_____ Research Report _____

Assessing Fetal Alcohol Spectrum Disorder in Women Offenders

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Assessing Fetal Alcohol Spectrum Disorder in Women Offenders

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Executive Summary

Key words: *Fetal Alcohol Spectrum Disorder, women offenders, screening*

Fetal Alcohol Spectrum Disorder (FASD) is an umbrella term that describes a continuum of birth defects that may result from prenatal alcohol exposure. Examining FASD in correctional populations is important because many of the associated impairments may affect offenders' ability to adjust to an institutional environment or to benefit fully from interventions and services. While it is strongly suspected that FASD is more common among offenders than it is in the general Canadian population, prevalence estimates vary given difficulties with identifying FASD in adulthood using traditional assessment approaches.

An FASD screening tool (FASD Brief Screen Checklist) was previously piloted with men offenders and found to effectively distinguish between those affected by FASD and those with non-FASD cognitive deficits or no cognitive deficits. The purpose of the current study was to examine whether a modified version of this measure, the Brief Screen Checklist for Women (BSC-W), was equally effective in identifying women offenders with FASD. A total of 23 women offenders participated in the study. In addition to the BSC-W, the women completed a battery of neuropsychological assessments and a medical intake interview, including having photographs taken for examination of the facial characteristics typical of FASD. Determination of FASD status was established jointly by a physician with expertise in FASD, a neuropsychologist, and a member of the research team.

Four of the 23 women participating in the study were identified as likely to have FASD (probable FASD), five were deemed to have cognitive deficits not related to FASD, and nine had no cognitive deficits. Five women were categorized as "uncertain" because they possessed some FASD characteristics but did not meet all of the criteria. The BSC-W was effectively able to discriminate those likely to have FASD from those with non-FASD cognitive deficits and those without deficits, providing preliminary support for the applicability of this tool for women offenders.

When all women with symptoms of FASD were compared to their counterparts without such symptoms, the patterns of findings were consistent with expectations based on the literature. For instance, women with FASD symptoms were more likely to have been adopted or raised in foster care. They were also more likely to experience a number of social problems: they were more likely to have had problems with school, work and employment; they reported deficits related to self-control and social skills; and they had difficulty understanding the consequences of their behaviour. In addition, almost all of the women with FASD symptoms had been diagnosed with Attention Deficit Hyperactivity Disorder – more than double the rate in women with other CNS deficits or no cognitive deficits.

Overall, these preliminary results suggest that the BSC-W has promise in identifying women offenders with probable FASD. Given the impact of FASD on offenders' institutional adjustment – and the potential impacts on ability to benefit fully from correctional interventions - effective screening of women offenders for FASD could be very useful in a correctional context.

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Introduction

Previous research has demonstrated that individuals diagnosed with Fetal Alcohol Spectrum Disorder (FASD) are more likely to be in trouble with the law (Streissguth et al., 2004), and rates of FASD are higher in correctional populations than in non-incarcerated populations (Boland, Burrill, Duwyn, & Karp, 1998; MacPherson, Chudley, & Grant, 2011). Examining the issue of FASD in correctional populations is important because many of the associated impairments may affect offenders' ability to adjust to an institutional environment or to benefit fully from interventions and services. However, confirming the presence of the disorder in adults, and particularly those in a correctional setting, has been difficult due to factors such as the lack of validated screening tools and stringent diagnostic requirements such as confirmation of maternal drinking during pregnancy (Chudley, Kilgour, Cranston & Edwards, 2007). Recently, a self-report assessment tool for identifying FASD among adult offenders, the Brief Screen Checklist, was developed and piloted with promising results (MacPherson et al., 2011). This original examination, however, focused exclusively on men offenders. The current study was undertaken to examine whether a modified version of the assessment measure, the Brief Screen Checklist for Women (BSC-W), could identify women offenders with FASD.

FASD

FASD is an umbrella term describing the continuum of birth defects and impairments resulting from prenatal alcohol exposure. Specific diagnoses falling within FASD describe the extent of individuals' impairment (Chudley et al., 2005). Fetal Alcohol Syndrome (FAS), the most visible manifestation of FASD, is distinguished by three main features: significant pre- and/or post-natal growth impairment, significant central nervous system impairment, and the presence of three distinct facial characteristics; short palpebral fissures, or eye openings; smooth or flattened philtrum, or groove between nose and upper lip; and, thin upper lip (Chudley et al., 2005; Chudley et al, 2007). Other potential birth defects found in individuals with this diagnosis include heart defects, cleft palate, brain malformations, visual and auditory impairments, kidney abnormalities, seizure disorders, skeletal effects, and other physical abnormalities (Chudley et al., 2005). On the other end of the spectrum, many individuals with FASD do not have visible facial abnormalities or growth impairment, but they exhibit the same significant central nervous

system impairments that affect learning, judgement, and problem solving. Though diagnostic groupings have evolved over time, the current FASD categories are FAS with confirmed alcohol exposure, FAS without confirmed alcohol exposure, partial FAS (pFAS), and Alcohol Related Neurodevelopment Disorder (ARND) (Chudley et al., 2005; Chudley, Kilgour, Cranston & Edwards, 2007).

Since the effects of prenatal exposure to alcohol are widespread, there is no common cognitive profile of an affected individual. The extent of damage to the developing fetus depends on many factors including the timing, amount and frequency of exposure to alcohol (Gibbard, Woas, & Clarke, 2003). Disabilities associated with FASD have been classified as primary or secondary (Streissguth, 1997). Primary disabilities are the result of alcohol interacting directly with developing fetal organ systems, and may manifest as intellectual deficits and learning disabilities, physical disabilities, hyperactivity, attention and/or memory deficiencies, inability to manage anger, difficulties with problem solving, and growth impairment (Boland, Chudley & Grant, 2002; Burd, Selfridge, Klug, & Juelson, 2003; Chudley et al., 2005; Streissguth, 1994). Secondary disabilities are the behavioural, social, and psychiatric consequences of living with brain damage. These include mental health problems (depression, anxiety, psychotic disorders, and attention deficit hyperactivity disorder), difficulties at school, problems with employment, inappropriate sexual behaviour, victimization, and trouble with the law. Indeed, given the limitations on affected individuals' ability to learn, reason, and understand the consequences of their behaviour, many adolescents and adults with FASD find themselves coming into contact with the criminal justice system (Streissguth et al., 1991). Within the correctional context, these impairments also contribute to those with FASD exhibiting more problematic institutional adjustment, simultaneously being more likely to perpetrate and be victimized in incidents of violence (Mullins, MacPherson, Moser, & Matheson, 2014).

Diagnosing FASDs in Offenders

Diagnosing FASD in adults is challenging under normal circumstances – for instance, obtaining information on maternal substance use after long delays is quite difficult – but it is especially so in a correctional system. FASD is often also comorbid with mental illnesses such as depression, anxiety, or substance use (Famy, Streissguth, & Unis, 1998), which may mask symptoms of FASD. Moreover, in a correctional setting, certain social and intellectual

characteristics of FASD such as attention deficits, learning difficulties, substance abuse problems, and impulsivity are also common among those who are not affected (Boe, Nafekh, Vuong, Sinclair, & Cousineau, 2003; MacPherson et al., 2011). However, despite these commonalities, it is important to identify offenders with FASD because their behavioural and cognitive deficits are typically more serious and intractable than are those of their counterparts without FASD.

Generally speaking, research has demonstrated that FASD is more common among offender populations (Boland, Chudley & Grant, 2002; Fast & Conry, 2004). In a recent study conducted with a small sample of Canadian men federal offenders at one penitentiary, the rate was found to be approximately ten times greater than that estimated in the general Canadian population (MacPherson et al., 2011). In this study, the authors reported on the development and application a brief screening tool (FASD Brief Screen Checklist) for the identification of FASD in adult men offenders (MacPherson et al., 2011). The tool, which includes 48 items reflecting behaviour, historical information, and maternal substance use, was considered together with medical information, neuropsychological assessments, results of examination of facial characteristics, and other information to both validate the tool and estimate the prevalence of FASD in a correctional population. The authors found support for their instrument and demonstrated that 9 (10%) of the 91 adult men offenders in the sample had FASD. They indicated that this estimate was likely a conservative one, as an additional 14 offenders were classified as "uncertain" or suspected due to insufficient availability of data. As noted, this study was specific to men offenders, and, at present, no screening tool for FASD exists for women offenders.

Gender Differences in FASD

Although prevalence of FASD has not been found to differ by gender, one could speculate that there may be gender differences in the manifestation of FASD and associated comorbidities. However, research in this area has either been conflicting or not demonstrated any differences. For example, with respect to the prevalence of comorbid ADHD, some studies of children with FASD have found that boys were significantly more likely to be diagnosed with ADHD than girls (Herman, Acosta, & Chang, 2008), while other researchers' findings showed that girls had higher scores of inattention than boys (Ramussen, Horne, & Witol, 2006).

Similarly, no consistent differences between men and women with FASD have been found for rates of depression (Famy, Streissguth & Unis, 1998) or substance use disorders (Classen, Smylie & Hapke, 2009; Famy et al., 1998).

Purpose of the Study

This study was undertaken as a first step to begin to address the gap in research related to FASD among adult women offenders. Questions related to both the identification and the manifestation of FASD within this group were of interest. With respect to identification, the FASD Brief Screen Checklist, originally piloted with men offenders (MacPherson et al., 2011), was adapted for screening FASD in women offenders, and the instrument's utility with this population was examined. Based on the results of the Brief Screen Checklist, women with suspected or confirmed FASD were profiled and compared to those who did not meet the diagnostic threshold with respect to of their behaviour, family history, criminogenic need, criminal history, and medical information.

Method

Participants

Participants were recruited at a Canadian federal institution for women and were eligible to participate if they were 35 years old or younger[1], and serving a federal sentence with a minimum of three months remaining prior to release (to enable sufficient time for women to complete all aspects of the study). During the study recruitment period from September 2011 to November 2012, 47 women offenders met the inclusion criteria and, of those, 29 agreed to participate. Six withdrew, leaving a final sample of 23 women. Of these, ten were White, nine Aboriginal, and the remainder were of other ethnic backgrounds. The average age was 28 years (*SD* = 5.3).

Procedure

Prior to participant recruitment, all women in the institution were invited to an information session on FASD and were informed that research on FASD would be taking place over the next several months. Participants who met inclusion criteria were then invited to meet with a member of the research team by means of a letter with an appointment time delivered through the institutional mail. During the initial recruitment interview the study was explained in detail, both verbally and in writing. Participants provided informed consent for participation, the release of medical records from birth, access to institutional health records, the taking of digital photographs to be analysed using an FAS facial photographic recognition software, and permission to contact collateral sources of information in the community (i.e., birth mother, family, close family friend)[2]. During the initial interview, participants also completed the Brief Screen Checklist for Women (BSC-W). In subsequent scheduled meetings, participants completed a medical intake interview, neuropsychological tests of central nervous system functioning, and a brief (10 minute) medical exam with the study physician via tele-health.

After the medical examination, neuropsychological testing, and other measures were completed, a diagnostic case conference was held between the physician, neuropsychologist, and

[1] This age range was chosen in order to maximize the possibility of obtaining complete hospital records.

[2] Women were also asked to volunteer the names of two collateral contacts who knew their mother at the time of their birth (to confirm maternal alcohol consumption). However, due to low participation rate for mothers and other collateral contacts, these data were not included in the analyses.

Research Liaison Officer. Based on the results of the testing, women were placed in one of four categories: Probable FASD, Uncertain (UC), Central Nervous System (CNS) Deficits and No Deficits. In reaching a probable diagnosis of FASD, four criteria were assessed according to the Canadian guidelines for FASD diagnosis (Chudley et al., 2005): pre- and postnatal growth, characteristic facial features, central nervous system impairment, and prenatal alcohol exposure. During individual debriefing sessions with the Research Liaison Officer, women received the results of their FASD diagnostic assessment, which included a letter from the neuropsychologist and another from the physician explaining their results. If a woman met the diagnostic criteria for FASD or had neuropsychological impairment, the neuropsychologist was present via teleconference in the debriefing and they were offered assistance to help them understand the information and its possible impact. For those with a FASD diagnosis or for whom diagnosis was uncertain due to insufficient information, support was also made available from the Research Liaison Officer for the duration of the study.

Data Sources

BSC-W. The BSC-W (Appendix A) was based on the Brief Screen Checklist developed by MacPherson and colleagues (2011) to screen men offenders for FASD; a small number of changes were made to reflect recommendations from experts in the field of women's health. The measure contains 47 questions focused on behaviour (30 questions), historical information (7 questions), and maternal alcohol use (10 questions). The behavioural items focused on areas such as impulsivity and concentration while the historical items gathered information regarding women's experience with adoption or foster care, early school failures, or other mental health diagnoses. The maternal alcohol use section was designed to largely parallel the criteria used for the assessment of FASD during diagnosis, with items relating to the timing and duration of alcohol exposure during pregnancy, as well as frequency and amount of alcohol consumed.

Battery of neuropsychological tests. Participants completed a battery of neuropsychological tests to assess central nervous system functioning. According to Canadian guidelines (Chudley et al., 2005), the following domains are to be assessed in diagnosing FASD: attention, memory, executive functioning, academic achievement, communication/language, adaptive behaviour, sensor motor functioning, and structural deficits. A battery of published, standardized neuropsychological assessments with satisfactory psychometric properties,

recommended by the project neuropsychologist, was administered by psychometrists in order to assess these areas (Appendix B provides a list of the tests administered). It should be noted that the neuropsychological assessment battery included the Word Memory Test (Green, 2003), used as an indicator of effort. This test's purpose is to identify those who were not putting forth a genuine effort on the other neuropsychological assessments, as their test results may not be valid. Completion of the battery typically took approximately three hours, spread across two testing sessions.

Medical information. Women completed a Medical Intake Interview (Appendix C). The questionnaire included medical history questions in areas such as hospitalizations, traumatic head injuries, chronic medical conditions, and family history of both acute and chronic medical problems. Medical records pertaining to the participants' birth were sent directly to the physician from the hospital, which were examined for indices of possible FASD at birth such as smaller birth weight, head circumference, and lower scores on standardized tests of physical condition in infants. Finally, the physician also conducted a ten to fifteen minute medical exam via telehealth.

Facial photographs. Three facial photographs of each woman (frontal, three-quarters, and profile) were taken by the Research Liaison Officer and examined by the study physician to identify the presence of three distinct characteristics associated with FAS: short palpebral fissures, or eye openings; smooth or flattened philtrum, or groove between nose and upper lip; and, thin upper lip. In addition, the physician noted the presence of other discernible anomalies.

The Offender Management System (OMS). OMS is CSC's electronic administrative database. Data were obtained from women's intake assessments, including the Dynamic Factor Identification and Analysis – Revised (DFIA-R), a measure of criminogenic need in seven domains: substance abuse, employment/education, marital/family, associate/social interaction, community functioning, personal/emotional orientation, and attitude (CSC, 2007; Brown & Motiuk, 2005). In addition, intake data were obtained on women's criminal history.

Data Analyses

Overall, the small number of women in the study – especially given they were classified into four distinct groups – meant that sample sizes were often too small to allow for the application of statistical tests such as chi-square tests of independence or analyses of variance. As a result, some analyses were descriptive.

The first series of analyses focused on describing the women's diagnostic categorization. Given this was the first application of the BSC-W to women offenders, the next set of analyses focused on its psychometric properties – in particular, on the behavioural indicators. Cronbach's alpha and item-total correlations were calculated to assess internal consistency, the diagnostic groups were compared on their total score for the BSC-W, and receiver operating characteristics (ROC) analyses were computed to establish thresholds for FASD. Finally, women in the different diagnostic groups were compared on family history and medical indicators from the BSC-W, the medical intake interview data, and the OMS data.

Effort test. As mentioned above, the neuropsychological assessment battery the women completed included a test of effort, the Word Memory Test (Green, 2003), which was included because failure on this measure may indicate that the other tests in the battery are invalid. However, research challenging this use of the Word Memory Test has emerged, especially with regard to individuals with cognitive impairments (Salekin & Doane, 2009; Willis, Farrer, & Bigler, 2011). In particular, Batt, Shores, and Chekaluk (2008) have found that the Word Memory Test requires greater cognitive capacity than had previously been believed, which would increase the likelihood of those with related deficits scoring poorly. Others have argued that the exclusion of those who do not succeed the Word Memory Test should be considered on a case-by-case basis (Willis et al., 2011). As such, exploratory analyses were conducted to decide whether to exclude women based on their Word Memory Test results. Ultimately, given that women who failed the Word Memory Test tended to be those with deficits[3] – that is, those for whom the test is argued to be less valid – and because effort test results were not found to be linked with scores on the behavioural indicators of the BSC-W, all women were retained in analyses.

[3] Of the nine women who failed the effort test, three were in the probable FASD group and two in the UC group, with another three in the CNS deficit group. Only one was in the no deficit group.

Results

Diagnostic Categorization

A total of four women were identified as likely or probable to have FASD[4] (see Table 1) while another five were classified as "uncertain" because they possessed some FASD characteristics, but did not meet all of the criteria laid out in the Canadian Guidelines for Diagnosis of FASD (Chudley et al., 2005). An additional five women were identified as having a non-FASD central nervous system deficit (CNS Deficit).

Table 1.

Women's Diagnostic Categorization

Diagnostic Category	*n*	%
Probable FASD	4	17
Uncertain	5	22
CNS deficit	5	22
No deficit	9	39

N = 23.

BSC-W

Psychometric properties. The next series of analyses focused on the BSC-W. Mean scores and standard deviations across the sample on each of the 30 behavioural items (similar analyses were not appropriate for the historical and maternal alcohol use indicators) are provided in Appendix D. Most of the BSC-W's behavioural indicators were approximately normally distributed across the sample of 23. Cronbach's alpha, computed as a measure of internal consistency, was good (alpha = .94), with 25 of the 30 items correlating with the score total at a magnitude of r = .40 or greater. One item, however, was *negatively* correlated with the total ("likes to be with other people"), but exploratory analyses showed that excluding this item had no appreciable effect on any of the subsequent results.

The total score on BSC-W was also examined. The mean total score was 85.2 (*SD* = 16.7) with a minimum of 55 and a maximum of 110. Total scores were approximately normally

[4] Of these four women, three met the criteria for ARND, but failed the effort test. The fourth women met the criteria for partial FAS, but was not comfortable with her mother, or any other collateral source, being contacted to confirm maternal drinking during pregnancy.

distributed despite the small sample size.

Distinguishing diagnostic groups. Total scores across the 30 BSC-W behavioural indicators were compared across diagnostic categories and found to differ, F (3, 19) = 4.58, p < .01.[5] Women in the Probable FASD group scored significantly higher on the BSC-W behavioural indicators than those in the CNS Deficit group and than those without a deficit, but did not differ from the uncertain group (see Table 2).

Table 2.

Total BSC-W Behavioural Indicators Scores

	Total BSC-W Behavioural Indicators Score	
Diagnostic Category	*M*	*SD*
Probable FASD	101.3	5.0
Uncertain	95.8	9.7
CNS deficit	76.2	15.9
No deficit	75.7	15.4

N = 23.

Exploratory analyses were also conducted to examine whether a threshold BSC-W behavioural indicators total score could distinguish between women in the Probable FASD group and those without a deficit. The total scores of those in these two groups were submitted to Receiver Operating Characteristic (ROC) analysis, which resulted in a suggested threshold score of 93. All four women in the Probable FASD group – and only two of those without a deficit – scored above this threshold.[6] This threshold value also discriminated relatively well for the other groups. Four out of the five women in the Uncertain group scored at or above the threshold, while only one of those with other CNS deficits did so.

[5] Given sample size issues, this ANOVA must be interpreted cautiously. Originally, given that the contribution of results on the effort test to understanding study results was uncertain, results on this test was also included in the analysis, and a 2 (passed/failed effort test) x 4 (diagnostic group) ANOVA was conducted on the sum of behavioural indicators. In these analyses, no relationships were identified between the women's total score, their diagnostic group, their effort test result, or the interaction of those two factors, though the relationship of the score with diagnostic group approached statistical significance, F (3, 15) = 2.67, p < .10. Given that effort test results exhibited no relationship with the behavioural scores, the analysis was replicated without including effort test results.

[6] For this threshold, the following values were obtained: sensitivity = 1.00; specificity = .82; positive predictive value = .67; negative predictive value = 1.00.

Differences between Diagnostic Groups

The next series of analyses focused on differences between women with FASD and those in the other groups on family history indicators, criminal history and criminogenic need, and medical indicators. For these analyses, a combined FASD / Uncertain group was created and contrasted with the CNS deficits and no deficits group. The combined group was created primarily because four of the five women in the Uncertain group reported that they had previously been told that they had FASD (compared to two of four in the Probable FASD group and none in the CNS deficit and no deficit groups). The fact that the Uncertain group scored similarly to the FASD group on the BSC-W behavioural indicators further supports combining these individuals into one group. Overall, the FASD / Uncertain group can be thought of as comprised of women with at least some of the impairments frequently seen in FASD individuals.

Family history. Patterns of response on the family history items of the BSC-W differed somewhat by group (see Table 3). Women in the FASD / Uncertain group were more likely to have spent time being raised by someone other than their birth parents, as well as to have had problems in school.

Table 3.

BSC-W Family History Indicators

Family History Indicator	Diagnostic Group (%)		
	FASD / Uncertain (n=9)	CNS Deficit (n=5)	No Deficit (n=9)
Adopted	33	0	0
Been in foster care	78	20	56
Problems with school from an early age	100	20	44

N = 23.

Maternal alcohol use. Women in the FASD / Uncertain group also differed from those in the other two groups in terms of their reports of maternal alcohol use. As can be seen in Table 4, rates were higher for the FASD / Uncertain group across all indicators, with the single exception of maternal drug use while pregnant. In this case, women in the FASD / Uncertain group and those without a deficit provided similar responses. In general, the mothers of women

with at least some FASD symptoms were most likely to have reported to both use during pregnancy and to have behaviours consistent with problematic substance use. Given that maternal alcohol use is a key diagnostic criterion for FASD, this result is not surprising.

Table 4.
BSC-W Maternal Substance Use Indicators

Maternal Substance Use Indicator	Diagnostic Group (%)		
	FASD / Uncertain	CNS Deficit	No Deficit
Mother drank alcohol while pregnant with woman (known)	67	0	11
Mother drank alcohol while pregnant with woman (suspected)	89	40	33
Mother used drugs while pregnant with woman	22	0	22
Mother drank alcohol when woman was young	89	60	44
Mother sometimes drank in morning when woman was young	44	0	0
Close friends / relatives worried / complained about mother's drinking when woman was young	67	40	0
Mother spoke about wanting to cut down on her drinking	33	20	0
Friends / family told mother about things she said / did while drinking that she could not remember	56	20	0

N = 23.

Criminal history. The three groups differed very little in terms of criminal history. Most of the 21 women for whom these data were available had prior convictions as adults (81%), while about half had convictions as youth (57%). Though all groups were quite likely to have previous adult convictions (FASD / Uncertain: 67%; CNS Deficit: 100%; no Deficit: 83%), differences emerged for youth convictions. Specifically, none of the women in the CNS Deficit group had previous youth convictions, while rates were higher for the other two groups (FASD / Uncertain: 67%; No Deficit: 75%).

Criminogenic need. At intake, women were assessed for the level of criminogenic need

they presented in the following seven domains: personal / emotional, marital / family, community functioning, education / employment, associates, substance use, and attitude. Table 5 presents the proportion in each group assessed as presenting moderate or high levels of need in each domain. In general, there was a trend for women in the FASD / Uncertain and CNS Deficit groups to be more likely to exhibit needs relating to education / employment and associates than were women without identified limitations.

Table 5.

Criminogenic Need

Criminogenic Need Domains	Diagnostic Group (%)		
	FASD / Uncertain	CNS Deficit	No Deficit
Personal / emotional	89	75	78
Marital / family	44	50	44
Community functioning	22	50	22
Education / employment	100	75	44
Associates	89	100	56
Substance use	89	100	78
Attitudes	44	50	22

Note. One of the 23 women in this study (from the CNS Deficit group) was excluded as her dynamic risk had been assessed using a previous system not directly comparable to that used for the majority of participants. $N = 22$.

Medical intake interview. The last series of comparisons focused on data derived from the medical intake interview. A number of historical indicators were identified, and, as can be seen in Table 6, the proportion of women in the FASD / Uncertain group endorsing these indicators tended to be greater than that of the two other groups. In turn, the proportion of the women in each group identified as presenting problems in various life skills during the medical intake interview is presented in Table 7. While rates of problems with motor and language skills were low, women in the FASD / Uncertain group tended to be identified as having more problems in other areas such as self-help skills, social skills and understanding the consequences of their behaviour.

Table 6.

Medical Intake Interview Historical Indicators

Historical Indicator	Diagnostic Group (%)		
	FASD / Uncertain	CNS Deficit	No Deficit
Previous head injury	89	0	88
Previously abused (physical, emotional, sexual, other)[a]	67	40	11
Previously diagnosed with ADHD	89	20	33
Worried about their development as a child	78	20	33
Previously homeless	78	60	44

Note. [a]Responses to this item must be interpreted cautiously as, in addition to "no" responses, the denominator also includes those who did not answer the question, did not know, or did not provide a clear response. ADHD = Attention Deficit Hyperactivity Disorder. $N = 23$.

Table 7.

Medical Intake Interview Life Skill Problem Indicators

Life Skill Problem Indicator	Diagnostic Group (%)		
	FASD / Uncertain	CNS Deficit	No Deficit
Gross motor skills	22	0	0
Fine motor skills	25[a]	0	11
Language skills	22	0	22
Self-control	78	20	67
Self-concept	100	25[a]	56
Bedwetting	63[a]	0	25[a]
Self-help skills	100[a]	0	25[a]
Social skills	67	0	22
Accident-prone	78	0	44
Understanding consequences of behaviour	89	20	50[a]

Note. [a]Data unavailable for one respondent. $N = 23$.

Discussion

To date, women offenders have been an overlooked group with respect to research on FASD. Neither estimates of the prevalence of FASD nor examinations of its correlates exist for this group. This oversight is striking given the overrepresentation of FASD among offender populations (MacPherson et al., 2011) and the association of FASD with features common among women offenders, such as previous histories of abuse and trauma (Barrett, Allenby, & Taylor, 2010; Fast & Conry, 2004). Therefore, this study, though limited by a small sample size, makes an important contribution to the existing knowledge regarding FASD among women in the correctional system.

The BSC-W, based on the Brief Screen Checklist developed for men offenders (MacPherson et al., 2011), was examined to determine its ability to identify women in the correctional system that are at risk for FASD. Despite the small number of women examined, the BSC-W was able to distinguish women with symptoms of FASD from those with other CNS deficits, as well as those with no cognitive deficits. In total, four women (17%) were identified as having a probable FASD. Notably, the five women who exhibited some symptoms of FASD (the Uncertain group) scored similarly on the BSC-W to those meeting FASD criteria. Given that some women fell into this category only because information required for the FASD diagnosis (such as maternal alcohol consumption) could not be confirmed, the fact that the Uncertain group was indistinguishable from the FASD group on the BSC-W is a promising result. Overall, there was very little overlap in scores between those with, and those without, FASD symptoms, providing preliminary support for the validity of the BSC-W.

These findings are particularly important due to the fact that a diagnosis of FASD relies in part on information about the mother's consumption of alcohol during pregnancy. Given that confirmation of this information in adulthood is difficult, confirming a diagnosis of FASD in adulthood is challenging. A valid and reliable self-report screening tool based on current behaviours could replace the requirements of the traditional FASD assessment approach. Though the current results require replication, they suggest that the BSC-W may contribute to identification of women offenders who either have FASD or have associated symptoms. Such identification could be helpful in terms of allocating necessary resources and interventions for

this disadvantaged group.

The fact that women exhibiting symptoms of FASD were more likely to report problematic alcohol use by their mother during pregnancy or during the women's youth, provides concurrent validity for the screening tool and for the categorizations applied in this study. Women with FASD symptoms were also more likely to have been adopted or raised in foster care, which is in keeping with findings that individuals with FASD are over-represented in the Canadian child welfare system (Fuchs, Burnside, Marchenski, & Murdy, 2005; Lange, Shield, Rehm, & Popova, 2013). Interestingly, they were not assessed as presenting greater dynamic need relating to marital and family relations than did women in the other groups. This latter finding may indicate that the women were able to develop healthier relationships in adulthood, or, conversely, this finding could reflect the fact that women in all three groups had similar problems in this area.

In keeping with previous findings (e.g., Fast & Conry, 2004), women in this sample who exhibited symptoms of FASD were more likely to experience a number of social problems: they were more likely to have had problems with school and work and employment, they reported deficits related to self-control and social skills, and they had difficulty understanding the consequences of their behaviour. In addition, almost all of the women with FASD symptoms had been diagnosed with Attention Deficit Hyperactivity Disorder – more than double the rate in women with other CNS deficits or no cognitive deficits. O'Malley and Nanson (2002) also found high rates of comorbidity between the two conditions. Given the disruptive and aggressive behaviour often associated with Attention Deficit Hyperactivity Disorder (e.g., Gunter, Arndt, Riggins-Capsers, Wenman, & Cadoret. 2006; Westmoreland et al., 2010), this pattern suggests that women offenders with FASD may experience additional challenges in a correctional setting. In a sample of men adult offenders, it was found that those diagnosed with FASD exhibited more difficulty with institutional adjustment than offenders without FASD and a trend towards lower rates of correctional program completion (Mullins, MacPherson, Moser & Matheson, 2014).

Limitations and Strengths

In interpreting study results, it is important to acknowledge a number of limitations, the first of which is the neuropsychological effort test results. The neuropsychological assessment played a critical role in determining FASD status. Many of the women whose

neuropsychological assessments, together with other results, suggested a diagnosis of FASD failed to pass the Word Memory Test (Green, 2003). Given the test is frequently used to assess effort, such results are generally interpreted to mean that a neuropsychological assessment is invalid (Green, Lees-Haley, & Allen, 2008). The decision was made, however, to retain these women in analyses. Researchers have found that those with cognitive deficits may do poorly on the test (Batt et al., 2008; Salekin & Doane, 2009; Willis et al., 2011). The fact that rates of failure in our study were much higher amongst those with deficits despite the lack of incentives for malingering aligns with these findings and lends credence to Larrabee's (2012) argument that this effort test is not appropriate for those with a cognitive impairment. Moreover, the decision to retain these women in the study was further supported by exploratory analyses that showed no relationship between effort test results and scores on the BSC-W. However, the lack of certainty regarding how to interpret these effort test results means results must be interpreted cautiously and further underscores the importance of their replication. Future researchers who attempt such replications may benefit from considering additional or alternative instruments as effort tests.

A second limitation concerns the small sample size. Future research would benefit from drawing individuals from multiple institutions to increase their numbers. With so few women with a probable FASD participating, it was not possible to assess differences across the FASD spectrum. That said, the fact that the BSC-W was able to so clearly discriminate between those likely to have symptoms of FASD and other women despite low numbers is promising in terms of its screening potential.

Conclusion

Overall, these preliminary results suggest that the BSC-W has promise as a low-cost self-report screening tool for detecting the presence of FASD or FASD symptoms among women offenders. Given the impact of FASD on offenders' institutional adjustment (Mullins, MacPherson, Moser & Matheson, 2014), and the potential impact of deficits associated with FASD on the ability to benefit fully from interventions aimed at decreasing the likelihood of re-offence (Burd et al., 2003), effective screening of women offenders could be very useful. Once identified, women with the condition could be routed to appropriate interventions and services. While this is true for all offenders, this might be especially pertinent for women offenders. FASD is a women's health issue, and women with FASD have been found to be more likely to

have children with FASD themselves (Rouleau et al., 2003). Indeed, in addition to the benefits of screening for identification of appropriate interventions and services, the BSC-W, if further validated, could also be used together with substance use information to identify women who could benefit from educational and health support relating to the risks of alcohol consumption during pregnancy.

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Appendix A: Fetal Alcohol Spectrum Disorder Brief Screen Checklist

Fetal Alcohol Spectrum Disorder Brief Screen Checklist – Women (BSC- W)

Instructions:

The checklist should be completed by the research assistant during the consent interview with the participant.

All questions on the checklist should be completed. If respondent does not know the answer to one or more questions, please circle "do not know" or "unknown". For questions that do not apply, check off "Not Applicable" or "Did not Drink/Use". Do not leave any questions blank.

Case ID:_____

Date: _____

(YYYY/MM/DD)

Fetal Alcohol Spectrum Disorder
Brief Screen Checklist

Case ID:_____

Date: _____
(YYYY/MM/DD)

Part 1
Behavioural Indicators

The first set of questions is about your behavior and abilities.

Directions: Please rate yourself on the following questions. There are no right or wrong answers, just do the best you can. I will begin asking you the first set of questions now.

		Disagree a lot	Disagree	Agree	Agree a lot	Do Not Know
Would you describe yourself as someone who :						
1.	Has a problem with managing money	1	2	3	4	0
2.	Has trouble following directions.	1	2	3	4	0
3.	Is restless.	1	2	3	4	0
4.	Has trouble with spelling.	1	2	3	4	0
5.	Makes bad choices a lot of the time	1	2	3	4	0
6.	Is easily distracted.	1	2	3	4	0
7.	Has temper tantrums.	1	2	3	4	0
8.	Has strong mood swings.	1	2	3	4	0

		Disagree a lot	Disagree	Agree	Agree a lot	Do Not Know
9.	Is hyperactive.	1	2	3	4	0
10.	Acts impulsively.	1	2	3	4	0
11.	Seems unaware of the consequences of your actions.	1	2	4	5	0
12.	Has trouble with math.	1	2	3	4	0
13.	Interrupts a lot during conversation.	1	2	3	4	0
14.	Is easily agitated.	1	2	3	4	0
15.	Is always forgetting things	1	2	3	4	0
16.	Talks a lot but has a hard time getting your point across	1	2	3	4	0
17.	Has a poor memory.	1	2	3	4	0
18.	Has trouble with reading.	1	2	3	4	0
19.	Is easily victimized	1	2	3	4	0
20.	Has trouble completing tasks.	1	2	3	4	0
21.	Has a hard time paying attention.	1	2	3	4	0
22.	Is easily manipulated.	1	2	3	4	0
23.	Is disorganized.	1	2	3	4	0
24.	Has trouble staying on topic.	1	2	3	4	0
25.	Has poor social skills	1	2	3	4	0
26.	Easily gets stressed out or anxious	1	2	3	4	0
27	Does not like change	1	2	3	4	0

		Disagree a lot	Disagree	Agree	Agree a lot	Do Not Know
28	Likes to be with other people	1	2	3	4	0
29	Has trouble making decisions	1	2	3	4	0
30	Has trouble staying interested in things	1	2	3	4	0

Score on behavioural items _____ (Maximum 120)

Part 2
Historical Information

The second set of questions is about your family and personal history. **Directions**: Please answer the following questions to the best of your ability. There are no right or wrong answers, just do the best you can. I will begin asking you the second set of questions now.

---

31. Were you adopted? **Yes** 1 **No** 0 **Do Not Know** 0

32. Have you ever been in foster care? **Yes** 1 **No** 0 **Do Not Know** 0

32a. If yes: Please tell me how many times. **1-2** 0 **3-5** 1 **5+** 2 **Do Not Know** 0 **N/A** 0

Please tell me how many foster homes if more than five:

_____

33. Have you had problems with school from an early age? **Yes** 1 **No** 0 **Do Not Know** 0

34. Have you ever been treated for a mental health problem? **Yes** 1 **No** 0 **Do Not Know** 0

If yes: Can you please tell me what type of treatment and what it was for?

34a.	If yes: Please specify how many times you were in treatment.	**1-2** 0	**3-5** 1	**5+** 2	**Do Not Know** 0	**N/A** 0

35.	Do have a brother or sister with diagnosed or suspected FASD?	**Yes** 1	**No** 0	**Do Not Know** 0	**N/A** 0

36.	If you have children, have you ever been told that your child has been diagnosed or suspected of having FASD?	**Yes** 1	**No** 0	**Do Not Know** 0	**N/A** 0

37.	Have you ever been told that you might have FASD?	**Yes** 1	**No** 0	**Do Not Know** 0

If yes, by whom?

_____

Score on historical items _____ (Maximum 9)

Part 3
Maternal Indicators

The next set of questions is about your **biological** mother's use of alcohol when you were young

Directions: Please answer the questions to the best of your ability. There are no right or wrong answers, just do the best you can. I will begin asking you the questions now.

---

38. Did your mother drink alcohol when you were young?

Yes	**No**	**Do Not Know**
1	0	0

(if answer is 'no' or 'do not know' then go to question 38)

38a. If yes: how often did your mother drink?

- ☐ **Once monthly or less**
- ☐ **2-4 times per month**
- ☐ **2-3 times per week**
- ☐ **4 or more times per week**
- ☐ **Do Not Know**
- ☐ **Not Applicable**

---

39. How many drinks of alcohol did she usually have on a typical drinking occasion?

One standard drink is defined as:

- *12 oz (341 ml, standard bottle) of regular beer*
- *5 oz (142 ml, regular size wine glass) of table wine,*
- *3 oz (85 ml) of fortified wine (sherry, port, vermouth),*
- *1.5 oz (43 ml, single shot) of spirits (whiskey, rum, gin)*

- ☐ **One**
- ☐ **Two to four**
- ☐ **Five or more (specify number if possible): _____**
- ☐ **Do Not Know**
- ☐ **Not Applicable**

40	When you were young, did close friends or relatives worry or complain about your mother's drinking?	**Yes** 1	**No** 0	**Do Not Know** 0
41	When you were young did your mother sometimes take a drink in the morning when she first got up?	**Yes** 1	**No** 0	**Do Not Know** 0
42	Did friends or family members ever tell your mother about things she said or did while she was drinking that she could not remember?	**Yes** 1	**No** 0	**Do Not Know** 0
43	Did your mother ever talk about wanting to cut down on her drinking?	**Yes** 1	**No** 0	**Do Not Know** 0

The final set of questions is about your mother's use of alcohol during the time she was pregnant with you.

Directions: Please answer the questions to the best of your ability. There are no right or wrong answers, just do the best you can. I will begin asking you the last set of questions now.

44.	Do you know if your mother drank alcohol when she was pregnant with you?	**Yes** 1	**No** 0	**Do Not Know** 0
45	Do you suspect that your mother drank alcohol when she was pregnant with you?	**Yes** 1	**No** 0	**Do Not Know** 0
46	Do you know if your mother used any other drugs during pregnancy?	**Yes** 1	**No** 0	**Do Not Know** 0

46a If so, what types?

- ☐ **Tobacco**
- ☐ **Prescription – from a doctor** _____
- ☐ **Prescription – used without a doctor's order** _____
- ☐ **Illicit** _____ _____
- ☐ **Do not know**
- ☐ **Did not use**

47. Please tell me how you got the information about your mother's use of alcohol and/or drugs during pregnancy.

- ☐ **Personal Information**
- ☐ **Other Relatives/friends**
- ☐ **Foster/adopted parent**
- ☐ **Health Professional**
- ☐ **Other:**_____

That is the end of the questions. Thank you for participating in this research.

NOTE TO INTERVIEWER: Please provide any other details discussed during the interview regarding the participant's behaviour, family history or mother's use of alcohol.

Appendix B: Neuropsychological tests used in the assessment of FASD

Neurological Domain	Test Used	Reference
General Intellectual Ability (IQ)	Wechsler Abbreviated Scale of Intelligence (WASI)	PsychCorp (1999). *Wechsler Abbreviated Scale of Intelligence Manual*. San Antonio, TX: Harcourt Assessment, Inc.
Academic Achievement	Wechsler Individual Achievement Test Second Edition-Abbreviated (WIAT-II-A)	The Psychological Corporation, a Harcourt Assessment Company. (2001). *Wechsler Individual Achievement Test Second Edition Abbreviated: Manual*. San Antonio, TX: Author.
Language	California Verbal Learning Test – Short Form	D.C. Delis, J.H. Kramer, E. Kaplan, B.A. Ober (2000). *California Verbal Learning Test – second edition. Adult version. Manual.* Psychological Corporation, San Antonio, TX
	Controlled Oral Word Association Test (COWAT)	Benton, A., Hamsher, K. & Sivan, A. (1994). *Multilingual Aphasia Examination.* Psychological Assessment Resources, Inc.
Memory	Brief Visuospatial Memory Test -R	Benedict, R.H.B. (1996). *Brief Visuospatial Memory Test-Revised (BVMT-R).* Psychological Assessment Resources, Inc.
	Rey Complex Figure Test and Recognition Trial	Meyers, J.E.. & Myers, K.R. (1995*). Rey Complex Figure Test and Recognition Trial: Professional Manual*. Lutz, FL: Psychological Assessment Resources, Inc.

Executive Function	Wisconsin Card Sorting Test (WCST)	Heaton, R.K, Chelune, G.J., Talley, J.L., Kay, G.G., & Curtiss, G. (1993). *Wisconsin Card Sorting Test Manual: Revised and Expanded*. Lutz, FL: Psychological Assessment Resources, Inc.
	Comprehensive Trail Making Test (CTMT)	Reynolds, C.R. (2002). *Comprehensive Trail-Making Test: Examiner's Manual*. Austin, TX: PRO-ED, Inc.
Adaptive Behaviour	Adaptive Behaviour Assessment System Second Edition – Adult form (ABAS-II)	Harrison, P.L. & Oakland, T. (2003). *Adaptive Behavior Assessment System – Second Edition*. San Antonio, TX: Harcourt Assessment, Inc.
Attention	Connors' Continuous Performance Task (CPT-II)	Conners, C.K. (2004). *Conners' Continuous Performance Test (CPT II) Version 5 for Windows Technical Guide and Software Manual*. Toronto: Multi-Health Systems Inc.
Malingering*	Word Memory Test	Green, P. (2003). Word Memory Test. Edmonton, AB: Green's Publishing.

* Malingering is not a recommended neurological domain for assessment of FASD; however it was used in the study as the participants were offenders in a federal penitentiary.

Appendix C: Medical Intake Interview

Medical Intake Interview – Cover Page

Instructions:

The medical interview should be completed by a member of the research team during her initial meeting with the offender at Nova Institution for women, or scheduled for another convenient date.

All questions should be completed. If the respondent does not know the answer to one or more questions, please write unknown or 'U' or put a check mark in the spot indicated for unknown. For questions that do not apply, write 'N/A' or put a check mark in the spot indicated for Not Applicable. Do not leave any questions blank.

Client Name: _____

Case ID: _____

FPS: _____

Date: _____

Case ID:_____

Date:_____

Please answer the following questions to the best of your ability.

PERSONAL HISTORY

Do you have any history of the following?

	Yes	No	Unknown
1. **Hearing or Vision concerns**			
Details:			
2. **Chronic Illnesses**			
Details:			
3. **Hospitalizations or Surgeries**			
Details: (include approximate dates)			
4. **History of traumatic head injury resulting in loss of consciousness**			
Details: (include number of times)			
5. **Has a Psychiatrist, Psychologist, Mental Health Worker, or Elder ever assessed or treated you?**			
Details (include approximate dates and methods of treatment):			
6. **Have you ever been a victim of physical abuse?**			
Details:			
7. **Have you ever been a victim of emotional abuse?**			
Details:			
8. **Have you ever been a victim of sexual abuse?**			
Details:			
9. **Have you ever been a victim of an 'other' form of abuse?**			
Details:			

EDUCATION

10. What is the highest grade you've completed? _____

11. Did you fail any grades?
    Yes ____ No _____ If yes, which grades? _____ _____ _____

12. Which grades did you repeat? _____ _____ _____ _____ _____

13. Were you ever expelled or suspended from school?
    Yes _____ No _____

    If yes, please provide details:

14. What are your strengths, or what do other people say you are good at?

15. What are your weaknesses?

DEVELOPMENTAL HISTORY

16. Have you ever been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD)? Yes ____ No _____

    If yes, have you ever been treated?
    Yes ____ No _____ N/A _____

17. When you were a child, were you ever worried about your physical or emotional development?
    Yes ____ No _____

    If yes, please explain:

Social History:

18. Have you ever been homeless? Yes ____ No _____

    Please explain:

19. Have you ever received a disability income? Yes ____ No _____

Please explain (including type of disability if yes)

20. Have you ever applied for a disability income ?

Yes ____ No _____

Please explain (including details if denied coverage)

21. Have you ever been responsible for caring for a child (your own or someone else's) that has had or was suspected of having FASD?

Yes ____ No _____

Please explain:

22. Do you expect to be caring for any children (your own or others) that have or are suspected of having FASD when you are released?

Yes ____ No _____

Please explain:

23. Have you ever had trouble with any of the following? (Check all that apply.)

		Yes	No	Unknown
23a	**Gross Motor Skills**			
Details:				
23b	**Fine Motor Skills**			
Details:				
23c	**Language Skills**			
Details:				
23d	**Self-Control Skills**			
Details:				
				Table continues on next page
23e	**Self-Concept**			
Details:				
23f	**Bed Wetting or Soiling**			
Details:				
23g	**Self-Help skills**			

		Yes	No	Unknown
Details:				
23h	**Social Skills**			
Details:				
23i	**Are you accident prone?**			
Details:				
23j	**Are you fearless?**			
Details:				
23k	**Do you have difficulty understanding the consequences of your behavior?**			
Details:				

FAMILY HISTORY

24. Mother's age at child's birth: _____

25. Mother's race: _____

26. Father's race: _____

27. Are parents related e.g. blood cousins? _____

28. List Offender's brother(s) and/or sister(s)

Name	M or F	Date of Birth (Y/M/D)
_____	____	_____
_____	____	_____
_____	____	_____
_____	____	_____

Has anyone in your biological family ever had any of the following? Please check all that apply. Please do not leave any spaces blank. Put 'Y' for yes, 'N' for no, 'U' for unknown and 'N/A' for not applicable.

		Birth Father	Father's Family	Birth Mother	Mother's Family	Siblings
29.	**Vision Problems**					
Details:						
30.	**Hearing Problems**					
Details:						
31.	**Birth Defects**					
Details:						
32.	**Stillbirths**	N/A				
Details:						
33.	**Miscarriages**	N/A				
Details:						
34.	**Learning Disorders**					
Details:						
35.	**Attention Deficit Disorder**					
Details:						
36.	**Hyperactivity**					
Details:						
37.	**Mental Illness**					
Details:						
38.	**Mental Retardation**					
Details:						
39.	**Other Developmental Disabilities**					
Details:						

Table continues on next page

		Birth Father	Father's Family	Birth Mother	Mother's Family	Siblings
40.	**Depression**					
Details:						
41.	**Alcoholism**					
Details:						
42.	**Suicide**					
Details:						
43.	**Delinquency**					
Details:						
44.	**Child Abuse**					
Details:						
45.	**Sexual Abuse**					
Details:						
46.	**Epilepsy**					
Details:						
47.	**Neurological Disease**					
Details:						
48.	**Chronic Illnesses**					
Details:						
49.	**Any specific genetic condition**					
Details:						
50.	**Other**					
Details:						

51. Other Maternal Drug Use

Did your birth mother use any of the following other substances during pregnancy?
Please check the appropriate response(s).

51a) **Drugs**

Yes ____ No ____ Unknown ____

b) **If yes: Check specific substance(s)**

Type of Drug	Yes	No	Unknown	N/A
THC (cannabis)				
Amphetamines				
Heroin				
Opiates				
Opioids				
Benzodiazepines				
Cocaine				
Crack Cocaine				
Dissociatives				
Volatiles				
Hallucinogens				

52. **Tobacco** Yes ____ No ____ Unknown ____

53. **Medication** Yes ____ No ____ Unknown ____

If yes: List specific substance(s):

54. Please provide any further information you may have that might help describe your mother's level of alcohol use before and during pregnancy.

_____

Interviewer Comments:

Appendix D: BSC-W: Behavioural Indicator Means, Standard Deviations, and Item-Total Correlations

Behavioural Indicator	*M*	*SD*	Item-Total Correlation
Has a problem managing money	3.00	1.00	.39
Has trouble following directions	2.55	.96	.70
Is restless	3.13	.76	.67
Has trouble with spelling	2.30	1.11	.62
Make bad choices a lot of the time	3.04	.88	.70
Is easily distracted	3.48	.73	.71
Has temper tantrums	2.36	.95	.48
Has strong mood swings	2.83	.94	.67
Is hyperactive	2.77	.92	.77
Acts impulsively	3.30	.70	.63
Seems unaware of consequences of actions	2.87	1.01	.62
Has trouble with math	3.22	1.00	.50
Interrupts a lot during conversation	2.83	1.03	.56
Is easily agitated	3.35	.71	.75
Is always forgetting things	3.04	.88	.70
Talks a lot but hard time getting point across	3.05	1.05	.87
Has a poor memory	2.91	.90	.60
Has trouble with reading	1.87	.76	.22
Is easily victimized	2.48	.79	.28
Has trouble completing tasks	2.82	.96	.92
Has a hard time paying attention	2.96	.93	.80
Is easily manipulated	2.43	1.04	.43
Is disorganized	2.30	.97	.20
Has trouble staying on topic	2.96	.88	.89
Has poor social skills	2.30	1.06	.45
Easily gets stressed out or anxious	3.17	.83	.72
Does not like change	3.00	.85	.57
Likes to be with other people	3.00	.91	-.41
Has trouble making decisions	2.83	.78	.72
Has trouble staying interested in things	3.04	.88	.77

N = 23