gadow, 2010). Overall, it is likely that there are many general characteristics inherent to autism that predispose individuals with ASD to be more anxious than those without ASD, or that can predispose them to stressful experiences that lead to anxiety (Wood & Gadow, 2010).

The overlap between symptoms of anxiety and core ASD features creates challenges in recognizing and diagnosing this comorbid condition. It is often difficult to determine whether certain symptoms, such as social avoidance, are due to an anxiety disorder (i.e., social phobia) or attributable to ASD-related social interaction deficits (Kerns et al., 2016b; White et al., 2009). In addition, anxiety may exacerbate core autism features, such as social skills deficits and RRBs (Wood & Gadow, 2010), and is associated with a variety of other psychological symptoms (e.g., depressive symptoms) and problem behaviors (e.g., self-injury) in this population (Kerns et al., 2015a). Further complicating differential and comorbid diagnosis, anxiety often presents differently in children and adults with ASD compared to neurotypical individuals. While typical symptoms of anxiety are often present, anxiety in this population may also present as atypical behaviors (e.g., plugging the ears, using perseverative phrases, humming), or may manifest as problem behaviors (e.g., aggression, self-injury, tantrums), especially in those with lower cognitive abilities (Moskowitz et al., 2013; White et al., 2009). Relatedly, emotion dysregulation, a common feature of ASD (Mazefsky & White, 2014), may be incorrectly interpreted as anxiety, or may cause true anxiety symptoms to be overlooked. Additionally, the content of the fears or anxiety may also differ for those with ASD; for example, Kerns et al. (2014) reported the prevalence of atypical anxiety, including specific phobias with an atypical focus (e.g., fear of running water, graffiti), worry related to specific preoccupations, or compulsive behavior related to rituals, in youth with ASD. In this way, symptoms of anxiety may be misinterpreted or minimized due to the individual's ASD, ID, or related difficulties.

Given that the cognitive (e.g., worry), affective (e.g., subjective fear experienced), and physiological (e.g., increased arousal) components of anxiety often cannot be directly observed in the same way that we can observe the behavioral component of anxiety (e.g., running away, crying), anxiety is particularly difficult to identify in ASD, especially for those with co-occurring ID and/or minimal verbal ability (Moskowitz et al., 2013). Individuals with ASD often exhibit difficulty describing their own mental states and daily experiences (Leyfer et al., 2006), rendering traditional self-report measures of anxiety unreliable or impossible, particularly in those with co-occurring ID (Hagopian & Jennet, 2008). Further, as those with ASD tend not to provide others with cues about their emotional states (Rogers, 1998), caretakers may not be aware of symptoms of anxiety, limiting the accuracy and usefulness of other-informant reports. For all of these reasons, parents, teachers, or practitioners may not recognize fear or anxiety in their children with ASD, especially those who have co-occurring ID, or they may even attribute their problem behavior (e.g., aggression, self-injury, RRBs) to noncompliance or disobedience, or to the ASD itself, rather than to anxiety.

Assessment. Despite the above-mentioned limitations, several questionnaires, interviews, and direct observation measures have been used to assess anxiety in youth and adults with ASD. In terms of questionnaires, while several measures designed for and validated in neurotypical youth have been used in those with ASD (e.g., the Multidimensional Anxiety Scale for Children [MASC], the Screen for Child Anxiety Related Emotional Disorders [SCARED]; see Kerns et al., 2016b and Lecavalier et al., 2014 for a review), some recent measures have been developed specifically for youth with ASD. Namely, the Anxiety Scale for Children—ASD (ASC-ASD; Rodgers et al., 2016), adapted from the Revised Child Anxiety and Depression Scale (RCADS) with additional items related to sensory anxiety, uncertainty, and phobias, was the first child- and parent-report anxiety questionnaire designed specifically for youth with ASD. While the ASC-ASD was designed for and validated with youth with ASD who had fluent speech and average cognitive abilities, more recently, the Parent-Rated Anxiety Scale for ASD (PRAS-ASD; Scahill et al., 2019) was created for and validated with youth with ASD, both with and without ID, with a focus on minimizing the language-dependent items (e.g., worries, complains). Although there were no measures of anxiety designed and validated specifically for adults with ASD, an adult version of the ASC-ASD questionnaire, the Anxiety Scale for Autism-Adults (ASA-A; Rodgers et al., 2020), was recently developed and validated with this population.

In terms of clinical interviews, Kerns and colleagues created the *Autism Spectrum Addendum* to the Anxiety Disorders Interview Schedule (ADIS/ASA; Kerns et al., 2014; Kerns et al., 2017) to differentiate traditional DSM anxiety disorders from ASD-related difficulties (such as social deficits) or the more atypical anxious behaviors (e.g., worries regarding schedule or environmental changes) often present in ASD. In determining whether a comorbid anxiety disorder diagnosis is warranted, Kerns et al. (2016b) suggested considering whether the anxiety is developmentally normative, assessing whether the anxiety symptoms (separate from the ASD symptoms) cause impairment, differentiating anxiety symptoms from the emotional or

sensory dysregulation associated with ASD, and assessing whether anxiety symptoms occur over and above what would be expected from ASD-related challenges. Although structured interviews such as the M.I.N.I (Sheehan et al., 1998) have been used with adults with ASD, no interviews have been developed explicitly to assess anxiety for this group (Hollocks et al., 2019).

Given the aforementioned limitations of self-report and parent-report in individuals with ASD, particularly for those with ID who are nonverbal or minimally verbal, anxiety must often be inferred from the individual's overt behavior or "fear responses" using direct observation (Moskowitz et al., 2017a; Rosen et al., 2016). However, it may not always be clear which observed behaviors are indicative of anxiety; although crying, screaming, withdrawing, running away, clinging, becoming tense, or behaving irritably might indicate anxiety in a child with ASD at certain times in certain contexts, the same child might also engage in any of those behaviors because he is tired, in pain, overstimulated, angry, frustrated, sad, or otherwise distressed. Given the complexity in interpreting observed symptoms of anxiety in ASD, it is generally important to use a variety of different measures and informants to provide converging data that identifies the symptoms associated with anxiety (see Moskowitz et al., 2013 for a multimethod assessment strategy to assess anxiety in children with ASD and comorbid ID).

Treatment. Evidence-based treatment of anxiety in youth with ASD varies depending on cognitive ability. For children with high-functioning ASD (HFA), Cognitive Behavioral Therapy (CBT) is widely recognized as the most effective evidence-based intervention for anxiety disorders (van Steensel & Bogels, 2015). CBT for anxiety typically involves *gradual exposure* to the anxiety-provoking stimuli or situations, which is typically preceded by *psychoeducation* about anxiety, *relaxation*, and *cognitive restructuring* (identifying and challenging anxious thoughts, teaching coping-focused thinking). Meta-analyses and systematic reviews have shown CBT to have moderate to large effect sizes for treating symptoms of anxiety in youth with HFA (e.g., Perihan et al., 2020). However, research on treating anxiety in adults with ASD is much more limited. A review by Spain et al. (2015) found only six studies that met criteria for CBT interventions used with adults with ASD (with only two RCTs), and the studies were characterized by small sample sizes, heterogeneous participant characteristics, and design flaws. Thus, while these limited studies suggest that CBT appears to be moderately effective for treating comorbid anxiety in adults with ASD, further research is needed to determine the effectiveness of such programs.

Adaptations to traditional CBT programs, such as visual supports, concrete examples, tailored psychoeducation and reinforcement strategies, incorporating special interests, longer sessions to allow for more repetition and practice, increasing parental involvement, using a modular format to individualize treatment, and adding extra modules to cover ASD-specific difficulties (e.g., teaching social skills), are often necessary for individuals with ASD (Moree & Davis III, 2010; Wood et al., 2020; Kerns et al., 2016a). In fact, a recent randomized controlled trial (RCT) comparing three conditions—standard-of-practice CBT, CBT adapted for ASD, and treatment-as-usual (TAU)—found that both CBT conditions were beneficial for

children with ASD and anxiety, but the adapted CBT program outperformed standard CBT and TAU (Wood et al., 2020). A systematic review also found that mindfulness training reduced anxiety in children and adults with HFA (Cachia et al., 2016), but research in this area is scarce and includes methodological limitations, so further research is needed.

Although CBT is considered to be an evidence-based treatment for anxiety in youth with HFA, there is limited research on CBT to treat anxiety in individuals with "low-functioning" ASD (LFA), meaning those who have ID and/or are minimally verbal. For those with LFA, the cognitive components of CBT (i.e., psychoeducation, cognitive restructuring) are often modified, simplified, or excluded altogether, making the treatment more "behavioral" rather than "cognitive-behavioral" (Moskowitz et al., 2017b). In a review of the literature on behavioral interventions for anxiety in individuals with LFA, Rosen et al. (2016) found that systematic desensitization (i.e., gradual exposure) and positive reinforcement were *efficacious* treatments for anxiety; prompting, modeling, and antianxiety stimuli were *possibly efficacious*; and blocking and safety signals were *undetermined* due to lack of studies. See Moskowitz et al. (2017b) for a description of strategies based in applied behavior analysis (ABA) and positive behavior support (PBS) that were found to be useful for treating anxiety in youth with ASD and comorbid ID.

Obsessive-Compulsive Disorder (OCD)

Prevalence. Obsessive Compulsive Disorder (OCD) is defined by the presence of obsessions (unwanted and intrusive thoughts, urges, or images) as well as compulsions (recurrent behaviors or mental acts that aim to reduce or prevent anxiety or distress) (APA, 2013). (Of note, while OCD was included as an anxiety disorder in the DSM-IV, obsessive compulsive and related disorders are now included in the DSM-5 as a separate chapter.) Research has shown a high comorbidity of OCD in individuals with ASD (Griffiths et al., 2017). Specifically, between 17% and 37% of children and adolescents with ASD are reported to have co-occurring OCD (Leyfer et al., 2006; van Steensel et al., 2011), which is substantially higher than the prevalence of pediatric OCD in youth without ASD, which ranges from 0.5% to 3% (Rapoport et al., 2000). In a recent population-based study of adults with ASD, the prevalence of OCD was 3.43% which, although lower than pediatric OCD, was still markedly raised in comparison to the rate of 0.47% in adults in the general population (Nimmo-Smith et al., 2020). Further, youth with both OCD and ASD present with significantly higher rates of other comorbid psychiatric disorders (ADHD, social phobia, separation anxiety disorder; Lewin et al., 2011) and greater functional impairment (Griffiths et al., 2017) than youth with OCD alone, with family accommodation mediating the association between ASD traits and functional impairment (Griffiths et al., 2017). Overall, individuals with OCD and ASD may demonstrate increased vulnerability to other disorders, highlighting the importance of developing appropriate treatment interventions.

Diagnostic Considerations. Given that repetitive behavior is a core diagnostic feature of both OCD and ASD, it is often difficult to differentiate which repetitive behaviors are part of ASD and which indicate co-occurring OCD. There is some evidence that the obsessions and compulsive/repetitive behaviors exhibited by those with OCD differ in content from the restricted and repetitive behaviors (RRBs) that are characteristic of ASD. For example, individuals with OCD may be more likely to experience contamination, aggressive, sexual, and religious obsessions, as well as checking compulsions, than individuals with ASD, who are more likely to exhibit hoarding, repeating, or ordering symptoms (McDougle et al., 1995; Ruta et al., 2010). However, other research has not found a difference in the content of obsessions or compulsions between individuals with ASD + OCD versus OCD alone (Lewin et al., 2011), which could be due to researchers and/or families in previous studies conceptualizing the child's behaviors as "obsessions" when they were really the rigid interests/fixations that are characteristic of ASD. The technical way that researchers and clinicians should distinguish between the compulsive behaviors that are characteristic of OCD versus the repetitive behaviors that are characteristic of ASD is that individuals with OCD typically find their obsessive thoughts and repetitive behaviors to be unwanted and distressing whereas, for individuals with ASD, some RRBs may not cause distress, but instead are preferred or enjoyed, with distress occurring when the repetitive behaviors are interrupted (Postorino et al., 2018). That is, rituals in OCD serve the function of alleviating the anxiety or distress caused by the obsession (i.e., negative reinforcement), such as engaging in the ritual of washing hands to reduce obsessive thoughts about contamination, whereas the repetitive behaviors exhibited by those with ASD, (e.g., hand-flapping, listening to the same song over and over again) are typically maintained by positive reinforcement. The reason we say that this is "the technical way" to differentiate is because, in practice, it may be difficult to ascertain if a person with ASD is engaging in a repetitive behavior because he enjoys it versus engaging in the behavior to alleviate distress if the person cannot communicate his emotions or describe why he is engaging in the behavior. It is often uncertain whether a person with ASD (particularly one who is minimally verbal) engages in RRBs to gain stimulation or pleasure versus to relieve anxiety/distress or self-soothe.

Assessment. The overlapping symptoms in ASD and OCD present a challenge for clinicians and researchers in assessing and diagnosing OCD in individuals with ASD. One method of assessing the symptoms and severity of OCD in youth without ASD is a semistructured interview, the Children's Yale-Brown Obsessive Compulsive Scale (CYBOCS; Scahill et al., 1997). The authors modified the CYBOCS for youth with ASD (CYBOCS-ASD; Scahill et al., 2014), 61% of whom had ID, by only including the Compulsions checklist from the original CYBOCS (obsessions were eliminated because of the cognitive and communication limitations in ASD) and adding repetitive behaviors commonly exhibited by youth with ASD. Although the CY-BOCS-ASD has good psychometric properties as a measure of repetitive behaviors in ASD, it can be difficult and even impossible to diagnose OCD by only relying on compulsions, without assessing obsessions, given the functional relationship between obsessions and compulsions. Thus, if differential diagnosis of ASD and

OCD is the goal, then the original CYBOCS, the Autism Comorbidity Interview (ACI; Leyfer et al., 2006), or the aforementioned ADIS/ASA may be more helpful (Maddox et al., 2016). Indeed, most research studies have used parent interviews, such as the ACI or ADIS or ADIS/ASA, to diagnose OCD in youth with ASD. Of note, when using the ADIS/ASA, Kerns et al. (2014) only considered a repetitive behavior to indicate OCD if the behavior could be clearly linked to a need to escape or eliminate obsessional thoughts/images/urges, prevent or attenuate distress, or prevent a feared outcome. In addition to using the clinician-administered YBOCS to diagnose OCD in adults with ASD, the Obsessive Compulsive Inventory—Revised (OCI-R), a self-report measure, has been shown to discriminate well between ASD + OCD versus ASD-alone and fairly well between ASD-alone and OCD-alone in adults with HFA (Cadman et al., 2015).

Treatment. The evidence-based treatment for OCD in individuals without ASD is a type of CBT known as Exposure and Response Prevention (ERP), which involves gradually exposing people to situations that trigger their obsessions while preventing their compulsions/rituals, such as coaching people to touch items that are "contaminated" (obsession) while helping them to refrain from washing their hands (ritual). Although there is far less research on behavioral interventions or CBT to treat OCD in people with ASD (compared to the many RCTs on CBT to treat anxiety disorders in youth with HFA), the limited literature suggests that CBT can improve obsessive-compulsive symptoms in ASD. One study that compared treatment outcomes of CBT for youth with OCD with and without ASD found worse outcomes for those with co-occurring ASD (Murray et al., 2015), perhaps because of the impairments that are inherent in ASD, such as difficulty recognizing or communicating emotions and/or because of higher impairment, comorbidity, and accommodation in ASD + OCD versus OCD alone (Griffiths et al., 2017). However, a recent review identified 11 studies that examined the use of CBT for individuals with ASD + OCD and found promising results, although very few of the studies demonstrated experimental control, with only two RCTs providing rigorous evidence of the effectiveness of CBT for reducing symptoms of OCD in children and adolescents with ASD (Kose et al., 2018). In an RCT examining CBT to treat OCD in adolescents and adults with HFA, both CBT and the control treatment (anxiety management) resulted in a significant reduction in OCD symptoms, with no statistically significant differences in symptom severity between the two groups at post-treatment, although more participants responded to CBT (45%) than anxiety management (20%) (Russell et al., 2013). Further, significant reductions in symptom severity have also been found in recent uncontrolled studies published since the Kose et al. (2018) review, such as a naturalistic follow-up study of adults with HFA (Nakagawa et al., 2019) and an open, non-randomized clinical effectiveness study of adults with HFA (Flygare et al., 2020).

Several modifications to traditional CBT/ERP for OCD have been used across studies of individuals with ASD, including an increased reliance on visual tools, incorporating special interests to convey concepts, increased parental involvement, the use of a more structured approach, and an increased focus on concrete exercises (i.e., exposure) while minimizing focus on cognitive strategies (e.g., challenging

thoughts) (e.g., Iniesta-Sepulveda et al., 2018; Kose et al., 2018; Russell et al., 2013). A preliminary RCT that incorporated function-based behavioral assessment and intervention with CBT found a significant decrease in obsessive compulsive behaviors in children with HFA at post-treatment and follow-up (Vause et al., 2017). Additional suggestions for future modifications include the need for extra time during exposure sessions and adding in-home support to increase completion of homework assignments (i.e., between-session exposures) for individuals with ASD (Flygare et al., 2020). Overall, further research is needed to examine treatment maintenance over time, treatment intervention for individuals with verbal and cognitive deficits, predictors of treatment efficacy, and the involvement of caregivers other than parents (e.g., teachers, staff) in treatment (Kose et al., 2018; Nakagawa et al., 2019).

Depression

Prevalence. Depressive disorders are characterized by the core symptoms of sad or irritable mood and/or anhedonia (loss of interest or pleasure), as well as additional symptoms such as fatigue, difficulty concentrating, feelings of guilt or worthlessness, psychomotor retardation, and recurrent thoughts of death (APA, 2013). In children, depression can present as severe irritability or anger as opposed to depressed mood. While youth with ASD consistently exhibit elevated levels of depressive symptoms compared to neurotypical youth, prevalence estimates vary widely between studies due to differences in sample characteristics and methods of assessment (Menezes et al., 2018). A systematic review of recent studies on depression in youth with ASD found prevalence estimates ranging from 7% to 47% (Menezes et al., 2018), which is higher than the prevalence of childhood depression in the general population (~3%; Ghandour et al., 2019). Adults on the autism spectrum also demonstrate higher lifetime prevalence rates of depression, ranging from 37% to 77% (Hollocks et al., 2019; Joshi et al., 2013), compared to ~8% in the general population (Brody et al., 2018), and verbally fluent adults with ASD have been shown to report cognitive symptoms of depression (e.g., guilt, pessimism) at an even higher rate than neurotypical adults (Gotham et al., 2015). Comorbid depression in youth and adults with ASD is associated with higher rates of suicidal ideation and attempts compared to neurotypical individuals (Cassidy et al., 2014; Mayes et al., 2013). In fact, overall suicide risk in individuals with ASD has been found to be 9 times that of the general population (Hirvikoski et al., 2016). The current literature on depression and suicide in ASD suggests that individuals with ASD may demonstrate increased vulnerability to co-occurring depressive disorders and suicidal ideation, emphasizing the importance of developing appropriate assessments and interventions. Individuals with higher cognitive and verbal abilities, social skills, and introspective capacity may be more likely to experience depression which, similar to anxiety, may be due to increased awareness of their differences and challenges or clinicians' increased difficulty recognizing and assessing symptoms in minimally verbal individuals.

Diagnostic Considerations. Just as it can be challenging to diagnose anxiety disorders in ASD, it is similarly challenging to diagnose depression, given that both are internalizing disorders in which diagnosis relies largely on the expression of internal thoughts and feelings (in contrast to externalizing disorders such as ADHD in which the symptoms are external and therefore observable behaviors). The first reason depression can be difficult to diagnose in ASD is because of the inherent social communication impairments in ASD; while symptoms of depression such as weight loss/gain and a reduction of physical movement can be observed by a clinician, an individual with ASD who has ID and/or limited verbal abilities (or even one who is verbally fluent but presents with alexithymia) might lack insight into his feelings and/or be unable to express the internal symptoms of depression such as feelings of worthlessness or guilt, difficulty concentrating, or thoughts of death. Second, although individuals with ASD who are depressed can present with typical symptoms, including sadness, anhedonia, and psychomotor difficulties, their depression can also manifest differently than in those without ASD (Rosen et al., 2018). For example, depression in people with ASD can manifest as an increase in core ASD features such as increased stereotypic behaviors or an intense focus on special interests, including morbid themes (Rosen et al., 2018). Depression may also present differently in individuals with ASD and ID due to limited communication skills; symptoms may manifest as behavioral regression, loss of adaptive skills, and/or increases in aggression and self-injury (Magnuson & Constantino, 2011; Stewart et al., 2006).

Third, symptom overlap between ASD and depression often contributes to diagnostic overshadowing. Common overlapping symptoms between the two conditions, including social withdrawal and avoidance, cognitive inflexibility, sleep difficulties, problems with expressing affect through facial and intonation cues (i.e., flat affect), rumination, and attention problems (Gotham et al., 2015; Rosen et al., 2018), make differential and comorbid diagnosis difficult. ASD-specific deficits may, in fact, contribute to higher levels of depressive symptoms; for example, impairments in theory of mind, emotion regulation, emotion recognition, and problem-solving skills, as well as cognitive rigidity and sensory sensitivities, may be associated with elevated depressive symptoms in youth with ASD (Mazefsky & White, 2014). In addition, core features of ASD, including impairments in social motivation and adaptive behavior, may be exacerbated by co-occurring depression (Ghaziuddin et al., 2002). Loneliness is thought to contribute to depression and thoughts of self-harm in this population (Hedley et al., 2018), reflecting the social isolation characteristic of ASD, experiences of rejection and bullying common in this population, and the need to consider the person's social engagement and support.

Assessment. Similar to assessing anxiety, given that individuals with ASD may have difficulty communicating subjective internal states of sadness, hopelessness, or disinterest, which limits the utility of self-reports, the diagnosis of depression in ASD often relies on observable behaviors or changes in mental state (e.g., increasingly negative affect) that can be gleaned from caregiver report (Magnuson & Constantino, 2011). Magnuson and Constantino (2011) suggest an algorithm for

assessing depression in individuals with ASD that focuses on inquiring about predisposing factors that could contribute to depression (e.g., family history, negative life event), examining alternative manifestations of depression in ASD, and considering risk factors for developing depression (e.g., bullying). Further, given that the symptoms of ASD (e.g., lack of social motivation) often overlap with the symptoms of depression (e.g., social withdrawal), it is critical to evaluate whether the behavior represents a marked change from baseline – for example, whether the onset of the social withdrawal was recent (which may be more indicative of depression) versus the person has always displayed the same level of social avoidance (which is more suggestive of ASD) (Magnuson & Constantino, 2011).

No measures have been developed specifically to assess depression in youth or adults with ASD. This is problematic, given that depression may present differently in ASD (e.g., manifesting as reduced pleasure in circumscribed interests, increased aggression or self-injury or repetitive behaviors, for example; Pezzimenti et al., 2019) and thus the questionnaires and interviews that are designed for neurotypical individuals might lead to many cases of depression being missed in those with ASD. However, the recently developed Autism Clinical Interview for Adults (ACIA; Wigham et al., 2020), a clinical interview for broadly assessing psychopathology in this population, was shown to accurately identify several comorbid conditions in adults with ASD, including depression. Further, the Beck-Depression Inventory-II (BDI-II; Beck et al., 1996), a self-report measure of depressive symptoms developed for the general population, has demonstrated the ability to identify depression in adults with ASD (Gotham et al., 2015), but further work is needed to determine if this tool and other measures developed for the general population are appropriate for those with ASD. Understanding the unique presentation of depression in ASD, differentiating the symptoms of the two disorders, and gathering information on changes in behavior can help clinicians and researchers to accurately diagnose comorbid depressive disorders in this population.

Treatment. Research on behavioral interventions for depression in ASD is limited. Although CBT is established as effective in reducing symptoms of internalizing disorders, including depression, in neurotypical youth and adults (Hofmann et al., 2012), CBT programs that have been adapted for those with ASD have generally targeted symptoms of anxiety, aggression, and core features of ASD as opposed to symptoms of depression (White et al., 2018). One non-randomized study demonstrated promising results for the efficacy of a group-based CBT program in reducing symptoms of depression and stress, including depressive automatic thoughts, in adolescents and adults with HFA compared to a waitlist control group; this symptom reduction was maintained at a 3- and 9-month follow-up (McGillivray & Evert, 2014). In addition, the Stepped Transition in Education Program for Students with ASD (STEPS), which is based in cognitive-behavioral techniques, has recently been shown to reduce symptoms of depression in an RCT with young adults with HFA compared to a waitlist control group (Capriola-Hall et al., 2020). Finally, studies on modified mindfulness-based therapy and group-delivered mindfulness-based stress reduction (MBSR) also found significant reductions in depression and rumination and an increase in positive affect in adults with HFA following intervention (Sizoo & Kuiper, 2017; Spek et al., 2013), but research in this area is also scarce.

Kerns et al. (2016a) suggested several adaptations to CBT for depression and anxiety in cognitively able adults with ASD, such as incorporating hands-on interactive activities (e.g., role-plays), visual illustrations and concrete strategies (e.g., worksheets listing helpful and unhelpful thoughts), and special interests; practicing skills in real-life situations; using technology (e.g., logging their moods on smartphones throughout the day); and incorporating social skills groups or social training, among other modifications. For depression specifically, Kerns et al. (2016a) further suggested that behavioral activation (e.g., introducing positive and rewarding activities as well as achievable goals into the person's daily routines) may be particularly helpful as part of a CBT program or on its own for adults with ASD, given that vocational training and supportive social interaction were found to improve depression in ASD. However, the existing literature on the efficacy of CBT for depression in ASD remains limited and inconsistent (Burkhart et al., 2018), and further work is needed to determine appropriate and effective modifications for this population. The involvement of family members in intervention, as well as the role of peers in social and vocational skills programs, may be important factors to consider in treating depression in ASD (Chandrasekhar & Sikich, 2015).

Conclusion

Several comorbid psychiatric conditions not reviewed in this chapter, such as ODD, conduct disorder, bipolar disorder, and schizophrenia/psychotic disorders, similarly affect individuals with ASD at higher rates than the neurotypical population, while prevalence rates of other disorders, such as posttraumatic stress disorder (PTSD) and eating disorders, remain unclear (Rosen et al., 2018). Given the potential negative consequences of delays in appropriate services due to missed or misdiagnosis, there is a need to develop assessments that accurately identify comorbid disorders in both youth and adults with ASD. Furthermore, due to the additional impairment associated with comorbid psychiatric diagnoses, evidence-based interventions specific to various psychiatric comorbidities are needed to mitigate negative outcomes for individuals with ASD.

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