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SUPPORT NEEDS OF CHILDREN WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES: AGE-RELATED IMPLICATIONS FOR ASSESSMENT

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The Supports Intensity Scale–Children's Version (SIS-C) was developed to assess the support needs of children and youth aged 5 to 16 years with intellectual and developmental disabilities. Data from the standardization sample of the SIS-C were analyzed to evaluate the impact of the age cohorts (5–6, 7–8, 9–10, 11–12, 13–14, and 15–16 years) used to stratify the sample on the measurement model, as well as the latent means, standard deviations, and correlations. The findings confirmed measurement invariance across age cohorts, but suggested that at the latent level, younger children, generally, have more intensive support needs and that as students with intellectual disability age, their support needs decrease. In addition, the 15- to 16-year-old cohort displayed differences in terms of the strength of correlations between support need domains, with stronger correlations than the other age groups. Implications for future research and practice are described. © 2015 Wiley Periodicals, Inc.

The social–ecological model, which defines disability as a function of the fit between a person's competencies and environmental demands, has been adopted by the World Health Organization in its International Classification of Functioning, Disability and Health (World Health Organization, 2001, 2007) and the American Association on Intellectual and Developmental Disabilities in its Terminology and Classification system (Luckasson et al., 2002; Luckasson et al., 1992; Schalock et al., 2010). When mismatches between personal competency and environmental demands are present, the need to identify and arrange supports that effectively address the mismatches exists. Increased attention, therefore, has been directed to the assessment of support needs. Support needs are defined as a "psychological construct referring to the pattern and intensity of support a person requires to participate in activities associated with typical human functioning" (Thompson et al., 2009, p. 135). The assumption is that efforts to assess and plan for support needs will result in the provision of personalized supports, which reduce the mismatch between personal competencies and environmental demands and enhance human functioning.

The Supports Intensity Scale (SIS; Thompson et al., 2004) was the first standardized measure developed to assess the support needs of adults with intellectual and developmental disabilities (ID/DD). It was normed for people aged 16 to 64 years, and consists of three sections: Section 1, Exceptional Medical and Behavioral Support Needs; Section 2, Support Needs Index Scale; and Section 3, Supplemental Protection and Advocacy Scale. Section 2 is the standardized portion of

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the scale, in which items are organized into six support need domains (Home Living, Community Living, Lifelong Learning, Employment, Health and Safety, and Social Activities). The SIS has been widely adopted, nationally and internationally, by developmental disability organizations to facilitate individualized support planning and inform decision-making in regard to the allocation of resources. The wide adoption of the SIS led to the need for, and subsequent development of, a version of the SIS-Children's Version, the SIS-C (Thompson, Wehmeyer, Hughes, Shogren, Little et al., in press). The SIS-C was developed using the SIS as a guide, but a systematic process was used to ensure the relevance of the support need domains and the items for children and youth with ID/DD ages 5 to 16 years (Thompson, Wehmeyer, Hughes, Shogren, Seo et al., in press). The SIS-C includes seven support need domains in the standardized portion of the scale: Home Life, Community and Neighborhood, School Participation, School Learning, Health and Safety, Social, and Advocacy Activities.

There is overlap between the adult version of the SIS and SIS-C in some domains; other domains, however (e.g., School Participation and Learning), are unique to the SIS-C and replaced domains on the adult version (e.g., Lifelong Learning and Employment). Also of note is that Advocacy Activities was included in the standardized portion of the scale on the SIS-C, but it is a supplemental scale on the SIS-A, because of early concerns with the interrater reliability of the items in this section which have since been addressed (Shogren et al., 2014). Like the adult version, the SIS-C has an Exceptional Medical and Behavioral Support Needs section that provides information about medical conditions and challenging behaviors that create unique support needs for children regardless of their relative intensity of support needs in other domains.

The SIS-C is administered through a semistructured interview that includes an interviewer and at least two respondents who know the child well. Despite the fact that respondents are asked to provide information on the extra support a child needs that is above and beyond support needed by typically developing children of the same age, when developing the sampling plan for the standardization of the SIS-C, it was assumed that support needs would be confounded with age, as younger children (with or without disabilities) would likely have higher levels of support need than would older children because they tend to be more dependent on adults. For this reason, the standardization sample was stratified by age cohorts in which support needs were assumed to be similar: 5–6, 7–8, 9–10, 11–12, 13–14, and 15–16 years. Within each age cohort, the sample was further stratified to ensure that the range of intellectual functioning/adaptive behavior of children and youth with ID/DD was represented. Three classifications were used: (i.e., mild, IQ $>$ 55; moderate, IQ 40–55; severe/profound, IQ $<$ 40).

Although the assumption that support needs are confounded with age is logical, research is needed to confirm this expectation in children and youth with ID/DD. Research is also needed to explore measurement-related issues (i.e., can the same items be used to measure support needs across age cohorts) and the specific pattern of differences across age cohorts (e.g., do some age cohorts show more or less similar patterns of differences in the mean scores, variances, standard deviations, and correlations in/among the seven support need domains). The purpose of this investigation was to explore the following research questions:

1. Can the seven support need domains measured on the SIS-C (Home Life, Community and Neighborhood, School Participation, School Learning, Health and Safety, Social, and Advocacy Activities) be comparably measured for children with ID/DD aged 5–6, 7–8, 9–10, 11–12, 13–14, and 15–16 years (i.e., does factorial invariance hold across these age groups)?
2. Are there differences in the latent means of the seven support need domains for children with ID/DD across the six age bands?

3. Are there differences in the latent variances and standard deviations of the seven support need domains for children with ID/DD across the six age bands?
4. Are there differences in the latent correlations among the seven support need domains for children with ID/DD across the six age bands?

Methods

Participants

Participants were 4,015 children or youth with intellectual disability (aged 5 to 16 years) who participated in the SIS-C standardization. Males made up 67.5% (n = 2,710) of the total participants, and females were 29.9% (n = 1,202). Participants from 23 states were recruited from state developmental disabilities service systems (n = 2,910; 72.5% of the total participants) and school districts (n = 1,105; 27.5% of the total participants). Approximately 56% of participants were White, 20% were Black, and the remainder was a range of ethnicities. As mentioned previously, the SIS-C task force stratified participants into the six age groups, and within each age group, the sample was further stratified based on ranges of intellectual functioning/adaptive behavior (i.e., mild, IQ > 55; moderate, IQ 40–55; severe/profound, IQ < 40). A small amount of data (1.7% of data) were missing on age and other demographic variables, and to recover missing information, we implemented multiple imputation in R software program (R Core Team, 2014) using the Amelia package with 100 iterations (Honaker, King, & Blackwell, 2011). Table 1 provides more information on demographic characteristics.

Assessment

As described previously, the SIS-C was designed to measure the pattern and intensity of support needs of children and youth with ID/DD. The SIS-C consists of two sections: (a) Exceptional Medical and Behavioral Needs and (b) Support Needs Index Scale. Section 1 evaluates medical conditions (i.e., respiratory care, feeding assistance, skin care, and other exceptional medical care) and challenging behaviors (i.e., externally directed destructiveness, self-directed destructiveness, sexual, and other exceptional behavioral concerns) that would impact support needs. Items on Section 1 are measured on a 0 to 2 scale (0 = *no support needed*; 1 = ; 2 = *extensive support needed*). Section 2 measures support needs across the seven domains: Home Life, Community and Neighborhood, School Participation, School Learning, Health and Safety, Social, and Advocacy Activities. Scores from the seven domains are used to compute subscale standard scores and a composite standard score (i.e., SIS-C Support Needs Index score). The standard scores indicate the relative intensity of a child's support needs against a normative sample of children with ID/DD. Each item is rated across three dimensions of support needs (i.e., type of support, frequency, and daily support time) and each dimension is scored on a 5-point scale.

Data Analysis

We conducted a multiple-group mean and covariance structures (MACS; Little, 1997) confirmatory factor analysis (CFA) to examine the research questions. Following the same procedures used for norming the SIS-C (Thompson, Wehmeyer, Hughes, Shogren, Seo et al., in press), before performing the MACS CFA, we created parcels (i.e., aggregate scores of items) that functioned as indicators of latent constructs in CFA models instead of original items (Little, 2013). Seo, Little, Shogren, and Lang (in press) provide further details on the benefits of parcels, procedures taken to create parcels, and the optimal parcel structure of the SIS-C. To maintain the metric of observed scores, we used the effects-coding method of identification introduced by Little, Slegers, and Card

Table 1
Demographic Characteristics of Normative Sample

Variable	*N*	%
Gender		
Male	2,710	67.5
Female	1,202	29.9
Missing	103	2.6
Age Cohort[a]		
5–6	513 (513)	12.8 (12.8)
7–8	562 (562)	14.0 (14.0)
9–10	762 (787)	19.0 (19.6)
11–12	804 (844)	20.0 (21.0)
13–14	818 (822)	20.4 (20.5)
15–16	487 (487)	12.1 (12.1)
Missing	69	1.7
Ethnicity		
White	2,244	55.9
Black	820	20.4
Hispanic	384	9.6
Multiple Ethnic Backgrounds	237	5.9
Asian/Pacific Islander	159	4.0
Native American	26	0.6
Other	73	1.8
Missing	72	1.8
Student's Intelligence Level		
<25 or Profound	459	11.4
25–39 or Severe	862	21.5
40–55 or Moderate	1,321	32.9
55–70 or Mild	1,157	28.8
Missing	216	5.4
Student's Adaptive Behavior Level		
Profound	563	14.0
Severe	1,052	26.2
Moderate	1,335	33.3
Mild	948	23.6
Missing	117	2.9

Note. Adapted with permission from Supports Intensity Scale–Children's Version User's Manual, by J. R. Thompson, M. L. Wehmeyer, C. Hughes, K. A. Shogren, H. Seo, T. D. Little, & R. Schalock, in press, Washington, DC: American Association on Intellectual and Developmental Disabilities. Copyright © 2015 by the American Association on Intellectual and Developmental Disabilities.
[a]Numbers in parentheses represent estimates after addressing missing data.

(2006). All analyses, using maximum likelihood estimation, were conducted in Mplus, version 7.0 (Muthén & Muthén, 1998–2012).

Research Question One—Construct Comparability. Establishing construct comparability—often referred to interchangeably with establishing measurement invariance—involves testing the impact of increasing constraints on the measurement model. The first test, configural invariance, examines whether the same model (e.g., same number of indicators and factors with same pattern of fixed and freed parameters) can be specified across groups. Next, weak invariance is tested by

placing equality constraints on factor loadings across groups (thus, more restrictive than—and nested within—the configural invariance model). Finally, strong invariance places invariance constraints on the intercepts along with constraints placed in previous models. When the change in Comparative Fit Index (CFI) was nonsignificant (CFI $<$. 01; Cheung & Rensvold, 2002) between two sets of nested models (i.e., configural vs. weak, weak vs. strong), we retained invariance constraints for factor loadings and intercepts, respectively. Establishing construct comparability is an essential step to compare group differences on the latent variables.

Research Question Two—Mean Differences. After construct comparability was established, we examined omnibus latent mean differences by placing seven sets of equality constraints on factor means across groups and conducting a likelihood ratio test. If differences were found, follow-up tests were performed by imposing equality constraints on a given domain across the six age groups. After identifying domains where data indicated meaningful differences, we then performed additional tests to determine the age groups that differed from each other by testing the impact of adding equality constraints within constructs across age groups.

Research Question Three—Variance and Standard Deviation Differences. To explore differences in the variances and standard deviations across age groups, when equality constraints were not tenable, we sequentially conducted follow-up tests to identify (a) which domains contributed to the omnibus difference and (b) which age groups had different variances in a given support need domain. As in Research Question Two, we gradually increased equality constraints to compare variances across groups rather than performing pairwise comparisons. We used final latent mean comparison model of each age group (i.e., a model with constraints placed on means, but not variances; obtained in Research Question Two) as a baseline model for likelihood ratio tests to simultaneously estimate means and variances. After obtaining means and variances for support need domains, we computed standard deviations of constructs by extracting square roots of variances.

Research Question Four—Correlation Differences. Because different variances existed across age groups in Research Question Three, we created higher-order phantom constructs using procedures established by Little (2013). Then, a chi-square difference test between nested models (correlations that are freely estimated vs. equality constraints on correlations) was conducted to simultaneously test whether the strength of the association between two constructs (21 correlations in total) differed across age groups. When equality constraints were not supported, we sequentially performed additional tests to determine which specific correlations led the omnibus difference and to identify which age groups showed differences. We used the strong invariance model with phantom constructs as a baseline model for difference tests.

Results

Research Question One—Construct Comparability

Table 2 provides fit indices for the nested sequence in the multiple-group CFA. The configural invariance model provided satisfactory model fit: $\chi^2(1{,}008) = 4{,}547.77$, root mean square error of approximation = .072 (90% CI [.070, .075]), CFI = .968, and Tucker–Lewis index = .960. Because equality constraints imposed on factor loadings did not worsen the model fit (ΔCFI = .001), we regarded the indicators as having comparable relationships with their respective latent constructs across groups (i.e., weak invariance was established). Strong invariance was also established, indicating that the six age groups had statistically equivalent observed values of the indicators when latent constructs are fixed at zero (Brown, 2015).

Table 2
Fit Indices for the Nested Sequence in the Multiple-Group CFA

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	RMSEA	RMSEA 90% CI	CFI	TLI	Constraint Tenable
Null Model	104842.70	1275	.00	–	–	–	–	–	–	–	–
Configural Invariance	4547.77	1008	.00	–	–	–	.072	.070–.075	.968	.960	–
Weak Invariance[a]	4738.57	1078	.00	–	–	–	.071	.069–.073	.967	.962	Yes
Strong Invariance[a]	5042.49	1148	.00	–	–	–	.071	.069–.073	.965	.962	Yes
Latent Mean Invariance[b]	5323.88	1183	.00	281.39	35	<.0001	–	–	–	–	No
Homogeneity of Variances/ Covariances[b]	5537.54	1288	.00	495.05	140	<.0001	–	–	–	–	No
Homogeneity of Variances[b]	5205.57	1183	.00	163.08	35	<.0001	–	–	–	–	No
Homogeneity of Covariances[b]	5358.04	1253	.00	315.55	105	<.0001	–	–	–	–	No
Phantom Constructs (Unconstrained)	5042.49	1148	.00	–	–	–	–	–	–	–	–
Phantom Constructs (Constrained) [2]	5351.37	1253	.00	308.88	105	<.0001	–	–	–	–	No

Note. RMSEA = root mean square error of approximation; TLI = Tucker–Lewis index. Each nested model contains its constraints, plus the constraints of all previous, tenable models.
[a]Evaluated with CFI model test
[b]Evaluated with χ^2 difference test

Table 3
Tests of the Latent Means

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Strong Invariance (Baseline Model)	5042.49	1148	.00	–	–	–	–
Latent Mean Invariance	5323.88	1183	.00	281.39	35	<.0001	No
Home Life Activities	5171.00	1153	.00	128.51	5	<.0001	No
Community and Neighborhood Activities	5108.72	1153	.00	66.23	5	<.0001	No
School Participation Activities	5099.96	1153	.00	57.47	5	<.0001	No
School Learning Activities	5058.29	1153	.00	15.80	5	.007	No
Health and Safety Activities	5118.59	1153	.00	76.10	5	<.0001	No
Social Activities	5150.41	1153	.00	107.92	5	<.0001	No
Advocacy Activities	5080.08	1153	.00	37.59	5	<.0001	No

Note. Alpha level of .01 was used.

Research Question Two—Mean Differences

Because an assumption of construct comparability was met, we compared means of latent constructs across groups. As shown in Table 3, the omnibus test and subsequent tests indicated that the six age groups had mean level differences in all support need domains. We then performed sequential comparisons by placing equality constraints on latent means to test which latent means between or among subgroups were statistically different. Based on likelihood ratio tests using

Bonferroni corrections that adjust for increased chances of type I error, final mean models for the seven domains were identified (see Table 4).

Table 5 provides estimated latent means across groups obtained from an unconstrained model (i.e., strong invariance model that freely estimates means) and constrained models (i.e., final models used to estimate means and variances at the same time; see Table 6). Generally, we found that the intensity of support need decreased in the older age cohorts across support need domains, suggesting less intensive support needs in older age cohorts. The 15- to 16-year-old cohort had significantly lower support needs in all domains. The 5- to 6-, 7- to 8-, and 9- to 10-year-old cohorts tended to have similar mean levels of support needs; the only domain in which 5- to 6-year-olds differed from 7- to 8- and 9- to 10-year-olds was Home Life. In addition, 11- to 12- and 13- to 14-year-olds tended to cluster together and showed nonsignificant differences from 5- to 6-, 7- to 8-, and 9- to 10-year-olds in School Participation, School Learning, and Advocacy. The estimates from constrained models were used to develop age-specific norms across the six cohorts on the SIS-C (see Thompson, Wehmeyer, Hughes, Shogren, Seo et al., in press). Age cohorts were not collapsed because, despite some patterns of similarities in mean levels, there were still differences in the constrained means and the standard deviations, as described later.

Research Question Three—Variance and Standard Deviation Differences

As shown in Table 2, homogeneity of variances and covariances was not established, χ^2 (140) = 495.05, $p < .0001$. Follow-up tests indicated that the six age cohorts had different variances, χ^2 (35) = 163.08, $p < .0001$, and covariances, χ^2 (105) = 315.55, $p < .0001$. With regard to the variances, as shown in Table 6, every support need domain had different variances across the six age groups. To isolate the specific differences, using the final latent mean models identified in Table 4 as baseline models, we gradually imposed equality constraints on latent variances across age cohorts within each support need domain. The estimated latent variances across groups obtained from the unconstrained model (i.e., a strong invariance model that freely estimates variances) and constrained models (i.e., models that have equality constraints on both means and variances) are provided in Table 5. We also presented corresponding standard deviations ($\sqrt{\text{var.}}$) from both models in Table 5; standard deviations estimated from constrained models were used to compute norms (see Thompson, Wehmeyer, Hughes, Shogren, Seo et al., in press). The variability tended to be higher in the older age cohorts, with most of the significant differences in the variances concentrated in the 15- to 16-year-old cohort versus all other age cohorts.

Research Question Four—Correlation Differences

As shown at the bottom of Table 2, after creating phantom constructs, significantly different patterns of correlations were identified across the six age groups, χ^2 (105) = 308.88, $p < .0001$. Follow-up tests indicated that 12 correlations differed. To isolate differences across the age cohorts (see Table 8), we performed sequential nested chi-square tests. The following correlations showed significant differences: Home Living with Health & Safety, Community & Neighborhood with School Learning, Community & Neighborhood with Health & Safety, Community & Neighborhood with Social, Health & Safety with Social, Social with Advocacy. Generally, the 5- to 6-, 7- to 8-, 9- to 10-, 11- to 12-, and 13- to 14-year-old cohorts tended to have similar associations; although the correlations were weaker than were those of 15- to 16-year-olds (Table 9). A different pattern was observed, however, in the correlation between Community and Neighborhood and School Learning activities. Specifically, the 5- to 6- and 7- to 8-year-old cohorts tended to have stronger correlations than did the 9- to 10-, 11- to 12-, 13- to

Table 4
Sequential Mean Comparisons across Age Bands in Each Support Need Domain

Model	Model Name	χ^2	*df*	Model Comparison	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Strong Invariance Model	M1	5,042.49	1,148	–	–	–	–	–
Home Life Activities (Bonferroni Correction = .01/6 = .002)								
5–6 = 7–8	A1	5,053.11	1,149	M1 vs. A1	10.62	1	.001	No
7–8 = 9–10	A2	5,042.97	1,149	M1 vs. A2	.48	1	.488	Yes
5–6 = 7–8 = 9–10	A3	5,060.56	1,150	A2 vs. A3	17.59	1	.000	No
11–12 = 13–14	A4	5,044.71	1,149	M1 vs. A4	2.22	1	.136	Yes
7–8 = 9–10 = 11–12 = 13–14	A5	5,074.78	1,151	–	–	–	–	–
[7–8 = 9–10] ≠ [11–12 = 13–14]	A6	5,045.19	1,150	A5 vs. A6	29.59	1	.000	No
11–12 = 13–14 = 15–16	A7	5,066.55	1,150	A4 vs. A7	21.84	1	.000	No
5–6 ≠ [7–8 = 9–10] ≠ [11–12 = 13–14] ≠ 15–16	Final	5,045.19	1,150	–	–	–	–	–
Community and Neighborhood Activities (Bonferroni Correction = .01/7 = .001)								
5–6 = 7–8	B1	5,045.78	1,149	M1 vs. B1	3.29	1	.070	Yes
7–8 = 9–10	B2	5,042.76	1,149	M1 vs. B2	.27	1	.603	Yes
5–6 = 7–8 = 9–10	B3	5,048.83	1,150	B2 vs. B3	6.07	1	.014	Yes
5–6 = 7–8 = 9–10 = 11–12	B4	5,061.84	1,151	B3 vs. B4	13.01	1	.000	No
11–12 = 13–14	B5	5,042.82	1,149	M1 vs. B5	.33	1	.566	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	B6	5,072.17	1,152	–	–	–	–	–
[5–6 = 7–8 = 9–10] ≠ [11–12 = 13–14]	B7	5,049.16	1,151	B6 vs. B7	23.01	1	.000	No
11–12 = 13–14 = 15–16	B8	5,061.63	1,150	B5 vs. B8	18.81	1	.000	No
[5–6 = 7–8 = 9–10] ≠ [11–12 = 13–14] ≠ 15–16	Final	5,049.16	1,151	–	–	–	–	–
School Participation Activities (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	C1	5,043.21	1,149	M1 vs. C1	.72	1	.396	Yes
5–6 = 7–8 = 9–10	C2	5,045.73	1,150	C1 vs. C2	2.52	1	.112	Yes
5–6 = 7–8 = 9–10 = 11–12	C3	5,052.80	1,151	C2 vs. C3	7.07	1	.008	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	C4	5,061.42	1,152	C3 vs. C4	8.62	1	.003	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	C5	5,099.96	1,153	C4 vs. C5	38.54	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,061.42	1,152	–	–	–	–	–
School Learning Activities (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	D1	5,043.66	1,149	M1 vs. D1	1.17	1	.279	Yes
5–6 = 7–8 = 9–10	D2	5,043.77	1,150	D1 vs. D2	.11	1	.740	Yes
5–6 = 7–8 = 9–10 = 11–12	D3	5,043.77	1,151	D2 vs. D3	.00	1	1.000	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	D4	5,044.54	1,152	D3 vs. D4	.77	1	.380	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	D5	5,058.29	1,153	D4 vs. D5	13.75	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,044.54	1,152	–	–	–	–	–
Health and Safety Activities (Bonferroni Correction = .01/7 = .001)								
5–6 = 7–8	E1	5,043.00	1,149	M1 vs. E1	.51	1	.475	Yes
7–8 = 9–10	E2	5,043.77	1,149	M1 vs. E2	1.28	1	.258	Yes

(*Continued*)

Table 4
Continued

Model	Model Name	χ^2	*df*	Model Comparison	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
5–6 = 7–8 = 9–10	E3	5,046.07	1,150	E2 vs. E3	2.30	1	.129	Yes
5–6 = 7–8 = 9–10 = 11–12	E4	5,057.15	1,151	E3 vs. E4	11.08	1	.001	No
11–12 = 13–14	E5	5,045.91	1,149	M1 vs. E5	3.42	1	.064	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	E6	5,074.73	1,152	–	–	–	–	–
[5–6 = 7–8 = 9–10] ≠ [11–12 = 13–14]	E7	5,048.58	1,151	E6 vs. E7	26.15	1	.000	No
11–12 = 13–14 = 15–16	E8	5,067.92	1,150	E5 vs. E8	22.01	1	.000	No
[5–6 = 7–8 = 9–10] ≠ [11–12 = 13–14] ≠ 15–16,	Final	5,048.58	1,151	–	–	–	–	–
Social Activities (Bonferroni Correction = .01/7 = .001)								
5–6 = 7–8	F1	5,043.04	1,149	M1 vs. F1	.55	1	.458	Yes
7–8 = 9–10	F2	5,043.59	1,149	M1 vs. F2	1.10	1	.294	Yes
5–6 = 7–8 = 9–10	F3	5,045.80	1,150	F2 vs. F3	2.21	1	.137	Yes
5–6 = 7–8 = 9–10 = 11–12	F4	5,066.61	1,151	F3 vs. F4	20.81	1	.000	No
11–12 = 13–14	F5	5,045.91	1,149	M1 vs. F5	3.42	1	.064	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	F6	5,097.58	1,152	–	–	–	–	–
[5–6 = 7–8 = 9–10] ≠ [11–12 = 13–14]	F7	5,049.22	1,151	F6 vs. F7	48.36	1	.000	No
11–12 = 13–14 = 15–16	F8	5,067.92	1,150	F5 vs. F8	22.01	1	.000	No
[5–6 = 7–8 = 9–10] ≠ [11–12 = 13–14] ≠ 15–16	Final	5,049.22	1,151	–	–	–	–	–
Advocacy Activities (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	G1	5,042.95	1,149	M1 vs. G1	.46	1	.498	Yes
5–6 = 7–8 = 9–10	G2	5,043.53	1,150	G1 vs. G2	.58	1	.446	Yes
5–6 = 7–8 = 9–10 = 11–12	G3	5,048.17	1,151	G2 vs. G3	4.64	1	.031	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	G4	5,055.12	1,152	G3 vs. G4	6.95	1	.008	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	G5	5,080.08	1,153	G4 vs. G5	24.96	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,055.12	1,152	–	–	–	–	–

Note. Each subscale had different levels of Bonferroni correction depending on the number of comparisons. Final models were used as baseline models for variance comparisons in the third research question.

14-, and 15- to 16-year-olds. Table 9 provides estimated latent correlations yielded from constrained models (i.e., final models in Table 8).

Discussion

In this article, we report the findings from our analysis of data from the standardization sample of the SIS-C. Our focus was to explore the impact of the age cohorts used to stratify the sample (5–6, 7–8, 9–10, 11–12, 13–14, and 15–16) on the measurement model, as well as the latent differences. The findings provide important information on assessing support needs in children and youth with ID/DD, namely, that age is an important consideration and developing norms based on age cohorts, as was done for the SIS-C (Thompson, Wehmeyer, Hughes, Shogren, Seo et al., in press), is necessary. The major implication is that planning teams must consider age when planning supports, and there

Table 5
Estimated Latent Means, Variances, and Standard Deviations across Age Groups

		Home Life		Community & Neighborhood		School Participation		School Learning		Health & Safety		Social		Advocacy	
Variable	Age Cohort	Uncon.	Con.	Uncon.	Con.	Uncon.	Con.	Uncon.	Con.	Uncon.	Con.	Uncon.	Con.	Uncon.	Con.
Mean	5–6	2.64	2.64	2.97	2.90	3.11	3.01	3.25	3.27	3.11	3.06	3.09	3.04	3.04	2.97
	7–8	2.47	2.45	2.88	2.90	3.07	3.01	3.29	3.27	3.07	3.06	3.05	3.04	3.01	2.97
	9–10	2.44	2.45	2.86	2.90	3.03	3.01	3.28	3.27	3.03	3.06	3.00	3.04	2.99	2.97
	11–12	2.31	2.28	2.79	2.78	2.98	3.01	3.28	3.27	2.95	2.92	2.87	2.83	2.94	2.97
	13–14	2.24	2.28	2.77	2.78	2.94	3.01	3.25	3.27	2.89	2.92	2.79	2.83	2.90	2.97
	15–16	2.03	2.03	2.60	2.60	2.74	2.74	3.14	3.14	2.70	2.70	2.59	2.59	2.76	2.76
Variance	5–6	.73	.69	.59	.52	.54	.56	.49	.46	.67	.58	.74	.74	.69	.59
	7–8	.65	.69	.56	.52	.53	.56	.43	.46	.57	.58	.66	.74	.57	.59
	9–10	.67	.69	.49	.52	.53	.56	.34	.37	.50	.58	.67	.74	.51	.59
	11–12	.72	.69	.49	.52	.56	.56	.38	.37	.56	.58	.77	.74	.57	.59
	13–14	.84	.91	.49	.52	.63	.56	.40	.37	.63	.58	.81	.74	.64	.59
	15–16	1.02	.91	.64	.64	.80	.80	.56	.56	.83	.83	.99	.99	.75	.75
Standard Deviation	5–6	.86	.83	.77	.72	.74	.75	.70	.68	.82	.76	.86	.86	.83	.77
	7–8	.80	.83	.75	.72	.73	.75	.66	.68	.75	.76	.81	.86	.76	.77
	9–10	.82	.83	.70	.72	.73	.75	.59	.61	.71	.76	.82	.86	.71	.77
	11–12	.85	.83	.70	.72	.75	.75	.62	.61	.75	.76	.88	.86	.75	.77
	13–14	.92	.95	.70	.72	.79	.75	.63	.61	.80	.76	.90	.86	.78	.77
	15–16	1.01	.95	.80	.80	.89	.89	.75	.75	.91	.91	.99	.99	.87	.87

Note. Uncon. = estimates from unconstrained models (i.e., strong invariance models); con. = estimates from constrained models (i.e., strong invariance models with equality constraints). Constrained estimates were used for norming process of the SIS-C. Adapted with permission from Supports Intensity Scale–Children's Version User's Manual, by J. R. Thompson, M. L. Wehmeyer, C. Hughes, K. A. Shogren, H. Seo, T. D. Little, & R. Schalock, in press, Washington, DC: American Association on Intellectual and Developmental Disabilities.

Table 6
Sequential Variance Comparisons across Age Bands in Each Support Need Domain

Model	Model Name	χ^2	*df*	Model Comparison	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Home Life Activities (Bonferroni Correction = .01/5 = .002)								
Final Latent Mean Comparison Model	A1	5,045.19	1,150	–	–	–	–	–
Model with Six Equality-Constraints on Variances	A2	5,082.23	1,155	A1 vs. A2	37.04	5	.000	No
5–6 = 7–8	A3	5,046.94	1,151	A1 vs. A3	1.75	1	.186	Yes
5–6 = 7–8 = 9–10	A4	5,047.17	1,152	A3 vs. A4	.23	1	.632	Yes
5–6 = 7–8 = 9–10 = 11–12	A5	5,048.24	1,153	A4 vs. A5	1.07	1	.301	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	A6	5,058.75	1,154	A5 vs. A6	10.51	1	.001	No
13–14 = 15–16	A7	5,050.33	1,151	A1 vs. A7	5.14	1	.023	Yes
[5–6 = 7–8 = 9–10 = 11–12] ≠ [13–14 = 15–16]	Final	5,053.38	1,154	–	–	–	–	–
Community and Neighborhood Activities (Bonferroni Correction = .01/5 = .002)								
Final Latent Mean Comparison Model	B1	5,049.16	1,151	–	–	–	–	–
Model with Six Equality-Constraints on Variances	B2	5,068.45	1,156	B1 vs. B2	19.29	5	.002	No
5–6 = 7–8	B3	5,049.76	1,152	B1 vs. B3	.60	1	.439	Yes
5–6 = 7–8 = 9–10	B4	5,055.35	1,153	B3 vs. B4	5.59	1	.018	Yes
5–6 = 7–8 = 9–10 = 11–12	B5	5,057.73	1,154	B4 vs. B5	2.38	1	.123	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	B6	5,058.62	1,155	B5 vs. B6	.89	1	.345	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	B2	5,068.45	1,156	B2 vs. B6	9.83	1	.002	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,058.62	1,155	–	–	–	–	–
School Participation Activities (Bonferroni Correction = .01/5 = .002)								
Final Latent Mean Comparison Model	C1	5,061.42	1,152	–	–	–	–	–
Model with Six Equality-Constraints on Variances	C2	5,092.39	1,157	C1 vs. C2	30.97	5	.000	No
5–6 = 7–8	C3	5,061.53	1,153	C1 vs. C3	.11	1	.740	Yes
5–6 = 7–8 = 9–10	C4	5,061.67	1,154	C3 vs. C4	.14	1	.708	Yes
5–6 = 7–8 = 9–10 = 11–12	C5	5,062.32	1,155	C4 vs. C5	.65	1	.420	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	C6	5,068.84	1,156	C5 vs. C6	6.52	1	.011	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	C2	5,092.39	1,157	C2 vs. C6	23.55	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,068.84	1,156	–	–	–	–	–
School Learning Activities (Bonferroni Correction = .01/5 = .002)								
Final Latent Mean Comparison Model	D1	5,044.54	1,152	–	–	–	–	–
Model with Six Equality-Constraints on Variances	D2	5,089.16	1,157	D1 vs. D2	44.62	5	.000	No
5–6 = 7–8	D3	5,046.58	1,153	D1 vs. D3	2.04	1	.153	Yes
5–6 = 7–8 = 9–10	D4	5,063.72	1,154	D3 vs. D4	17.14	1	.000	No
9–10 = 11–12	D5	5,046.62	1,153	D1 vs. D5	2.08	1	.149	Yes
9–10 = 11–12 = 13–14	D6	5,048.84	1,154	D5 vs. D6	2.22	1	.136	Yes
9–10 = 11–12 = 13–14 = 15–16	D7	5,081.69	1,155	D6 vs. D7	32.85	1	.000	No

(*Continued*)

Table 6
Continued

Model	Model Name	χ^2	*df*	Model Comparison	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
[5–6 = 7–8] ≠ [9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,050.88	1,155	–	–	–	–	–
Health and Safety Activities (Bonferroni Correction = .01/5 = .002)								
Final Latent Mean Comparison Model	E1	5,048.58	1,151	–	–	–	–	–
Model with Six Equality-Constraints on Variances	E2	5,091.81	1,156	E1 vs. E2	43.23	5	.000	No
5–6 = 7–8	E3	5,052.09	1,152	E1 vs. E3	3.51	1	.061	Yes
5–6 = 7–8 = 9–10	E4	5,061.08	1,153	E3 vs. E4	8.99	1	.003	Yes
5–6 = 7–8 = 9–10 = 11–12	E5	5,061.09	1,154	E4 vs. E5	.01	1	.920	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	E6	5,064.60	1,155	E5 vs. E6	3.51	1	.061	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	E2	5,091.81	1,156	E2 vs. E6	27.21	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,064.60	1,155	–	–	–	–	–
Social Activities (Bonferroni Correction = .01/5 = .002)								
Final Latent Mean Comparison Model	F1	5,049.22	1,151	–	–	–	–	–
Model with Six Equality-Constraints on Variances	F2	5,078.75	1,156	F1 vs. F2	29.53	5	.000	No
5–6 = 7–8	F3	5,051.05	1,152	F1 vs. F3	1.83	1	.176	Yes
5–6 = 7–8 = 9–10	F4	5,051.51	1,153	F3 vs. F4	.46	1	.498	Yes
5–6 = 7–8 = 9–10 = 11–12	F5	5,055.43	1,154	F4 vs. F5	3.92	1	.048	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	F6	5,060.22	1,155	F5 vs. F6	4.79	1	.029	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	F2	5,078.75	1,156	F2 vs. F6	18.53	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,060.22	1,155	–	–	–	–	–
Advocacy Activities (Bonferroni Correction = .01/5 = .002)								
Final Latent Mean Comparison Model	G1	5,055.12	1,152	–	–	–	–	–
Model with Six Equality-Constraints on Variances	G2	5,084.34	1,157	G1 vs. G2	29.22	5	.000	No
5–6 = 7–8	G3	5,059.56	1,153	G1 vs. G3	4.44	1	.035	Yes
5–6 = 7–8 = 9–10	G4	5,068.61	1,154	G3 vs. G4	9.05	1	.003	Yes
5–6 = 7–8 = 9–10 = 11–12	G5	5,068.78	1,155	G4 vs. G5	.17	1	.680	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	G6	5,072.08	1,156	G5 vs. G6	3.30	1	.069	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	G2	5,084.34	1,157	G2 vs. G6	12.26	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,072.08	1,156	–	–	–	–	–

Note. Each subscale had different levels of Bonferroni correction depending on the number of comparisons.

is a need for repeated support needs assessment, particularly during major transitions in a child's life. For example, as students transition from elementary to middle to high school, new support plans should be developed to address the new environmental demands that are inherent in new settings and new activities (i.e., new contexts).

Table 7
Omnibus Correlation Comparisons across Age Bands

Variable	Model Name	χ^2	*df*	Model Comparison	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Strong Invariance Model with Phantom Constructs	Base	5,042.49	1,148	–	–	–	–	–
Correlation between HLA and CNA	A1	5,046.38	1,153	Base vs. A1	3.89	5	.565	Yes
Correlation between HLA and SPA	A2	5,050.34	1,153	Base vs. A2	7.85	5	.165	Yes
Correlation between HLA and SLA	A3	5,053.24	1,153	Base vs. A3	10.75	5	.057	Yes
Correlation between HLA and HSA	A4	5,063.06	1,153	Base vs. A4	20.57	5	.001	No
Correlation between HLA and SA	A5	5,059.22	1,153	Base vs. A5	16.73	5	.005	No
Correlation between HLA and AA	A6	5,049.12	1,153	Base vs. A6	6.63	5	.250	Yes
Correlation between CNA and SPA	B1	5,049.86	1,153	Base vs. B1	7.37	5	.195	Yes
Correlation between CNA and SLA	B2	5,059.36	1,153	Base vs. B2	16.87	5	.005	No
Correlation between CNA and HSA	B3	5,063.56	1,153	Base vs. B3	21.07	5	.001	No
Correlation between CNA and SA	B4	5,066.73	1,153	Base vs. B4	24.24	5	.000	No
Correlation between CNA with AA	B5	5,059.96	1,153	Base vs. B5	17.47	5	.004	No
Correlation between SPA and SLA	C1	5,051.07	1,153	Base vs. C1	8.58	5	.127	Yes
Correlation between SPA and HSA	C2	5,062.78	1,153	Base vs. C2	20.29	5	.001	No
Correlation between SPA and SA	C3	5,046.67	1,153	Base vs. C3	4.18	5	.524	Yes
Correlation between SPA and AA	C4	5,057.95	1,153	Base vs. C4	15.46	5	.009	No
Correlation between SLA and HSA	D1	5,046.31	1,153	Base vs. D1	3.82	5	.576	Yes
Correlation between SLA and SA	D2	5,044.31	1,153	Base vs. D2	1.82	5	.873	Yes
Correlation between SLA and AA	D3	5,060.84	1,153	Base vs. D3	18.35	5	.003	No
Correlation between HSA and SA	E1	5,065.47	1,153	Base vs. E1	22.98	5	.000	No
Correlation between HSA and AA	E2	5,060.12	1,153	Base vs. E2	17.63	5	.003	No
Correlation between SA and AA	F1	5,087.91	1,153	Base vs. F1	45.42	5	.000	No

Note. Alpha level of .01 was used. HLA = Home Life Activities; CNA = Community and Neighborhood Activities; SPA = School Participation Activities; SLA = School Learning Activities; HSA = Health and Safety Activities; SA = Social Activities; AA = Advocacy Activities.

Overall, the findings suggest that it is justified to use the same set of items and domains to measure support needs across age cohorts, but that the hypothesized general decrease in the intensity of support needs with age (represented by significantly different latent domain means) was supported. It is important to note that the standardization sample was further stratified within each age cohort by level of intellectual functioning/adaptive behavior, suggesting that this pattern of decreasing intensities of support needs occurs across children with ID/DD across a range of intellectual functioning/adaptive behavior levels. However, future research is needed that specifically examines the impact of intellectual functioning/adaptive behavior levels on support needs across ages, as well as the impact of other demographic variables such as gender.

Adolescents in the 15- to 16-year-old cohort had significantly lower support needs than all the other students in all support need domains. Moreover, they had significantly greater variances than all other students did except in the Home Life domain, where they did not differ from the 13- to 14-year-olds but did differ from the younger children. In addition, in general, the 15- to 16-year-old cohort was the main group that differed in the strength of the correlations between support need domains, with these correlations being stronger for the majority of domains, with the exception of Community and Neighborhood and School Learning Activities. This finding suggests that this group

Table 8
Sequential Correlation Comparisons across Age Bands

Model	Model Name	χ^2	*df*	Model Comparison	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Strong Invariance Model with Phantom Constructs	Base	5,042.49	1,148	–	–	–	–	–
HLA and HSA (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	A1	5,043.80	1,149	Base vs. A1	1.31	1	.252	Yes
5–6 = 7–8 = 9–10	A2	5,045.61	1,150	A1 vs. A2	1.81	1	.179	Yes
5–6 = 7–8 = 9–10 = 11–12	A3	5,046.76	1,151	A2 vs. A3	1.15	1	.284	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	A4	5,052.48	1,152	A3 vs. A4	5.72	1	.017	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	A5	5,063.06	1,153	A4 vs. A5	10.58	1	.001	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,052.48	1,152	–	–	–	–	–
CNA and SLA (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	C1	5,042.56	1,149	Base vs. C1	.07	1	.791	Yes
5–6 = 7–8 = 9–10	C2	5,054.91	1,150	C1 vs. C2	12.35	1	.000	No
9–10 = 11–12	C3	5,042.75	1,149	Base vs. C3	.26	1	.610	Yes
9–10 = 11–12 = 13–14	C4	5,043.05	1,150	C3 vs. C4	.30	1	.584	Yes
9–10 = 11–12 = 13–14 = 15–16	C5	5,046.67	1,151	C4 vs. C5	3.62	1	.057	Yes
[5–6 = 7–8] ≠ [9–10 = 11–12 = 13–14 = 15–16]	Final	5,046.74	1,152	–	–	–	–	–
CNA and HSA (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	D1	5,042.84	1,149	Base vs. D1	.35	1	.554	Yes
5–6 = 7–8 = 9–10	D2	5,046.51	1,150	D1 vs. D2	3.67	1	.055	Yes
5–6 = 7–8 = 9–10 = 11–12	D3	5,046.57	1,151	D2 vs. D3	.06	1	.806	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	D4	5,051.30	1,152	D3 vs. D4	4.73	1	.030	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	D5	5,063.56	1,153	D4 vs. D5	12.26	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,051.30	1,152	–	–	–	–	–
CNA and SA (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	E1	5,044.33	1,149	Base vs. E1	1.84	1	.175	Yes
5–6 = 7–8 = 9–10	E2	5,050.43	1,150	E1 vs. E2	6.10	1	.014	Yes
5–6 = 7–8 = 9–10 = 11–12	E3	5,054.97	1,151	E2 vs. E3	4.54	1	.033	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	E4	5,057.31	1,152	E3 vs. E4	2.34	1	.126	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	E5	5,066.73	1,153	E4 vs. E5	9.42	1	.002	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,057.31	1,152	–	–	–	–	–
HSA and SA (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	J1	5,044.38	1,149	Base vs. J1	1.89	1	.169	Yes
5–6 = 7–8 = 9–10	J2	5,046.69	1,150	J1 vs. J2	2.31	1	.129	Yes
5–6 = 7–8 = 9–10 = 11–12	J3	5,046.77	1,151	J2 vs. J3	.08	1	.777	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	J4	5,050.75	1,152	J3 vs. J4	3.98	1	.046	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	J5	5,065.47	1,153	J4 vs. J5	14.72	1	.000	No

(*Continued*)

Table 8
Continued

Model	Model Name	χ^2	*df*	Model Comparison	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,050.75	1,152	–	–	–	–	–
SA and AA (Bonferroni Correction = .01/5 = .002)								
5–6 = 7–8	L1	5,044.04	1,149	Base vs. L1	1.55	1	.213	Yes
5–6 = 7–8 = 9–10	L2	5,044.15	1,150	L1 vs. L2	.11	1	.740	Yes
5–6 = 7–8 = 9–10 = 11–12	L3	5,049.58	1,151	L2 vs. L3	5.43	1	.020	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14	L4	5,056.92	1,152	L3 vs. L4	7.34	1	.007	Yes
5–6 = 7–8 = 9–10 = 11–12 = 13–14 = 15–16	L5	5,087.91	1,153	L4 vs. L5	30.99	1	.000	No
[5–6 = 7–8 = 9–10 = 11–12 = 13–14] ≠ 15–16	Final	5,056.92	1,152	–	–	–	–	–

Note. Based on results from follow-up tests, we only presented correlations that showed significant differences among age groups. There were six correlations (HLA with SA, CNA with AA, SPA with HSA, SPA with AA, SLA with AA, and HSA with AA) that did not have specific correlational patterns among groups, even though their respective omnibus tests (Table 9) indicated differences. HLA = Home Life Activities; CNA = Community and Neighborhood Activities; SPA = School Participation Activities; SLA = School Learning Activities; HSA = Health and Safety Activities; SA = Social Activities; AA = Advocacy Activities.

is qualitatively and quantitatively different from the other age cohorts. This difference may relate to the fact that these students are increasingly preparing for the transition to adulthood; have had more experience in school, their neighborhoods, and homes; and have different intensities of supports in these domains. Although the SIS-C is normed from ages 5 to 16, students in the 15- to 16-year-old band may be more focused on the domains that are unique to the adult version of the SIS (i.e., Lifelong Learning and Employment) or items on parallel domains (i.e., Home Life, Community Living, Health and Safety, Social, and Protection and Advocacy) that have more relevance to adult life. For these reasons, the adult version of the SIS may be more useful to students nearing the age of 16 for assessment and planning purposes. In fact, in testing shared measurement properties between the SIS-C and the adult version of the SIS in youth aged 15 to 21, Seo et al. (in press) found that five parallel domains have aligned items (i.e., that measure the same underlying information) and unique items (i.e., that measure differential support needs) incorporating the specific environmental demands encountered by youth and young adults. When considering whether the children's or the adult version of the SIS would be most appropriate, the differentiating factor may be whether the focus is on planning for school-based supports or supports for the transition to adulthood. Further research exploring the use of both assessments for planning is needed.

In addition to the differences in the 15- to 16-year-old cohort, in several domains, the 11- to 12- and 13- to 14-year-olds grouped together (Home Life, Community and Neighborhood Activities, Health and Safety, Social Activities), suggesting that these students share commonalities in their needed supports in these areas. This finding highlights the importance of considering re-assessment in elementary, middle, and high school. Interestingly, cohorts from the 5–6 to 13–14 cohorts did not show any significant mean level differences in School Learning, School Participation, and Advocacy, suggesting that in these three domains remain relatively stable over time. Five- and 6-year-olds differed from other students in Home Life, suggesting that younger children may need more intense supports in activities in the home environment. The pattern of correlational relationships also suggests that younger age cohorts tend to have slightly weaker relationships across domains,

Table 9
Estimated Latent Correlations in Each Age Group

5–6	HLA	CNA	SPA	SLA	has	SA	AA
HLA	1.00						
CNA	.85	1.00					
SPA	.82	.83	1.00				
SLA	.72	**.80**	.90	1.00			
HSA	**.79**	**.88**	.82	.78	1.00		
SA	.72	**.76**	.80	.76	**.86**	1.00	
AA	.71	.78	.79	.75	.86	**.87**	1.00

7–8	HLA	CNA	SPA	SLA	HSA	SA	AA
HLA	1.00						
CNA	.88	1.00					
SPA	.81	.87	1.00				
SLA	.69	**.80**	.90	1.00			
HSA	**.79**	**.88**	.83	.81	1.00		
SA	.68	**.76**	.79	.75	**.86**	1.00	
AA	.74	.83	.80	.79	.90	**.87**	1.00

9–10	HLA	CNA	SPA	SLA	HSA	SA	AA
HLA	1.00						
CNA	.88	1.00					
SPA	.82	.88	1.00				
SLA	.66	**.75**	.88	1.00			
HSA	**.79**	**.88**	.86	.80	1.00		
SA	.69	**.76**	.82	.76	**.86**	1.00	
AA	.71	.80	.81	.78	.90	**.87**	1.00

11–12	HLA	CNA	SPA	SLA	HSA	SA	AA
HLA	1.00						
CNA	.84	1.00					
SPA	.77	.84	1.00				
SLA	.64	**.75**	.87	1.00			
HSA	**.79**	**.88**	.87	.81	1.00		
SA	.70	**.76**	.82	.73	**.86**	1.00	
AA	.72	.81	.83	.81	.90	**.87**	1.00

13–14	HLA	CNA	SPA	SLA	HSA	SA	AA
HLA	1.00						
CNA	.84	1.00					
SPA	.77	.86	1.00				
SLA	.61	**.75**	.88	1.00			
HSA	**.79**	**.88**	.87	.79	1.00		
SA	.67	**.76**	.79	.73	**.86**	1.00	
AA	.70	.80	.82	.82	.89	**.87**	1.00
15–16	HLA	CNA	SPA	SLA	HSA	SA	AA
HLA	1.00						
CNA	.86	1.00					
SPA	.82	.86	1.00				
SLA	.64	**.75**	.84	1.00			
HSA	**.84**	**.91**	.87	.78	1.00		
SA	.74	**.81**	.83	.73	**.91**	1.00	
AA	.74	.84	.84	.80	.91	**.93**	1.00

Note. Every correlation is significant at $p < .001$. All correlations are estimates from constrained models. Correlations in boldface significantly differ across age groups, whereas the remaining correlations (not in boldface) are statistically equivalent across groups. HLA = Home Life Activities; CNA = Community and Neighborhood Activities; SPA = School Participation Activities; SLA = School Learning Activities; HSA = Health and Safety Activities; SA = Social Activities; AA = Advocacy Activities.

compared with older age cohorts, perhaps because younger age cohorts are still developing skills and experiencing environmental contexts that impact the intensity of their support needs in differing ways.

The findings suggest the need to consider developmental changes in support needs assessment as children age and confirm the need for norms based around age bands for standardized measures of support needs in children and youth with ID/DD. Future work is needed to develop and validate meaningful ways to translate the information gained from support needs assessment to meaningful systems of support, particularly at the elementary, middle, and high school level. Further work is also needed on transitioning from assessment with the SIS-C to the adult version of the SIS. Additionally, while the pattern and intensity of support needed to participate in activities associated with typical human functioning are assessed on the SIS-C (Thompson et al., 2009), supports are the actual resources and strategies implemented to enhance human functioning (Luckasson et al., 2002). Support needs assessment information indicates that supports are necessary to address support needs. Thus, taking information from the assessment and creating meaningful strengths-based systems of supports is a necessary next step that must follow assessment with the SIS-C. Having tools to assess support needs moves us in this direction, but assessment alone will not enhance human functioning. Instead, it provides critical information for identifying the resources and strategies that will do so based on an understanding of existing needs. Further research is needed to investigate the integrated use of support needs assessment to build individualized and appropriate systems of supports for children and youth.

References

Brown, T. A. (2015). Confirmatory factor analysis for applied research (2nd ed.). New York, NY: Guilford.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. Structural Equation Modeling, 9, 233–255.

Honaker, J., King, G., & Blackwell, M. (2011). Amelia II: A program for missing data. Journal of Statistical Software, 45, 1–47.

Little, T. D. (1997). Mean and covariance structures (MACS) analyses of cross-cultural data: Practical and theoretical issues. Multivariate Behavioral Research, 32, 53–76.

Little, T. D. (2013). Longitudinal structural equation modeling. New York: Guilford Press.

Little, T. D., Slegers, D. W., & Card, N. A. (2006). A non-arbitrary method of identifying and scaling latent variables in SEM and MACS models. Structural Equation Modeling, 13, 59–72.

Luckasson, R., Borthwick-Duffy, S., Buntinx, W. H. E., Coulter, D. L., Craig, E. P. M., Reeve, A., & Tasse, M. J. (2002). Mental retardation: Definition, classification, and systems of support (10th ed.). Washington, DC: American Association on Mental Retardation.

Luckasson, R., Coulter, D. L., Polloway, E. A., Reiss, S., Schalock, R. L., Snell, M. E., & Stark, J. A. (1992). Mental retardation: Definition, classification, and systems of supports (9th ed.). Washington, DC: American Association on Mental Retardation.

Muthén, L. K., & Muthén, B. O. (1998-2012). Mplus user's guide (6th ed.). Los Angeles, CA: Muthén & Muthén.

R Core Team. (2014). R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing.

Schalock, R. L., Borthwick-Duffy, S., Bradley, V., Buntix, W. H. E., Coulter, D. L., Craig, E. P. M., & Yeager, M. H. (2010). Intellectual disability: Definition, classification, and systems of support (11th ed.). Washington, DC: American Association on Intellectual and Developmental Disabilities.

Seo, H., Little, T. D., Shogren, K. A., & Lang, K. (in press). On the benefits of latent variable modeling for norming scales: The case of the Supports Intensity Scale – Children's Version. International Journal of Behavioral Development.

Seo, H., Shogren, K. A., Wehmeyer, M. L., Hughes, C., Thompson, J. R., Little, T. D., & Palmer, S. B. (in press). Examining shared measurement properties and the score comparability between two versions of the Supports Intensity Scale. Career Development and Transition for Exceptional Individuals.

Shogren, K. A., Thompson, J. R., Wehmeyer, M. L., Chapman, T., Tassé, M. J., & McLaughlin, C. A. (2014). Reliability and validity of the Supplemental Protection and Advocacy Scale of the Supports Intensity Scale. Inclusion, 2, 100–109.

Thompson, J. R., Bradley, V., Buntinx, W. H. E., Schalock, R. L., Shogren, K. A., Snell, M. E., . . . Yeager, M. H. (2009). Conceptualizing supports and the support needs of people with intellectual disability. Intellectual and Developmental Disabilities, 47, 135–146.

Thompson, J. R., Bryant, B. R., Campbell, E. M., Craig, E. P. M., Hughes, C. M., Rotholz, D. A., & Wehmeyer, M. L. (2004). Supports Intensity Scale. Washington, DC: American Association on Intellectual and Developmental Disabilities.

Thompson, J. R., Wehmeyer, M. L., Hughes, C., Shogren, K. A., Little, T. D., Copeland, S. R., & Tassé, M. J. (in press). Supports Intensity Scale - Children's Version. Washington, DC: American Association on Intellectual and Developmental Disabilities.

Thompson, J. R., Wehmeyer, M. L., Hughes, C., Shogren, K. A., Seo, H., Little, T. D., & Tassé, M. J. (in press). Supports Intensity Scale – Children's Version User's Manual. Washington, D.C.: American Association on Intellectual and Developmental Disabilities.

World Health Organization. (2001). International classification of functioning, disability, and health. Geneva, Switzerland: Author.

World Health Organization. (2007). International classification of functioning, disability and health: Children and youth version. Geneva: Author.