DIAGNOSTIC ASSESSMENT OF AUTISM SPECTRUM DISORDER: A CROSS-DISCIPLINARY ANALYSIS

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Abstract

To date, there are no known biological markers to diagnose Autism Spectrum Disorder (ASD). Thus, diagnosis generally relies on behavioural assessment, parental self-report, and considerable clinical judgement on the part of the diagnostician. Very little is known about the assessment methodology Canadian physicians and psychologists use, which is troubling given the high stakes nature of an ASD diagnosis, and its implication for service provision. The current study provides information regarding these practices utilizing an online questionnaire directed to physicians and psychologists. A total of 64 participants (23 physicians and 41 psychologists) completed the survey. Overall, the participants represented an experienced group of professionals who reported a relatively homogenous set of assessment practices. Small differences were noted in the usage of some assessment tools and in the composition of their clinical team. Assessment tool usage differed depending on the estimated cognitive level (above average or below average) of the client population a clinician worked with. Limitations and future directions for the research are discussed. It is hoped that these results will help promote further research into the clinical practice of diagnosticians working with children diagnosed with (or being assessed for) ASD.

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Introduction

Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neurodevelopmental disability that is generally diagnosed in early childhood (American Psychiatric Association [APA], 2013). Children who receive a diagnosis of ASD display impairments in two domains of functioning: social-communication, and repetitive and restrictive behaviours and interests (APA, 2013). These impairments must have been present during early childhood, and they must cause significant impairment in the individual's day to day life. Social impairments are a hallmark of the ASD diagnosis, and as such, significant attention has been devoted to better understanding these impairments from an epidemiological, as well as clinical perspective. The social deficits displayed by children diagnosed with ASD can include: poor eye-contact, difficulty with joint-attention and social orienting, the inability to perceive emotions in peers and others in their environment, limited theory of mind, failure to imitate behavioural models of both adults and peers, and restricted ability to engage in associative, co-operative, and symbolic play (Cicchetti, 2016; Dawson et al., 2004). As basic social skills are generally a pre-requisite to more complex adaptive living skills, and to the ability to learn rapidly in one's environment, such dysfunctions result in negative outcomes for children with ASD beyond the social domain, into adaptive functioning, and thus across the lifespan (Cicchetti, 2016; Fenton et al., 2003).

The pervasive nature of these deficits is quite troubling, given the rising prevalence of ASD diagnoses. In the 1960s, the prevalence of ASD was estimated to be about 1 in every 2,500 children. By the year 2000, this prevalence rate had increased to roughly 1 in 150 children (Baio, 2014). Today, the most recent estimates assert that this rate has increased to 1 out of every 68 children, meaning that roughly 1.5% of children born today will display the symptomatology

consistent with an ASD diagnosis (Baio, 2014; National Autism Spectrum Disorder Surveillance System, 2018). These increasing prevalence rates are thought to reflect a multitude of factors, including assessment practices, greater clinical awareness of ASD symptomatology, as well as broadened diagnostic categories (Matson & Kozlowski, 2011). It should also be noted that fluctuation in prevalence rates could reflect the sampling methodology used (i.e., confirmed diagnosis versus parental self-report or administrative data; Mandell & Lecavalier, 2014). This high prevalence, combined with the detrimental nature of these deficits, highlights the need for efficient and accurate assessment and diagnostic practices, which allow for appropriate intervention to help ameliorate these challenges, and promote positive outcomes for children with ASD, across the lifespan.

Early Intensive Behavioural Intervention (EIBI) is an evidence-based behaviour therapy for young children diagnosed with ASD. During the optimal window of intervention (about age 2-4 years), outcomes for children who receive EIBI have been quite positive (Freeman et al., 2011; Flanagan, Perry & Freeman 2012; Howlin et al., 2009; Perry et al., 2008). The challenge for children with ASD in the province of Ontario, and in Canada as a whole, is the structure of the funding and intervention models. In order to receive ASD services, a diagnosis of ASD from a qualified diagnostician is required. However, the mean age of ASD diagnosis is generally at the upper end for early intervention, or entirely out of this optimal age range, and waitlists of one to two years for an ASD assessment are not uncommon (Oulette-Kuntz et al., 2009). Further, even after diagnosis, the waitlist to receive these services is roughly two to three years, meaning that children tend to be between 5 and 7 before they enter behavioural services (Turan, 2014). Given what is known about age of entry into behavioural services and its subsequent effect on treatment outcomes, these wait times are not only undesirable, but could be potentially

deleterious in regards to therapeutic outcomes. Therefore, access to timely, valid, and reliable diagnostic services are of the utmost importance.

Professional Assessment Standards in ASD

A comprehensive assessment for ASD includes information gathering at a variety of levels. For instance, it is often considered best practice to obtain information regarding an individual's cognitive functioning, adaptive functioning, medical history, and developmental history. Prior to a formal assessment, however, best-practice indicates that regular screening should be conducted in order to detect potential ASD symptomatology as early as possible. Over the past two decades, there have been a variety of practice standards to emerge, in regards to the screening, assessment and diagnosis of ASD. One of the seminal works in the field, conducted by Filipek and colleagues (2000) for the American Academy of Neurology (AAN), outlines the practice parameters of screening and diagnosing ASD. In their practice guidelines, Filipek and colleagues identify a two-level approach to the assessment process, with the first being routine developmental screening. At this level of assessment, the goal is to identify children who are at risk for atypical development in any respect. Further, the goal is to classify the subset of children within the "at-risk" group who are at risk for ASD specifically. In this second level of screening, family doctors and pediatricians should closely monitor the development of the child in question, probing where necessary about developmental milestones, skill development, and parental concerns. More specifically, standardized and psychometrically sound developmental interviews or questionnaires, normed on representative samples should be utilized to obtain an objective measure of the child's development, as a whole. If ASD is suspected, ASD-specific screening questionnaires should be utilized. Due to the social nature of the deficits associated with ASD,

Filipek and colleagues recommend that a formal audiology assessment be conducted to ensure that the deficits being expressed are not simply due to hearing challenges.

The second level of the diagnostic procedure, as recommended by Filipek and colleagues (2000), involves specifically assessing for ASD. At this level of analysis, it is recommended that further medical testing, including genetic screening be conducted. By doing so, the diagnostic team can rule out other developmental disabilities which may have a similar presentation to ASD. It is then recommended to conduct autism-specific assessment, which includes parental interviews, structured observation, cognitive and adaptive behaviour testing, speech and language evaluations, as well as gross and fine motor assessments. Following a positive diagnosis of ASD, a one-year follow up is recommended, to monitor symptom severity, as well as response to intervention. It should be noted that Filipek and colleagues advocate for a multidisciplinary approach to assessment and diagnosis, and assert that any one assessment tool is not sufficient to diagnose ASD.

More recent examinations of the best practice framework regarding ASD assessment have maintained this position, that the assessment process should be multidisciplinary. For instance, in a report by the American Academy of Pediatrics (AAP; Johnson & Myers, 2007), it is suggested that physicians work collaboratively to obtain as holistic a picture as possible of the patient who is being assessed for ASD. Similar to Filipek and colleagues (2000), Johnson and Myers assert that general practitioners and pediatricians have an obligation to conduct thorough surveillance and screening for ASD, especially when the child is at risk. The use of a standardized developmental assessment at regular intervals is recommended, regardless of whether or not parents raise developmental concerns about their child. In this way, physicians can ensure that potential ASD symptoms are identified in an efficient and timely fashion,

allowing for a more detailed assessment. Further, to ensure that children do not "slip between the cracks," the AAP suggests that physicians conduct an ASD-specific standardized screen on all of their patients at 18 months. If, after routine screening, there is reason to be concerned about ASD, the AAP recommends that the child receive a comprehensive evaluation. This evaluation should include a health and behaviour history, physical examination including an audiology exam, developmental and psychometric assessment (including cognitive ability and adaptive behaviour), an assessment of the parent's ability to cope, and their knowledge regarding ASD, and finally lab and genetic screening for common comorbid conditions, or other developmental disabilities which could present in a similar fashion to an ASD (Johnson & Myers, 2007).

Most recently, Volkmar and colleagues (2014) conducted a review and revision of the ASD practice parameters for the Academy of American Child and Adolescent Psychiatry (AACAP). Similarly, to the AAN and the AAP, the AACAP holds the position that routine check-ups and assessments should include questions regarding ASD-like symptomatology and that, if these routine screens result in positive identification of ASD symptoms, a comprehensive diagnostic assessment should be conducted. Comprehensive assessment should include interviews with the child's parents and other close family members, a standardized developmental assessment, as well as ASD-specific assessment tools. This comprehensive assessment should also be multidisciplinary in nature, include medical assessment such as a physical, audiology assessment, and genetic screen, a psychological assessment including cognitive ability and adaptive behaviour, for treatment and intervention planning, as well as speech-language assessment to assess communication deficits in greater detail. It should be noted that the AACAP places a heavy emphasis on the need to keep differential diagnosis in mind throughout the entire assessment process, to ensure a valid and reliable diagnosis. Emphasis is

also placed on differential diagnosis to avoid diagnostic overshadowing, as means to ensure that the diagnostician takes into consideration diagnoses that may actually increase the likelihood of an ASD diagnosis (Volkmar et al., 2014).

There have been some similar Canadian efforts. The Miriam Foundation (2008) conducted a review of the available evidence to construct Canadian best practice guidelines in the assessment and diagnosis of ASD. From their review of the evidence, it was suggested that practitioners who work within this population should conduct screening of children who are at risk for displaying ASD. For instance, children who miss developmental milestones (especially language), or those who have a sibling diagnosed with ASD, should be screened routinely to ensure early detection. Screening, however, should only rely on instruments that are both sensitive, and specific in identifying ASD. Following a positive screen, the child with queried ASD should be referred to an experienced diagnostician, with expertise in assessing and diagnosing the disorder. Similar to the recommendations laid out by the various American professional organizations discussed earlier, the Miriam Foundation review suggests that the more formal assessment should comprise an audiological assessment, a speech-language assessment, as well as a cognitive and developmental assessment. Further, it is suggested that the diagnostician work within the framework of an inter-disciplinary team, where every professional provides input into the final diagnosis, even after their assessment has been completed. In terms of autism-specific measures, the review asserted that a comprehensive assessment must include a thorough developmental history, and the use of at least one standardized parent interview/questionnaire, and one standardized behavioural observation tool. Namely, it was suggested that clinicians consider using the Autism Diagnostic Observation Schedule (ADOS) and the Autism Diagnostic Interview – Revised (ADI-R) in concert, as they are viewed as the

gold-standard assessment instruments in the field. Importantly, it is suggested that clinical judgement be used following the administration of standardized assessment tools. In other words, the diagnostician should not rely on a set of scores to assign a diagnosis, but rather use those scores to inform their judgment regarding the case at hand (The Miriam Foundation, 2008).

Most recently from a Canadian perspective, Anagnostou and colleagues (2015) provided an update review of what constitutes an evidence-based ASD assessment. Similar to previous work conducted in this area, Anagnostou and colleagues assert that assessment and diagnosis should follow a hierarchical model, with all children receiving regular symptomatology surveillance by a primary care physician. For children for whom concerns are identified, a developmental assessment is warranted, which would include record review, child observation, as well as screening questionnaires regarding development and ASD symptomatology. If a screening returns positive results, it would then be warranted to conduct a more comprehensive assessment, led by either a physician or psychologist. At this stage, it is noted that multi-disciplinary team involvement becomes important, to allow for a comprehensive understanding of the child, and could involve speech-language assessment, neurological assessment, genetics testing, and psychological testing, depending on the needs of the child. It should be noted that not all children need every assessment during the diagnostic process. The main goal, however, should be to ensure that differential diagnosis is considered fully. Following an assigned diagnosis of ASD, Anagnostou and colleagues (2015) recommend continued involvement with a multi-disciplinary team to ensure that the child receives the correct supports, services, and intervention, through continued assessment and surveillance.

Taken together, the recommendations provided by various professional bodies, including Canadian authorities, are consistent and quite prescriptive in what they state constitutes best

practice in regards to assessing and diagnosing ASD. Specifically, assessment should follow a bio-psycho-social approach, in which data are gathered at all of these levels. Data should also be collected in as wide-reaching a scope as possible. For instance, data about the child's behaviour in the clinic, while informative, may not be indicative of behaviour in other settings such as at home, or in pre-school. The clinician should consider behaviour across environments, and over time. Further, the process should not be done in isolation by any one practitioner, with any one theoretical orientation to their practice. A multidisciplinary, team-based approach is believed to lead to the highest quality of care. In fact, a best-practice diagnostic assessment cannot be achieved without working from this framework, as an individual professional may not have the ability, qualification, or resources to engage in every activity listed above, for each and every ASD case that presents itself.

ASD Assessment in Practice

While it is clear that a multidisciplinary, comprehensive approach is recommended by most authorities in ASD assessment, it seems as though there is considerable variability in regards to what practices professionals are engaging in (Randall et al., 2016; Skellern, Mcdowell & Schluter, 2005; Taylor et al., 2016). Further, reliance on such a comprehensive approach could have disadvantages. Comprehensive, multidisciplinary assessments, could inadvertently result in increased waitlists for both assessment and intervention (Zwaigenbaum & Penner, 2018) and it could be argued that not all components are required in all cases. Finally, empirical evidence is needed to test the assumption that a multidiciplinary team makes better diagnoses. Stewart, Vigil, Ryst, and Yang (2014) examined the extent to which various health-care professionals' diagnoses agreed with an expert panel of multidisciplinary clinicians. They recruited 20 health care professionals, including five speech-language pathologists, five

occupational therapists, five school psychologists, and five pediatricians. It should be noted that while speech-language pathologists and occupational therapists do not have diagnostic authority, they are commonly involved in the assessment process. The participants were shown videotapes of 15 children being assessed with the ADOS. Of these 15 children, five had been previously diagnosed with ASD by the expert panel, five were not diagnosed with ASD, and five were diagnosed with other emotional or behavioural disorders. Prior to viewing the videos, each participant completed a clinical practice questionnaire, gauging his or her level of experience and perceived competence with assessing and diagnosing ASD. Stewart and colleagues found that, when compared to the expert panel, who synthesized their knowledge to assign a diagnosis together, professionals diagnosing in isolation had relatively low accuracy rates, with school psychologists having the highest mean accuracy of 69%, and pediatricians having the lowest mean accuracy of 59% (refer to Appendix A for definitions regarding various team compositions). The accuracy of the individual practitioner's diagnoses was significantly related to the frequency of interaction these professionals had with ASD. Overall, in terms of sensitivity and specificity, when compared to the trans-disciplinary team, the individual practitioners diagnosed ASD correctly in 71% of cases and did not assign an ASD diagnosis correctly in 63% of cases. While Stewart and colleagues (2014) assert that caution must be exercised in the interpretation of these results due to the small sample size, the results do, indeed, highlight the advantages of assessing in a multidisciplinary team, namely a greater wealth of experience within the population, as well as a larger breadth of diagnostic skills, which may lead to greater sensitivity and specificity in the ASD diagnostic outcome.

Recently, there has been an increased level of research activity into the actual assessment practices of health care professionals who work within this population. Taylor and colleagues

(2016) conducted a survey of 173 health professionals in Australia who assessed and diagnosed ASD, to determine the composition of their assessment team, the logistics of their assessment (i.e., location of assessment), as well as the assessment battery they use during an ASD assessment. The professions sampled in the participant pool included general practice medicine (n = 1), paediatrics (n = 32), psychiatry (n = 4), psychology (n = 75), speech pathology (n = 46), occupational therapy (n = 9), as well as four professionals of undisclosed specialization. It should be noted that physicians were the least well represented profession, even though they are likely the first point of contact for children with queried ASD. Taylor and colleagues (2016) found that, when clinicians worked in a multidisciplinary team, the team was most often comprised of a physician, psychologist, and a speech-language pathologist. Further, clinicians who worked in the multidisciplinary team never diagnosed ASD in isolation, but rather followed a collaborative approach, in which all clinicians discussed the diagnosis following the assessment and assigned the ASD diagnosis together. In contrast, clinicians who did not use a team approach rarely worked collaboratively during the process, but rather worked either in isolation, making the diagnosis alone, or in a sequential format, where they completed their part of the assessment or referred for other assessment components, but did not actively collaborative with the professional(s) conducting the other parts of the assessment. In regards to the location of assessments, 95% of participants reported that the assessments they conducted most frequently took place in the clinic in which they were employed. Multi-site assessments were less common amongst the participants, and of those who reported including multiple sites, 77% noted that they included in-school observations, and 47% indicated that they included in-home observations. Overall, across the entire sample, the median percent of assessments that included an in-school observation was 20%, while the median percent of assessments that included an in-home

observation was 0%, meaning that most children being assessed do not actually receive assessment components outside of the clinic setting. In fact, only 3% of participants said that they included home or school observations for 75% or more of their assessments, again lending support to the hypothesis that multi-site assessments are relatively rare (Taylor et al., 2016).

In regards to actual diagnostic practices, the results presented by Taylor and colleagues (2016) indicated considerable variability. As mentioned above in the section reviewing practice guidelines, audiology assessments are considered best practice. However only 10% of the pediatricians surveyed in this study endorsed conducting them for every case, while 55% endorsed conducting them frequently or usually in an ASD assessment. Similarly, medical and genetic screening are indicated as best practice, however only 19% of pediatricians indicated that they include these components in every ASD assessment they conduct, while 71% indicated that they usually do so. Psychologists, as a profession, were most likely to include standardized developmental (35%), cognitive (70%), adaptive (72%) and ASD specific (90%) assessment measures when compared to the other professions. Pediatricians administered these assessment tools to a much lesser extent, with adaptive assessments being the least likely (19%) and ASD specific assessments being the most (57%). To account for ability and qualification to administer certain types of assessments, Taylor and colleagues (2016) also asked clinicians if they reviewed the results of these assessments conducted by other professionals. Surprisingly, only 68% of the participants indicated that they reviewed assessment results before assigning a diagnosis and, of those clinicians who do not conduct assessments, only 35% indicated that they always reviewed assessment results. There was no cross-disciplinary difference in the proportion of individuals who reviewed assessment results before diagnosing. Although this study is exploratory in nature, it provides evidence that best practices in assessment may not be so common in practice. Further,

it provides evidence that the recommended multidisciplinary collaboration (Stewart et al., 2014) is not occurring to the degree recommended, at least in this Australian sample.

Skellern, and colleagues (2005) examined the assessment and diagnostic methodology of medical professionals, also in Australia, most likely to assign a diagnosis of ASD. They distributed a questionnaire to 79 pediatricians and 26 child psychiatrists, asking them about their diagnostic practices. Skellern et al. (2005) found a great degree of heterogeneity in the practices of the surveyed medical professionals. A large number of the professionals included indirect assessments in their assessment battery. Specifically, 99% included informal reports from parents, and 97% included informal reports from other informants such as teachers. Further, 89% of the physicians said that they refer out to an allied health professional for an assessment, where appropriate, although they may not work collaboratively with these professionals. Surprisingly, only 19% of the respondents indicated that they included an autism-specific assessment instrument, and 45% indicated that they used a structured autism-specific parent questionnaire or interview. Although Skellern and colleagues (2005) did not survey psychologists, who also have diagnostic authority in most jurisdictions, they demonstrate a similar finding to that of Taylor and colleagues in regards to physicians, in that diagnostic practices are heterogeneous, and that recommended ASD assessment tools are seldom implemented in practice. It should be noted, however, that the majority of physicians in this study worked within a multidisciplinary team, referring when appropriate. Given the relatively small sample size, these results should be taken with caution, as they may not be representative of Australian physicians.

Randall and colleagues (2016) utilized questionnaires to examine the ASD diagnostic process of 124 Australian pediatricians. Similar to the results found by Skellern and colleagues (2005), Randall and colleagues found that the majority of pediatricians reported using informal

observation (90%), parent report (86%), and teacher report (75%) as their most common assessment methods when conducting an ASD assessment. In regards to their specific assessment practices, participants were asked about the proportion of cases in which they utilized certain practices. They found that 64% of the pediatricians reported reviewing the results of a speech assessment in more than half of their cases, while only 52% utilized results from a cognitive assessment in more than half of cases, when formulating their diagnosis. Even less common was the use of structured autism-specific instruments. For instance, 36% of the pediatricians reported using the Childhood Autism Rating Scale (CARS) in more than half of their cases, and 34% reported using the ADOS in more than half of their cases. Further, the majority of the sample reported rarely or never using standardized interviews (80%), observational tools (70%), or parent interviews (51%). This information, however, is not being gained through referrals, given the fact that 25% of the sample worked within a multidisciplinary team more than half of the time, and that a third reported that they mostly, or sometimes made an ASD diagnosis without allied health input/consultation (Randall et al., 2016).

Ward, Sullivan and Gilmore (2016) conducted a further study of the diagnostic practices of pediatricians, psychiatrists, and psychologists practising in Australia. By utilizing a questionnaire asking about their perceived barriers to assessment, as well as about their use of diagnostic instruments, Ward and colleagues (2016) found that there was considerable variability in how the three professions approached assessment. For instance, psychologists were the least likely of the three professions to follow a “wait and see” approach when unsure about a diagnosis, and spent significantly longer conducting the ASD assessment before arriving at a diagnostic decision. Further, psychologists were significantly more likely than both pediatricians and psychiatrists to use both standardized interviews and observation tools as part of the

assessment. Psychiatrists and pediatricians, however, were likely (81% and 63% respectively) to consult multidisciplinary reports during their diagnostic process, meaning they would obtain the information from such assessments, if a psychologist or other qualified professional had conducted them. Interestingly, the majority of professionals from all three groups found diagnosis under 2 years of age to be difficult, and found the gold standard assessment tools (i.e. ADOS and ADI-R), and the DSM criteria to be of a lower utility when assessing a child under the age of 3. Professionals from all three professions also endorsed a much higher level of confidence in their ability to diagnose ASD when the child they were assessing was above the age of 3 (Ward et al., 2016). This hesitancy and unease with diagnosing ASD in children 3 years of age or younger is problematic, given the findings in the intervention literature that the optimal window for intervention is between 2 and 4 years of age, and the children outside of this range generally demonstrate smaller gains in adaptive and cognitive functioning (Blacklock et al., 2014; Granpeesheh et al., 2009).

The Present Study

While the literature provides evidence that diagnostic practices are heterogeneous and that best practices are not always adhered to, with respect to ASD assessment and diagnosis, it should be noted that these data are almost all Australian in origin. Very little is known about how Canadian clinicians with diagnostic authority, namely physicians and clinical psychologists, assess for and diagnose ASD, although one of the best practice guidelines was Canadian in origin (i.e., Miriam Foundation, 2008). The current study aims to remedy this gap in the knowledge base and provide information on the assessment and diagnostic practices of these two groups of Canadian diagnosticians. Due to the exploratory nature of this study, there are no a priori hypotheses being tested. The main research questions, however, include:

1. Assessment Practices
    a. What assessment practices are Canadian physicians and psychologists using when they are working on a queried ASD diagnostic case?
    b. Which specific ASD measures do they typically use?
2. Are physicians and psychologists working within a multidisciplinary team when conducting an assessment, or do they utilize assessment information obtained from other professionals?
3. Do their assessment practices change, depending on the perceived, or actual cognitive and adaptive functioning level of the child in question?

It is hoped that the results of this survey study will provide much needed information on what is actually happening in the field of ASD assessment and diagnosis in Canada. It is imperative to have a more concrete understanding of assessment practices in this field, to ensure that limited provincial resources are being allocated towards ASD intervention in an efficient manner. Further, it is hoped that research into these practices can help facilitate a discussion regarding greater reliability among the health professions with diagnostic authority, as well as inform further education and professional developmental regarding ASD assessment and diagnostic practices.

Method

Recruitment Process

Participants from two professions: psychology and medicine were recruited using snowball sampling. Recruitment included various sub-specializations in psychology (including clinical psychology, neuropsychology, and school psychology) and medicine (including pediatrics, developmental pediatrics, psychiatry, family medicine, and neurology). In order to obtain data that were as representative as possible regarding the assessment and diagnostic

practices of these Canadian clinicians, pan-Canadian recruitment was attempted, by soliciting provincial and federal professional groups. For example, to reach psychologists, the Canadian Psychological Association, and the Ontario Psychological Association, were contacted. Professional associations were solicited via e-mail and the nature of the current research was explained (Appendix B). If the organization agreed to assist with survey dissemination, a link to the questionnaire as well as a brief prospectus were forwarded to the contact person (Appendix C). This process was repeated for various federal and provincial professional associations, as well as with professional contacts held by the author and the supervisory committee (refer to Appendix D for a list of organizations that were solicited). Participation in the study was both voluntary and anonymous. No identifying information was collected throughout the recruitment process, ensuring that completion of the survey could not be linked back to the individual medical professional.

From these recruitment efforts, 83 individuals began completing the survey, with 64 providing complete data which was used for analyses. Fifteen participants met the exclusion criteria, with 4 indicating that they did not work primarily with children and/or adolescents, 3 indicating that they did not assess and/or diagnose ASD, and 8 indicating that their caseload was less than 20% ASD. It should be noted that the exclusion criterion regarding percentage of caseload was removed midway through recruitment, as a large number of participants were being screened out. Following removal of this criterion, only three participants indicated that they had a caseload that was comprised of less than 20% ASD. Five participants provided an incomplete data set (< 50% of the survey completed) and were removed from the study; four only providing consent then exited the survey, and one only providing demographic information and no responses on assessment and diagnosis questions. One additional participant was removed from

analyses as he or she indicated they were a Board-Certified Behaviour Analyst (BCBA). BCBAs are not authorized to make diagnoses, and thus did not meet the inclusion criteria for this study. After these deletions, 62 complete survey participants remained.

Participants

The 62 participants represented professionals from both medicine and psychology. Overall, 23 participants identified as a physician, and 41 identified as a psychologist. The sample obtained represented a relatively experienced group of professionals, with physician participants reporting between one and 44 years of practice (M = 13.4, SD = 11.6), and psychologists reporting between one and 35 years of practice (M = 13.6, SD = 9.2; $t[61] = -0.09$, $p = .92$). The participants were asked about their geographic location (see Table 1), medical or psychological specialty (Table 2 and 3), education level (Table 4), as well as their current employment setting (Table 5). It should be noted that participants indicating "other" as their workplace frequently endorsed working in children's rehabilitation facilities, and childhood community agencies.

Table 1

Participant Geographic Location

Province	Physicians *n* (%)	Psychologists *n* (%)
Alberta	0	7 (17)
British Columbia	0	5 (12)
Newfoundland	0	1 (2)
Nova Scotia	1 (4)	6 (15)
Ontario	21 (92)	21 (51)
Quebec	1 (4)	0

Participant Geographic Location

Saskatchewan	0	1 (2)
Total	23	41

Table 2

Participant Medical Specialty

Specialty	Number of Physicians *n* (%)
Developmental Pediatrics	17 (74)
Neurology	1 (4.5)
Pediatrics	4 (17)
Psychiatry	1 (4.5)
Total	23

Table 3

Participant Psychological Specialty

Specialty	Number of Psychologists *n (%)*
Clinical Developmental Psychology	27 (66)
General Clinical Psychology	12 (29)
School Psychology	2 (5)
Total	41

Table 4

Participant Education Level

Degree Earned	Physicians *n (%)*	Psychologists *n (%)*
Ph.D. / Psy.D.	0	37 (90)
M.D. and Ph.D.	3 (13)	0
M.D.	20 (87)	0
Master's Degree	0	4 (10)

Table 5

Participant's current work environment

Work Setting	Physicians *n (%)*	Psychologists *n (%)*
Hospital	15 (65)	13 (32)
Private Practice	6 (26)	24 (59)
Community mental health centre	0	3 (7)
Education	1 (4)	4 (10)
Post-secondary	0	2 (5)
LTC facility – children	1 (4)	1 (2)
Academia	5 (22)	4 (10)
Other	9 (39)	5 (12)

Note: participants could endorse more than one current work setting, and thus % does not add up to 100% of participants.

Materials

The questionnaire in this study was administered online, through the use of Qualtrics. By administering the survey online, it was hoped that the response effort of completion was minimized. The questionnaire was comprised of four distinct parts: demographics, composition of the assessment team, components of the assessment (broad-based), and components of the assessment (specific). Please refer to Appendix E for a copy of the full questionnaire.

The demographics section included questions pertaining to the clinician's education and experiences. It also included questions about their perceived competence in making an ASD diagnosis. The assessment team section probed the extent to which the clinician works within a multidisciplinary team, and who exactly comprises the team, if there is one. When asked about the components of their assessment more broadly, clinicians were asked to indicate the average duration of their assessment before arriving at a diagnosis, the degree to which multiple environments are utilized in the assessment process, and which broad-based methods (i.e., interviews, in-situ observation), they use when they assess for ASD. After the clinicians were finished completing the broad questions listed above, they were asked if they would like to continue with the survey to answer more specific questions regarding assessment tools. If they chose no, the survey concluded, ending their participation. If they chose yes, they continued on to the more specific section. In the specific components section, the clinician was asked to identify the specific methodology that he or she may use in the assessment process. For instance, in this section respondents were asked about autism-specific instruments such as the Autism Diagnostic Observation Schedule (ADOS; Lord, DiLavore & Gotham, 2012) or the Autism Diagnostic Interview – Revised (ADI-R; Rutter, Le Couteur & Lord, 2003), and others, and the extent to which they are used.

Procedure

Once the participants read the online consent form, and provided their informed consent, they were routed to the online questionnaire administered through Qualtrics. As part of the initial screening, participants were asked whether or not they assess for, and diagnose ASD as part of their clinical practice. If they indicated that they do not, the questionnaire terminated, ending their participation. Further, participants were asked if they primarily work with children and or adolescents, and what proportion of their caseload over the past two years has been ASD assessment and diagnosis. As mentioned above, participants were screened out if they did not work with children, and originally if their caseload was less than 20% ASD. This last criterion was later removed due to a higher number (n = 9) of participants being excluded. These exclusion criteria were set up to ensure some degree of professional continuity amongst the participants. Essentially, these exclusion criteria ensured that the sample obtained represented Canadian clinicians who assessed for and diagnosed ASD in children as a regular part of their work.

Participants who did meet the exclusion criteria were then forwarded into the main questionnaire and proceeded through each of the three main sections. Once participants completed the broad assessment questions, they were asked if they wished to continue on to the specific assessment questions. If they indicated that they wanted to continue, they proceeded to finish the final section of the survey. Those who indicated that they did not want to continue were able to terminate the survey at that time (n = 8). Upon completion of the questionnaire, the results were recorded and stored in the online Qualtrics database. At this point, participants were able to indicate whether they wished to enter their name into a draw for a $25 Starbucks gift card.

Statistical Analyses

Prior to conducting analyses, the data were screened for input errors, impossible values, and missing data. Input and improbable data errors were screened for using the "explore" function in SPSS, looking for impossible values in both the "minimum" and "maximum" values on each item. No impossible values or input errors were detected. In addition to these screening measures, questionnaire completion time was also examined, to screen out participants who responded to the survey in very quick fashion (i.e., less than 3 minutes). No participants were screened out due to quick completion time. Analyses of group membership were also conducted to ensure that the sample was comprised of professions from both desired groups.

Following data screening, analyses were conducted on the obtained data, including descriptive analysis of raw percentage of participants endorsing various choices in a question, as well as chi-square analyses to determine whether engaging in certain assessment activities and practices was dependent on one's professional affiliation. For questions that asked about the percentage of cases clinicians engaged in a particular assessment practice, the choices were collapsed into two variables; one representing less than 60% of the time, and the other representing 60% or more of the time. Sixty percent was selected as the dichotomization point, as 60% represents a commonly used procedure. Similarly, for questions asking about comfort level around diagnoses, comfort level was dichotomized to comfortable and uncomfortable, collapsing five comfort categories into two. This allowed for the data to meet the assumptions of chi square analysis. In cases where the data did not meet the assumptions of chi square, Fisher's exact test was utilized, to correct for expected values of less than 5. To answer research question three, participants' responses to a question regarding the cognitive level of the clients was dichotomized to "average and above" and "below average," similar to the correction discussed

above. This dichotomization was necessary, as there was not sufficient spread across all five original levels to meet the assumptions of chi square analysis. Further, analyses of assessment practices based upon adaptive level were not possible, as 58 (91%) participants indicated that the children they assessed were below average in terms of adaptive function.

Results

Research Question 1: Assessment Practices

Research question 1a: broad assessment procedures. The questionnaire asked participants about the logistics (i.e., assessment environment and time spent assessing) around their ASD assessment. To determine the nature of the participant group obtained, participants were also asked about their comfort level performing assessment activities within the ASD population. Overall, the sample indicated a high degree of comfort in both assessing for and diagnosing ASD. More specifically, 100% of physicians (n = 23) and psychologists (n = 41) endorsed feeling comfortable performing these activities. Similarly, 91% of physicians (n = 21), and 90% (n = 37) of psychologists indicated that they were comfortable diagnosing comorbid mental health disorders in children with ASD. In regards to comfort level in diagnosing a comorbid intellectual disability (ID), 52% (n = 12) of physicians and 95% of psychologists (n = 39) said that they were comfortable doing so. Comfort level in diagnosing a comorbid ID was significantly dependent on occupational group, with psychologists endorsing a higher level of comfort than physicians (X^2 [2] = 18.4, $p < .001$).

The majority of psychologists (78%, n = 31) indicated that they assess children in multiple settings at least some of the time. Comparatively, only 43% of physicians (n = 10) indicated that they do so (see Table 6). Propensity to assess in multiple environments was dependent on occupational group, with psychologists being more likely to endorse assessing in multiple environments, at least some of the time (X^2 [2] = 7.18, p = .03). For those who

indicated that they sometimes assess in multiple environments, the majority of participants indicated that they do so if the case warrants it due to clinical complexity, and if resources allow. Participants were also asked about the amount of time they spent on a typical ASD assessment. Fisher's exact test indicated that psychologists were more likely to spend longer on their assessment than physicians ($p = .012$; Table 7).

Table 6

Do you assess in multiple settings?

Response	Physicians *n* (%)	Psychologists *n* (%)
Yes	3 (13)	14 (34)
No	13 (57)	10 (24)
Sometimes	7 (30)	17 (42)

Table 7

Time spent assessing an ASD case

Time	Physicians *n* (%)	Psychologists *n* (%)
1-4 hours	14 (61)	11 (27)
5-9 hours	8 (35)	17 (41)
10-14 hours	0	9 (22)
> 15 hours	1 (4)	4 (10)

All psychologists and the majority of physicians indicated that they reviewed previously collected cognitive, adaptive, and ASD specific assessment data when formulating an ASD diagnosis (Table 8). Fisher's exact test indicated that reviewing both cognitive ($p < .0001$) and

adaptive (p = 0.003) assessment data were dependent on occupational group, with psychologists being more likely to review both types of data than physicians. Further, chi square analyses revealed that psychologists were more likely than physicians to report reviewing cognitive (X^2 [1] = 11.13, p = .001) and adaptive (X^2 [1] = 8.32, p = .004) data, and Fisher's exact test indicated that psychologists were also more likely to use ASD-specific assessment data (p = .03) in 60% or more of cases.

Table 8

Types of assessment results reviewed

Assessment Results	Physicians *n* (%)		Psychologists *n* (%)	
	Yes	No	Yes	No
Cognitive Assessment Data	15 (68)	7 (32)	40 (100)	0 (0)
Adaptive Assessment Data	18 (82)	4 (18)	39 (100)	0 (0)
ASD-specific Assessment Data	21 (96)	1 (4)	40 (100)	0 (0)

Participants were also asked about the array of general practices they use while conducting an ASD assessment, and whether they conduct the assessment method personally, refer out, or review the material if it is available (Table 9). The majority of physicians and psychologists indicated that they personally conduct intake interviews with the parent and child, review previous medical, psychological and educational reports, conduct in-situ observation of the child, adaptive skills assessment, and specific ASD assessments. Both groups also indicated that they primarily utilize DSM-5 diagnostic criteria for ASD. Fisher's exact test indicated that physicians were more likely than psychologists to indicate that they obtain genetic screen data (78%, n =17; p < .001), and audiological data (87%, n = 19, p < .001) either through direct

collection or referral. It should be noted that, in many jurisdictions, psychologists are unable to make a referral for medical services such as a genetic screen. Despite these limitations to practice, the majority of psychologists indicated that they reviewed genetic screen (50%, *n* = 20) and audiological assessments (68%, *n* = 27) if they were readily available to them. The majority of psychologists (78%, *n* = 31) indicated that they complete a cognitive assessment as part of the overall assessment procedure.

Table 9

Broad assessment methodology

Assessment Method	Degree of importance	Physicians (*n* = 22) *n* (%)	Psychologists (*n* = 40) *n* (%)
Intake interview with parent/caregiver	Personally conduct	22 (100)	34 (85)
	Refer	0	2 (5)
	Review if available	0	3 (7.5)
	Do not include	0	1 (2.5)
Intake interview with the child/client	Personally conduct	20 (91)	27 (67.5)
	Refer	2 (9)	3 (7.5)
	Review if available	0	4 (10)
	Do not include	0	6 (15)
Review of previous medical reports	Personally conduct	20 (91)	33 (82.5)
	Refer	0	3 (7.5)
	Review if available	2 (9)	4 (10)
	Do not include	0	0
Review of previous psychological reports	Personally conduct	20 (91)	36 (90)
	Refer	0	2 (5)
	Review if available	2 (9)	2 (5)
	Do not include	0	0
Review of previous education reports	Personally conduct	20 (91)	34 (85)
	Refer	0	3 (7.5)
	Review if available	2 (9)	3 (7.5)
	Do not include	0	0

Broad assessment methodology			
Audiology assessment	Personally conduct	3 (13.5)	1 (2.5)
	Refer	16 (73)	7 (17.5)
	Review if available	3 (13.5)	27 (67.5)
	Do not include	0	5 (12.5)
Genetic screen	Personally conduct	10 (45.5)	0
	Refer	7 (32)	7 (17.5)
	Review if available	2 (9)	20 (50)
	Do not include	3 (13.5)	13 (32.5)
In-situ observation of the child/client	Personally conduct	20 (91)	31 (77.5)
	Refer	0	3 (7.5)
	Review if available	1 (4.5)	3 (7.5)
	Do not include	1 (4.5)	3 (7.5)
Cognitive assessment	Personally conduct	0	31 (77.5)
	Refer	10 (45.5)	6 (15)
	Review if available	11 (50)	2 (5)
	Do not include	1 (4.5)	1 (2.5)
Language function assessment	Personally conduct	2 (9)	9 (22.5)
	Refer	13 (59)	15 (37.5)
	Review if available	7 (32)	15 (37.5)
	Do not include	0	1 (2.5)
Adaptive skills assessment	Personally conduct	11 (50)	37 (92.5)
	Refer	5 (23)	3 (7.5)
	Review if available	4 (18)	0
	Do not include	2 (9)	0
Social-emotional broad-based assessment	Personally conduct	9 (41)	30 (75)
	Refer	3 (13.5)	5 (12.5)
	Review if available	3 (13.5)	5 (12.5)
	Do not include	7 (32)	0
Specific social-emotional assessment	Personally conduct	6 (27.5)	23 (57.5)
	Refer	2 (9)	5 (12.5)
	Review if available	3 (13.5)	9 (22.5)
	Do not include	11 (50)	3 (7.5)
Behavioural Assessment	Personally conduct	2 (9)	17 (42.5)
	Refer	5 (23)	7 (17.5)
	Review if available	5 (23)	10 (25)
	Do not include	10 (45)	6 (15)

Broad assessment methodology

ASD specific assessment	Personally conduct	18 (82)	38 (95)
	Refer	4 (18)	2 (5)
	Review if available	0	0
	Do not include	0	0
DSM-IV-TR criteria	Personally conduct	4 (18)	15 (37.5)
	Refer	0	0
	Review if available	0	5 (12.5)
	Do not include	18 (82)	20 (50)
DSM-5 Criteria	Personally conduct	22 (100)	38 (95)
	Refer	0	0
	Review if available	0	0
	Do not include	0	2 (5)

Physicians and psychologists provided further information regarding the percentage of cases in which they use a particular assessment modality (Table 10). All physicians (100%, n = 22) and the majority of psychologists (95%, *n = 37)* indicated that they conducted an intake interview with parents in more than 60% of cases. Similarly, the majority of physicians (73%, n = 16) and psychologists (64%, n = 21) conducted an interview with the child in more than 60% of cases. Medical, psychological, and educational file review were commonly reported methods for both professions, as were in-situ observation of the child, ASD specific measures, and utilization of the DSM-5 criteria. Physicians were more likely to review audiological (X^2 [1] = 21.85, $p < .001$) and genetic screen (X^2 [1] = 9.81, $p = .002$) data in 60% or more of cases. Psychologists were more likely to review cognitive data in 60% or more of cases (X^2 [1] = 18.85, $p < .001$). Only three physicians indicated that they used the DSM-IV-TR in any capacity, while 20 psychologists indicated that they still referenced these diagnostic criteria. It should be noted that all physicians and the large majority of psychologists (95%, n = 38) indicated that they utilize the DSM-5.

Table 10

Frequency of broad assessment methodology usage

Assessment Method	Frequency of use	Physicians *n* (%)	Psychologists *n* (%)
Intake interview with parent/caregiver (Physician *n* = 22 Psychologist *n* = 39)	< 20% of cases	0	2 (5)
	21-40% of cases	0	0
	41-60% of cases	0	0
	61-80% of cases	0	1 (3)
	>80% of cases	22 (100)	36 (92)
Intake interview with the child/client (Physician *n* = 22 Psychologist *n* = 34)	< 20% of cases	1 (4.5)	3 (9)
	21-40% of cases	2 (9)	7 (20)
	41-60% of cases	3 (14)	3 (9)
	61-80% of cases	1 (4.5)	2 (6)
	>80% of cases	15 (68)	19 (56)
Review of previous medical reports (Physician *n* = 22 Psychologist *n* = 40)	< 20% of cases	0	2 (5)
	21-40% of cases	1 (4.5)	1 (2.5)
	41-60% of cases	1 (4.5)	0
	61-80% of cases	2 (9)	5 (12.5)
	>80% of cases	18 (82)	32 (80)
Review of previous psychological reports (Physician *n* = 22 Psychologist *n* = 40)	< 20% of cases	1 (4.5)	0
	21-40% of cases	1 (4.5)	1 (2.5)
	41-60% of cases	1 (4.5)	5 (12.5)
	61-80% of cases	2 (9)	5 (12.5)
	>80% of cases	17 (77.5)	29 (72.5)
Review of previous education reports (Physician *n* = 22 Psychologist *n* = 40)	< 20% of cases	0	0
	21-40% of cases	2 (9)	4 (10)
	41-60% of cases	2 (9)	1 (2.5)
	61-80% of cases	2 (9)	6 (15)
	>80% of cases	16 (73)	29 (72.5)
Audiology assessment (Physician *n* = 22 Psychologist *n* = 35)	< 20% of cases	2 (9)	15 (43)
	21-40% of cases	1 (4.5)	9 (26)
	41-60% of cases	0	3 (9)
	61-80% of cases	5 (23)	2 (9)
	>80% of cases	14 (63.5)	5 (14)
Genetic screen (Physician *n* = 19 Psychologist *n* = 27)	< 20% of cases	2 (10.5)	17 (63)
	21-40% of cases	3 (6)	3 (11)
	41-60% of cases	1 (5)	1 (4)
	61-80% of cases	2 (10.5)	3 (11)
	>80% of cases	11 (58)	3 (11)

Frequency of broad assessment methodology usage

In-situ observation of the child/client (Physician *n* = 21 Psychologist *n* = 37)	< 20% of cases	0	4 (11)
	21-40% of cases	1 (5)	4 (11)
	41-60% of cases	0	3 (8)
	61-80% of cases	0	5 (13.5)
	>80% of cases	20 (95)	21 (56.5)
Cognitive assessment (Physician *n* = 21 Psychologist *n* = 39)	< 20% of cases	9 (38)	1 (2.5)
	21-40% of cases	5 (24)	2 (5)
	41-60% of cases	2 (10)	3 (8)
	61-80% of cases	3 (14)	4 (10)
	>80% of cases	3 (14)	29 (74.5)
Language function assessment (Physician *n* = 22 Psychologist *n* =39)	< 20% of cases	2 (9)	7 (18)
	21-40% of cases	2 (9)	8 (20.5)
	41-60% of cases	5 (23)	6 (15.5)
	61-80% of cases	4 (18)	4 (10)
	>80% of cases	9 (41)	14 (36)
Adaptive skills assessment (Physician *n* = 20 Psychologist *n* = 39)	< 20% of cases	1 (5)	0
	21-40% of cases	6 (30)	3 (8)
	41-60% of cases	5 (25)	3 (8)
	61-80% of cases	2 (10)	1 (3)
	>80% of cases	6 (30)	32 (82)
Social-emotional broad-based assessment (Physician *n* = 15 Psychologist *n* = 40)	< 20% of cases	2 (13)	4 (10)
	21-40% of cases	2 (13)	3 (7.5)
	41-60% of cases	3 (20)	6 (15)
	61-80% of cases	3 (20)	3 (7.5)
	>80% of cases	5 (33)	24 (60)
Specific social-emotional assessment (Physician *n* = 11 Psychologist *n* = 37)	< 20% of cases	3 (27)	9 (24)
	21-40% of cases	2 (18)	8 (22)
	41-60% of cases	2 (18)	5 (14)
	61-80% of cases	1 (9)	4 (11)
	>80% of cases	3 (27)	11 (30)
Behavioural Assessment (Physician *n* = 12 Psychologist *n* = 34)	< 20% of cases	7 (58)	12 (35)
	21-40% of cases	1 (8)	5 (15)
	41-60% of cases	2 (17)	7 (21)
	61-80% of cases	2 (17)	3 (9)
	>80% of cases	0	7 (21)

Frequency of broad assessment methodology usage

ASD specific assessment	< 20% of cases	0	0
(Physician *n* = 22	21-40% of cases	0	0
Psychologist *n* = 40)	41-60% of cases	1 (4.5)	0
	61-80% of cases	3 (13.5)	2 (5)
	>80% of cases	18 (82)	38 (95)
DSM-IV-TR criteria	< 20% of cases	0	5 (25)
(Physician *n* = 3	21-40% of cases	0	2 (10)
Psychologist *n* = 20)	41-60% of cases	0	2 (10)
	61-80% of cases	0	1 (5)
	>80% of cases	3 (100)	10 (50)
DSM-5 Criteria	< 20% of cases	0	0
(Physician *n* = 22	21-40% of cases	0	0
Psychologist *n* = 38)	41-60% of cases	0	0
	61-80% of cases	0	2 (5)
	>80% of cases	22 (100)	34 (95)

Note: only participants who indicated that they use the assessment method were asked how often they used it.

Participants also rated how important each piece of information was when they were later formulating their diagnosis (Table 11). All physicians (100%, *n* = 22) and the majority of psychologists (95%, *n* = 37) noted that a caregiver interview was important to their diagnostic decision making. Similarly, physicians (87% *n* = 19) and psychologists (81%, *n* = 27) said the same regarding an intake interview with the child. Consistent with the large number of participants who endorsed completing various file reviews, Fisher's exact text indicated that there was no difference in how important the groups viewed these data, as the majority of both professional groups indicated the medical (p = .29), psychological (p = .53), and educational (p = .65) record reviews were important for their diagnostic decisions. There was no difference in how important the two groups found audiological (X^2 [1] = 3.00, p = .08) and genetic (X^2 [1] = .07, p = .79) assessment data. Psychologists, however, viewed cognitive data as more important to their diagnostic decision making than physicians (X^2 [1] = 19.66, p = <.001).

Table 11

Importance of broad assessment practices

Assessment Method	Importance	Physicians *n* (%)	Psychologists *n* (%)
Intake interview with parent/caregiver (Physician *n* = 22 Psychologist *n* = 39)	Not at all Important	0	0
	Unimportant	0	0
	Neutral	0	2 (5)
	Important	1 (4.5)	2 (5)
	Very Important	21 (95.5)	35 (90)
Intake interview with the child/client (Physician *n* = 22 Psychologist *n* = 34)	Not at all Important	0	0
	Unimportant	0	0
	Neutral	3 (13.5)	7 (20.5)
	Important	3 (13.5)	8 (23.5)
	Very Important	16 (73)	19 (56)
Review of previous medical reports (Physician *n* = 22 Psychologist *n* = 40)	Not at all Important	0	0
	Unimportant	0	0
	Neutral	0	4 (10)
	Important	11 (50)	23 (57.5)
	Very Important	11 (50)	12 (32.5)
Review of previous psychological reports (Physician *n* = 22 Psychologist *n* = 40)	Not at all Important	0	0
	Unimportant	0	0
	Neutral	0	1 (2.5)
	Important	10 (45.5)	17 (43.5)
	Very Important	12 (54.5)	21 (54)
Review of previous education reports (Physician *n* = 22 Psychologist *n* = 40)	Not at all Important	0	0
	Unimportant	0	0
	Neutral	1 (4.5)	4 (10)
	Important	8 (36.5)	20 (50)
	Very Important	13 (59)	16 (40)
Audiology assessment (Physician *n* = 22 Psychologist *n* = 35)	Not at all Important	0	3 (8.5)
	Unimportant	0	1 (3)
	Neutral	4 (18)	10 (28.5)
	Important	4 (18)	18 (51)
	Very Important	14 (64)	3 (9)
Genetic screen (Physician *n* = 19 Psychologist *n* = 27)	Not at all Important	0	2 (7.5)
	Unimportant	0	0
	Neutral	7 (37)	9 (33)
	Important	10 (52.5)	14 (51)
	Very Important	2 (10.5)	2 (7.5)

Importance of broad assessment practices

In-situ observation of the child/client (Physician *n* = 21 Psychologist *n* = 37)	Not at all Important	0	0
	Unimportant	0	0
	Neutral	0	5 (13.5)
	Important	4 (19)	11 (29.5)
	Very Important	17 (81)	21 (57)
Cognitive assessment (Physician *n* = 21 Psychologist *n* = 39)	Not at all Important	1 (5)	0
	Unimportant	1 (5)	0
	Neutral	7 (33)	0
	Important	8 (38)	18 (46)
	Very Important	4 (19)	21 (54)
Language function assessment (Physician *n* = 22 Psychologist *n* =39)	Not at all Important	0	1 (2.5)
	Unimportant	0	0
	Neutral	2 (9)	3 (7.5)
	Important	12 (55)	23 (59)
	Very Important	8 (36)	12 (31)
Adaptive skills assessment (Physician *n* = 20 Psychologist *n* = 39)	Not at all Important	0	0
	Unimportant	0	0
	Neutral	2 (10)	3 (7.5)
	Important	12 (60)	12 (32.5)
	Very Important	6 (30)	24 (60)
Social-emotional broad-based assessment (Physician *n* = 15 Psychologist *n* = 40)	Not at all Important	0	1 (2.5)
	Unimportant	0	0
	Neutral	5 (33)	13 (32.5)
	Important	5 (33)	16 (40)
	Very Important	5 (33)	10 (25)
Specific social-emotional assessment (Physician *n* = 11 Psychologist *n* = 36)	Not at all Important	0	0
	Unimportant	0	2 (5.5)
	Neutral	5 (45.5)	13 (26)
	Important	5 (45.5)	15 (41.5)
	Very Important	1 (9)	6 (17)
Behavioural Assessment (Physician *n* = 12 Psychologist *n* = 34)	Not at all Important	0	1 (3)
	Unimportant	0	3 (9)
	Neutral	7 (58)	14 (41)
	Important	5 (42)	11 (32)
	Very Important	0	5 (15)

Importance of broad assessment practices			
ASD specific assessment	Not at all Important	0	0
(Physician *n* = 22	Unimportant	0	0
Psychologist *n* = 40)	Neutral	0	0
	Important	6 (27)	2 (5)
	Very Important	16 (73)	38 (95)
DSM-IV-TR criteria	Not at all Important	1 (33)	1 (5)
(Physician *n* = 3	Unimportant	0	4 (20)
Psychologist *n* = 20)	Neutral	1 (33)	3 (15)
	Important	0	2 (10)
	Very Important	1 (33)	10 (50)
DSM-5 Criteria	Not at all Important	0	0
(Physician *n* = 22	Unimportant	0	1 (2.5)
Psychologist *n* = 38)	Neutral	1 (4.5)	0
	Important	1 (4.5)	4 (10.5)
	Very Important	20 (91)	33 (87)

Note: only participants who indicated that they use the assessment method were asked about how important it was to their clinical decision making.

Research question 1b: specific assessment tool usage. In addition to the general practices described so far, participants were asked if they would be willing to complete a supplementary section of the questionnaire on specific ASD assessment measures. The majority of participants did so and Fisher's exact test indicated that there was no relationship between the likelihood of completing the additional questions and occupational group ($p = .10$).

There were 12 items on the list of specific ASD methods/measures, as shown in Table 12. No participant endorsed using the Diagnostic Instrument for Social and Communication Disorders (DISCO), or the Autistic Behaviour Interview (ABI). Further, physicians did not endorse using the Developmental, Dimensional and Diagnostic Interview (3Di), The Gilliam Autism Rating Scales (GARS), and The Pervasive Developmental Disorder Behaviour Inventory (PDDBI). It should be noted that very few psychologists reported using these assessment tools as well.

All physicians and the majority of psychologists reported using both unstructured observation, as well as the ADOS in their assessments. In terms of unstructured observation, 94% of physicians (n = 16) and 48% of psychologists (n =17) endorsed engaging in this practice in more than 60% of their cases. Chi square analysis indicated that physicians were more likely than psychologists to report using this method (X^2 [1] = 9.08, p = .003) than psychologists. The ADOS was used by 82% of physicians (n = 14), and 83% of psychologists (n = 30) in 60% or more of their assessment caseload (Fisher's exact test not significant, p =.34). Psychologists were more likely to use the Autism Diagnostic Interview- Revised (ADI-R) in 60% or more of their cases (Fisher's exact test p = .02), however there was no difference in use of the Social Responsiveness Scale (SRS; Fisher's exact test, p = .15), or the Social Communication Questionnaire (SCQ; Fisher's exact test, p = 1.00). Please refer to Table 12 for a detailed breakdown of participant responses.

Table 12

Specific assessment tool / method usage

Assessment Method	Frequency of use	Physicians (n = 17) n (%)	Psychologists (n = 36) n (%)
Unstructured Observation	Never	0	3 (8)
	< 20% of cases	0	8 (22)
	21-40% of cases	1 (6)	5 (14)
	41-60% of cases	0	3 (8)
	61-80% of cases	0	2 (6)
	>80% of cases	16 (94)	15 (42)
The Autism Diagnostic Observation Schedule (ADOS)	Never	0	4 (11)
	< 20% of cases	2 (12)	1 (3)
	21-40% of cases	1 (6)	1 (3)
	41-60% of cases	0	0
	61-80% of cases	4 (23)	4 (11)
	>80% of cases	10 (59)	26 (72)

Specific assessment tool / method usage

The Childhood Autism Rating Scale (CARS)	Never	15 (88)	23 (64)
	< 20% of cases	0	4 (11)
	21-40% of cases	0	1 (3)
	41-60% of cases	0	0
	61-80% of cases	1 (6)	1(3)
	>80% of cases	1 (6)	7 (19)
The Autism Diagnostic Interview – Revised (ADI-R)	Never	8 (47)	9 (25)
	< 20% of cases	6 (35)	7 (19)
	21-40% of cases	2 (12)	2 (6)
	41-60% of cases	0	2 (6)
	61-80% of cases	0	3 (8)
	>80% of cases	1 (6)	13 (36)
The Social Responsiveness Scale (SRS)	Never	5 (29)	13 (36)
	< 20% of cases	1 (6)	2 (6)
	21-40% of cases	2 (12)	7 (19)
	41-60% of cases	2 (12)	7 (19)
	61-80% of cases	5 (29)	3 (8)
	>80% of cases	2 (12)	4 (11)
The Social Communication Questionnaire (SCQ)	Never	8 (47)	19 (53)
	< 20% of cases	5 (29)	7 (19)
	21-40% of cases	2 (12)	4 (11)
	41-60% of cases	1 (6)	3 (8)
	61-80% of cases	0	2 (6)
	>80% of cases	1 (6)	1 (3)
The Autism Spectrum Rating Scale (ASRS)	Never	15 (88)	22 (61)
	< 20% of cases	1 (6)	1 (3)
	21-40% of cases	0	1 (3)
	41-60% of cases	0	3 (8)
	61-80% of cases	0	3 (8)
	>80% of cases	1 (6)	6 (17)
The Pervasive Developmental Disorder Behaviour Inventory (PDDBI)	Never	17 (100)	34 (94)
	< 20% of cases	0	0
	21-40% of cases	0	1 (3)
	41-60% of cases	0	0
	61-80% of cases	0	1 (3)
	>80% of cases	0	0

Specific assessment tool / method usage

The Diagnostic Instrument for Social and Communication Disorders (DISCO)	Never	17 (100)	36 (100)
	< 20% of cases	0	0
	21-40% of cases	0	0
	41-60% of cases	0	0
	61-80% of cases	0	0
	>80% of cases	0	0
The Gilliam Autism Rating Scales (GARS)	Never	17 (100)	28 (77)
	< 20% of cases	0	5 (14)
	21-40% of cases	0	1 (3)
	41-60% of cases	0	1 (3)
	61-80% of cases	0	0
	>80% of cases	0	1 (3)
The Developmental, Dimensional and Diagnostic Interview (3Di)	Never	17 (100)	35 (97)
	< 20% of cases	0	1 (3)
	21-40% of cases	0	0
	41-60% of cases	0	0
	61-80% of cases	0	0
	>80% of cases	0	0
The Autistic Behaviour Interview (ABI)	Never	17 (100)	36 (100)
	< 20% of cases	0	0
	21-40% of cases	0	0
	41-60% of cases	0	0
	61-80% of cases	0	0
	>80% of cases	0	0

Participants were also asked to rate the relative weight that they gave to the results of assessment tools in formulating a diagnosis (Table 13). Results are reported only for assessment tools that at least 30% of physicians or psychologists reported using. As mentioned prior, the ADOS and unstructured observation were the two most common procedures used by both physicians and psychologists. In terms of importance, 88% of physicians (n = 15) and 72% of psychologists (n = 23) indicated that unstructured observation impacted their decision to assign

an ASD diagnosis strongly or very strongly. Fisher's exact test indicated that there was no difference between the professions in their rating of unstructured observation's importance (p =.29). Similarly, there was no difference in the professions' rating of the importance of the ADOS (Fisher's exact test, p = .65). The majority of both physicians (94%, n = 16) and psychologists (87%, n = 27) indicated that ADOS results strongly influenced their diagnostic decision making. The majority of psychologists who utilized the ADI-R (74%, n = 20) also indicated that its results strongly impacted their diagnostic decision making. While fewer physicians overall (47%, n = 8) endorsed using the ADI-R during their assessment, the majority of those who did (75%, n = 6) indicated that its results strongly impacted their diagnostic decision making. Similarly, for psychologists who endorsed using the Childhood Autism Rating Scale (CARS; n =13), 78% (n = 10), reported that the results were important for formulating an ASD diagnosis. Both the SCQ as well as the SRS were less impactful on both physicians' and psychologists' decision making. Two-thirds of physicians (n = 8) and psychologists (n = 15) who use the SRS indicated that it impacts their diagnostic decision making "a bit" or "to a limited degree." Similarly, 88% of physicians (n = 7) and 69% of psychologists (n = 11) who endorsed using the SCQ, indicated that the tool impacts their diagnostic decision making "a bit" or less.

Table 13

Importance placed on the results of the assessment method / tool when later deciding whether or not to assign an ASD diagnosis.

Assessment Method	Degree of importance	Physicians *n* (%)	Psychologists *n* (%)
Unstructured Observation	Not at all	0	0
(Physicians *n* = 17,	To a limited degree	0	1 (3)
Psychologists *n* = 33)	A bit	2 (12)	8 (24)
	Strongly	7 (41)	11 (33)
	Very Strongly	8 (47)	13 (40)

Importance placed on the results of the assessment method / tool when later deciding whether or not to assign an ASD diagnosis.

The Autism Diagnostic Observation Schedule (ADOS) (Physicians *n* = 17, Psychologists *n* = 32)	Not at all	0	0
	To a limited degree	1 (6)	1 (3)
	A bit	0	3 (9)
	Strongly	8 (47)	9 (28)
	Very Strongly	8 (47)	19 (60)
The Childhood Autism Rating Scale (CARS) (Physicians *n* = 2, Psychologists *n* = 13)	Not at all	0	0
	To a limited degree	0	1 (7)
	A bit	1 (50)	2 (15)
	Strongly	1 (50)	5 (39)
	Very Strongly	0	5 (39)
The Autism Diagnostic Interview – Revised (ADI-R) (Physicians *n* = 8, Psychologists *n* = 27)	Not at all	0	2 (7.5)
	To a limited degree	0	2 (7.5)
	A bit	2 (25)	3 (11)
	Strongly	3 (37.5)	10 (37)
	Very Strongly	3 (37.5)	10 (37)
The Social Responsiveness Scale (SRS) (Physicians *n* = 12, Psychologists *n* = 23)	Not at all	0	0
	To a limited degree	1 (8.33)	4 (17.5)
	A bit	7 (58.33)	11 (48)
	Strongly	4 (33.33)	7 (30.5)
	Very Strongly	0	1 (4)
The Social Communicative Questionnaire (SCQ) (Physicians *n* = 8, Psychologists *n* = 17)	Not at all	0	1 (6)
	To a limited degree	2 (25)	1 (6)
	A bit	5 (62.5)	9 (53)
	Strongly	1 (12.5)	5 (29)
	Very Strongly	0	1 (6)
The Autism Spectrum Rating Scale (ASRS) (Physicians *n* = 2, Psychologists *n* = 14)	Not at all	0	1 (7)
	To a limited degree	0	2 (14)
	A bit	0	7 (50)
	Strongly	1 (50)	4 (29)
	Very Strongly	1 (50)	0

Note: only participants who indicated that they use the assessment method were asked about how important it was to their clinical decision making.

Research Question 2: Team and Multi-disciplinary Approach

When asked about whether they assess in a team, 66% of physicians (n = 15) and 61% (n = 25) psychologists indicated that they assess in a team at least some of the time (Table 14). Assessing in a team format was independent of occupational group (X^2 [2] = .95, p = .62). Physicians who indicated that they sometimes assess with a team noted that resource availability (e.g., hospital versus community setting), complexity of the presenting case, as well as the nature of the referral determined whether or not they assessed with a team. For psychologists who indicated that they sometimes assess with a team, case complexity, nature of the referral, and work environment (i.e., publicly-funded agency versus private practice) appear to determine whether or not they assessed with a team.

Table 14

Do you assess in a team?

Do you assess in a team	Physicians (*n = 23)* *n (%)*	Psychologists (*n = 41)* *n (%)*
Yes	5 (22%)	12 (29%)
No	8 (34%)	16 (39%)
Sometimes	10 (44%)	13 (32%)

For those who indicated that they do assess in a team, at least sometimes, 34% (n = 5) of physicians and 44% (n = 11) of psychologists endorsed working in a team on more that 60% of cases (Table 15). To correct for expected values less than five, percentage of cases was dichotomized to 60% of cases or less versus over 60% of cases. After making this correction, frequency of team usage was independent of occupational group (X^2 [2] = .44, p = .51).

Table 15

How often do you assess in a team?

Percentage of cases	Physicians (n = 15) n (%)	Psychologists (n = 24) n (%)
Less than 20% of cases	2 (13%)	3 (12%)
Between 21-40% of cases	6 (40%)	5 (20%)
Between 41-60% of cases	2 (13%)	6 (24%)
Between 61% and 80% of cases	1 (7%)	2 (8%)
More than 80% of cases	4 (27%)	8 (32%)

Note: only participants who indicated that they assess in a team at least some of the time were shown this question, and thus counted in the results above.

When asked what professionals comprise the assessment team, physicians indicated that another physician was the most common member of the team. Ninety-five percent (95%, n = 14) of physicians indicated that they included another physician in the assessment in more than 60% of cases. Physicians also indicated that speech language pathologists (SLP) were consulted frequently, with 80% of physicians (n = 12) indicating that that an SLP was involved with the assessment in some of their cases. Psychologists indicated that the most common member of their team was another psychologist, with 96% (n = 24) indicating that a second psychologist was involved with at least some proportion of their cases. The second most common team member for psychologists, was a physician, with 84% (n = 21) indicating that a physician was involved with at least some proportion of their cases. Please refer to Table 16 for further details of the results related to team composition.

Table 16

Team composition for professionals who work in a team at least some of the time

Professional team member	Frequency of contact	Physician (*n* = 15) *n* (%)	Psychologist (*n* = 25) *n* (%)
Physician	Never	1 (7)	4 (16)
	< 20% of cases	0	7 (28)
	21-40% of cases	0	1 (4)
	41-60% of cases	0	5 (20)
	61-80% of cases	1(7)	4 (16)
	>80% of cases	13 (86)	4 (16)
Nurse / Nurse Practitioner	Never	12 (80)	21(84)
	< 20% of cases	1(7)	3 (12)
	21-40% of cases	1(7)	0
	41-60% of cases	1(7)	1 (4)
	61-80% of cases	0	0
	>80% of cases	0	0
Occupational Therapist	Never	7 (47)	17 (68)
	< 20% of cases	1 (7)	3 (12)
	21-40% of cases	2 (13)	1 (4)
	41-60% of cases	2 (13)	1 (4)
	61-80% of cases	2 (13)	1 (4)
	>80% of cases	1 (7)	2 (8)
Psychologist	Never	5 (33)	1 (4)
	< 20% of cases	4 (26)	2 (8)
	21-40% of cases	3 (20)	1 (4)
	41-60% of cases	1 (7)	1 (4)
	61-80% of cases	1 (7)	2 (8)
	>80% of cases	1 (7)	18 (72)
Psychometrist	Never	13 (86)	14 (56)
	< 20% of cases	1 (7)	3 (12)
	21-40% of cases	1 (7)	0
	41-60% of cases	0	1(4)
	61-80% of cases	0	0
	>80% of cases	0	7 (28)
Physiotherapist	Never	10 (67)	23 (92)
	< 20% of cases	4 (26)	1 (4)
	21-40% of cases	0	0
	41-60% of cases	1 (7)	0
	61-80% of cases	0	0
	>80% of cases	0	1 (4)

Team composition for professionals who work in a team at least some of the time

Social Worker	Never	5 (33)	19 (76)
	< 20% of cases	3 (20)	2 (8)
	21-40% of cases	0	1 (4)
	41-60% of cases	1 (7)	1 (4)
	61-80% of cases	0	0
	>80% of cases	6 (40)	2 (8)
Speech Language Pathologist	Never	3 (20)	11 (44)
	< 20% of cases	2 (13)	4 (16)
	21-40% of cases	1 (7)	2 (8)
	41-60% of cases	0	3 (12)
	61-80% of cases	1(7)	1 (4)
	>80% of cases	8 (53)	4 (16)
Audiologist	Never	9 (60)	20 (80)
	< 20% of cases	0	3 (12)
	21-40% of cases	0	1 (4)
	41-60% of cases	1 (7)	0
	61-80% of cases	1 (7)	0
	>80% of cases	4 (26)	1 (4)
Board Certified Behaviour Analyst	Never	11 (73)	24 (96)
	< 20% of cases	2 (13)	0
	21-40% of cases	1 (7)	1 (4)
	41-60% of cases	0	0
	61-80% of cases	1(7)	0
	>80% of cases	0	0

Finally, participants were asked about the degree to which their team was involved with the decision-making process around whether or not to assign an ASD diagnosis (Table 17). In the majority of cases, the team was involved in diagnostic formulation and there was no difference in the extent of team involvement based on profession (X^2 [1] = 0.62, p = .43).

Table 17

Nature of team involvement

Nature of team involvement	Physicians (n = 15) n (%)	Psychologists (n = 25) n (%)
I formulate the diagnosis myself after team does their part of assessment	6 (40)	7 (28)
Team helps to formulate the diagnosis even after assessment is complete	9 (60)	18(72)

Research Question 3: Assessment Procedures and Cognitive Functioning

Participants were asked about their client populations' general level of intellectual functioning (Table 18). Due to the small number of participants endorsing high or very high cognitive functioning, functioning level was dichotomized into low, and average or above. There was no difference in the profile of clients seen by the two occupational groups (X^2 [1] = 2.17, p = .23). A small number of physicians (30%, n = 6) saw clients who were described as being average or above in terms of cognitive function. Due to this small number, a comparison of tool use by profession and by cognitive function was not feasible. Thus, results from both physicians and psychologists were amalgamated to examine whether tool use frequency was dependent on client cognitive functioning (see Table 19). Please note that, as described in the methods section, frequency of tool use has been dichotomized to 60% or greater of cases, and less than 60% of cases.

Table 18

Estimated level of clients' cognitive functioning

Cognitive Functioning	Physicians (*n* =22) *n* (%)	Psychologists (*n* = 40) *n* (%)
Very low	2 (9)	7 (18)
Low	12 (55)	13 (32)
Average	6 (27)	18 (45)
High	0	2 (5)
Very high	0	0
Unknown	2 (9)	0

Note: one physician and one psychologist did not provide a response to this question

Table 19

Assessment methodology used by clinicians working with clients of higher and lower estimated cognitive functioning.

Assessment Method	Frequency of use	Below average cognitive functioning (n = 27) n (%)	Average and above cognitive functioning (n = 23) n (%)
Unstructured Observation	Never	0	3 (13)
	< 20% of cases	3 (11)	4 (17)
	21-40% of cases	2 (7.5)	3 (13)
	41-60% of cases	0	3 (13)
	61-80% of cases	0	2 (9)
	>80% of cases	22 (81.5)	8 (35)
The Autism Diagnostic Observation Schedule (ADOS)	Never	1 (4)	3 (13)
	< 20% of cases	3 (11)	0
	21-40% of cases	1 (4)	1 (4)
	41-60% of cases	0	0
	61-80% of cases	5 (19)	3 (13)
	>80% of cases	17 (63)	16 (70)
The Childhood Autism Rating Scale (CARS)	Never	18 (66.5)	17 (74)
	< 20% of cases	0	4 (18)
	21-40% of cases	0	1 (4)
	41-60% of cases	0	0
	61-80% of cases	2 (7.5)	0
	>80% of cases	7 (26)	1 (4)
The Autism Diagnostic Interview – Revised (ADI-R)	Never	10 (37)	5 (22)
	< 20% of cases	8 (29.5)	5 (22)
	21-40% of cases	3 (11)	1 (4)
	41-60% of cases	2 (7.5)	0
	61-80% of cases	2 (7.5)	1 (4)
	>80% of cases	2 (7.5)	11(48)
The Social Responsiveness Scale (SRS)	Never	10 (37)	8 (35)
	< 20% of cases	2 (7.5)	1 (4)
	21-40% of cases	5 (18.5)	2 (13)
	41-60% of cases	3 (11)	5 (22)
	61-80% of cases	5 (18.5)	2 (9)
	>80% of cases	2 (7.5)	4 (17)

Assessment methodology used by clinicians working with clients of higher and lower estimated cognitive functioning.

The Social Communication Questionnaire (SCQ)	Never	12 (44.5)	12 (52)
	< 20% of cases	6 (22)	6 (26)
	21-40% of cases	3 (11)	3 (13)
	41-60% of cases	3 (11)	1 (4)
	61-80% of cases	2 (7.5)	0
	>80% of cases	1 (4)	1 (4)
The Autism Spectrum Rating Scale (ASRS)	Never	20 (73.5)	16 (70)
	< 20% of cases	1 (4)	0
	21-40% of cases	1 (4)	0
	41-60% of cases	1 (4)	2 (9)
	61-80% of cases	2 (7.5)	1 (4)
	>80% of cases	2 (7.5)	4 (17)

Clinician usage of the ADOS (Fisher's exact test, $p = 1.0$), SRS (X^2 [1] = 0.0002, $p = .99$), SCQ (X^2 [1] = .77, $p = .38$), and ASRS (Fisher's exact text, $p = .72$) was not dependent on their clients' level of estimated cognitive functioning. However, there were several significant findings suggesting differential assessment methods based on client level of functioning. Use of unstructured observation (X^2 [1] = 7.79, $p = .005$) and the CARS (Fisher's exact test, $p = .014$) was more commonly reported by clinicians who worked with clients with below average cognitive functioning, and the ADI-R (X^2 [1] = 7.97, $p = .005$) was more commonly used by clinicians who generally worked with clients at or above average intellectual functioning.

Discussion

The present study evaluated the assessment and diagnostic procedures of Canadian physicians and psychologists who engage in ASD diagnosis, representing the first study of its kind in Canada. Twenty-three physicians and 41 psychologists who represented a relatively experienced clinical sample responded to the questionnaire. Participants were primarily from Ontario, however there was some geographic diversity within the psychologist sample.

Participants provided information about their assessment and diagnostic procedures, including but not limited to their demographics, assessment format, and assessment procedures. Overall, participants indicated a high level of comfort assessing for and diagnosing ASD. Both groups of participants also indicated that they felt comfortable diagnosing comorbid mental health concerns. There was, however, a difference in comfort around diagnosing comorbid ID within ASD, with psychologists indicating a higher level of comfort. Rates of comorbidity between ASD and ID have been estimated at around one third of cases, making it quite common. Further, intellectual functioning has been shown to affect the presentation of problem behaviour, with lower intellectual functioning generally resulting in higher levels of behaviour (Matson, 2009). Similarly, low intellectual functioning has also been shown to relate to poor intervention outcomes (Perry, Blacklock & Dunn Geier, 2013). While an accurate profile of one's intellectual functioning is not required for ASD diagnosis, it helps conceptualize and convey prognosis and response to intervention. While the majority of physicians and psychologists indicate that they reviewed cognitive data during their diagnostic decision making, it is unclear the extent to which this information was used to communicate a diagnosis of ID. Future research should evaluate the extent to which physicians are communicating ID diagnoses within the ASD population. Also, understanding why physicians are less likely to report diagnosing ID is important.

Psychologists were more likely than physicians to endorse assessing a child in multiple environments. Psychologists were also more likely to spend a longer amount of time assessing a child for ASD. When thinking about the current funding structure for medical and psychological services, this difference does make sense. The majority of psychologists indicated that their current place of employment was in private practice, while the majority of physicians indicated that their current place of employment was in a hospital. Within a private, fee for

service setting, psychologists are able to spend as much or as little time with a client as needed. Further, there is a much higher degree of latitude in regards to where an assessment happens and what components are involved in an assessment. Essentially, there is greater latitude around the psychologist's time and practices. Physicians on the other hand, generally have little time to spend with each individual patient who enters the hospital due to long waiting lists, and are subject to the budgetary pressures associated with public institutions. Physicians are also subject to provincial billing codes which may or may not allow for lengthy assessment periods, or for out of hospital assessment. Under these constraints, a physician's time and caseload is much more regimented, and hospital practices may be more prescriptive. A secondary explanation for this result, is that physicians may see patients on a more regular basis, allowing them to track development over time. For instance, a paediatrician may express concerns around an ASD diagnosis at a routine checkup. When the child presents to the paediatrician again, they may feel more comfortable assigning an ASD diagnosis based solely on the evolution of symptom presentation over repeated encounters. Psychologists working in the private sector do not likely follow an individual child to the same extent physicians are expected to, and thus, when a child presents to their practice, it could very well be the first encounter. Thus, a lengthier assessment may be required to obtain a holistic understanding of the child. Future research should inquire about whether or not professionals encounter a child for other concerns or through routine practice, before the ASD assessment and diagnosis take place.

Reports of broad assessment procedures were similar to the practices reported by professionals in Australia studied by Taylor and colleagues (2016) study. Both groups of professionals indicated that caregiver and child interviews, as well as record reviews (medical, psychological, and education) were important components of their assessment. Physicians

reported conducting genetic and audiological assessment in more cases, however they did not rate these data as more important to the case formulation than did psychologists. Cognitive data were reviewed more frequently and rated as more important by psychologists than physicians. This result is commensurate with psychologists' education, as well as role in the provision of ASD services. Within service provision, psychologists may supervise and monitor a child's entry into, and progress in intervention. These data, then, could play a larger role for treatment planning and prognosis (i.e., in terms of a comorbid intellectual disability), meaning that psychologists could include these data in an assessment to inform further clinical decision making, funding, eligibility for services, and so on. Genetic and audiological assessments comprise an important part of the differential diagnostic process (Volkmar et al., 2014), as they help screen out hearing concerns, as well as other genetic syndromes. Physicians are able to both order and interpret the results of these assessments. Psychologists, however have limited ability to order and interpret medical tests, making it is unsurprising that fewer psychologists indicated reviewing these data. In this case, reliance on a multidisciplinary team for comprehensive data collection would be important, to ensure that an assessment has a high level of sensitivity.

Psychologists were more likely than physicians to endorse assessing in a team format. More specifically, for those who indicated that they assessed in a team at least some of the time a second member of the profession (i.e., a second physician for physicians and second psychologist for psychologists) was the most commonly reported team member. While indicative of intra-professional consultation and collaboration, this practice is not consistent with that of multi-disciplinary consensus-based diagnosis. Both psychologists and physicians in this sample reported low levels of consultation with other disciplines. For psychologists, physicians were the second most common member of the team. For physicians, SLPs were the second most common

members of the assessment team. It should be noted that in many Canadian jurisdictions, psychologists do not have the authority to write referrals for medical consultation, or to speciality services. This in part could explain the low frequency of interprofessional collaboration reported by psychologists. While multidisciplinary collaboration is considered the "gold-standard" in assessment methodology (Anagnostou et al., 2015; Volkmar et al., 2014), the restrictions in place on psychologists within the health care system do not lend themselves to such a method. Further, for physicians, time and resource constraints within the current health care framework can greatly limit the ability to practice in alignment with these recommendations. It should be noted that resource limitations include limitations on the personnel available to consult. For instance, a psychologist may be less readily available than an SLP. Future research should include feasibility studies around the impact of multidisciplinary assessment methods on available resources, and on the wait times for service.

Both physicians and psychologists indicated that they used the ADOS and unstructured observation in a high proportion of their caseload, with physicians being more likely to use unstructured observation than psychologists. Further, the ADI-R was also used by the majority of both professions, albeit in a lower proportion of cases. For participants who used these assessment methods, the majority of both physicians and psychologists indicated that the results factored into their diagnostic decision making strongly. Taken together, these results indicate that the majority of participants utilize these measures when assessing for ASD. The literature commonly cites the combination of the ADOS and ADI-R as the "gold-standard" tools used for assessment (Falkmar, Anderson, Falkmar & Horlin, 2013). When used together, these tools correctly identify ASD in roughly 88% of children under three years of age, and about 83%

of children over three years of age. Correct classification remains high (above 80%) when either of these two tools is used in isolation (Falkmar et al., 2013).

From the data obtained in this sample, it appears as though Canadian clinicians utilize assessment tools which have relatively good psychometric properties. It should be noted, however, that research into the sensitivity and specificity of the ADI-R and ADOS have revealed mixed findings. Mazefsky and Oswald (2006) indicated that the ADOS and ADI-R resulted in a 25% false positive rate when clinicians relied on scores from the assessment alone, instead of on team-based collaboration. Similarly, Malloy, Murray, Akers, Mitchell, and Manning-Courtney (2011) reported specificities between 65% (module 1) and 90% (module 2) when original scoring algorithms were used but that scores decreased substantially to as low as 29% when revised scoring algorithms were used. It should be noted that the current study did not ask participants the specifics about the ADOS usage (i.e., modules use, standard vs adjusted algorithm usage). Future research should include more detailed questions regarding how the assessment tools are administered and scored and which scores are used. With such discrepant findings reported in the literature, reliance on one tool or score for diagnosis should be avoided, as should placing undue weight on the results of a single assessment.

Participants reported some degree of differential assessment tool selection depending on the estimated or actual cognitive functioning of the clients they worked with. Participants working with clients of average or above intellectual functioning reported using the ADI-R more frequently than did clinicians working with clients of below average intellectual function. For clinicians who saw clients with below average cognitive functioning, unstructured observation, as well as the CARS were more likely to be used. These results provide evidence that those working with lower functioning children seem to favour unstructured observational methods.

These results are consistent with findings that the CARS demonstrates high sensitivity (98%) when used for children who have lower cognitive functioning (Mayes et al., 2009). It should be noted that the CARS second edition now includes a high-functioning module (CARS2-HF) which demonstrates high sensitivity (100%) and adequate specificity (.71; Dawkins, Meyer, & Van Bourgondien, 2016). The current study did not ask participants about the different editions of the CARS, which could have altered these results. Future investigations into diagnostic practices should ensure that the most up to date versions and forms of assessment tools are included in the choices available to participants.

Unstructured observation was also more likely to be used with clients of lower cognitive functioning levels. Lower intellectual functioning has been associated with higher degrees of core ASD symptomatology (Lecavalier, Snow, & Norris, 2011). With increasing levels and magnitudes of ASD symptomatology, symptom presentation becomes easier to discern through observational measures. For instance, high frequency motor stereotypy is likely to be observed more readily through unstructured means than a perseverative interest might be. If symptoms are readily observable, it may not be necessary for a clinician to include a battery of assessment tools and consult a multidisciplinary team for diagnostic purposes. Assessment and diagnosis in these cases may not require as resource-intensive a process. Future research should evaluate the extent to which unstructured observation is sensitive and specific for varying degrees of ASD symptomatology and cognitive function and different ages. Doing so could help provide needed information on this practice, and to evaluate if there is merit to forgoing the gold standard assessment procedure in at least a subset of cases.

Limitations

The current study is not without limitations; the first being the small sample size. Initially, it was hoped that there would be a minimum of 40 individuals in each of the professional groups. While that number was achieved for psychologists, only 23 physicians were recruited. Further, the majority of these physicians were developmental pediatricians. Initially, it was hoped that adequate numbers of physicians from various professions (i.e., family medicine, psychiatry) would be recruited to allow for intra-professional comparison. These small numbers limit the generalizability of the results to the larger population of physicians and psychologists practicing within ASD. Similarly, it was initially hoped that a representative sample from across Canada would be recruited, with participants representing each of Canada's provinces and territories. The current sample was largely comprised of clinicians from Ontario, with more heterogeneity within the psychologist subgroup. Because of these small numbers, generalizations cannot be made regarding specific Canadian regions, and the assessment and diagnostic activities that occur.

A second limitation inherent to survey research, is that of self-report. While efforts were made to ensure that questions were written in an objective fashion, it is unclear as to how participants interpreted the questions. For instance, participants could have a different idea of how cognitive functioning is assessed (i.e., through formal testing vs. parental report and observation), and how the distinction between low compared to very low would be operationalized. Also inherent to survey research, is the issue of response validity. The professional groups sampled for this study comprise a busy group of people with limited time. Because of this, a concern around random, quick responding to finish the survey becomes an issue. While the data were screened for completion time, there were no built-in validity checks to

ensure that participants were reading fully reading the question and the possible choices presented to them. While the data were visually inspected for impossible values and anomalies in responding, formal validity checks set up within the survey software would help mitigate this limitation in the future.

Finally, it is possible that the sampling methodology could have resulted in a biased sample of participants. The sample for this study comprised a group of busy professionals. Taking time out of a busy schedule to complete a research questionnaire would thus be indicative of a highly motivated professional, who is committed to the field of ASD, and or research within the field. This selection bias could have resulted in a group of highly engaged professionals, who may not be representative of ASD diagnosticians as a professional group. Because of this potential response bias, the results obtained may not generalize to the larger population of Canadian clinicians who make diagnoses of ASD.

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Appendices

Appendix A: Glossary

Multidisciplinary Team: "In a multidisciplinary team, health care providers tend to treat patients independently and to share information with each other, while the patient may be a mere recipient of care" (Choi & Pak, 2006, p. 354).

Interdisciplinary Team: "An interdisciplinary team aspires to a more profound level of collaboration (than a multidisciplinary team), in which constituents of different backgrounds combining their knowledge mutually complete different levels of planned care" (Choi & Pak, p. 354).

Transdisciplinary Team: "Transdisciplinary projects are those in which researchers from different fields not only work closely together on a common problem over an extended period, but also create a shared conceptual model of the problem that integrates and transcends each of their separate disciplinary perspectives" (Choi & Pak, 2006, pp.354-355).

Appendix B: Initial Recruitment E-mail

Hello,

My name is Jeffrey Esteves, and I am a second year Masters student at York University in the Clinical Developmental Psychology program. With Dr. Adrienne Perry, I am investigating the diagnostic assessment practices of health care professionals across Canada, in regards to diagnosing Autism Spectrum Disorder (ASD) in childhood. Currently, there are no known biological markers that can accurately diagnose ASD and as such, diagnosis generally relies on behavioural observations and assessment. An ASD diagnosis provides access to a variety of supports and services, however, very little is known regarding the assessment and diagnostic practices of Canadian clinicians. The current study endeavours to address this gap in the knowledge base. As such, participation in the study involves a brief (~10 minute) online questionnaire asking about ASD assessment and diagnostic procedures. This study has received ethics approval through the York University Human Participants Research Committee. Given that your organization represents a large number of clinicians who have diagnostic authority and who may be involved in the assessment and diagnosis of ASD in childhood, I am reaching out in hopes that you would consider disseminating this study to your membership through your newsletter, listserv, or by whatever method your organizational by-laws allow. If this is at all possible, I can send a brief research prospectus as well as the link to the online questionnaire.

Thank you very much for your time and consideration,

Jeffrey Esteves

Appendix C: Research Prospectus for Recruitment

The Assessment and Diagnosis of Autism Spectrum Disorder: A Cross-Disciplinary Analysis

Currently, there are no known biological markers that can accurately diagnose ASD. As such, diagnosis generally relies on behavioural observations and assessment. While best-practice guidelines exist regarding assessment and diagnosis in ASD, very little is known regarding what practices clinicians are engaging in, in the field. This is troubling given the "high-stakes" nature of an ASD diagnosis, in that a diagnosis enables parents to access a variety of publicly-funded services for their child, which are inaccessible without one. Valid and reliable diagnoses are thus imperative to ensure that children with ASD in Canada receive appropriate supports and services. The current study endeavours to address this gap in the knowledge base. Should you choose to participate, you will be asked to fill out a short questionnaire (~10 minutes) regarding your assessment and diagnostic practices when working on a queried ASD case. You will be asked to provide information regarding the nature of your work environment, professional credentials, experience in working with ASD, as well as your assessment and diagnostic practices more broadly. Should you wish to participate in an additional supplementary section of the questionnaire (~5 minutes), you will be asked to answer questions regarding specific assessment tools which you may or may not use when working on a queried ASD case. After participating, you may choose to enter yourself into a draw to win one of three $25 Starbucks gift cards. This study has received ethics approval through the York University Human Participants Research Committee.

Link to questionnaire: https://yorkufoh.ca1.qualtrics.com/jfe/form/SV_0VAO95IFkhMoXcx

Appendix D: List of Organizations and Individuals Solicited

Organization / Contact	Date Sent	Date Accepted or Declined
Canadian Psychological Association	22-Jan	Accepted February 2nd and added to R2P2
Ontario Psychological Association	22-Jan	No response
Ontario Medical Association	23-Feb	Declined
Canadian Pediatric Society	23-Feb	Accepted February 27th and sent out to Developmental pediatrics forum
Canadian Psychiatric Association	26-Feb	No Response
Ontario Psychiatric Association	26-Feb	No Response
Pediatrician Alliance of Ontario	26-Feb	Accepted February 26th and to be included in monthly newsletter
Canadian Neurological Sciences Federation	26-Feb	Rejected
Canadian Academy of Child and Adolescent Psychiatry	26-Feb	Accepted February 27th, posted on website
Personal Contacts	23-Feb	10 Individuals agreed to disseminate
Ontario College of Family Physicians	18-Mar	Accepted on March 21st and was included in newsletter
Manitoba Psychological Association	06-May	Rejected
Physicians of Ontario Neurodevelopmental Advocacy	07-May	No response

Appendix E: Questionnaire

ASD Assessment and Diagnostic Practices

Start of Block: Informed Consent

Informed Consent Form

Study Name: The Assessment and Diagnosis of Autism Spectrum Disorder: A Cross-Disciplinary Analysis

Purpose of the Research
Very little is known about the assessment and diagnostic practices of Canadian clinicians, in regards to Autism Spectrum Disorder (ASD). While best-practice guidelines exist regarding assessment and diagnosis in ASD, very little is known regarding what practices clinicians are engaging in, in the field. This is troubling given the "high-stakes" nature of an ASD diagnosis, in that a diagnosis enables parents to access a variety of publicly-funded services for their child, which are inaccessible without one. Valid and reliable diagnoses are thus imperative to ensure that children with ASD in Canada receive appropriate supports and services, but also to ensure that limited government resources are used efficiently. Given the paucity of research in this field, the current study is exploratory in nature, and asks the questions: 1) What assessment practices are physicians and psychologists using when they are working on a queried ASD case? 2) Are physicians and psychologists working within a multidisciplinary team when conducting an assessment and assigning a diagnosis? 3) Do their assessment practices change, depending on the perceived, or actual cognitive and adaptive function of the child in question?

What You Will Be Asked to Do in the Research: Should you choose to participate, you will be asked to fill out a short survey regarding your assessment and diagnostic practices when working on a queried ASD case. You will be asked to provide information regarding the nature of your work environment, professional credentials, experience in working with ASD, as well as your assessment and diagnostic practices more broadly. Should you wish to participate in an additional section of the questionnaire, you will be asked to answer questions regarding specific assessment tools which you may or may not use when working on an ASD diagnosis case. Following the broad assessment questions, you will be asked if you wish to end the survey, or continue on to answer the more specific questions. Choosing to end your participation does not affect your previous participation in the study; your data will be analyzed and included in the summary results. It is expected that the overall time commitment of this study is 15 minutes if you do not complete the second part of the questionnaire, and 20 minutes if you do choose to continue and answer these questions. The questionnaire is administered online, so a reliable internet connection is required.

Risks and Discomforts: We do not foresee any risks or discomfort from your participation in the research. You have the right to not answer any questions on the survey.

Benefits of the Research and Benefits to You: It is hoped that the results from this study will help provide information regarding the assessment and diagnostic practices of clinicians in Canada. With this information, we hope to identify gaps in knowledge and training around the assessment and diagnosis of ASD, which could be used to help inform both professional development opportunities, as well as professional education. Completion of this study will also enter you in a draw (should you wish to be entered) to win one of three $20 Starbucks gift cards.

Voluntary Participation: Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the nature of your relationship with your current workplace, with any professional associations you may be a part of, or the nature of your relationship with York University either now, or in the future.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researchers, York University, or any other group associated with this project. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

Confidentiality*:* All information you supply during the research will be held in confidence. We are not collecting personally identifying information, so your name will not appear in any report or publication of the research. Data will be collected using Qualtrics, which is a secure online survey management and administration platform. Your data will be safely stored on this platform, which is only accessible via a password protected account. When the data is extracted from this platform for analysis the data file will be encrypted and password protected and stored on a password protected computer, with only Dr. Adrienne Perry and Jeffrey Esteves having access to the data. Data will be retained from 10 years following the completion of this study, as prescribed by the College of Psychologists of Ontario. Confidentiality will be provided to the fullest extent possible by law.

Questions About the Research? If you have questions about the research in general or about your role in the study, please feel free to contact Dr. Adrienne Perry, either by telephone (on file) or by e-mail (on file) or Jeffrey Esteves either by telephone (on file) or by e-mail (on file). This research has been reviewed and approved by the Human Participants Review Committee, on behalf of York University, and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines (file number: 1772). If you have any questions about this process, or about your rights as a participant in the study, please contact the Senior Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Research Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures:

I consent to participate in *"The Assessment and Diagnosis of Autism Spectrum Disorder: A*

Cross-Disciplinary Analysis" conducted by Dr. Adrienne Perry and Jeffrey Esteves. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. I understand that selecting the "I give consent to participate in the research study discussed above and wish to participate" box will be taken as my electronic signature, indicating that I have given informed consent.

○ I give consent to participate in the research study discussed above and wish to participate. (1)

○ I do not consent to participate in the research study discussed above and do not wish to participate. (2)

Skip To: End of Survey If Informed Consent Form Study Name: The Assessment and Diagnosis of Autism Spectrum Disorder: A... = I do not consent to participate in the research study discussed above and do not wish to participate.

End of Block: Informed Consent

Start of Block: Demographics

Do you Assess for and Diagnose Autism Spectrum Disorder?

○ Yes (1)

○ No (2)

Skip To: End of Survey If Do you Assess for and Diagnose Autism Spectrum Disorder? = No

Over the past two years, what proportion of your assessment and diagnostic work has been with the ASD population?

○ 0-20% (1)

○ 21-40% (2)

○ 41-60% (3)

○ 61-80% (4)

○ 80-100% (5)

Is your current focus of practice with children / adolescents?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Is your current focus of practice with children / adolescents? = No

What is your profession?

- ○ Physician (1)
- ○ Psychologist (2)
- ○ Other (please specify) (3) _____

Display This Question:
If What is your profession? = Psychologist

What psychological speciality do you practice?

- ○ General Clinical Psychology (1)
- ○ Clinical Developmental Psychology (2)
- ○ Clinical Neuropsychology (3)
- ○ Rehabilitation Psychology (4)
- ○ School Psychology (5)
- ○ Counselling Psychology (6)

Display This Question:
If What is your profession? = Physician

Which medical speciality do you practice?

- ○ Family Medicine (1)
- ○ Psychiatry (2)
- ○ Pediatrics (3)
- ○ Developmental Pediatrics (4)
- ○ Neurology (5)
- ○ General Practitioner (6)
- ○ Other (please specify) (7) _____

Please select your highest level of education

- ○ M.D. (1)
- ○ M.A. / M.Sc. (2)
- ○ M.Sc.N (3)
- ○ M.D. / Ph.D (4)
- ○ Ph.D (5)
- ○ Other (please specify) (6) _____

How long (in years) have you been practicing within your profession?

_____

In which province / territory do you currently practice in?

- ○ Ontario (1)
- ○ Quebec (2)
- ○ British Columbia (3)
- ○ Alberta (4)
- ○ Manitoba (5)
- ○ Saskatchewan (6)
- ○ Nova Scotia (7)
- ○ New Brunswick (8)
- ○ Newfoundland and Labrador (9)
- ○ Prince Edward Island (10)
- ○ Northwest Territories (11)
- ○ Yukon (12)
- ○ Nunavut (13)

Which of the following settings or systems have you worked in (check all that apply)?

	I currently work in this setting (1)	I have worked in this setting in the past (2)	This has been my primary work setting throughout my career (3)
Hospital (1)	☐	☐	☐
Family Medicine Clinic (2)	☐	☐	☐
Walk-in Clinic (3)	☐	☐	☐
Private practice (4)	☐	☐	☐
Community Mental Health Centre (5)	☐	☐	☐
Education (elementary and secondary education) (6)	☐	☐	☐
Post-secondary education (college and university) (7)	☐	☐	☐
Psychiatric Hospital (8)	☐	☐	☐
Long-term care facility - Children (9)	☐	☐	☐
Long-term care facility - Adults (10)	☐	☐	☐
Academia (11)	☐	☐	☐
Corrections (12)	☐	☐	☐

Child Welfare (13)	☐	☐	☐
Other (please specify) (14)	☐	☐	☐
Other (please specify) (15)	☐	☐	☐

Throughout your career, which of the following paediatric populations have you worked with? Please select all the apply.

- [ ] Children with non-psychiatric medical diagnoses (1)
- [ ] Children diagnosed with Depression / Mood Disorders (2)
- [ ] Children diagnosed with Anxiety Disorders (3)
- [ ] Children diagnosed with Autism Spectrum Disorder (4)
- [ ] Children diagnosed with Conduct Disorders (5)
- [ ] Children diagnosed with Schizophrenia (6)
- [ ] Children diagnosed with Intellectual Disabilities (7)
- [ ] Children diagnosed with Learning Disabilities (8)
- [ ] Children diagnosed with ADHD (9)
- [ ] Children diagnosed with other psychiatric conditions (please specify) (10)

_____

- [ ] Children currently involved with the child welfare system (11)
- [ ] Children involved with the legal system (12)

Think about the children you assess for ASD. With respect to overall adaptive functioning level (i.e., the ability to which they are able to complete activities of daily living independently, communicate, and socialize relative to their same aged peers), which group of children do you see most frequently?

- ○ Very low (much below same aged peers) (1)
- ○ Low (somewhat below same aged peers) (2)
- ○ Average (at the same level as same aged peers) (3)
- ○ High (somewhat above same aged peers) (4)
- ○ Very high (much above same aged peers) (5)
- ○ I do not know the adaptive functioning level of the children I work with (6)

Think about the children you assess for ASD. With respect to overall intellectual level (i.e. their level of cognitive functioning, relative to their same aged peers), which group of children do you see most frequently?

- ○ Very low (much below same aged peers) (1)
- ○ Low (somewhat below same aged peers) (2)
- ○ Average (at the same level as same aged peers) (3)
- ○ High (somewhat above same aged peers) (4)
- ○ Very high (much above same aged peers) (5)
- ○ I do not know the intellectual functioning level of the children I work with (6)

Please rate your comfort level for the following activities:

	Extremely comfortable (1)	Somewhat comfortable (2)	Neither comfortable nor uncomfortable (3)	Somewhat uncomfortable (4)	Extremely uncomfortable (5)
Assessing for ASD (1)	○	○	○	○	○
Diagnosing ASD (2)	○	○	○	○	○
Diagnosing a comorbid Intellectual Disability with ASD (3)	○	○	○	○	○
Diagnosing a comorbid mental health disorder with ASD (4)	○	○	○	○	○

End of Block: Demographics

Start of Block: Team Composition

When conducting an assessment for ASD, do you typically assess with a team?

○ Yes (1)

○ No (2)

○ It depends (please specify) (3)

_____

Skip To: End of Block If When conducting an assessment for ASD, do you typically assess with a team? = No

How often do you assess and/or diagnose in a team format

- ○ Less than 20% of cases (1)
- ○ Between 21-40% of cases (2)
- ○ Between 41-60% of cases (3)
- ○ Between 61-80% of cases (4)
- ○ More than 80% of cases (5)

Which of the following professionals comprise the assessment team? Please indicate how often they are involved in queried ASD cases.

	Never (1)	Less than 20% of cases (2)	Between 21-40% of cases (3)	Between 41-60% of cases (4)	Between 61-80% of cases (5)	More than 80% of cases (6)
Physician (1)	○	○	○	○	○	○
Nurse / Nurse Practitioner (2)	○	○	○	○	○	○
Occupational Therapist (3)	○	○	○	○	○	○
Psychologist (4)	○	○	○	○	○	○
Psychometrist (5)	○	○	○	○	○	○
Physiotherapist (6)	○	○	○	○	○	○
Social Worker (7)	○	○	○	○	○	○
Speech Language Pathologist (8)	○	○	○	○	○	○
Audiologist (9)	○	○	○	○	○	○
Board Certified Behaviour Analyst (10)	○	○	○	○	○	○
Other (please specify) (11)	○	○	○	○	○	○
Other (please specify) (12)	○	○	○	○	○	○

To what extent is the team involved in the assessment process?

- ○ Each individual member does his/her part of the assessment. I alone consider all of the results and make the diagnosis (1)
- ○ Each individual member does their part, and then remains a part of the assessment process. Together, we collaborate on and discuss the diagnosis. (2)
- ○ Other (please specify) (3) _____

End of Block: Team Composition

Start of Block: Components of the Assessment (broad)

On a typical case, how much time do you personally spend on the ASD assessment before arriving at a diagnostic decision?

- ○ 1 hour or less (1)
- ○ 1-4 hours (2)
- ○ 5-9 hours (3)
- ○ 10-14 hours (4)
- ○ 15+ hours (5)

Display This Question:

If When conducting an assessment for ASD, do you typically assess with a team? != No

On a typical case, how much time does your team as a whole spend on the ASD assessment before arriving at a diagnostic decision?

- ○ 1 hour or less (1)
- ○ 1-4 hours (2)
- ○ 5-9 hours (3)
- ○ 10-14 hours (4)
- ○ 15+ hours (5)

Do you assess the child in multiple settings (e.g., school, in-home, in-clinic)?

- ○ Yes (1)
- ○ No (2)
- ○ Sometimes (please specify) (3) _____

Display This Question:

If Do you assess the child in multiple settings (e.g., school, in-home, in-clinic)? != No

How often do you assess in multiple environments?

- ○ Less than 20% of cases (1)
- ○ Between 21-40% of cases (2)
- ○ Between 41-60% of cases (3)
- ○ Between 61-80% of cases (4)
- ○ More than 80% of cases (5)

Which of the following pieces of information do you incorporate when working on a queried ASD case? If an assessment method is not within your scope of practice, you may still consider the results of such an assessment.

	I personally conduct this assessment (1)	I refer to someone else to complete this assessment, and consider the results as part of my assessment (2)	If this information is readily available, I will consider it, but do not actively refer to someone to obtain this information (3)	I do not include this assessment (4)
Intake interview with parent/caregiver (1)	○	○	○	○
Intake interview with the child/client (2)	○	○	○	○
Review of previous medical reports (3)	○	○	○	○
Review of previous psychological reports (4)	○	○	○	○
Review of previous educational reports (5)	○	○	○	○
Audiology Assessment (6)	○	○	○	○
Genetic Screen (7)	○	○	○	○
In-situ observation of the child/client (8)	○	○	○	○
Cognitive assessment (e.g. IQ testing; Wechsler Intelligence Scale	○	○	○	○

for Children, Stanford-Binet) (9)				
Language function assessment (10)	○	○	○	○
Adaptive skills assessments (e.g., the Vineland Adaptive Behaviour Scale) (11)	○	○	○	○
Social-Emotional broad based assessments (e.g. the Child Behaviour Checklist) (12)	○	○	○	○
Specific social-emotional measures (e.g. anxiety or depression scales) (13)	○	○	○	○
Behavioural assessments (e.g. Functional Behaviour Assessment) (14)	○	○	○	○
ASD specific measures (i.e. assessment tools specifically designed to assess for ASD such as the Autism Diagnostic Observation Schedule) (15)	○	○	○	○
DSM-IV-TR criteria for Autistic Disorder / Asperger Syndrome (16)	○	○	○	○

DSM-5 criteria for autism Spectrum disorder (17)	○	○	○	○

Carry Forward Unselected Choices from "Which of the following pieces of information do you incorporate when working on a queried ASD case? If an assessment method is not within your scope of practice, you may still consider the results of such an assessment. "

How often do you include these procedures in your formulation?

	Less than 20% of cases (1)	Between 21-40% of cases (2)	Between 41-60% of cases (3)	Between 61-80% of cases (4)	More than 80% of cases (5)
Intake interview with parent/caregiver (x1)	○	○	○	○	○
Intake interview with the child/client (x2)	○	○	○	○	○
Review of previous medical reports (x3)	○	○	○	○	○
Review of previous psychological reports (x4)	○	○	○	○	○
Review of previous educational reports (x5)	○	○	○	○	○
Audiology Assessment (x6)	○	○	○	○	○
Genetic Screen (x7)	○	○	○	○	○
In-situ observation of the child/client (x8)	○	○	○	○	○
Cognitive assessment (e.g. IQ testing; Wechsler Intelligence Scale for Children, Stanford-Binet) (x9)	○	○	○	○	○

Langauge function assessment (x10)	○	○	○	○	○
Adaptive skills assessments (e.g., the Vineland Adaptive Behaviour Scale) (x11)	○	○	○	○	○
Social-Emotional broad based assessments (e.g. the Child Behaviour Checklist) (x12)	○	○	○	○	○
Specific social-emotional measures (e.g. anxiety or depression scales) (x13)	○	○	○	○	○
Behavioural assessments (e.g. Functional Behaviour Assessment) (x14)	○	○	○	○	○
ASD specific measures (i.e. assessment tools specifically designed to assess for ASD such as the Autism Diagnostic Observation Schedule) (x15)	○	○	○	○	○
DSM-IV-TR criteria for Autistic Disorder / Asperger	○	○	○	○	○

Syndrome (x16)					
DSM-5 criteria for autism Spectrum disorder (x17)	○	○	○	○	○

Carry Forward Unselected Choices from "Which of the following pieces of information do you incorporate when working on a queried ASD case? If an assessment method is not within your scope of practice, you may still consider the results of such an assessment. "

How important is each piece of information when formulating an ASD diagnosis?

	Not at all important (1)	Unimportant (2)	Neutral (3)	Important (4)	Very Important (5)
Intake interview with parent/caregiver (x1)	○	○	○	○	○
Intake interview with the child/client (x2)	○	○	○	○	○
Review of previous medical reports (x3)	○	○	○	○	○
Review of previous psychological reports (x4)	○	○	○	○	○
Review of previous educational reports (x5)	○	○	○	○	○
Audiology Assessment (x6)	○	○	○	○	○
Genetic Screen (x7)	○	○	○	○	○
In-situ observation of the child/client (x8)	○	○	○	○	○
Cognitive assessment (e.g. IQ testing; Wechsler Intelligence Scale for Children, Stanford-Binet) (x9)	○	○	○	○	○

Langauge function assessment (x10)	○	○	○	○	○
Adaptive skills assessments (e.g., the Vineland Adaptive Behaviour Scale) (x11)	○	○	○	○	○
Social-Emotional broad based assessments (e.g. the Child Behaviour Checklist) (x12)	○	○	○	○	○
Specific social-emotional measures (e.g. anxiety or depression scales) (x13)	○	○	○	○	○
Behavioural assessments (e.g. Functional Behaviour Assessment) (x14)	○	○	○	○	○
ASD specific measures (i.e. assessment tools specifically designed to assess for ASD such as the Autism Diagnostic Observation Schedule) (x15)	○	○	○	○	○
DSM-IV-TR criteria for Autistic Disorder / Asperger	○	○	○	○	○

Syndrome (x16)					
DSM-5 criteria for autism Spectrum disorder (x17)	○	○	○	○	○

When formulating a diagnosis, do you review cognitive assessment data?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If When formulating a diagnosis, do you review cognitive assessment data? = Yes

How often do you review cognitive assessment data?

- ○ Less than 20% of cases (1)
- ○ Between 21-40% of cases (2)
- ○ Between 41-60% of cases (3)
- ○ Between 61-80% of cases (4)
- ○ More than 80% of cases (5)

When formulating a diagnosis, do you review adaptive assessment data?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If When formulating a diagnosis, do you review adaptive assessment data? = Yes

How often do you review adaptive assessment data?

- Less than 20% of cases (1)
- Between 21-40% of cases (2)
- Between 41-60% of cases (3)
- Between 61-80% of cases (4)
- More than 80% of cases (5)

When formulating a diagnosis, do you consider scores from autism-specific diagnostic measures?

- Yes (1)
- No (2)

Display This Question:

If When formulating a diagnosis, do you consider scores from autism-specific diagnostic measures? = Yes

How often do you review scores from autism-specific diagnostic measures?

- Less than 20% of cases (1)
- Between 21-40% of cases (2)
- Between 41-60% of cases (3)
- Between 61-80% of cases (4)
- More than 80% of cases (5)

End of Block: Components of the Assessment (broad)

Start of Block: Specific Assessment Tools

Do you wish to complete some supplementary questions regarding specific assessment instruments you may use in your assessment and diagnostic practices? Participation in this section is not required for completion of the survey, and will take no longer than 5 minutes to complete.

- ○ Yes, I wish to continue (1)
- ○ No, I do not wish to continue (2)

Skip To: End of Block If Do you wish to complete some supplementary questions regarding specific assessment instruments yo... = No, I do not wish to continue

Please indicate which of the following assessment tools you use in your ASD assessment and diagnostic practices

	Do not use (1)	Less than 20% of cases (2)	Between 21-40% of cases (3)	Between 41-60% of cases (4)	Between 61-80% of cases (5)	More than 80% of cases (6)
Unstructured Observation (1)	○	○	○	○	○	○
The Autism Diagnostic Observation Schedule (ADOS) (2)	○	○	○	○	○	○
The Childhood Autism Rating Scale (CARS) (3)	○	○	○	○	○	○
The Autism Diagnostic Interview (ADI-R) (4)	○	○	○	○	○	○
The Diagnostic Instrument for Social and Communication Disorders (DISCO) (5)	○	○	○	○	○	○
Gilliam Autism Rating Scales (GARS) (6)	○	○	○	○	○	○
The Developmental, Dimensional and Diagnostic Interview (3Di) (7)	○	○	○	○	○	○
Autistic Behaviour Interview (ABI) (8)	○	○	○	○	○	○
The Social Responsiveness Scale (SRS) (9)	○	○	○	○	○	○

The Social Communication Questionnaire (SCQ) (10)	○	○	○	○	○	○
The Autism Spectrum Rating Scale (ASRS) (11)	○	○	○	○	○	○
The Pervasive Developmental Disorder Behaviour Inventory (PDDBI) (12)	○	○	○	○	○	○

Carry Forward Unselected Choices from "Please indicate which of the following assessment tools you use in your ASD assessment and diagnostic practices"

When later deciding whether or not to assign a diagnosis, how strongly do the results of your selected assessment tools factor into the decision?

	Not at all (1)	To a limited degree (2)	A bit (3)	Strongly (4)	Very strongly (5)
Unstructured Observation (x1)	○	○	○	○	○
The Autism Diagnostic Observation Schedule (ADOS) (x2)	○	○	○	○	○
The Childhood Autism Rating Scale (CARS) (x3)	○	○	○	○	○
The Autism Diagnostic Interview (ADI-R) (x4)	○	○	○	○	○
The Diagnostic Instrument for Social and Communication Disorders (DISCO) (x5)	○	○	○	○	○
Gilliam Autism Rating Scales (GARS) (x6)	○	○	○	○	○
The Developmental, Dimensional and Diagnostic Interview (3Di) (x7)	○	○	○	○	○
Autistic Behaviour Interview (ABI) (x8)	○	○	○	○	○
The Social Responsiveness Scale (SRS) (x9)	○	○	○	○	○

The Social Communication Questionnaire (SCQ) (x10)	○	○	○	○	○
The Autism Spectrum Rating Scale (ASRS) (x11)	○	○	○	○	○
The Pervasive Developmental Disorder Behaviour Inventory (PDDBI) (x12)	○	○	○	○	○

End of Block: Specific Assessment Tools

Start of Block: Block 5

Thank you for your participation. If you would like to be entered into a draw for a $25 Starbucks gift certificate, or would like a copy of the results of the study, please click on the link below, which will take you to a separate website where you can submit your contact information. Please note that your contact information will not be associated with the data provided in this survey, thus your answers will remain anonymous.

https://www.surveymonkey.com/r/PWNZGYM

End of Block: Block 5