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## Support for the construct validity of the Supports Intensity Scale based on clinician rankings of need

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## ABSTRACT

The Supports Intensity Scale (SIS) is designed as a measure of support needs for individuals with intellectual disability. The current validity study required five experienced clinicians to rank a total of 50 cases as having Low, Medium, or High Support Need based on descriptions that were part of an assessment package for services. These rankings were compared to individuals' SIS scores. The three groups (Low, Medium, High Need) differed in their SIS Support Needs Index scores as well as 6 of the 7 subscale scores. Home Living Activities and Exceptional Behavioral Support Needs emerged as the strongest predictors of group status. These results suggest that the SIS provides valid information regarding the needs of individuals with intellectual disability receiving services.

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Understanding the support needs of people with intellectual disability is important for developing appropriate individualized community supports, and tailoring the demands of a person's environment with their abilities (Thompson, Tassé, & McLaughlin, 2008). It is also important to examine support needs at the population level, to ensure that public services meet the requirements of clients in the community and to improve resource capacity and allocation. The Supports Intensity Scale (SIS; Thompson et al., 2004) was developed to provide a standardized measure of the intensity of support needs of adults with intellectual disability. The SIS differs from measures of adaptive behavior in that it assesses the frequency, type, and duration of supports that a person needs to perform activities successfully and not merely what a person typically does independently.

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The SIS has become the measure of choice among state and provincial governments who aim to understand and analyze the service needs of their citizens with intellectual disability (Schalock, Thompson, & Tassé, 2008a; Schalock, Thompson, & Tassé, 2008b; Schalock, Thompson, & Tassé, 2008c). The SIS has been adopted by approximately 15 states and provinces. Some states have adopted the SIS as their reliable and valid measure of individual support needs for the purpose of developing individualized support plans. Other states have used the SIS to assist them in determining rates for services in conjunction with other information to develop models for establishing individual resource allocations.

There have been a number of studies examining the SIS reliability and validity. In terms of reliability, the SIS Users Manual presented results indicating strong internal consistency, test-retest, and interscorer reliabilities (Thompson et al., 2004), and a recent study by Thompson et al. (2008) reported strong inter-interviewer and inter-respondent reliability when interviewers were trained in SIS administration and scoring. Establishing reliability is a critical, but not sufficient, step towards ensuring a measure's validity. Although reliability speaks to the level of accuracy of results produced, it fails to speak to whether the information collected represents the constructs that the instrument is designed to measure.

The SIS Users Manual reported good validity along a number of indices. Criterion-related validity was assessed by asking key informants to estimate each person's support needs on a five-point Likert scale (i.e., "low support needs" to "high support needs"), and results indicated moderate correlations among subscale scores and respondent rankings. There were also significant differences in overall mean SIS subscale scores between individuals who were considered by respondents to be of "low need" compared to those ranked as "high need" (i.e., received a ranking of 1 or 2 vs. a ranking of 4 or 5), a reflection of construct validity. More recently, Guscia, Harries, Kirby, Nettelbeck, and Tapling (2006) assessed the construct validity of a pre-published version of the SIS by showing that test scores discriminated among people with multiple disabilities (either 1, 2, or 3 disabilities), and that test scores were correlated with the severity of the person's primary disability as ranked by respondents (i.e., mild, moderate, severe, profound). These group differentiation studies are limited by the fact that ranked level of support need (i.e., low vs. high) and SIS scores were obtained through the same respondent. A more rigorous test of construct validity would be to use information that is separate from the SIS questionnaire to judge level of need, and to employ distinct clinicians to function as SIS interviewer and judge.

The current validity study aims to build upon the previous validity studies of the SIS by comparing participant SIS rankings to judgments about support needs made by independent clinicians. In this study, clinicians ranked clients as having Low, Medium, or High Support Need based on written client descriptions that were part of an assessment package for services. These rankings of support need were then compared to clients' SIS scores. It was hypothesized that mean SIS scores would be significantly different for the individuals ranked into the three levels of Support Need based on the clinicians' rankings.

## 1. Method

### 1.1. Study sample

We selected profiles of 50 participants at random from a group of 479 adults with intellectual disability who participated in a larger project on service utilization and support need. Participants were selected from across the province of Ontario. The current sample's support needs, service use, and demographic information is compared to that of the entire sample in Table 1. To assess the extent to which the current sample was similar to the larger sample, chi-square tests of independence and independent samples *t*-tests were calculated comparing the total sample's percentages ( $N = 479$ ) to those of the current sample ( $n = 50$ ), assuming  $\alpha = .01$  for multiple comparisons. The mean age of clients in the current sample was similar to that of the total sample ( $M = 43.2$  years,  $S.D. = 15.3$ , compared to  $M = 39.6$  years,  $S.D. = 14.6$ , respectively ( $p > .01$ ). A significantly greater percent of individuals in the current sample lived in group homes and used service coordination supports

**Table 1**  
Sample characteristics and mean SIS scores.

	Current sample (n = 50)	Total sample (N = 479)
English as first language	78	86
Sign language	10	9
Understand spoken language ( $\chi^2(2) = 6.73, p = .04$ )		
Not at all	0	3
Moderately	58	40
Very well	42	56
Hearing supports	6	9
Vision supports	42	45
Mobility supports	22	23
Residential status		
Independent or with roommate	2	6
Group home ( $\chi^2(1) = 9.11, p = .003$ )	51	39
Supported independent living	9	8
Living with family member ( $\chi^2(1) = 5.78, p = .02$ )	26	38
Other (nursing home, shelter, hospital, long term care, etc.)	11	9
Supports currently received		
Day activities ( $\chi^2(1) = 4.88, p = .03$ )	86	71
Employment	20	18
Service coordination ( $\chi^2(1) = 8.80, p = .005$ )	42	23
Specialized services	30	25
Respite	14	19
Supports requested		
Residential service ( $\chi^2(1) = 4.77, p = .03$ )	10	24
Day activities	8	14
Specialized services	4	4
Respite	4	8
SIS Total Index score (M, S.D.)	98.4 (14.1)	94.7 (15.7)
SIS Home Living (M, S.D.)	9.8 (3.0)	9.2 (3.0)
SIS Community Living (M, S.D.)	8.7 (2.5)	8.4 (2.5)
SIS Lifelong Learning (M, S.D.)	10.6 (1.9)	10.3 (2.3)
SIS Employment (M, S.D.)	10.2 (2.0)	9.5 (2.2)
SIS Health and Safety (M, S.D.)	9.6 (2.2)	9.0 (2.7)
SIS Social Activities (M, S.D.)	9.6 (2.0)	9.1 (2.2)
SIS Exceptional Behavioral Support Needs (M, S.D.)	3.9 (4.2)	3.4 (3.8)
SIS Exceptional Medical Support Needs (M, S.D.)	1.3 (1.9)	1.5 (2.3)

compared to the total sample (51% vs. 39%, and 42% vs. 23%, respectively). Supports Intensity Scale scores did not differ significantly between groups (all  $p > .05$ ).

## 1.2. Measures

### 1.2.1. Supports Intensity Scale

The SIS consists of three sections: Section 1, Supports Needs Scale, assesses need in 49 life activities that are grouped into six support domains or subscales (i.e., Home living, Community living, Lifelong learning, Employment, Health and Safety, and Social); Section 2, Supplemental Protection and Advocacy Scale—assesses support need in 8 protection advocacy activities; and Section 3, Exceptional Medical and Behavioral Support Needs, assesses support need pertaining to 15 medical conditions and 13 problem behaviors. Each activity in Sections 1 and 2 is evaluated on a five-point scale (0–4) according to the frequency, daily support time, and type of support required for the person to successfully participate in the activity. Section 3 items are assessed on a three-point composite scale of intensity of needed support (0–2). All respondents knew clients well and were interviewed by someone who was trained in SIS administration.

### 1.2.2. Other elements of the assessment package

In addition to the SIS, information was collected across a number of standardized areas to describe clients in a person-centered way, in the form of an Ontario assessment package. A reference group of advocates, clinicians, and administrators developed the assessment package through consensus, which was piloted with 250 individuals with intellectual disability across Ontario, and then revised. The assessment package contained client information divided into eight sections: (1) core information (gender, date of birth, language, hearing/vision/mobile supports, current living situation, financial situation, family/caregiver situation); (2) additional medical and behavioral information (extreme support requirements); (3) the person-centered plan (open-ended questions to describe personal dreams/visions, strengths, preferences, likes, dislikes, what helps, what hinders, what is important, what others see as important, goals, etc.); (4) additional considerations (transportation, safety and security); (5) current supports and services (current participation in supports and services including school, day activities, employment, evening programs, accommodation support, respite, attendant care support, etc.); (6) supports and services requested; (7) summary support questions (faith or cultural preferences, support priorities of the clients and of primary caregivers), and (8) questions about how well the current supports and services are helping the client reach their personal goals and visions. Trained assessors administered the assessment package to participants and their caregivers, and recorded all the information about the participant directly on the assessment questionnaire. This included verbatim responses to open-ended questions as well as ratings reached by consensus of the participant–caregiver group. The interviews were conducted using a person-centered approach over 1 or 2 sessions, which included the SIS administration.

### 1.3. Procedure

An interdisciplinary group of five clinicians from the Dual Diagnosis Program at the Centre for Addiction and Mental Health (i.e., a nurse, behavior therapist, psychologist, and two social workers) served as the clinical raters. The Dual Diagnosis program provides a range of assessment and intervention services to individuals with intellectual disability and mental health problems in the Greater Toronto region of Ontario. These clinicians have extensive experience reviewing intake records and clinical forms as well as planning services for individuals with intellectual disability. Much of their work involves individuals with complex support needs.

All identifying information about the participants was removed prior to clinician review, and clinicians were not currently working with any of the participants. First, all clinicians participated as a group in training on levels of support need (Low, Medium, and High Need) with three of the authors (JW, YL, and JD), and together the group developed prototypes for each level of need. It was stressed that there was no algorithm for determining level of need, but that clinicians could consider what a typical level of need would look like based on clients seen in the past. The three levels of support need were operationalized as follows: (1) a typical “Low Need” individual may live independently, with a roommate, spouse or family, or in supported independent living, have no serious medical or behavioral issues, be able to travel fairly independently, not use or request many supports, and is likely satisfied with their current level of support; (2) a typical “Medium Need” individual may be living in a family home or group home, have a small amount of medical or behavioral concerns, use assisted transportation, require some assistance with sleeping through the night, currently use a medium number of supports (e.g., 3–5), and may be requesting some new supports; and (3) a typical “High Need” client may live in another supported arrangement not fitting with “Low” or “Medium” need levels, have serious medical or behavioral concerns, have forensic involvement, not be able to take public transportation, use a high number of supports, request specialized services, and may be extremely dissatisfied with current level of supports. Next, clinicians reviewed one package as a group and discussed why a certain level of need was assigned (e.g., Medium Need) to that individual. After general consensus was obtained using this package without seeing the accompanying SIS questionnaire results, the five clinicians reviewed the remaining participant descriptions (i.e., 49). Four of the clinicians reviewed the assessment questionnaires of 10 participants, while the fifth clinician reviewed the assessment questionnaires of nine participants. Each review took an average of 30 min. Clinicians took a maximum of 5 h each to complete all their reviews.

Upon completion of all their rankings, clinicians were randomly assigned a number of assessment questionnaires that had been independently evaluated by another clinician as Low, Medium, or High Need in an effort to ascertain inter-rater reliability. A total of 31 out of 49 participants (63%) were ranked by two clinicians. Clinicians were in agreement regarding the intensity of support need ranking 71% of the time. No two clinicians ranked the same participant as Low and High need, meaning that the discrepancies were always between one clinician's ranking of Medium, and the other clinician's ranking of Low or High. In the case where there was a discrepancy, the more extreme of the two rankings was taken as the participant's rank, to allow for more conservative analysis of differences between groups. By virtue of the SIS scores being normally distributed, we can assume that a greater proportion of individuals would have scores in the centre of the distribution (i.e., a Medium range of need). By assigning individuals as the more extreme case (Low or High), groups did not profit by this central tendency. If, for instance, all discrepant cases were given rankings of Medium instead of the more extreme ranking, then the remaining "non-discrepant" Low or High groups would likely possess even more extreme SIS mean scores, making it more easy to find differences. After the rankings were provided, we provided clinicians with the SIS protocols that were originally withheld to ensure that they were blind to SIS scores, and agreement rose to 90%.

## 2. Results

Twenty-eight percent of individuals were ranked as Low Need, 35% were ranked as Medium Need, and 37% were ranked as High Need. Table 2 lists the mean differences in support needs between Low, Medium, and High Need groups as well as differences in key demographic characteristics. Nonparametric analyses suggest that characteristics are differentiated in expected directions. Groups differed significantly with regard to the percent that speak English as a first language (with the highest percent being in the Low Need group), that use sign language (with the highest percent being in the High Need group), that currently receive employment supports (with the highest percent being in the Low Need group), and specialized services (with the highest percent being in the High Need group). There was also a significant relationship between level of need and the level of receptive language (the highest percent of individuals understanding spoken language "Very Well" are found in the Low Need group, while the highest percent understanding spoken language only "Moderately Well" are found in the High Need group).

A one-way ANOVA was calculated to test the hypothesis that groups (Low, Medium, High) would have significantly different mean SIS Support Needs Index scores. As shown in Table 2, this hypothesis was confirmed,  $F(2, 47) = 42.13, p < .001$ . *Post hoc* analyses using Sidak–Bonferroni adjustment indicated that the Low Need group had a significantly lower mean SIS Support Needs Index score compared to individual in the Medium Need group (mean difference =  $-17.58, p < .001$ ) and High Need group (mean difference =  $-27.93, p < .001$ ). The Medium Need group also had a significantly lower Support Needs Index score than the High Need group (mean difference =  $-10.53, p = .003$ ).

A one-way MANOVA was calculated to assess differences in SIS subscale scores based on group status. Multivariate tests revealed a significant difference between groups, Wilks' Lambda  $F(12, 84) = 5.32, p < .001$ . Subsequent analyses of each subscale indicated that groups were significantly different with regard to almost all of the SIS subscale scores, including: Home Living, Community Living, Lifelong Learning, Employment, Health and Safety, and Social Activities (all  $p$  values  $< .001$ ). As evident in Table 2, nearly all two-way comparisons were significant in *post hoc* analyses using Sidak–Bonferroni adjustment (all  $p < .05$ ), except for the lack of a significant difference between Medium and High Need groups in Lifelong Learning.

A similar one-way MANOVA was calculated to assess differences in SIS Exceptional Medical and Behavioral Support Needs scores based on group status. Multivariate tests revealed a significant difference between groups, Wilks' Lambda  $F(4, 90) = 8.91, p < .001$ . Individuals ranked as High Need had significantly higher Exceptional Behavioral Support Need scores compared to individuals ranked as Low Need (mean difference =  $4.96, p = .001$ ) and Medium Need (mean difference =  $4.12, p = .005$ ). Individuals ranked as High Need also had significantly higher Exceptional Medical Support Need scores compared to individuals ranked as Low Need (mean difference =  $1.82, p = .01$ ), and there was a trend toward a difference with the Medium Need group (mean difference =  $1.41, p = .08$ ). With respect

**Table 2**  
Differences in SIS scores and sample characteristics (percentage) based on Low, Medium, and High Need groups.

	Low Need (n = 14)	Medium Need (n = 17)	High Need (n = 18)
English as first language ( $\chi^2(2) = 12.22, p < .001$ )	100	87	47
Sign language ( $\chi^2(2) = 7.46, p = .02$ )	0	7	33
Understand spoken language ( $\chi^2(2) = 16.23, p < .001$ )			
Not at all	0	0	0
Moderately	17	50	93
Very well	83	50	7
Hearing supports	0	12	6
Vision supports ( $\chi^2(2) = 15.61, p < .001$ )	85	38	17
Mobility supports	20	13	33
Residential status			
Owned or rented by individual	0	6	0
Group home	67	65	83
Living with family member	33	29	11
Other	0	0	6
Supports currently received			
Day activities	80	75	100
Employment ( $\chi^2(2) = 11.93, p = .003$ )	47	6	6
Service coordination ( $\chi^2(2) = 10.71, p = .005$ )	33	19	72
Specialized services ( $\chi^2(2) = 20.92, p < .001$ )	13	0	67
Respite	20	0	22
Supports requested			
Residential service	7	13	11
Day activities	7	12	6
Specialized services	7	0	6
Respite	0	6	6
SIS Total Index score (M, S.D.)	82.1 (12.3)	99.7 (8.4)	110.0 (4.0)
SIS Home Living (M, S.D.)	6.7 (2.4)	9.4 (2.1)	12.5 (1.3)
SIS Community Living (M, S.D.)	6.1 (2.4)	9.0 (1.8)	10.5 (0.7)
SIS Lifelong Learning (M, S.D.)	8.6 (1.3)	11.1 (1.3)	11.8 (1.3)
SIS Employment (M, S.D.)	8.2 (1.9)	10.5 (1.2)	11.7 (0.8)
SIS Health and Safety (M, S.D.)	7.4 (2.0)	9.8 (1.6)	11.3 (0.9)
SIS Social (M, S.D.)	7.4 (2.1)	9.9 (1.2)	11.1 (0.7)
SIS Exceptional Behavioral Supports (M, S.D.)	1.8 (1.8)	2.7 (2.3)	6.4 (5.4)
SIS Exceptional Medical Supports (M, S.D.)	0.9 (1.4)	0.5 (0.9)	2.2 (2.5)

to both Exceptional Behavioral and Medical Support Needs, individuals ranked as Low Need did not differ significantly from individuals ranked as Medium Need (both  $p > .10$ ).

A stepwise discriminant analysis was conducted to determine which aspects of the SIS best predict group status (i.e., Low, Medium, or High). When SIS subscale scores and Exceptional Medical and Behavioral Support Needs scores were entered in a stepwise fashion, Home Living and Exceptional Behavioral Support Needs were retained in an overall model that was significant, Wilks' Lambda Exact

**Table 3**  
Classification results of Low, Medium, and High Needs (%).

	Predicted Group Membership		
	Low	Medium	High
Original Group Membership			
Low	93%	7%	0
Medium	12%	71%	18%
High	0	6%	94%

$F(6, 86) = 15.11, p < .001$ . As shown in Table 3, 85% of the original cases were correctly classified when these predictors were entered into the discriminant analysis of Low, Medium, and High Need groups.

### 3. Discussion

The current findings lend support for the construct validity of the SIS. Clinicians assessed the intensity of support needs of individuals unknown to them into 3 levels (Low, Medium, or High) based on clinical information provided in an assessment package for services. Groups with clinician-rated Low, Medium, and High Needs had significantly different SIS Support Needs Index scores and six of seven SIS subscale scores. The only exception was on the Life-Long Learning subscale score between individuals rated as having Medium and High Needs. Groups also had significantly different levels of current service use, residential status, language understanding, and the use of sensory supports (i.e., hearing, visual, mobility). These results suggest that the SIS scores provide valid information regarding the intensity of support needs of individuals with intellectual disability currently receiving services. The High Need group also had significantly higher Exceptional Behavioral and Medical Support Needs than the Medium and Low Need groups, who did not differ from each other. The lack of a statistical difference between SIS scores of individuals rated in the Low and Medium Need groups is consistent with the description of the Exceptional Behavioral and Medical Support Needs scales being measures of intense levels of support needs that are not commonly seen in most individuals with intellectual disability.

This is the first study to attempt to examine the predictive capacity of the different SIS domain scores for different rated levels of overall need. Of all the standard SIS scores, Home Living Activities was the strongest predictor of clinician-ranked level of need. Individuals who have high scores on this subscale need more intense supports in self-care and home-living activities, such as dressing, hygiene, using appliances and equipment, and preparing and eating food. The current results suggest that individuals who require more frequent and/or intense supports of this kind, and who may by extension have low levels of adaptive behavior in activities of daily living, may be regarded by clinicians as requiring higher levels of support need. Activities of daily living have a long history of being included in the assessment of adaptive behavior and intellectual disability, and clinicians might be sensitive to these skills in determining level of need. This finding might explain the high correlation between the SIS Support Needs Index score and the composite score on the Inventory for Client and Agency Planning (Guscia et al., 2006). The Exceptional Behavioral Support Needs score was the other important predictor of clinician-ratings of support need. As mentioned, a high score on Exceptional Behavioral Support Needs would represent someone with extreme problem behaviors or mental health problems that require intense supports to manage. Thus, experienced clinicians more likely rated individuals who had high scores on the SIS Exceptional Behavior Support Needs subscale as requiring High levels of support.

It is important to establish the reliability and validity of any standardized measure. It is especially important to determine the validity of the SIS, as it is being increasingly used by state and provincial agencies to make service planning decisions as well as funding decisions (Smith & Fortune, 2008; Weber & Stern, 2008). The SIS is likely a useful measure to quantify and standardize levels of need, and guide resource allocation, in concert with professional clinical judgment. The ability to plan for appropriate services and recognize individuals who may require more resources is critical if governments are to move to a proactive-based model from a reactive crisis-based model of service provision. It is prohibitively expensive to serve the few individuals in the most serious crisis, to the neglect of other individuals not yet in crisis with unmet needs. By providing the correct level of support, service planners can reduce the probability that individuals will require more expensive services in the future. The growing necessity for accountability has led to the implementation of needs-based assessments of people with intellectual disability in number of jurisdictions (in the US and UK), and the SIS appears to reflect different levels of need as recognized by experienced clinicians.

Many jurisdictions are beginning to use information from a standardized needs assessment scale to develop a funding formula and estimate levels of individualized funding (Severance & Campbell, 2008; van Loon, 2008; Wehmeyer et al., 2009). Our findings that SIS scores strongly correlate with clinician-ranked levels of support need suggest that the SIS may be helpful to assist in the process of

determining an individual's funding allocation, so long as additional cost drivers are considered in the process, in addition to support needs. Information on cost drivers would thus be determined through research on costs within the sector. Relevant variables may include the need for 1:1 support in various settings, transportation costs, medical costs, and costs to support families in need (not examined with the SIS).

There are a number of limitations to this validity study. Clinicians were in perfect agreement on 71% of cases despite not having information on level of support need, and differed by one need level for the remaining 29% of cases. Although we decided to take the more conservative route to resolve discrepancies, any testing that uses clinician judgment contains some subjectivity and presents with the challenge of applying discrete categories to complex individuals with unique profiles of need, ability, and context. Our follow-up with clinicians after their original ranking suggested that the information from the SIS protocols (i.e., the type, frequency, and intensity of supports) increased agreement to 90%, and highlights the importance of this type of information for the clinical assessment of need. As well, given that the assessment packages were completed by community agencies, the current results are only as valid as the recruitment strategies and data collection techniques from those agencies, which could not be entirely controlled. Despite having trained assessors on data collection methods, there was variability in the degree of information provided in assessment packages, which may have negatively impacted results. Further, results might underestimate the validity of the SIS for individuals who are the hardest for agencies to reach, and who might be individuals with the highest level of need; the marginalized, the dually diagnosed, or those receiving their supports informally through their families.

Understanding support needs is critical for needs based planning, policy development, resource allocation, waitlist management, prioritization, individualized service planning, and monitoring of outcomes. Future research would do well to study how clinicians conduct these interviews with individuals with intellectual disability and their families to learn which parts of the interview drive decision-making. The move towards a standardized assessment of need across clinicians is an important step to achieve these goals, and the SIS is quickly becoming the measure of choice by a number of jurisdictions. The current study is an essential test of construct validity of the SIS, associating it with clinician ranking of need.

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