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Review article

Commonly studied comorbid psychopathologies among persons with autism spectrum disorder

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ABSTRACT

The study of comorbid psychopathology among persons with autism spectrum disorder (ASD) is picking up steam. The purpose of this paper was to review and describe important characteristics of existing studies. Among the current crop of papers, depression, anxiety, and attention-deficit/hyperactivity disorder (ADHD) have been frequently evaluated. Groups studied have most frequently been children. Persons with ASD and normal intelligence quotient (IQ) scores have been studied more often than individuals with ASD and intellectual disability. Additional characteristics are discussed, and the implications of these data for future developments in the field are reviewed.

Contents

1. Introduction

Autism spectrum disorder (ASD) is a chronic, life long condition that is among the most debilitating of the developmental disabilities. The disorder is composed of a number of core features including communication and social skill deficits and excesses in addition to stereotypies and repetitive behaviors (Fodstad, Matson, Hess, & Neal, 2009; Gadow & Drabick, 2012; Matson, Dempsey, & Fodstad, 2009; Matson, LoVullo, Rivet, & Boisjoli, 2009; Matson & Wilkins, 2009; Poon, 2012). Recently, researchers have pointed to a marked increase in the number of ASD cases identified, further underscoring the importance of the condition (Lin, Lin, & Wu, 2009; Matson & Kozlowski, 2011).

ASD was first described in the 1940s and for several decades after, the focus was on the core symptoms of the disorder. More recently, the notion of comorbid conditions has become a prominent area for study (Rumpf, Kamp-Becker, Becker, & Kauschke, 2012; Smith & Matson, 2010a, 2010b, 2010c). Among the most concerning and prominent of these comorbid

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disorders and problems are challenging behaviors and mental health issues (Kuhn & Matson, 2004; Matson, Dixon, & Matson, 2005; Matson & Kuhn, 2001; Matson, Mayville, et al., 2005).

This field of comorbidity is rapidly expanding and for good reasons. First, researchers are still learning how ASD interfaces with various forms of psychopathology (Matson & Smiroldo, 1997; Matson, Smiroldo, Hamiltion, & Baglio, 1997). Second, these data are important for better understanding the etiology of all of these problems as well as how they interact (Grondhuis & Aman, 2012; Paclawskyj, Matson, Bamburg, & Baglio, 1997; Turner & Romanczyk, 2012). Third, these data have important implications for assessment and treatment (Edwards, Watkins, Lotfizadeh, & Poling, 2012; Fentress & Lerman, 2012; Matson & LoVullo, 2008; Matson, Wilkins, & González, 2008). For these and other reasons, research on this topic is flourishing. The purpose of this review was to take stock and provide an overview of common characteristics of these studies.

2. Method

To establish a database of articles, SCOPUS was searched using the terms autism, comorbidity, psychopathology, ADHD, diagnosis, depression, anxiety, schizophrenia, and disorders. Further, the references from the papers identified in the search were crosschecked to identify additional articles and related topics. One hundred nine papers were viewed as distinct. Papers were excluded if they failed to address the topic of comorbid symptoms in ASD. Seventy-two papers remained and are reported below.

3. Results and discussion

The papers were all of recent origin and are presented in Table 1.

Three papers were reported in 2000. Zero to three papers per year were located through 2007. The year with the most papers was 2008 ($n = 14$). From 2008 through 2013, seven or more papers were identified each year (see Fig. 1). This trend demonstrates that emphasis on this topic is growing. Until recently, core symptoms were viewed distinct from comorbid conditions. For example, the *Diagnostic and Statistical Manual of Mental Disorders*, *Fourth Edition* (*DSM-IV*) did not allow for a dual diagnosis of ASD and attention-deficit/hyperactivity disorder (ADHD). However, these beliefs have changed and are at least in part reflected by the research trend noted above. The current version of the *DSM* (*DSM-5*) now permits comorbid diagnoses with ASD.

Thirty-one different disorders were studied in the papers reviews. The most frequently studied problem was ADHD ($n = 38$ papers) followed by anxiety ($n = 35$), depression ($n = 20$), obsessive compulsive disorder (OCD; $n = 12$), oppositional

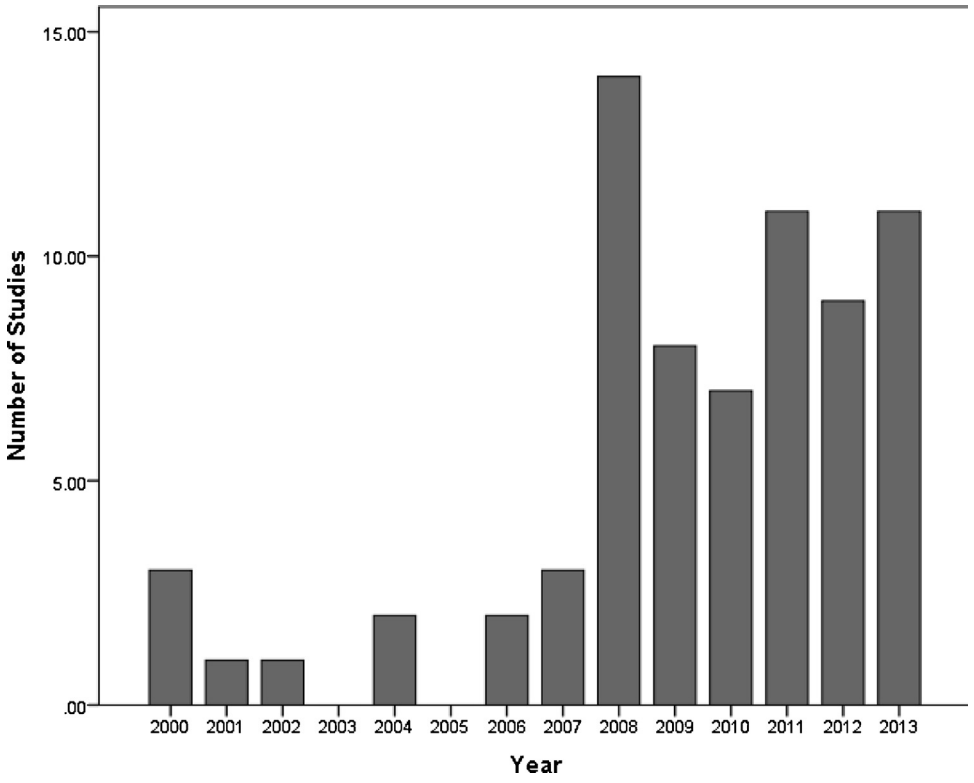

Fig. 1. Number of studies addressing comorbid psychopathologies in ASD by year.

Table 1
Studies Addressing Comorbid Psychopathologies in ASD.

Authors	Type of disorder(s)	I.Q.	Age	Gender	Test(s) used
La Malfa et al. (2007)	Anxiety, depression, schizophrenia, mania, eating disorders, sexual disorders	Severe intellectual disability (ID)	$M = 39.6$ years	49 M 41 F	Diagnostic Assessment for the Severely Handicapped-II (DASH-II)
Worley and Matson (2011)	Worry/depression, avoidant behavior, conduct disorder (CD), under- and over-eating	Normal IQ	$M = 8.34$ years	71 M 58 F	Autism Spectrum Disorders–Comorbid for Children (ASD-CC)
Strang et al. (2012)	Depression, anxiety	IQ > 70	Range: 6–18 years	86% M 14% F	Child Behavior Checklist (CBCL)
Mayes, Calhoun, et al. (2013)	Unusual fears	Normal IQ and ID	Range: 1–16 years	83.3% M 16.7% F	Fear items from the Checklist for Autism Spectrum Disorder (CASD)
Mehtar and Mukaddes (2011)	Posttraumatic stress disorder	Unspecified	Range: 6–18 years	53 M 16 F	Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS, PTSD Scale)
Blakeley-Smith, Reaven, Ridge, and Hepburn (2012)	Anxiety	Normal IQ	Range: 8–14 years	56 M 7 F	Screen for Child Anxiety Emotional Disorders in Children (SCARED)
Helverschou and Martinsen (2011)	Anxiety	ID	Range: 14–57 years; $M = 23.9$ years	45 M 17 F	Anxiety items from the Psychopathology in Autism Checklist (PAC)
Mayes, Gorman, Hillwig-Garcia, and Syed (2013)	Suicide ideation	Normal IQ and ID	Range: 1–16 years; $M = 6.6$ years	665 M 126 F	CASD; Pediatric Behavior Scale (PBS)
Mayes, Calhoun, Murray, Ahuja, and Smith (2011)	Anxiety, depression, irritability	Normal IQ and ID	Range: 6–16 years	1265 M 125 F	PBS
Weissman and Bates (2010)	Bipolar disorder	Normal IQ	Range: 7–13 years	115 M 24 F	K-SADS; CBCL
Davis et al. (2011)	Anxiety	Normal IQ and ID	Range: 2 –14 years; $M = 7.46$ years	72 M 27 F	Checklist from DSM-IV-TR
Vasa et al. (2013)	Anxiety	Normal IQ and ID	Range: 2–17.5 years	1032 M 284 F	CBCL
Jepsen, Gray, and Taffe (2012)	Anxiety, depression, attention-deficit/hyperactivity disorder (ADHD), CDs, Somatic complaints	Normal IQ	Range: 12–18 years	40 M 5 F	CBCL
Helverschou, Bakken, and Martinsen (2009)	Psychosis, depression, anxiety, obsessive compulsive disorder (OCD)	ID	Range: 17–56 years; $M = 35$ years	26 M 9 F	PAC
Thorson and Matson (2012)	Depression, eating disorders	Normal IQ	Range: 2–17 years; $M = 8.36$ years	449 M 180 F	ASD-CC
Matson, Boisjoli, Hess, and Wilkins (2011)	CD, hyperactivity, eating disorders, sleep disorders	Normal IQ and ID	Range: 17–37 months; $M = 27.33$ months	72.2% M 27.8% F	Baby and Infant Screen for Children with aUtIsm Traits–Part 2 (BISCUIT-Part 2)
Matson, LoVullo, et al. (2009)	Depression, eating disorders	Normal IQ and ID	Range: 2–17 years; $M = 8.51$ years	78% M 22% F	ASD-CC
Mazefsky, Kao, and Oswald (2011)	Depression, anxiety, OCD, ADHD	Normal IQ	Range: 10–17 years	82% M 18% F	Children's Depression Inventory (CDI)
Manouilenko et al. (2013)	ADHD	Normal IQ	$M = 30$ years	12 M 11 F	DSM-IV; Structure Interview for Diagnostic Interview (SCID-I); Adult ADHD Self-Report Scale (ASRS)

Mayes, Calhoun, Mayes, and Molitoris (2012)	ADHD	Normal IQ	Range: 2–16 years	816 M 188 F	PBS
Konst, Matson, and Turygin (2013)	ADHD	Normal IQ and ID	Range: 2–18 years	273 M 74 F	ASD-CC
Stratis and Lecavalier (2013)	Depression, anxiety, ADHD, oppositional defiant disorder (ODD)	Normal IQ and ID	Range: 5–17 years	88% M 12% F	Social Communication Questionnaire
Amr et al. (2012)	ADHD, ODD, anxiety, depression, CD, OCD, phobia	Normal IQ and ID	$M = 8$ years	37 M 23 F	Interview based on the DSM-IV-TR criteria; Semi-Structured Clinical Interview for Children and Adolescents (SCICA)
Reiersen, Constantino, Grimmer, Martin, and Todd (2008)		ADHD	Normal IQ	Range: 18–33 years; $M = 23$ years	43% M 57% F
Ronald, Simonoff, Kuntsi, Asherson, and Plomin (2008)	ADHD	Normal IQ	8 years	~3385 M ~3385 F	Conners Hyperactivity Scales; DSM-IV
Reiersen, Constantino, and Todd (2008)	ADHD	Normal IQ	Range: 7–19 years	521 M 330 F	CBCL; Semistructured Psychiatric Interview; DSM-IV
Reiersen, Constantino, Volk, and Todd (2007)	ADHD	Normal IQ	$M = 14.1$ years; twins	587 M 359 F	DSM-IV
Ronald, Edelson, Asherson, and Saudino (2010)	ADHD	Normal IQ	2 years	~312 M ~312 F	CBCL
Rydén and Bejerot (2008)	ADHD	Normal IQ	$M = 30$ years	45 M 39 F	Global Assessment of Functioning; Scales of Personality, SCID-II
Simonoff et al. (2008)	ADHD, anxiety disorders, depression, ODD, CD, tics, trichotillomania	Normal IQ and ID	Range: 10–14 years	112 children	Child and Adolescent Psychiatric Assessment (CAPA); DSM-IV
Sinzig, Bruning, Morsch, and Lehmkuhl (2008)	ADHD	Normal IQ	Range: 6–18 years	86 M 15 F	K-SADS; DSM-IV
Anholt et al. (2010)	ADHD, OCD	Normal IQ	$M = 37$ years	89 M 107 F	DSM-IV; Yale-Brown Obsessive-Compulsive Checklist
Giovinazzo, Marciano, Giana, Curatolo, and Porfirio (2013)	ADHD, Tourette syndrome, anxiety disorders, OCD, psychosis	Normal IQ	$M = 14.9$ years	77 M 11 F Outpatients	K-SADS; CBCL; Conners Hyperactivity Scales; Swanson, Nolan, and Pelham Teacher and Parent Rating Scale, Version IV (SNAP-IV); CDI; Multidimensional Anxiety Scale for Children (MASC)
Hendriksen and Vles (2008)	Duchenne muscular dystrophy	Unspecified	Range: 3–38 years; $M = 11.9$ years	351 M 0 F	Parent-Reported Diagnosis
Sinzig, Morsch, Bruning, Schmidt, and Lehmkuhl (2008)	ADHD	Normal IQ	Range: 6–18 years	68 M 12 F	DSM-IV; ICD-10
Stahlberg, Soderstrom, Rastam, and Gillberg (2004)	Bipolar disorder, schizophrenia, and other psychotic disorders	Normal IQ	Adults	241 outpatients	DSM-IV; ICD-10
Sukhodolsky et al. (2008)	Anxiety disorders	Borderline to profound ID	Range: 5–17 years	144 M 28 F	Child and Adolescent Symptom Inventory (CASI); Aberrant Behavior Checklist (ABC)
Scheirs and Timmers (2009)	ADHD	Generally Normal IQ	$M = 9.6$ years	91 M 24 F	Wechsler Intelligence Scale for Children, Third Edition (WISC-III)
Ames and White (2011)	ADHD	Normal IQ	Range: 7–13 years	48 M 7 F	The Developmental, Dimensional, and Diagnostic Interview (3Di)
Rosenberg, Kaufmann, Law, and Law (2011)	ADHD, anxiety disorders, depression, bipolar disorder, schizophrenia	Normal IQ	Range: 5–18 years	3625 M 721 F	Online Parent Questionnaire
Matson, Mahan, Hess, and Fodstad (2010)	ADHD symptoms	Normal IQ and ID	Range: 16–37 months	63 M 55 F	BISCUIT-Part 2
Lecavalier (2006)	ADHD, anxiety	Normal IQ and ID	Range: 3–21 years	82.6% M 17.4% F	Nisonger Child Behavior Rating Form

Table 1 (*Continued*)

Authors	Type of disorder(s)	I.Q.	Age	Gender	Test(s) used
Yoshida and Uchiyama (2004)	ADHD	Normal IQ and ID	$M = 10.25$ years	48 M 5 F	DSM-IV
Luteijn et al. (2000)	ADHD	Normal IQ	Range: 5–12 years	579 M 103 F	CBCL; Autism Behaviour Checklist; Children's Social Behavior Questionnaire
Mukaddes, Hergüner, and Tanidir (2010)	Depression	IQ > 70	Range: 6–15 years	60 children	K-SADS, Present and Lifetime Version (K-SADS-PL)
Kim, Szatmari, Bryson, Streiner, and Wilson (2000)	Anxiety, mood problems	Normal IQ	Range: 9–14 years; $M = 12$ years	52 M 7 F	Ontario Child Health Study Scales, Revised (OCHS-R)
van Steensel, Bögels, and de Bruin (2013)	ODD, CD, anxiety disorders, mood disorder	Normal IQ and ID	Range: 7–18 years	73 M 7 F	DSM-IV; Structure Clinical Interview for DSM-IV Childhood Diagnoses (KID-SCID)
Larson et al. (2010)	ADHD, tic disorder, developmental coordination disorder, learning disorder	Unspecified	Range: 6–19 years	71 M 20 F	Autism-Tics, AD/HD and other Comorbidities Inventory (A-TAC)
Frazier et al. (2001)	ADHD	Normal IQ	Range: 5–18 years	135 M 30 F	SNAP-IV; K-SADS-PL; Schedule for Affective Disorders and Schizophrenia-Lifetime Version, Modified for the Study of Anxiety Disorders and Updated for DSM-IV (SADS-LAR-IV); DSM-IV; CBCL
Frazier, Doyle, Chiu, and Coyle (2002)	Bipolar disorder, OCD	Normal IQ	13 years	1 M	Clinical interview
Geurts et al. (2008)	ADHD, tic disorders	Normal IQ	Range: 6–13 years	179 M 37 F	Diagnostic Interview Schedule for Children for DSM-IV, parent version (DISC-IV)
Kanne, Abbacchi, and Constantino (2009)	Affective, anxiety, attentional, conduct, oppositional and somatic problems	Unspecified	Range: 1–18 years	298 M 27 F	CBCL; Caregiver/Teacher Report Form (C-TRF) or Teacher Report Form (TRF); Social Responsiveness Scale (SRS)
Handen, Johnson, and Lubetsky (2000)	ADHD	Normal IQ and ID	Range: 5.6–11.2 years	10 M 3 F	Conners Hyperactivity Scales; ABC
Hurtig et al. (2009)	Anxiety, depression, ADHD	IQ > 70	Range: 11–17 years	117 M 143 F	CBCL; Youth Self-Report (YSR); TRF
Guttmann-Steinmetz, Gadow, and DeVincent (2009)	ADHD	Normal IQ	$M = \sim 8.5$ years	100% M 0% F	Child Symptom Inventory-4 (CSI-4)
Gadow, DeVincent, and Drabick (2008)	ODD	Normal IQ	Range: 3–12 years	737 M 197 F	Early Childhood Iventory-4 (ECI-4); CSI-4
Gadow and Drabick (2012)	ODD	Unspecified	Range: 6–18 years	810 M 350 F	CASI
Gadow, Roohi, DeVincent, and Hatchwell (2008)	ADHD, tics, anxiety	M IQ > 70	Range: 4–14 years	58 M 9 F	DSM-IV; CSI-4
Pine, Guyer, Goldwin, Towbin, and Leibenluft (2008)	Mood disorders, anxiety disorders	IQ > 70	Range: 7–17 years	194 M 158 F	Structured Psychiatric Interview; Children's Communication Checklist; Social Communication Questionnaire; SRS
de Bruin, Ferdinand, Meester, de Nijs, and Verheij (2007)	Anxiety disorders, OCD, PTSD, depression, mania, schizophrenia, ADHD, ODD, CD	Normal IQ and ID	Range: 6–12 years	83 M 11 F	DISC-IV
Yerys et al. (2009)	ADHD	Normal IQ	Range: 6–13 years	51 M 19 F	DSM-IV; ADHD Rating Scale
Leyfer et al. (2006)	Mood disorders, anxiety disorders, manic disorders, OCD, ADHD, ODD, adjustment disorders	Normal IQ and ID	Range: 5–17 years	94.29% M 5.71% F	Modified autism-specific version of the K-SADS (Autism Comorbidity Interview- Present and Lifetime Version; ACI-PL)

van Steensel, Bögels, and Dirksen (2012)	Anxiety disorders	Normal IQ	Range: 7–18 years	152 M 85 F	Anxiety Disorder Interview Schedule, Child and Parent version (ADIS-C/P); SCARED; EuroQol-5D (EQ-5D); Children's Social Behavioral Questionnaie (CSBQ)
Hallett et al. (2013)	Anxiety	Normal IQ and ID	Range: 10–15 years	290 M 126 F	The Revised Child Anxiety and Depression Scale (RCADS)
Mattila et al. (2010)	ADHD, CD, ODD, anxiety disorders, OCD, tic disorders, mood disorders, enuresis, encopresis, sleep disorders	IQ > 75	Range: 9–16 years	82 M 26 F	K-SADS
Ooi, Tan, Lim, Goh, and Sung (2011)	Affective problems, anxiety, somatic problems, ADHD, ODD and CD problems	Unspecified	Range: 6–18 years	56 M 15 F	CBCL
Mayes, Calhoun, Murray, and Zahid (2011)	Anxiety, depression	Normal IQ and ID	Range: 1–17 years	85.56% M 14.44% F	CASD; PBS
Pouw, Rieffe, Stockmann, and Gadow (2013)	Depression	IQ > 80	*M* = 11.5 years	100% M	CDI
Tsuji et al. (2009)	Anxiety, depression	Normal IQ	Range: 6–15 years	102 M 26 F	CBCL; CDI; State-Trait Anxiety Inventory for Children (STAIC)
Rieske, Matson, May, and Kozlowski (2012)	Anxiety	Normal IQ	Range: 4–16 years	134 M 47 F	ASD-CC
Caamaño et al. (2013)	Affective disorders, psychotic disorders, anxiety disorders, OCD, enuresis, encopresis, ADHD, ODD, Tic disorder, eating disorders	Normal IQ	Range: 7–17 years	47 M 3 F	K-SADS-PL
Charlot et al. (2008)	Anxiety, OCD, depression, mania	ID	*M* = 39 years	68 M 45 F	The Mood and Anxiety Semi-Structured (MASS) Interview

Note: *M* = mean; IQ = intelligence quotient; M = male; F = female.

defiant disorder (ODD; $n = 11$), conduct disorder (CD; $n = 10$), eating disorder ($n = 6$), tics ($n = 6$), mood disorder ($n = 5$), schizophrenia ($n = 4$), mania ($n = 4$), psychosis ($n = 4$), bipolar disorder ($n = 3$), affective disorder ($n = 3$), somatic problems ($n = 3$), enuresis and encopresis ($n = 2$), sleep disorders ($n = 2$), and posttraumatic stress disorder ($n = 2$). A variety of additional disorders/problems were addressed within one paper. Among these problems were suicidal ideation, unusual fears, Duchenne Muscular Dystrophy, irritability, phobia, sexual disorders, trichotillomania, avoidant behavior, Tourette syndrome, developmental coordination disorder, learning disorder, and adjustment disorder.

Children and adolescents were primarily studied in the papers published to date. Sixty were designed to focus on this group while nine papers focused on adults and one paper reported a mix of children and adults up to 38 years of age. Many psychiatric disorders are age-based. Some conditions develop largely during childhood; others are more prevalent and more severe in adulthood. This fact has obvious implications for the current review and for the study of comorbid psychopathology in the ASD population. For example, it should not be surprising that ADHD, often recognized primarily as a childhood disorder, had been the most frequently studied comorbid psychopathology to date. Other commonly studied problems such as ODD, CD, and eating disorders are seen disproportionately in children and adolescents.

Interestingly, the bulk of the papers studied were with persons evincing normal intelligence quotient (IQ) scores ($n = 39$). The fact that upwards of 70% of individuals with ASD evince intellectual disability (ID; Matson & Shoemaker, 2009) underscores that these papers are not representative of the overall population. Of the remaining papers, five studied persons with intellectual disability only, while 22 papers had a mix of persons with normal IQ and intellectual disabilities. In six papers, the intellectual skills of the participants studied were unspecified.

The vast majority of studies used one or more standardized measures of psychopathology. The picture is complicated by the fact that a broad range of assessment instruments has been used. At this point, there is no consensus on particular methods for best practice in conducting such evaluations. The most common practice to date for identifying comorbid psychopathologies had been the use of the *DSM-IV* criteria ($n = 16$ studies). In most instances, these criteria were used in conjunction with one or more standardized tests ($n = 11$). In five studies, the *DSM-IV* criteria were used as a stand-alone approach. This method is not ideal; the criteria in the *DSM* are intended for use as guidelines only. Unlike standardized tests, the *DSM* criteria have not been subjected to rigorous development of reliability and validity. In two instances, *International Classification of Diseases, Tenth Revision* (*ICD-10*) criteria were used in conjunction with *DSM-IV* criteria. The issue that arises with this approach involves the fact that diagnostic criteria across these classification systems do not always match. This scenario did not qualify as the use of a test in conjunction with the *DSM-IV* criteria and was categorized accordingly.

Forty-five of the studies used only one method for classifying comorbid psychopathology while 27 papers used two or more methods. The second most commonly used method to assess comorbid psychopathology was the *Child Behavior Checklist* (*CBCL*; $n = 13$ studies). This finding should not be particularly surprising as this measure has been in widespread use in the assessment of child psychopathology for some time. However, this scale does not have especially good norms for the

Table 2
Measures of psychopathology used in one study.

ADHD Rating Scale
Adult ADHD Self-Report Scale (ASRS)
Anxiety Disorder Interview Schedule, Child and Parent version (ADIS-C/P)
Autism Behaviour Checklist
Autism-Tics, AD/HD and other Comorbidities Inventory (A-TAC)
Caregiver/Teacher Report Form (C-TRF)
Child and Adolescent Psychiatric Assessment (CAPA)
Children's Communication Checklist
Children's Social Behavior Questionnaire
The Developmental, Dimensional, and Diagnostic Interview (3Di)
Diagnostic Assessment for the Severely Handicapped-II (DASH-II)
Early Childhood Iventory-4 (ECI-4)
EuroQol-5D (EQ-5D);
Global Assessment of Functioning
The Mood and Anxiety Semi-Structured (MASS) Interview
Multi-dimensional Anxiety Scale for Children (MASC)
Nisonger Child Behavior Rating Form
Ontario Child Health Study Scales, Revised (OCHS-R)
The Revised Child Anxiety and Depression Scale (RCADS)
Schedule for Affective Disorders and Schizophrenia-Lifetime Version, Modified for the Study of Anxiety Disorders and Updated for DSM-IV (SADS-LAR-IV)
Semi-Structured Clinical Interview for Children and Adolescents (SCICA)
Semi-Structured Psychiatric Interview
Social Behavior Questionnaire
State-Trait Anxiety Inventory for Children (STAIC)
Wechsler Intelligence Scale for Children, Third Edition (WISC-III)
Yale Brown Obsessive Compulsive Checklist
Youth Self Report (YSR)
Online Parent Questionnaire[a]

[a] Non-test.

ASD population. Thus, measures of comorbidity specific to ASD are being developed and are likely to take the place of the *CBCL* for this population in the near future.

A number of different tests were used in a few studies, but still in more than one paper. These measures included various versions of the *Kiddie Schedule for Affective Disorders and Schizophrenia* (*K-SADS*; *n* = 9 papers), the *Autism Spectrum Disorders – Comorbid for Children* (*ASD-CC*; *n* = 5), the *Pediatric Behavior Scale* (*PBS*; *n* = 4), the *Children Depression Inventory* (*CDI*; *n* = 4), the *Conners Hyperactivity Scale* (*n* = 3), the *Checklist for Autism Spectrum Disorder* (*CASD*; *n* = 3), the *Child Symptom Inventory-4* (*CSI-4*; *n* = 3), the *Swanson, Nolan, and Pelham Teacher and Parent Rating Scale, Version IV* (*SNAP-IV*; *n* = 2), the *Structured Clinical Interview for DSM-IV* (*SCID*; *n* = 2), the *Baby and Infant Screen for Children with aUtIsm Traits – Part 2* (*BISCUIT-Part 2*; *n* = 2), the *Social Communication Questionnaire* (*n* = 2), the *Screen for Child Anxiety Emotional Disorders in Children* (*SCARED*; *n* = 2), the *Pathology in Autism Checklist* (*PAC*; *n* = 2), the *Child and Adolescent Symptom Inventory* (*CASI*; *n* = 2), the *Aberrant Behavior Checklist* (*ABC*; *n* = 2), the *Diagnostic Interview Schedule for Children for DSM-IV* (*DISC-IV*; *n* = 2), the *Teacher Report Form* (*TRF*; *n* = 2), and the *Social Responsiveness Scale* (*SRS*; *n* = 2). Methods utilizing clinical interviews were used in three studies. A large number of test methods were reported in one study only. The measures used in just one study are listed in Table 2.

4. Conclusions

The notion of comorbid psychopathology among persons with ASD is of recent origin. However, the idea has rapidly taken hold and a robust literature on the topic is beginning to develop. These potential overlaps are now generally accepted in the research community. The study of comorbidity between ASD and ADHD has become a particularly hot topic (Matson, Rieske, & Williams, 2013). This phenomenon is particularly ironic given that the *DSM-IV* specifically stated that these diagnoses could not be given together. The *DSM-5* has corrected this error.

One of the major tasks in distinguishing ASD from comorbid disorders is differentiating between the core symptoms of ASD versus the core symptoms of other conditions. Conceptually, disorders such as anxiety disorders and OCD would appear to be particularly difficult to identify. This factor is based upon the potential similarity of how the symptoms of these disorders appear when compared to ASD. However, even in these cases, symptoms present in a sufficiently distinct manner. Each disorder can be distinguished from one another. However, the challenge is that many clinicians do not know how ASD, or some of the other frequent comorbid psychopathologies present.

A number of future research needs exist with respect to the diagnosis of comorbid conditions with ASD. First, there is a need to develop and use measures of psychopathology specific to the ASD population. There should be general measures that address the common types of psychopathology that present among persons with ASD. Because the types of disorders and symptoms of comorbid psychopathology will vary by age, further development of age-specific measures for infants and toddlers, children, adolescents, and adults with ASD are needed. A focus should also be placed on developing follow-up measures that are more detailed and geared toward the assessment of one specific disorder such as ADHD or depression. These measures would serve a three-fold purpose. First, they would help in the initial evaluation process and in establishing the specific diagnosis. Additionally, they would be of value in identifying specific targets for intervention. Lastly, such condition-specific measures could serve as a sensitive measure of treatment progress and outcome.

Future research should also focus on samples of persons who are more representative of the general population of persons with ASD. The current research has disproportionately focused on people with normal IQ. Therefore, there is a demand for more research conducted on individuals with ASD and ID. Researchers know that gender is also a factor in symptom presentation as well as the frequency and type of psychopathology present in the general population. It stands to reason that these differences are also present when comorbid psychopathology occurs among persons with ASD. At present, these differences have barely been acknowledged. Establishing this topic as a priority for study is needed.

Children constitute the bulk of the studies surveyed. The acknowledgment that ASD is a life long disorder is generally well established although some professionals espouse the idea that ASD can be cured. The authors fall in the former versus the latter camp. Having said that, symptoms of comorbid psychopathology most assuredly wax and wane, or become more severe and pronounced over time. Very little is known about these issues at present. Thus, further study addressing comorbid psychopathology across the lifespan is urgently needed. Much has been learned but the surface has only been scratched on what needs to be discovered.

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