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Original quantitative research

Validation of a brief version of the Social Provisions Scale using Canadian national survey data

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Abstract

Introduction: The 10-item Social Provisions Scale (SPS-10) has been implemented to measure social support in a number of national surveys in Canada. The objective of this study was to reduce the SPS-10 to a brief, five-item scale (SPS-5), while maintaining adequate measurement properties.

Methods: Data from individuals aged 18 years and older who responded to the Social Provisions Scale module in the Canadian Community Health Survey 2012 Mental Health Focus cycle (CCHS 2012 MH) and the Canadian Community Health Survey 2017 Annual cycle (CCHS 2017) were analyzed. We used exploratory factor analysis and item-to-total correlations from the CCHS 2012 MH data to choose items. A correlation analysis between the SPS-5, SPS-10 and related positive mental health (PMH) constructs were used to assess the criterion-related validity of the SPS-5 compared to the SPS-10. A confirmatory factor analysis using data from the CCHS 2017 was conducted to confirm the factor structure of the SPS-5.

Results: The SPS-5 showed high internal consistency (Cronbach's alpha of 0.88) and similar correlations as the SPS-10 with related PMH constructs. The SPS-5 and SPS-10 were also very highly correlated (r = 0.97). The confirmatory factor analysis demonstrated that a single factor model of the SPS-5 fit the data well. The SPS-5 and SPS-10 yield similar estimates of high social support, of 92.7 and 91.5%, respectively.

Conclusion: The new SPS-5 demonstrated adequate measurement properties, and functioned in a similar manner to the SPS-10, supporting a reduced version of the Scale. The SPS-5 is a feasible and valid alternative to the SPS-10 that could be used to reduce respondent burden on national health surveys.

Keywords: *social support, surveys, measurement, factor analysis*

Highlights

- Population health surveys are facing increasing demands for new content related to emerging health issues, while the need for continued monitoring of existing concepts remains.
- We investigated whether the SPS-10 could be reduced to five items, and continue to have adequate measurement properties, to minimize respondent burden on population health surveys in Canada.
- The SPS-5 demonstrated criterion-related and structural validity, with similar results for men and women.
- Use of the SPS-5 can reduce respondent burden when a single factor measure of social support is required in health research.

Introduction

Social support is recognized as an important determinant of health and well-being.[1] The Public Health Agency of Canada (PHAC) describes social support as "feeling loved and cared for, and having a network of family, friends, neighbours, co-workers and community members that are there in times of need."[2] Higher levels of social support are associated with higher levels of positive mental health (PMH), lower psychological distress and better quality of life.[3-5] Lower levels of social support are associated with higher rates of cardiac[6] and all-cause mortality.[7]

A number of measures of social support have been developed, such as the Medical Outcomes Study Social Support Scale,[8] the Social Support Behavior Scale[9] and the Multidimensional Scale of Perceived Social Support.[10] The Social Provisions Scale (SPS)[1] is one of the most commonly utilized. The SPS was developed and validated by Cutrona & Russell based on Weiss's model of social provisions.[1,11] This model includes six social needs that can be derived from interpersonal relationships: *guidance* (advice or information); *reliable alliance* (tangible help); *reassurance of worth* (appreciation of an individual's competence, abilities and value by others); *opportunity for nurturance* (the individual as a source of support for others); *attachment* (emotional bond from which an individual achieves a sense of security); and *social integration* (sense of belonging to a group with mutual interests, concerns and hobbies as the individual).[1,12]

The original SPS includes 24 items. The six social needs identified by Weiss[11] are

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each represented by four items, two of which are formulated negatively and two of which are formulated positively. The SPS was validated using a sample of 1183 students from introductory psychology courses,[1] 303 public school teachers[13] and 306 nurses from a military hospital.[14] The reliability of the individual social provisions subscales was adequate, with Cronbach alpha coefficients ranging from 0.65 to 0.76.[1] The factor structure of the SPS has been partially confirmed, with some items deviating from the theoretical structure depending on the sample (students or general public). Convergent and divergent validity have been demonstrated.[1,15] The 24-item SPS has also been translated into French and validated in the province of Quebec by Caron using a sample of 790 participants.[16] Among the participants in Quebec, the instrument demonstrated excellent internal consistency (α = 0.96) and Cronbach's alpha for each SPS subscale varied between 0.73 and 0.88.[16] The temporal stability of the scale was also very good (r = 0.86). Factor analyses confirmed the multidimensional structure of the scale consistent with the proposed factor structure.[16] The 24-item SPS has been used with various samples including public school teachers,[13] college students,[15,17,18] therapists[19] and spouses of cancer patients[20] as well as in several studies in Canada such as samples from the general population[21] and from a low-income population,[3,22] individuals diagnosed with schizophrenia and their families,[23-25] individuals who have attempted suicide[26] and families with a child in daycare.[27]

A 10-item version of the SPS was recently developed and validated.[4] The SPS-10 includes five of the six original SPS subscales. The *opportunity for nurturance* subscale was dropped because this subscale mostly measures the support offered by the individual rather than the support received by others. In several previous studies, this subscale had the weakest relationship with mental health, and dropping it reduced administration time.[4] The SPS-10 includes 10 items with each subscale represented by two positively worded statements.

Caron[4] demonstrated that the SPS-10 possesses excellent psychometric properties such as strong concurrent validity with the SPS-24, excellent internal consistency with Cronbach's alpha coefficients greater than 0.80 and a predictive power similar to the SPS-24.[4] However, an exploratory factor analysis did not yield the expected factor structure of this version.

In contrast, Steigen & Bergh found shortcomings in the SPS-10 related to targeting and construct validity using the polytomous Rasch model.[28] An alternate 10-item version of the SPS that measures each subscale with the two negatively worded statements has also been developed to better represent the *lack* of social support, but does not appear to be widely implemented.[29]

In this paper, we refer to the SPS-10 as the version with positively worded items developed by Caron.[4]

The SPS-10 has been implemented in the Canadian Community Health Survey (CCHS) 2012 Mental Health Focus cycle and on several subsequent cycles of the CCHS Annual cycles. It is widely used in national surveillance and research.[30]

As our understanding of health grows to encompass a wide range of behavioural and psychosocial determinants, there is increasing demand for content on national health surveys that does not increase respondent burden. One way to address this challenge is to shorten scales related to priority content while maintaining adequate measurement properties. Within this context, we aimed to reduce the SPS-10 from 10 to five items (SPS-5), and to assess the criterion-related and factorial validity of the resulting scale.

Methods

Data sources

We analyzed two secondary data sources: the CCHS 2017 Annual cycle and the 2012 Mental Health Focus cycle (CCHS 2012 MH). The CCHS 2012 MH includes a total of 25 113 Canadians aged 15 years or older living in the 10 provinces. This sample excludes Canadians living on reserves and other Aboriginal communities, full-time personnel of the Canadian Forces and individuals who are institutionalized; however, this represents less than 3% of the Canadian population. To establish satisfactory coverage by age group and sex in each province, we used a multistage sampling design derived from the Labour Force Survey. Data collection took place from January to December 2012. The national response rate was 68.9%. Interviews were conducted using computer-assisted personal interviewing (CAPI) and computer-assisted telephone interviewing (CATI), with the majority (87%) using CAPI. Proxy interviews were not conducted because of the personal nature of the questions. Sampling and bootstrap weights were provided by Statistics Canada.

The annual component of the CCHS is an ongoing household survey of Canadians aged 12 years or older living in the 10 provinces and three territories. We analyzed the 2017 cycle of this survey (CCHS 2017). This survey also excludes Canadians living on reserves and other Aboriginal communities and full-time Canadian Forces personnel as well as 12- to 17-year-old youth living in foster homes, institutionalized individuals and those living in the Quebec health regions of Région du Nunavik and Région des Terres-Cries-de-la-Baie-James; in total, this represents less than 3% of the Canadian population. In 2017, the SPS-10 was collected in British Columbia, Alberta, Prince Edward Island and Newfoundland and Labrador. Only these provinces are included in the analyses reported in this paper. For Canadians aged 18 years or older, an area frame based on the Labour Force Survey was used. A list frame based on the Canadian Child Tax Benefits files was used for Canadians aged between 12 and 17 years. Data collection took place from January to December 2017. The national response rate was 62.8%. Approximately 74% of the interviews were conducted using CATI and the rest of the interviews were conducted using CAPI. Statistics Canada calculated sample weights.

Data were obtained from Statistics Canada through a sharing agreement. Statistics Canada collects these data under the authority of the Statistics Act. Participants were asked at the time of data collection whether they agreed to share their data with PHAC and Health Canada. Only the de-identified microdata from respondents who agreed to share their data were provided by Statistics Canada to PHAC.

Respondents self-reported their sex, age, household income, marital status, primary spoken language, education and immigration status. Statistics Canada determined each respondent's population centre (urban/rural) based on their six-digit postal code. Where no data on income were collected or available from linked tax data for the

CCHS 2017 annual component, missing data on income were imputed using the nearest neighbour imputation method.[31]

Social support was measured through the 10-item SPS validated by Caron[4] based on the original 24-item SPS by Cutrona & Russell.[1] Specifically, the SPS-10 assesses five forms of social provisions: attachment (items 1 and 10), guidance (items 2 and 7), social integration (items 3 and 8), reliable alliance (items 4 and 6) and reassurance of worth (items 5 and 9). Each item is rated on a four-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). A continuous scale score is computed by summing responses to the 10 questions, with values ranging from 10 to 40. The SPS-10 summary score is not computed for respondents with data missing on any items. Higher scores can be interpreted as having higher levels of social support. In national surveillance efforts, participants are identified as having "high" social support on the SPS-10 if their score was 30 or above.[30]

Self-rated mental health was evaluated using one question: "In general, would you say that your mental health is: excellent (5), very good (4), good (3), fair (2), or poor (1)?" Self-rated mental health has been identified as a useful measure for monitoring general mental health.[32]

Life satisfaction was assessed with one question: "Using a scale of 0 to 10, where 0 means 'very dissatisfied' and 10 means 'very satisfied,' how do you feel about your life as a whole right now?" This question is considered reliable and valid for use in population surveys and is recommended by the Organisation for Economic Cooperation and Development (OECD).[33]

Sense of belonging was measured with one question: "How would you describe your sense of belonging to your local community? Would you say it is…: very strong (4), somewhat strong (3), somewhat weak (2), or very weak (1)?" Among various social constructs that this measure may tap into, this question demonstrates validity as a measure of neighbourhood social capital.[34]

The continuous score from the Mental Health Continuum–Short Form (MHC-SF) scale was included on the CCHS MH 2012 as a general measure of PMH.[35] The MHC-SF includes 14 items that measure emotional, psychological and social well-being, answered on a six-point Likert scale ranging from "Never" (0) to "Every day" (6). An overall summary score is calculated by summing responses, with scores ranging from 0 to 70. The MHC-SF has demonstrated factorial, convergent and divergent validity.[36]

Psychological distress was measured using the Kessler Psychological Distress Scale (K10) on the CCHS 2012 MH only. The K10 includes 10 items about the respondent's level of distress, on a scale of 0 to 40.[37] The K10 Psychological Distress Scale is often used as a general measure of mental ill health and includes symptoms associated with depression and anxiety. It has demonstrated good convergent and discriminant validity.[38]

Data from all respondents were analyzed for the CCHS 2012 MH, while only data from respondents in the four provinces that included the SPS-10 content were included in analyses of the CCHS 2017 data. Analyses were restricted to participants aged 18 years and older. Analyses from the CCHS 2012 MH were used to make decisions about item choice; analyses of the CCHS 2017 annual component were used to confirm these decisions. Frequencies and descriptive statistics were calculated for all variables. For the SPS-10 items, skewness and kurtosis (unweighted), and weighted item-to-total correlations (both item included in the total, and item excluded) were also calculated. Exploratory factor analysis was conducted using the CCHS 2012 MH data to identify SPS-10 variables with the highest loadings on the underlying factor, using maximum likelihood estimation. An eigenvalue of 1 was used as the criterion to determine the number of factors, as well as visual inspection of the scree plot. A factor loading of 0.45 was identified as the minimum value.[39] Cronbach's alpha of the SPS-10 and the SPS-5, and Pearson correlations between SPS-10 and SPS-5 scores and related PMH constructs were calculated. Correlation confidence intervals (CIs) were calculated using Fisher *z*-transformation. We used linear regression to examine the proportion of the variance of psychological distress, and PMH, as measured by the MHC-SF, explained by the SPS-10 and the SPS-5. All analyses were weighted unless otherwise noted, and variance was calculated using the bootstrap procedure in the SAS SURVEY suite of procedures. These analyses were conducted in SAS Enterprise Guide 5.1 (SAS Institute Inc., Cary, NC, USA).

Confirmatory factor analysis was conducted in MPlus Version 7.3 (Muthén & Muthén, Los Angeles, CA, USA) using maximum likelihood estimation with the CCHS 2017 data. We adopted model fit criteria as suggested by Hu and Bentler:[40] 0.95 or above for the Tucker Lewis index (TLI) and the comparative fit index (CFI); 0.08 for standardized root mean square residuals (SRMR); and 0.06 for root mean square error of approximation (RMSEA).[40] The model was fit for the full sample, then separately for men and women.

Results

Descriptive statistics

Both samples comprised about equal proportions of men and women (Table 1). Most respondents were married or living with a partner, and 69% and 80% of respondents in the 2012 and 2017 surveys, respectively, had some postsecondary education. About three-quarters of respondents stated English was their primary spoken language, while approximately one in five reported French as their primary spoken language. More than 80% lived in urban settings.

Social Provisions Scale descriptive statistics

Mean scores on the items of the SPS on CCHS 2012 MH ranged from 3.45 to 3.70 (Table 2). No values for skewness or kurtosis were greater than $|3|$ (data not shown). Item to item-deleted total correlations ranged from 0.66 to 0.79. A similar pattern of means and item to item-deleted total correlations were observed with the CCHS 2017 annual data.

Exploratory factor analysis

We conducted exploratory analysis using the CCHS 2012 MH data. A single factor was identified using a minimum eigenvalue of 1 as the criterion; inspection of the scree plot supported this decision. Bartlett's test of sphericity was significant ($p < 0.001$), indicating that the data were appropriate for factor analysis. The factor loadings are shown in Table 2; all were above 0.45. No rotation was used because only one factor was identified. Loadings of items were examined on a pairwise basis; the item with the higher loading was chosen for retention. In one case

TABLE 1
Demographic characteristics of samples, CCHS 2012 MH[a] and CCHS 2017[b]

Characteristics	Per cent of sample (95% CL)	
	CCHS 2012 MH [a]	CCHS 2017 [b]
Sex		
Males	49.16 (48.99, 49.33)	49.72 (49.72, 49.72)
Females	50.84 (50.67, 51.01)	50.27 (50.27, 50.27)
Age (years)		
18–34	28.23 (27.46, 29.01)	29.57 (29.57, 29.57)
35–49	26.57 (25.57, 27.58)	25.74 (25.74, 25.74)
50–64	27.08 (26.38, 27.78)	25.52 (25.52, 25.52)
65+	18.12 (18.05, 18.18)	19.17 (19.17, 19.17)
Marital status		
Single/never married	23.13 (22.31, 23.96)	23.53 (22.69, 24.37)
Widowed/divorced/separated	13.64 (12.94, 14.35)	12.72 (11.99, 13.45)
Married/living common-law	63.23 (62.18, 64.28)	63.75 (62.71, 64.79)
Highest education level		
Less than secondary school graduation	14.87 (14.12, 15.62)	4.14 (3.75, 4.54)
Secondary school graduation	16.18 (15.38, 16.98)	15.38 (14.44, 16.33)
Some postsecondary and postsecondary graduation	68.95 (67.86, 70.05)	80.47 (79.50, 81.45)
Household income quintile (national quintile)		
Q1 (lowest quintile)	19.48 (18.53, 20.42)	17.64 (16.66, 18.62)
Q2	19.91 (18.93, 20.88)	19.42 (18.50, 20.35)
Q3	20.05 (19.16, 20.93)	20.28 (19.29, 21.28)
Q4	19.93 (18.96, 20.91)	19.38 (18.42, 20.34)
Q5 (highest quintile)	20.64 (19.60, 21.69)	23.27 (22.17, 24.37)
Immigrant		
Yes	26.10 (24.74, 27.46)	25.55 (24.36, 26.74)
No	73.91 (72.55, 75.27)	74.45 (73.26, 75.64)
Living in a population centre		
Urban	82.37 (80.86, 83.88)	85.14 (84.08, 86.21)
Rural	17.63 (16.12, 19.14)	14.86 (13.79, 15.92)
Primary spoken language		
English	76.21 (75.42, 77.00)	97.38 (96.89, 97.87)
French	21.61 (20.95, 22.28)	—[E]
Other	2.18 (1.74, 2.62)	—
Self-rated health		
Excellent	22.13 (21.13, 23.13)	22.74 (21.60, 23.88)
Very good	38.18 (37.11, 39.25)	37.77 (36.58, 38.97)
Good	29.19 (28.11, 30.27)	27.13 (26.02, 28.24)
Fair	8.22 (7.66, 8.78)	9.00 (8.33, 9.68)
Poor	2.28 (2.02, 2.55)	3.35 (2.93, 3.77)
Province		
British Columbia	13.52 (13.40, 13.63)	49.94 (49.94, 49.94)
Alberta	10.81 (10.71, 10.91)	42.91 (42.91, 42.91)
Saskatchewan	2.88 (2.85, 2.91)	NA
Manitoba	3.41 (3.38, 3.45)	NA
Ontario	38.90 (38.72, 39.08)	NA

Continued on the following page

TABLE 1 (continued)
Demographic characteristics of samples, CCHS 2012 MH[a] and CCHS 2017[b]

Characteristics	Per cent of sample (95% CL)	
	CCHS 2012 MH [a]	CCHS 2017 [b]
Province (continued)		
Quebec	23.58 (23.43, 23.74)	NA
New Brunswick	2.19 (2.17, 2.22)	NA
Prince Edward Island	0.43 (0.42, 0.43)	1.55 (1.55, 1.55)
Nova Scotia	2.76 (2.73, 2.79)	NA
Newfoundland and Labrador	1.52 (1.50, 1.54)	5.60 (5.60, 5.60)

Abbreviations: CCHS, Canadian Community Health Survey; CL: confidence limit; MH, mental health; NA, not applicable.
[a] All 10 provinces; n = 22 486.
[b] British Columbia, Alberta, Prince Edward Island and Newfoundland and Labrador; n = 15 189.
[E] Cannot release data due to high sampling variability.
— Suppressed due to sampling variability of estimate above.

(items 4 and 6), the loadings were the same. In this case, item 4 was chosen based on lower kurtosis and skewness. The following items were retained for the five-item scale: items 3, 4, 5, 7 and 10. Items 1, 2, 6, 8 and 9 were dropped.

Internal consistency and correlation analysis

Using the CCHS 2012 MH data, Cronbach's alpha for the SPS-10 was 0.93; for the SPS-5 it was 0.88. Cronbach's alpha for the SPS-5 using the CCHS 2017 data was 0.88. Reducing items by half had a modest impact on the internal consistency of the scale, and Cronbach's alpha continued to surpass guidelines for adequate internal consistency.[41] The scores for the 5- and 10-item scales correlate strongly (r = 0.97) using data from both the CCHS 2012 MH and CCHS 2017 datasets (Table 3). Correlations between the SPS-5 and PMH measures are very similar to values obtained using the SPS-10 (Table 3). For example, the correlations between sense of belonging and both the SPS-5 and the SPS-10 were r = 0.18 when using CCHS 2012 MH data. The correlations between the SPS-5 and SPS-10 scales and satisfaction with life scale were r = 0.34 and 0.33, respectively. This pattern was consistent for both men and women. The SPS-10 explained 8.1% of the variance in psychological distress

TABLE 2
Descriptive statistics, item-to-total correlations and factor loadings from exploratory factor analysis for 10-item Social Provisions Scale items, CCHS 2012 MH, and descriptive statistics and item-to-total correlations for 5-item Social Provisions Scale, CCHS 2017

	CCHS 2012 MH SPS-10 [a]					CCHS 2017 SPS-5 [b]		
Item	Mean	SEM	Per cent missing	Item-to-total correlation	Factor loading	Mean	SEM	Item-to-total correlation
1 There are people I can depend on to help me if I really need it.	3.67	0.01	0.25	0.68	0.71	–	–	–
2 There are people who enjoy the same social activities I do.	3.54	0.01	0.72	0.69	0.70	–	–	–
3 I have close relationships that provide me with a sense of emotional security and well-being.	3.59	0.01	0.52	0.78	0.81	3.46	0.01	0.76
4 There is someone I could talk to about important decisions in my life.	3.65	0.01	0.41	0.78	0.83	3.56	0.01	0.76
5 I have relationships where my competence and skill are recognized.	3.53	0.01	1.15	0.73	0.74	3.40	0.01	0.70
6 There is a trustworthy person I could turn to for advice if I were having problems.	3.66	0.01	0.40	0.79	0.83	–	–	–
7 I feel part of a group of people who share my attitudes and beliefs.	3.45	0.01	0.77	0.71	0.73	3.34	0.01	0.67
8 I feel a strong emotional bond with at least one other person.	3.68	0.01	0.42	0.73	0.77	–	–	–
9 There are people who admire my talents and abilities.	3.49	0.01	1.90	0.66	0.66	–	–	–
10 There are people I can count on in an emergency.	3.70	0.01	0.36	0.77	0.80	3.59	0.01	0.71
SPS-10	36.04	0.05	3.32	–	–	–	–	–
SPS-5	17.93	0.03	1.80	–	–	17.37	0.03	–

Abbreviations: CCHS, Canadian Community Health Survey; MH, mental health; SEM, standard error of the mean; SPS, Social Provisions Scale; SPS-5, 5-item Social Provisions Scale; SPS-10, 10-item Social Provisions Scale; –, not applicable.
[a] All 10 provinces; n = 22 486.
[b] Four provinces: British Columbia, Alberta, Prince Edward Island and Newfoundland and Labrador; n = 15 189.

TABLE 3
Correlations for 10-item and 5-item Social Provisions Scale with positive mental health concepts, CCHS 2012 MH [a], by sex

	% (95% CL)	
	SPS-5	SPS-10
Total		
SPS-5	1	0.97 (0.97, 0.97)
SPS-10	0.97 (0.97, 0.97)	1
Self-rated mental health	0.30 (0.29, 0.31)	0.29 (0.28, 0.30)
Positive mental health	0.42 (0.40, 0.43)	0.40 (0.39, 0.42)
Life satisfaction	0.34 (0.32, 0.35)	0.33 (0.32, 0.34)
Sense of belonging	0.18 (0.17, 0.20)	0.18 (0.17, 0.19)
Psychological distress	−0.29 (−0.31, −0.28)	−0.28 (−0.30, −0.27)
Males		
SPS-5	1	0.97 (0.97, 0.97)
SPS-10	0.97 (0.97, 0.97)	1
Self-rated mental health	0.32 (0.30, 0.34)	0.31 (0.30, 0.33)
Positive mental health	0.41 (0.39, 0.42)	0.39 (0.38, 0.41)
Life satisfaction	0.34 (0.33, 0.36)	0.34 (0.32, 0.36)
Sense of belonging	0.19 (0.17, 0.20)	0.18 (0.16, 0.19)
Psychological distress	−0.29 (−0.31, −0.27)	−0.28 (−0.30, −0.26)
Females		
SPS-5	1	0.97 (0.97, 0.98)
SPS-10	0.97 (0.97, 0.98)	1
Self-rated mental health	0.29 (0.27, 0.30)	0.28 (0.26, 0.30)
Positive mental health	0.43 (0.41, 0.44)	0.42 (0.40, 0.43)
Life satisfaction	0.33 (0.31, 0.35)	0.32 (0.31, 0.34)
Sense of belonging	0.18 (0.16, 0.20)	0.18 (0.16, 0.20)
Psychological distress	−0.31 (−0.33, −0.30)	−0.30 (−0.32, −0.28)

Abbreviations: CCHS, Canadian Community Health Survey; CL: confidence limits; MH, mental health; SPS-5, 5-item Social Provisions Scale; SPS-10, 10-item Social Provisions Scale.
Note: $p < 0.001$, confidence intervals calculated using Fisher *z*-transformation.
[a] All 10 provinces; $n = 22\,486$.

and 16.3% of the variance in PMH (MHC-SF) using linear regression, while the SPS-5 explained 8.7% and 17.3%, respectively.

Confirmatory factor analysis

We conducted a confirmatory factor analysis using data from the CCHS 2017 to confirm a single factor model of social provisions, using the SPS-5. The model fit the data well with no modifications, except a slightly higher than acceptable RMSEA (i.e. > 0.06 [40]). All factor loadings were statistically significant, salient and substantively meaningful. Fully standardized factor loadings (standard error) were 0.826 (0.003), 0.827 (0.003), 0.733 (0.004), 0.737 (0.004) and 0.754 (0.004) for items 3, 4, 5, 7 and 10, respectively. Standardized item residuals were all less than 1.96. The model fit the data well for men and women separately, again with slightly higher than acceptable RMSEA (Table 4).

Mean and prevalence estimates

Mean scores on the SPS-10 and SPS-5 were 36.04 (95% CI: 35.96–36.12) and 17.93 (95% CI: 17.88–19.97) respectively, using the CCHS 2012 MH data (Table 2). A similar pattern of means by sociodemographic characteristics was observed for both the SPS-10 and SPS-5 (Table 5). For example, younger adults aged 18–34 years had higher mean scores on both the SPS-10 and SPS-5 compared to older adults ages 65 years and older; those with less than secondary school graduation had lower mean scores than those with some postsecondary education or postsecondary graduation; and women had higher mean scores than men. When scale scores were converted to *z*-scores, there were no differences in mean scores between the SPS-5 and SPS-10 by sociodemographic group (data not shown).

The SPS-10 scale score is currently used with a cutoff of 30 to identify participants with high levels of social support;[30] a cutoff of 15 on the SPS-5 corresponds to this. Using these cutoffs for the SPS-10 and SPS-5, data from the CCHS 2012 MH, representing Canadians in 10 provinces, yielded a prevalence for high social support of 91.5% (95% CI: 90.8–92.1) using the SPS-10 and 92.7% (95% CI: 92.1–93.3) using the SPS-5 (Table 5). A similar pattern of results is maintained when the prevalence of high social support is examined by sociodemographic groups; however, the SPS-5 yields a marginally higher prevalence of "high" social support across most groups; 97% of participants were classified as "high" using both the SPS-10

TABLE 4
Results of confirmatory factor analysis of SPS-5, CCHS 2017[a], by sex

	$\chi 2$	*df*	RMSEA (95% CL)	SRMR	CFI	TLI
Total (n = 14 807)	403.8	5	0.073 (0.067, 0.080)	0.015	0.989	0.978
Males (n = 6828)	219.3	5	0.079 (0.070, 0.088)	0.017	0.987	0.974
Females (n = 7979)	185.5	5	0.067 (0.059, 0.076)	0.014	0.991	0.982

Abbreviations: CCHS, Canadian Community Health Survey; CFI, comparative fit index; CL, confidence limits; *df*, degrees of freedom; RMSEA, root mean square error of approximation; SPS-5, 5-item Social Provisions Scale; SRMR, standardized root mean square residual; TLI, Tucker Lewis index.

[a] British Columbia, Alberta, Prince Edward Island and Newfoundland and Labrador; n = 15 189.

TABLE 5
Mean scores and proportion with level of high social support using 10-item and 5-item Social Provisions Scale, CCHS 2012 MH[a], by sociodemographic groups

Characteristic	Mean (95% CL)		% (95% CL)	
	SPS-10	SPS-5	High SPS-10	High SPS-5
Total sample	36.04 (35.96, 36.12)	17.93 (17.88, 17.97)	91.47 (90.83, 92.11)	92.69 (92.08, 93.30)
Sex				
Males	35.77 (35.65, 35.89)	17.76 (17.70, 17.83)	91.20 (90.29, 92.10)	92.16 (91.22, 93.10)
Females	36.30 (36.19, 36.42)	18.09 (18.03, 18.15)	91.73 (90.91, 92.55)	93.20 (92.46, 93.94)
Age, years				
18–34	36.72 (36.59, 36.85)	18.29 (18.22, 18.36)	94.37 (93.25, 95.49)	95.30 (94.30, 96.29)
35–49	36.01 (35.83, 36.19)	17.92 (17.82, 18.01)	91.64 (90.27, 93.01)	92.39 (91.13, 93.64)
50–64	35.80 (35.63, 35.96)	17.79 (17.69, 17.88)	90.91 (89.71, 92.12)	92.06 (90.73, 93.39)
65+	35.36 (35.21, 35.51)	17.58 (17.51, 17.66)	87.54 (86.28, 88.79)	90.00 (88.85, 91.16)
Marital status				
Single/never married	35.87 (35.71, 36.03)	17.83 (17.75, 17.92)	90.11 (88.77, 91.44)	91.25 (89.99, 92.51)
Widowed/divorced/separated	34.97 (34.76, 35.17)	17.37 (17.26, 17.48)	85.58 (83.87, 87.29)	88.29 (86.79, 89.78)
Married/living common-law	36.33 (36.22, 36.44)	18.08 (18.03, 18.14)	93.27 (92.51, 94.03)	94.17 (93.40, 94.95)
Highest education level				
Less than secondary school graduation	34.81 (34.59, 35.02)	17.30 (17.19, 17.41)	84.46 (83.66, 87.25)	87.90 (86.27, 89.54)
Secondary school graduation	35.80 (35.61, 35.99)	17.82 (17.72, 17.92)	91.10 (89.57, 92.63)	93.12 (91.88, 94.37)
Some postsecondary and postsecondary graduation	36.36 (36.26, 36.46)	18.09 (18.04, 18.14)	93.14 (92.51, 93.77)	93.85 (93.18, 94.52)
Household income quintile				
Q1 (lowest quintile)	34.55 (34.34, 34.76)	17.17 (17.05, 17.28)	83.45 (81.65, 85.25)	86.25 (84.65, 87.86)
Q2	35.46 (35.27, 35.64)	17.64 (17.54, 17.74)	90.54 (89.18, 91.89)	91.64 (90.36, 92.91)
Q3	36.09 (35.92, 36.27)	17.95 (17.86, 18.04)	91.48 (89.86, 93.09)	92.70 (91.30, 94.25)
Q4	36.70 (36.54, 36.86)	18.26 (18.17, 18.34)	95.17 (94.16, 96.18)	95.97 (95.21, 96.73)
Q5 (highest quintile)	37.27 (37.11, 37.42)	18.57 (18.48, 18.65)	96.36 (95.63, 97.10)	96.52 (95.18, 97.86)
Immigrant				
Yes	35.24 (35.04, 35.45)	17.55 (17.44, 17.66)	89.35 (87.79, 90.91)	90.90 (89.48, 92.32)
No	36.32 (36.23, 36.41)	18.06 (18.01, 18.11)	92.31 (91.68, 92.94)	93.37 (92.75, 93.99)
Urban and rural status				
Urban	36.01 (35.91, 36.10)	17.91 (17.86, 17.96)	91.16 (90.43, 91.89)	92.39 (91.73, 93.06)
Rural	36.21 (36.02, 36.40)	18.02 (17.92, 18.12)	92.91 (91.56, 94.26)	94.06 (92.46, 95.66)
Primary spoken language				
English	35.97 (35.87, 36.06)	17.88 (17.83, 17.93)	91.30 (90.54, 92.05)	92.52 (91.67, 93.27)
French	36.57 (36.39, 36.75)	18.24 (18.15, 18.34)	93.12 (91.98, 94.25)	94.10 (93.17, 95.04)
Other	33.40 (32.61, 34.19)	16.62 (16.21, 17.03)	83.11 (79.95, 89.17)	85.12 (79.51, 90.74)

Abbreviations: CCHS, Canadian Community Health Survey; CL, confidence limits; MH, mental health; SPS-5, 5-item Social Provisions Scale; SPS-10, 10-item Social Provisions Scale.

[a] All 10 provinces; n = 22 486.

and the SPS-5, while the SPS-5 classifies 2% of cases as high where the SPS-10 does not.

Discussion

This paper outlines the process used to create and validate a brief version of the SPS-10, to reduce survey administration time. We used exploratory factor analysis to identify items with the highest loading from each item pair, creating a brief, five-item scale of the SPS (SPS-5). The resulting scale showed high internal consistency through Cronbach's alpha and very high correlation with the SPS-10. Indeed, the correlation of the SPS-5 with the SPS-10 exceeds that between the SPS-10 and the SPS-24, of $r = 0.93$, reported by Caron.[4] The pattern of relationships between the SPS-10 and PMH constructs such as life satisfaction, sense of belonging and self-rated mental health remained similar with the SPS-5, supporting criterion validity. Both the SPS-5 and the SPS-10 explain approximately the same amount of variance in psychological distress and PMH scores. Moreover, the SPS-5 had a lower level of missing data (6.9%) than the SPS-10 (8.3%), which may modestly improve sample size for analysis. Confirmatory factor analysis demonstrated that a single factor model of the SPS-5 fit the data well, supporting factorial validity, which was supported for men and women separately. Although the pattern of high social support by sociodemographic characteristics was maintained across the two measures, it should be noted that the prevalence of high social support is slightly higher when using the SPS-5 than when using the SPS-10. However, the threshold for "high" social support is not based on an external criterion or normative value.[30] Thus, while the reported prevalences of high social support are useful for making comparisons between populations, further research to establish more meaningful cutoffs would be useful.

Strengths and limitations

Because we reduced the SPS-10 to five items, only one item per concept is included in the measure. Previously, researchers could use the sum of two items for each of the five concepts measured by the SPS-10. With the SPS-5, only a summary score for social provisions is available and content validity may be reduced. This study does not provide support to use the single items as measures of component constructs within the SPS-5's overall construct of social provisions. The SPS-10 that we were modifying only included positively worded items, which can result in automatic responses and artifactual relationships.[42] We were unable to conduct analyses of concurrent validity with a different measure of social support, as no separate measure of social support was implemented at the same time as the SPS in the datasets we analyzed. Future research would benefit from examining the relationship between an alternate measure of social support (such as the Medical Outcomes Study Social Support Scale) and the SPS-10 and the SPS-5 to ensure that the SPS-5 maintains similar concurrent validity as the SPS-10.

The comparator outcome measures used to support construct validity were also measured through self-report survey. Thus, associations between these measures and the SPS-10 and SPS-5 may reflect shared methods variance and reporting bias. Including additional measures to further explore convergent and discriminant validity would strengthen the evidence for the SPS-5 as a measure of social provisions.

The CCHS 2017 data were used to confirm our choice of items for the SPS-5. Our data from 2017 only included residents from four provinces; this reduces the generalizability of this confirmation step. Our data are cross-sectional, and as such, we were unable to assess temporal stability. We used Cronbach's alpha to describe internal consistency as this statistic is widely reported and accepted in the literature. While Cronbach's alpha is based in classical test theory, which has limitations, classical test theory is still considered appropriate and acceptable in a wide range of applications.[43] Future research could apply item-response theory approaches to the SPS to further evaluate the functioning of each item.

Conclusion

The SPS-5 maintains good psychometric properties while supporting criterion validity. A single factor model fits the data well through confirmatory factor analysis. Reducing the number of items on the SPS-10 by half decreases respondent burden on surveys, which is particularly important as the number of topics population health surveys need to address continues to expand.

This study supports the use of the SPS-5 as a feasible and valid measure of social support on population health surveys when space for content is limited.

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Conflicts of interest

No conflicts of interest to declare.

Authors' contributions and statement

HO conceived of the project. HO and KY conducted the data analysis and wrote the paper. JL contributed to interpreting the data and critically revising the paper.

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