Psychometric properties of the Supports Intensity Scale (SIS):
an international review

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Aim: To (a) investigate and review the psychometric properties of the Supports Intensity Scale (SIS) and (b) report on the usefulness of the SIS for different purposes in research and practice.

Method: The reliability and validity (including factor validity) of the SIS was investigated in representative samples of the Dutch and Flemish populations of people with ID. Outcomes were compared with results from studies with the original US, the French, the Italian and the Spanish versions of the SIS.

Results: Comparisons on reliability (Cronbach alpha, test-retest, inter-interviewer, inter-respondent) and validity (content, construct, factor) were made and reviewed. Data on experiences with the use of the SIS in Flanders and in the Netherlands were collected and different applications were reported.

Conclusion: The SIS appears to be a robust scale that maintains its reliability and validity throughout various international samples. Some caution should be exercised when interviewing people with ID (i.e. the need to use more sources of information) and when comparing SIS scores between different ‘levels of ID’ groups.

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an international review

W. Buntinx, B. Maes, C. Claes, & L. Curfs

Maastricht University

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Published by AAIDD in 2004
Translated in 13 languages / 19 nations
This study: data from USA – Canada – Belgium – the Netherlands – Italy – Spain
People with ID experience a mismatch between their personal competency and environmental demands.

With support needs assessment and person centered Planning, meaningful life goals can be identified and prioritized, and supports can be arranged to address the person-environment mismatch.

Thoughtful planning and application of individualized supports can lead to a more meaningful Quality of Life.
What SIS Measures

**Individual Being Assessed:**
- Involvement in activities in typical settings

**SIS measures the difference**
- In terms of...
  1. Type of Support
  2. Frequency of Support
  3. Daily Support Time

**Standard of a Typical Adult:**
- Involvement in activities in typical settings

In 6 + 1 life activity domains and 2 special needs domains
SIS domains / subscale structure

1. Home living activities
2. Community living activities
3. Lifelong learning activities
4. Employment activities
5. Health and safety activities
6. Social activities

7. Protection and Advocacy

8. Special Medical / nursing needs
9. Special Behavioral support needs

Section 1 → SIS Index 49 items
Section 2 8 items
Section 3 16 items

Total: 86 items
The SIS is a professional instrument to measure the relative intensity of the support needs of adults with intellectual disability (ID)

- Provides insight in the pattern and intensity of support that is required for an adult person with ID to participate successfully in community settings

- Provides an individual profile and index of the intensity of support needs as compared with other persons with ID

- Is NOT a measure of skills or adaptive behavior
**Profile**

**Subscales**

**M** = 10  
**SD** = 3

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### Sectie 1A: uitzlag ondersteuningsbehoeften

1. Neem de ruwe scores van sectie 4 en het F-over.
2. Vind de standaard en de percentile scores in de handleiding.
3. Vul de SS- Ondersteuningsbehoefte index in naaıê psychometrische handleiding.

<table>
<thead>
<tr>
<th>Subschaal Sectie 1</th>
<th>A: Actieve levensstijl in huis</th>
<th>B: Activiteiten in de samenleving</th>
<th>C: Organiseren Persoonlijke zorg</th>
<th>D: Arbeidsmarktactiviteiten</th>
<th>E: Gezondheid en veiligheid</th>
<th>F: Sociale Activiteiten</th>
<th>Totale score</th>
<th>SS Ondersteuningsbehoefte index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Index**

**M** =100  
**SD** = 15
Component 1: Identify desired life experiences and goals

Component 2: Determine the Intensity of Support Needs

Component 3: Develop the Individualized Support Plan

Component 4: Monitor Progress

Component 5: Evaluation
SIS psychometric characteristics

- **Validity**

  - Content validity (literature ‘Quality of Life’ – Q-sort on 130 initial indicators of ‘supports’ – expert judgment)
  - Criterion related validity of full scale: $= .62 / .83$

<table>
<thead>
<tr>
<th>SIS Sect.1 subscale</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crit.</td>
<td>.79</td>
<td></td>
<td>.81</td>
<td></td>
<td></td>
<td></td>
<td>NL</td>
</tr>
<tr>
<td>Crit.</td>
<td>.66</td>
<td>.51</td>
<td>.46</td>
<td>.59</td>
<td>.53</td>
<td>.62</td>
<td>USA</td>
</tr>
</tbody>
</table>

Criterion = independent judgment of intensity of needed supports on a 5 point Likert scale by professional direct support staff, per domain / subscale and for the full scale
### SIS psychometric characteristics

- **Validity**
  - **Construct validity**
  - Subscale intercorrelations

<table>
<thead>
<tr>
<th>SIS SECTION 1</th>
<th>SIS A</th>
<th>SIS B</th>
<th>SIS C</th>
<th>SIS D</th>
<th>SIS E</th>
<th>SIS F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SIS A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIS B</strong></td>
<td>0.84/0.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIS C</strong></td>
<td>0.57/0.77</td>
<td>0.66/0.85/0.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIS D</strong></td>
<td>0.59/0.73</td>
<td>0.62/0.77/0.34</td>
<td>0.85/0.82/0.54</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIS E</strong></td>
<td>0.86/0.85</td>
<td>0.84/0.86/0.52</td>
<td>0.70/0.85/0.40</td>
<td>0.71/0.79/0.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIS F</strong></td>
<td>0.70/0.76</td>
<td>0.77/0.85/0.51</td>
<td>0.77/0.84/0.51</td>
<td>0.77/0.82/0.46</td>
<td>0.82/0.85/0.51</td>
<td></td>
</tr>
<tr>
<td><strong>SIS Index</strong></td>
<td>0.86/0.90</td>
<td>0.89/0.94/0.59</td>
<td>0.86/0.93/0.62</td>
<td>0.86/0.89/0.59</td>
<td>0.93/0.94/0.62</td>
<td>0.91/0.93/0.59</td>
</tr>
</tbody>
</table>

**NL**: 0.57 / 0.84  
**BE**: 0.76 / 0.85  
**USA**: 0.30 / 0.56
SIS psychometric characteristics

• Validity

➤ Factor validity

Spain: N=600: Structure of Section 1 = confirmed!
Belgium: N=14,862: Structure of Section 1 = firmly confirmed!

‘Support Needs = multidimensional construct that is adequately represented by
the SIS subscale activity domains of Section 1 and Section 2’

‘SIS construct = same in male and female groups’
‘SIS construct = stable across age groups’

Att! Although the general factor structure is maintained, SIS item factor loadings
are slightly different across ‘level of functioning’ groups (mild/moder./severe/profound)
Att! In groups of persons with OTHER THAN ID disabilities, the factor
structure is different (exploratory factor analysis)!

→ 33 items / 4 factor structure: 1 personal & social life / 2 community
    participation / 3 self help / 4 work

Att! Leaving out the F scores results in the same factor structure as F+DST+T
SIS psychometric characteristics

- **Validity**
- **Construct validity**

Correlation SIS Index and Vineland Adaptive Behavior Scale

USA: \(-.59\) (subscales: \(-.45 / -.61\)) \(N=284\)
Belgium/NL: \(-.77\) (subscales: \(-.41 / -.84\)) \(N=75\)

No relevant correlation between SIS and age.
SIS psychometric characteristics

• Reliability
  ➢ Cronbach α
  ➢ Split half
  ➢ Standard error of measurement (SEM)
  ➢ Test – Retest / Inter-interviewer / inter-respondent correlations
### SIS Internal consistency (Cronbach α), SEM, and Split Half coefficient of SIS subscales and SIS Index

<table>
<thead>
<tr>
<th></th>
<th>Netherlands</th>
<th>Belgium 1</th>
<th>Belgium 2</th>
<th>USA 1</th>
<th>Italy</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>N study</td>
<td></td>
<td>570</td>
<td>4,211</td>
<td>14,862</td>
<td>1,306</td>
<td>1,052</td>
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<tr>
<td>SIS subscale</td>
<td>N items</td>
<td>α</td>
<td>SEM</td>
<td>α</td>
<td>SEM</td>
<td>α</td>
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<tr>
<td>Sectie 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>deel A</td>
<td>8</td>
<td>0,95</td>
<td>0,7</td>
<td>0,97</td>
<td>0,93</td>
<td>0,8</td>
</tr>
<tr>
<td>deel B</td>
<td>8</td>
<td>0,96</td>
<td>0,6</td>
<td>0,96</td>
<td>0,95</td>
<td>0,7</td>
</tr>
<tr>
<td>deel C</td>
<td>9</td>
<td>0,97</td>
<td>0,5</td>
<td>0,96</td>
<td>0,95</td>
<td>0,7</td>
</tr>
<tr>
<td>deel D</td>
<td>8</td>
<td>0,96</td>
<td>0,6</td>
<td>0,92</td>
<td>0,94</td>
<td>0,7</td>
</tr>
<tr>
<td>deel E</td>
<td>8</td>
<td>0,95</td>
<td>0,7</td>
<td>0,94</td>
<td>0,92</td>
<td>0,8</td>
</tr>
<tr>
<td>deel F</td>
<td>8</td>
<td>0,97</td>
<td>0,5</td>
<td>0,97</td>
<td>0,94</td>
<td>0,7</td>
</tr>
<tr>
<td>SIS Index</td>
<td>49</td>
<td>0,99</td>
<td>1,5</td>
<td>0,98</td>
<td>0,98</td>
<td>2,1</td>
</tr>
</tbody>
</table>
### SIS Test-Retest, Inter-interviewer, Inter-respondent and Cliënt/Professional respondent Correspondence Correlations (Pearson)

<table>
<thead>
<tr>
<th>SIS subscale</th>
<th>Test-Retest</th>
<th>Inter-interviewer</th>
<th>Inter-respondent</th>
<th>Cliënt / Pro.respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA 1</td>
<td>Canada</td>
<td>Spain</td>
<td>USA 1</td>
<td>USA 2</td>
</tr>
<tr>
<td><strong>N study</strong></td>
<td>106</td>
<td>19</td>
<td>143</td>
<td>106</td>
</tr>
<tr>
<td><strong>SIS Index</strong></td>
<td><strong>0.82</strong></td>
<td><strong>0.84</strong></td>
<td><strong>0.94</strong></td>
<td><strong>0.59</strong></td>
</tr>
<tr>
<td><strong>Interval</strong></td>
<td>3 weeks</td>
<td>3 weeks</td>
<td>3 weeks</td>
<td>&lt;1 week</td>
</tr>
</tbody>
</table>

- deel A: deel A
- deel B: deel B
- deel C: deel C
- deel D: deel D
- deel E: deel E
- deel F: deel F

#### Section 1

<table>
<thead>
<tr>
<th>SIS subscale</th>
<th>Test-Retest</th>
<th>Inter-interviewer</th>
<th>Inter-respondent</th>
<th>Cliënt / Pro.respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA 1</td>
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<td>Spain</td>
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<td>USA 2</td>
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<td>106</td>
<td>19</td>
<td>143</td>
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</tr>
<tr>
<td><strong>SIS Index</strong></td>
<td><strong>0.82</strong></td>
<td><strong>0.84</strong></td>
<td><strong>0.94</strong></td>
<td><strong>0.59</strong></td>
</tr>
<tr>
<td><strong>Interval</strong></td>
<td>3 weeks</td>
<td>3 weeks</td>
<td>3 weeks</td>
<td>&lt;1 week</td>
</tr>
</tbody>
</table>

- deel A: deel A
- deel B: deel B
- deel C: deel C
- deel D: deel D
- deel E: deel E
- deel F: deel F

#### deel A
- 0.87
- 0.85
- 0.98
- 0.90
- 0.80
- 0.92
- 0.86
- 0.73
- 0.88
- 0.74

#### deel B
- 0.74
- 0.77
- 0.94
- 0.68
- 0.89
- 0.82
- 0.86
- 0.91
- 0.87
- 0.58

#### deel C
- 0.75
- 0.75
- 0.93
- 0.55
- 0.88
- 0.85
- 0.71
- 0.75
- 0.87
- 0.44

#### deel D
- 0.83
- 0.75
- 0.96
- 0.55
- 0.77
- 0.90
- 0.62
- 0.93
- 0.87
- 0.31

#### deel E
- 0.86
- 0.81
- 0.90
- 0.72
- 0.96
- 0.79
- 0.71
- 0.91
- 0.91
- 0.77

#### deel F
- 0.94
- 0.68
- 0.98
- 0.60
- 0.74
- 0.79
- 0.66
- 0.87
- 0.85
- 0.51

**Interval**
- 3 weeks
- 3 weeks
- 3 weeks
- <1 week
- <1 week
- <1 week
- <1 week
- <1 week
- <1 week
- <1 week

**Result obtained with untrained interviewers! / other values: results of instructed interviewers**
SIS applications

Functions of the SIS (why would you want to use the SIS?)
(experiences from 5 years of use in service practices and research)

1. Raise awareness on the ‘supports perspective’ *(teaching & learning the supports paradigm in practice)*
2. Selecting goals in the context of Individual Supports Plans
3. Base line measurement for assessing development of support needs over time
4. Group profiles *(planning purpose – selecting staff competences – comparisons between groups / divisions / regions)*
5. Funding analysis and allocation of resources *(organization / corporate level or national level)*
6. Research *(management research and scientific research)*
Conclusions

- SIS psychometric properties are robust.
- Psychometric properties are stable across different international populations of persons with ID.
- SIS reliability is positively affected by special training of the interviewers (required).
- Collecting reliable information involves more than 1 source of information – caution when ‘client = respondent’ (‘cloak of competence’ effect - Edgerton).
- Indications that a ‘short’ form of the SIS for certain applications is possible without loss of psychometric properties (caution: less content information will be available on support needs in context of Individual Supports Plan).
- SIS applications cover a wide range of support service, policy and research problems/needs.
- More research needed on full scale (section 1+2+3) properties and applications.
Contact

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For training and consultancy, see also: www.buntinx.org

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