



Review article

Measuring social skills of children and adolescents in a Chinese population: Preliminary evidence on the reliability and validity of the translated Chinese version of the Social Skills Improvement System-Rating Scales (SSIS-RS-C)



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ABSTRACT

The *Social Skills Improvement System-Rating Scales* (SSIS-RS; Gresham & Elliott, 2008) are designed to assist in the screening and classification of students (aged 5–18 years) who are suspected of presenting with social skills deficits and to offer guidelines in the development of interventions to remediate those types of problems. The objective of this study is to examine the preliminary reliability and validity of the translated Chinese version of the SSIS-RS, referred to as the SSIS-RS-C. In this study, parent-reported social skills and problem behaviors among students with typical development ($n = 79$) were compared with those of age- and gender-matched students with a known developmental disability ($n = 79$) using the SSIS-RS-C. The results indicated that the SSIS-RS-C subscale scores in all the disability groups were significantly different except for those in the Assertion scale for one disability group. Furthermore, the normative sample of typically developing children and adolescents (aged 5–12 and 13–18 years, $n = 567$) from Hong Kong was established to improve the psychometric properties of the SSIS-RS-C. There were moderate to strong relationships between the common subscales across all forms of the SSIS-RS-C. Acceptable to excellent levels of internal consistency across all common subscales was also obtained. The scores for the Hong Kong sample ($n = 567$) derived from the use of the SSIS-RS-C were then compared to the normative sample scores from the American version of the SSIS-RS. It was found that there were statistically significant differences on five out of the seven SSIS-RS-C Social Skill subscales for children aged 5–12 years and on four out of the seven SSIS-RS-C Social Skills subscales for the adolescent group (aged 13–18 years). Also, there were statistically significant differences between the American and Hong Kong samples on all of the SSIS-RS-C Problem Behavior scale scores. It was concluded that the SSIS-RS-C is a promising instrument for clinicians to be able to differentiate social skills and problem behaviors among students presenting with and without developmental disabilities in Hong Kong contexts.

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1. Introduction

Social skills are an important ability that students need to be successful and happy in their daily lives at school, with peers, and with their families. Well-developed social skills contribute to academic success and improved learning outcomes for students (Malecki & Elliot, 2002; Welsh, Parke, Widaman, & O'Neil, 2001). Students with proficient social skills know how and when to use a repertoire of social behaviors appropriately, including tone of voice, hand gestures, facial expressions, body posture, working cooperatively with others, and responding effectively in situations where conflict might occur (Gresham & Elliott, 2008). Conversely, students presenting with social skills deficits can experience poor academic performance and may develop social adjustment problems or serious psychosocial challenges in adulthood, including depression, anxiety, or suicide (Langeveld, Gundersen, & Svartdal, 2012; Tantam, 2000).

Social skills constitute an essential part of social competence, and deficits in this area are present in many students with identified special educational needs (SEN), for instance autism (Simpson, de Boer-Ott, & Smith-Myles, 2003; Ostmeyer & Scarpa, 2012), emotional and behavioral disorders (Gresham, Cook, Crews, & Kern, 2004; Maag, 2005), attention deficit/hyperactivity disorder (Smith, Barkley, & Shapiro, 2007), conduct disorder (Dodge & Pettit, 2003), and intellectual disabilities (Smith & Matson, 2010). Since the introduction of inclusive education and a whole-school approach in Hong Kong in 1997, there has been an increase in the prevalence of students with SEN in mainstream schools (Hong Kong Government, 2000). As a result, teachers need to be able to effectively handle these students in the school classroom environment. This can be challenging for teachers because of the diversity of symptom presentation and the high degree of heterogeneity in the SEN population. As a consequence, it is necessary to address factors that negatively impact school success for these student groups.

It is evident that a valid and reliable measure of social competence and problem behavior is a key component for the assessment of these factors in education settings. Interventions that target problem skill areas early on can lead to positive interpersonal relationships and help to minimize behavioral difficulties by focusing on positive alternative skills (Hagen, Ogden, & Bjornbekk, 2011). There are several measures of social skills that incorporate a broad range of assessment methods, including ratings by multiple informants (e.g., parent, teacher, and child/adolescent self-report), naturalistic and structured behavioral observations, behavioral interviews, and socio-metric evaluations (e.g., acceptance by peers).

Observational rating scales, in particular, are frequently used due to their ease of administration and scoring, standardization, and use of multiple informants across a range of environmental contexts (e.g., school-based teacher ratings and home-based parent ratings). The most frequently cited social skills rating scales include the *Social Skills Improvement System-Rating Scales* (SSIS-RS) (formerly SSRS; Gresham & Elliott, 1990; Elliot and Gresham, 2008), the *Social Responsiveness Scale* (SRS; Constantino, Przybeck, Friesen, & Todd, 2000) and the *Social Skills Questionnaire* (SSQ; Spence, 1995).

The SSIS-RS appears promising and warrants further consideration. By adopting a formalized, broad-based social learning and behavioral theoretical framework, the SSIS-RS has utilized a multi-rater assessment and intervention model in which

Table 1
Demographic characteristics of samples.

Characteristic	TD (n=567)		ASD (n=18)		ADHD (n=26)		DD (n=35)	
	5–12	13–18	5–12	13–18	5–12	13–18	5–12	13–18
N	382	185	9	9	18	8	20	15
Age								
M (Year & Month) ^a	9y3m	15y2m	12y0m	14y6m	9y3m	14y4m	9y5m	14y10m
SD (Month)	23	16	31.5	10.4	26.5	12.0	29.0	20.1
Gender								
Female	159	101	4	0	5	2	9	1
Male	223	84	5	9	13	6	11	14
Respondent								
Father	91	41	2	2	5	2	2	2
Mother	274	129	7	7	11	5	1	11
Others	9	9	0	0	1	0	0	0
Missing	8	6	0	0	1	1	0	2

Note. TD = Typical Development samples; ASD = Autism Spectrum Disorder; ADHD = Attention Deficit Hyperactivity Disorder; DD = Developmental Delay.

^a 9y3m = 9 years 3 months.

the target student, teachers, and parents provide assessment information on the respective student's social competence (Crosby, 2011). The SSIS-RS has been translated into several different languages, including Spanish, Norwegian, Portuguese, Hindi, Dutch, Iranian, Slovakian, German, Russian, and Korean (Gresham, Elliot, Vance, & Cook, 2011), and evidence of the acceptable psychometric properties of those translated versions of the SSIS-RS has been reported in the refereed literature (Klaussen & Rasmussen, 2013). This study will examine the psychometric properties and utility of a translated Chinese version of the SSIS-RS (referred to as the SSIS-RS-C).

2. Method

This study investigated the utility of SSIS-RS-C in assessing the social skills of children and adolescents in Hong Kong. It aimed to compare the social skills of students with and without developmental delay (DD), attention deficit hyperactivity disorder (ADHD), and autistic spectrum disorder (ASD) and to assess parent perceptions regarding the importance of the items in the SSIS-RS-C. Using receiver operating characteristic (ROC) curve analysis, the cut-off scores of the Social Skills and Problem Behavior Scale for differentiating children with typical development (TD) and those with disabilities (DD, ADHD, ASD) were determined. Furthermore, the SSIS-RS-C scores from a sample of children and adolescents from the Hong Kong sample were then compared to the normative sample scores from the American version of the SSIS-RS to determine if similarities and differences existed.

2.1. Sample

The study sample included children with TD and children with a known developmental disability. All the children and adolescents with TD were recruited from four mainstream primary and three secondary schools in Hong Kong. Ten parents reported that their child has formal medical diagnoses, and therefore the data for those children were removed from the sample. The sample group with TD included children who were 5–12 years old (n = 382) and adolescents who were aged 13–18 (n = 185). There were more males (54.1%) than females (45.9%) in the sample. The majority of the participants who completed the self-report social scales were the mothers of the children (71.1%), while 23.3% were fathers and 3% were significant others such as grandparents. There were 14 participants with missing data (see Table 1).

For the sample group with developmental disabilities, the children and adolescents were recruited from several parent self-help associations and one private rehabilitation clinic in the Hong Kong region. Among the group (n = 79), 18 children had ASD, 26 had ADHD, and 35 had DD. All of the children were currently attending mainstream kindergarten, primary school, or secondary school.

2.2. Instrumentation

The instrument was composed of two parts: The first part asked questions about the participants' demographic data, while the second part included the *Social Skills Improvement System-Rating Scale* (SSIS-RS). This part of the questionnaire asked informants to provide information about their child (including age), if their child had a formal diagnosis of one or more of 11 different types of developmental disability, and if their child was taking any medication on a regular basis to manage their disabilities.

2.2.1. *The Social Skills Improvement System-Rating Scales (SSIS-RS)*

The SSIS-RS (Parent version) is an evidence-based, multi-tiered assessment and intervention system designed to help students develop, improve, and maintain important social skills (Gresham & Elliott, 2008). It was designed to facilitate the universal screening of students at risk of developing social behavior difficulties, to help plan interventions for improving these behaviors, and to evaluate progress on targeted skills after intervention (Elliott & Gresham, 2008). The SSIS-RS focuses on key skills that facilitate the academic success of students (Gresham & Elliott, 2008).

The SSIS-RS (Parent form) consists of two scale domains: Social Skills and Problem Behaviors. The Social Skills domain is made up of seven subscales: Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-control. The Problem Behaviors domain has five subscales: Externalizing, Bullying, Hyperactivity/Inattention, Internalizing, and Autism Spectrum.

The two scale domains are rated on a four-point Likert rating scale (0 = Never, 1 = Sometimes, 2 = Often, 3 = Almost always) indicating how frequently the parents think their children exhibit each social skill and/or problem behavior item. Social skills are additionally rated on a three-point Likert rating scale (0 = Not important, 1 = Important, 2 = Critical) that indicates how important the parents think the social skill items are for their children. Examples of social skills subscale items include “takes turn in conversations,” “makes eye contact when talking,” “shows concern for others,” and “feels bad when others are sad.” Examples of problem behavior subscale items include “disobeys rules or requests,” “fights with others,” “fidgets or moves around too much,” and “acts anxious with others” (Gresham & Elliott, 2008).

2.3. *Procedure*

The project was approved by the research ethics committee of Hong Kong Polytechnic University.

2.3.1. *Translation of the instrument*

A professional translator translated the SSIS-RS items from English into Chinese and then a second professional translation completed a backward translation of the Chinese version back into English. The translated and backward translated versions were compared to identify any revisions that were needed to improve the accuracy of the Chinese version of the SSIS-RS. The translated Chinese version of the SSIS-RS was field tested on a group of eight parents who were asked to provide feedback on any of the items they found hard to understand or that did not make sense. This feedback was used to make further revisions to the SSIS-RS-C.

2.3.2. *Review of the content validity and the translated Chinese version*

An expert panel of occupational therapists was formed and asked to critically review the SSIS-RS-C items. Seven qualified occupational therapists who had an average of 13 years of clinical experience working with children with developmental disabilities or special needs were recruited. They were asked to review the fluency of the SSIS-RS-C items, content relevance, cultural relevance, and content representativeness. The panel members provided constructive feedback on ways to improve the wording and phrasing of the translated version with the aim of enhancing the cultural relevance of the social skills and problem behavior scale domain items.

2.3.3. *Collection of parents' ratings of children's and adolescents' social skills*

Contact was made with school principals and head teachers in mainstream primary and secondary schools, and they were asked to take part in the study. The purpose and procedures of the study were explained to them. After obtaining formal permission from the schools, staff helped to distribute envelopes containing an invitation letter, research information sheet, and consent form to the parents of students enrolled at the schools. The SSIS-RS-C and demographic questionnaire was then distributed to the children's parents or guardians when their written consent was received. Participation was voluntary and no incentives were offered. Parents were asked to fill in the questionnaire and return it in a sealed envelope back to their children's school before a specified deadline.

3. **Results**

Good validity and reliability evidence was obtained for the different diagnostic groups for comparison. The Cronbach's α for the SSIS-RS-C's domains and subscales were examined for the sample of children presenting with TD ($n = 567$) (see Table 2). The internal consistency for the scale domains of the SSIS-RS-C version was very good, as reflected by the Cronbach's alphas of 0.95 and 0.94 respectively. The Cronbach's alpha for the 12 SSIS-RS-C subscales varied from 0.71 to 0.86, indicating moderate to good internal consistency, as reported in Table 2.

3.1. *Gender and age differences in social skills as measured by the SSIS-RS-C*

The descriptive statistics of the SSIS-RS-C scale and subscale scores are reported in Table 3. Using the Kolmogorov–Smirnov test of normality, only the Social Skill total scale scores followed a normal distribution ($p = 0.035$). Among the distributions of all the SSIS-RS-C scales and subscales, the kurtosis of the Responsibility subscale (0.58) and the skewness of the Internalizing

Table 2Internal consistency of the parent form scales and subscales of the *Social Skills Improvement System–Rating Scales – Chinese version (SSIS-RS-C)* (n = 567).

Scales and Subscales	Cronbach's α
Social Skills Scale	0.95
Communication	0.90
Cooperation	0.78
Assertion	0.71
Responsibility	0.82
Empathy	0.86
Engagement	0.81
Self-control	0.86
Problem Behavior Scale	0.94
Externalizing	0.86
Bullying	0.78
Hyperactivity/Inattention	0.80
Internalizing	0.84
Autism Spectrum	0.83

Table 3Summary statistics of the *Social Skills Improvement System–Rating Scales – Chinese version (SSIS-RS-C)* scales and subscales (N = 567).

SSIS Scales & Subscales	M	SD	Skewness	Kurtosis
Social Skills subscales	96.56	17.46	−0.05	0.12
Communication	15.13	3.04	−0.16	0.02
Cooperation	13.44	2.41	−0.07	0.04
Assertion	14.99	2.94	−0.11	−0.24
Responsibility	12.80	2.76	−0.29	0.58
Empathy	12.07	3.07	−0.15	−0.13
Engagement	14.71	3.37	−0.25	−0.15
Self-Control	13.44	3.49	−0.07	0.17
Problem Behavior subscales	24.60	13.56	0.62	0.77
Externalizing	9.05	5.19	0.74	0.87
Bullying	2.17	2.17	1.37	2.12
Hyperactivity/Inattention	7.36	3.67	0.17	−0.20
Internalizing	6.99	4.62	0.55	0.37
Autism Spectrum	11.66	5.67	0.37	0.22

subscale were high. The Problem Behavior scale domain and the Externalizing subscale both had high measures of skewness and kurtosis. The score distributions of these scales were more skewed than the other subscales.

Using a general linear model, gender and age were examined to see if they had significant effects on the social skill scores measured by the SSIS-RS-C. On the whole, there were no differences in the social skills and problem behavior profile between boys and girls (Wilk's $\lambda = 0.79$, $p = 0.46$). It was also found that age had no overall effect over the Social Skills and Problem Behavior scale domains (Wilk's $\lambda = 0.88$, $p = 0.42$). When the univariate statistics for the subscales were examined, there were significant increases on the Assertion ($F = 3.99$, $p < 0.05$), Responsibility ($F = 11.95$, $p < 0.01$), and Self-Control ($F = 11.24$, $p < 0.01$) subscales and a significant decrease on the Hyperactivity/Inattention ($F = 8.33$, $p < 0.01$) subscale as age increased. The potential impact of the gender of the respondent (mothers or fathers) on the social skill ratings of the children was also examined, but the effect was found to be not significant.

3.2. Comparison of social skills between children presenting with typical development and children presenting with developmental disabilities

In this matched sample comparison, all participants from each diagnostic category were matched with a participant in the TD group on the basis of gender and age. For example, a 5 year 4 month old girl with ASD was matched with a participant of the same age and gender from the TD group. These matchings served to remove the source of variation from the normative group. Using a general linear model, an examination of the scale domains and subscales was conducted to see if the SSIS-RS-C scores were different between the matched samples with TD and those with ASD, ADHD, or DD. The results indicated that the SSIS-RS-C scale domains and subscale scores of the typically developing and developmental disabilities groups were significantly different (see Table 4). Only one subscale, Assertion, showed no significant difference between the two groups.

3.3. Cut-off scores for delineating children with and without disabilities

The ROC curve was used to identify the cut-off scores for differentiating children with TD from those with known developmental disabilities. Fig. 1 shows the ROC curve for differentiating children with ASD from children with TD. It shows that the Social Skill scale is not useful for differentiating the two groups as the ROC curve is below the reference line and the

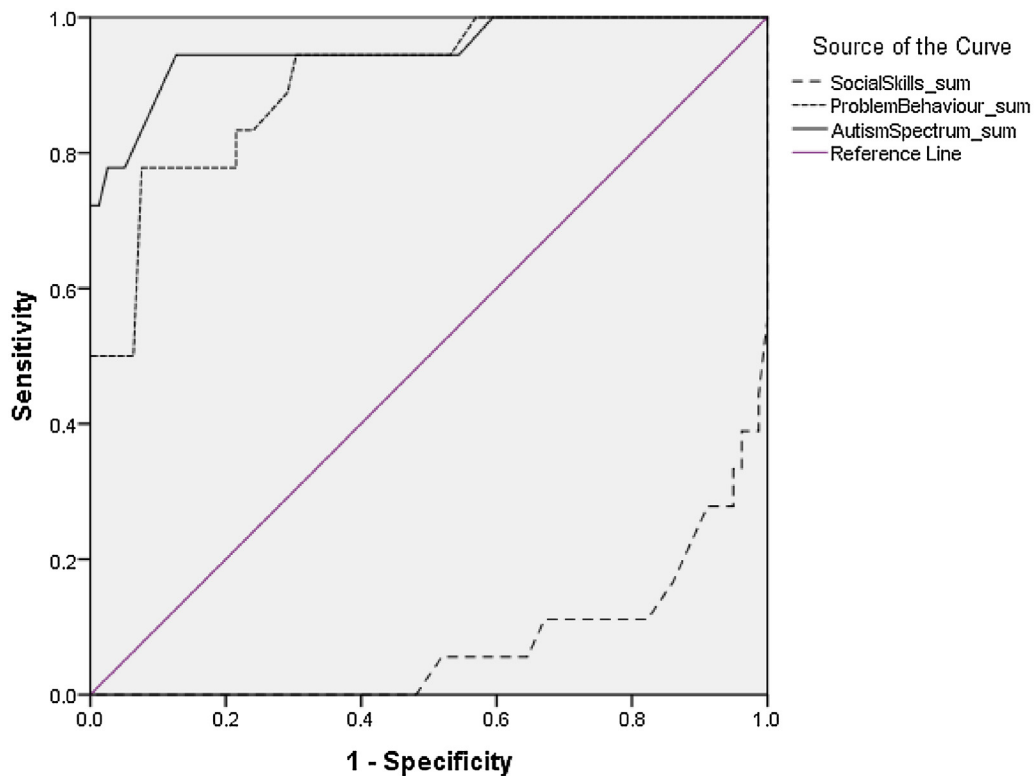
Table 4

Comparison of the *Social Skills Improvement System-Rating Scales – Chinese version (SSIS-RS-C)* scales and subscales between matched samples of children with typical development and developmental disabilities.

Scales and Subscales	TD (n = 18) M(SD)	ASD (n = 18) M(SD)	F	TD (n = 26) M(SD)	ADHD (n = 26) M(SD)	F	TD (n = 35) M(SD)	DD (n = 35) M(SD)	F
Social skills	2.24(0.26)	1.63(0.39)	29.88***	2.25(0.21)	1.79(0.38)	28.48***	2.22(0.23)	1.81(0.39)	28.01***
Communication	2.27(0.35)	1.61(0.44)	24.70***	2.31(0.24)	1.81(0.48)	22.67***	2.29(0.32)	1.94(0.43)	14.33***
Cooperation	2.37(0.38)	1.91(0.46)	10.95**	2.40(0.30)	1.85(0.40)	31.33***	2.33(0.32)	2.04(0.45)	9.87***
Assertion	2.17(0.26)	1.74(0.61)	7.59**	2.25(0.31)	2.03(0.47)	3.70ns	2.13(0.30)	1.82(0.54)	8.91**
Responsibility	2.44(0.40)	1.68(0.39)	33.56***	2.28(0.34)	1.65(0.43)	33.29***	2.36(0.33)	1.96(0.59)	12.68**
Empathy	2.09(0.49)	1.47(0.56)	12.58**	2.20(0.31)	1.67(0.60)	15.51***	2.15(0.38)	1.58(0.53)	27.03***
Engagement	2.29(0.31)	1.62(0.52)	22.09***	2.20(0.37)	1.91(0.59)	4.36*	2.20(0.31)	1.67(0.54)	25.18***
Self-Control	2.09(0.42)	1.41(0.33)	28.43***	2.12(0.34)	1.58(0.39)	28.59***	2.08(0.38)	1.71(0.47)	13.20**
Problem behaviors	0.61(0.30)	1.38(0.50)	30.68***	0.61(0.24)	1.32(0.47)	47.29***	0.67(0.27)	1.12(0.42)	29.22***
Externalizing	0.62(0.36)	1.26(0.62)	14.46**	0.64(0.23)	1.34(0.51)	40.97***	0.62(0.26)	1.00(0.43)	19.78***
Bullying	0.38(0.43)	0.91(0.59)	9.62**	0.27(0.27)	0.82(0.62)	17.64***	0.26(0.27)	0.67(0.45)	20.98***
Hyperactivity/In.	0.76(0.40)	1.71(0.65)	27.47***	0.96(0.28)	2.04(0.46)	103.11***	0.91(0.41)	1.52(0.54)	28.38***
Internalizing	0.58(0.29)	1.37(0.58)	26.62***	0.52(0.38)	1.10(0.62)	16.87***	0.70(0.39)	1.10(0.55)	12.68**
Autism Spectrum	0.64(0.31)	1.43(0.38)	46.42***	0.64(0.23)	1.23(0.53)	28.05***	0.66(0.26)	1.22(0.38)	49.43***

Note. TD = Typical Development; ASD = Autism Spectrum Disorder; ADHD = Attention Deficit Hyperactivity Disorder; DD = Developmental Delay. ns = not significant.

* $p < 0.05$.
 ** $p < 0.01$.
 *** $p < 0.001$.



Diagonal segments are produced by ties.

Fig. 1. Receiver operating characteristics (ROC) curve for finding cut-off score of SSIS-RS-C scales for differentiating children with typical development and autism spectrum disorder.

Table 5
Cut-off scores for differentiating children with and without disabilities using the SSIS-RS-C.

Typical Development (n = 79) compared with	SSIS-RC-C scales or subscales	Sensitivity	1-Specificity	Youden's J	Cutting score	Area under the curve
ASD (n = 18)	Problem Behavior scale	0.78	0.08	0.70	35	0.91
	Autism Spectrum subscale	0.94	0.13	0.82	14.5	0.95
ADHD (n = 26)	Problem Behavior scale	0.77	0.08	0.69	34.5	0.88
	Hyperactive/Inattention subscale	0.92	0.03	0.90	10.5	0.97
DD (n = 35)	Problem Behavior scale	0.74	0.24	0.76	26.5	0.84
Any Disability (n = 79)	Problem Behavior scale	0.86	0.48	0.33	23.5	0.67

Table 6a
Perceived importance of aspects of the specific *Social Skills Improvement System-Rating Scales – Chinese version* (SSIS-RS-C) Social Skills scales based on parental report.

Perceived Importance of	M	SD	Rank
Communication	1.44	0.09	2
Cooperation	1.39	0.01	3
Assertion	1.32	0.01	6
Responsibility	1.47	0.02	1
Empathy	1.35	0.02	4
Engagement	1.25	0.02	7
Self-Control	1.34	0.02	5

area below the curve is less than 0.50. The ROC curve and the Youden's statistic showed that a score larger than 14.5 in the Autism Spectrum subscale ($J=0.82$) or a score larger than 35 in the Problem Behavior subscale ($J=0.70$) were effective in identifying children with ASD from those with TD (Table 5).

When the ROC curve analysis for differentiating other disability groups was repeated, it was found that the Social Skills scale was also not effective in identifying children with ADHD or DD. The cut-off score for identifying children with ADHD was 34.5 for the Problem Behavior scale ($J=0.69$) and 10.5 for the Hyperactive/Inattention subscale ($J=0.90$). The cut-off score for differentiating children with DD was 26.5 for the Problem Behavior scale. When finding a cut-off score that would delineate children with TD or any disability was investigated, it was determined to be 23.5 for the Problem Behavior scale.

Parents' perception of importance of children's social skills Tables 6a and 6b presents the perceived importance of the seven SSIS-RS-C subscales, social skills scales, and problems scales for the TD Hong Kong sample based on parental report. Parents perceived the Responsibility, Communication, and Cooperation subscales as the first top priorities for their children to learn in social skills training. Conversely, the Self-control, Assertion, and Engagement subscales were the least important scales. These findings reflect that parents from Hong Kong may value their children taking responsibility and demonstrating cooperation, which is consistent with Chinese culture, where achieving and maintaining social order and interpersonal harmony are primary concerns (Chen, Rubin, Li, & Li, 1999).

3.4. Comparison of SSIS-RS total scores between Hong Kong and American samples

Tables 6a and 6b reports the results of the comparison of the SSIS-RS-C scale domains and subscale mean scores of the Hong Kong Chinese sample group ($n=567$) norm group with those of the American SSIS-RS standardization group ($n=2000$ for ages 5–12 and $n=400$ for ages 13–18). For the 5–12 age group, all items from the social skills groups and problem scales were statistically significant except for two subscales, namely Assertion and Engagement. For the older group, all items were statistically significant except for four subscales, namely, Cooperation, Assertion, Engagement, and Self-control. Again, these differences could likely be attributable to cultural differences between the United States and Hong Kong in terms of social norms, behaviors, and values.

4. Discussion

The profile of social behaviors for each of the SEN samples corresponded with what has been previously published in the empirical literature. This suggests that the SSIS-RS-C is sensitive enough to differentiate between two groups of individuals (e.g., Hong Kong children and adolescents) with a known difference, that is, being with or without social skills deficits.

Table 6bComparison of the *Social Skills Improvement System–Rating Scales English and Chinese versions* total scores between Hong Kong and American sample groups.

SISS Scale and subscales	American (N = 2000 for age 5–12) (N = 400 for age 13–18)		HK (N = 567)		t	p
	M	SD	M	SD		
5–12 years of age						
Social skills	98.4	18.1	96.25	17.30	–2.21	0.03*
Communication	16.0	3.0	15.16	3.03	–4.99	<0.001***
Cooperation	13.2	2.9	13.37	2.27	1.27	0.20
Assertion	15.1	3.3	15.16	2.98	0.35	0.73
Responsibility	13.1	3.1	12.56	2.70	–3.49	<0.001***
Empathy	13.4	3.2	11.92	3.08	–8.54	<0.001***
Engagement	15.3	3.5	14.91	3.39	–2.03	0.04*
Self-control	12.2	3.8	13.17	3.43	4.96	<0.001***
Problem Behavior	16.2	12.5	24.64	13.01	11.70	<0.001***
Externalizing	6.6	5.3	9.32	4.88	9.84	<0.001***
Bullying	1.1	1.7	2.20	2.06	9.84	<0.001***
Hyperactivity	5.0	3.8	7.63	3.60	12.95	<0.001***
Internalizing	4.8	4.1	6.81	4.61	7.92	<0.001***
Autism Spectrum	8.3	5.3	11.44	5.51	10.26	<0.001***
13–18 years of age						
Social Skills	101.1	19.2	97.22	17.38	–2.43	0.02*
Communication	16.4	3.2	15.11	3.02	–4.72	<0.001***
Cooperation	13.9	2.9	13.62	2.57	–1.17	0.24
Assertion	14.9	3.3	14.57	2.82	–1.26	0.21
Responsibility	14.2	3.1	13.30	2.78	–3.50	<0.001***
Empathy	13.5	3.3	12.37	2.98	–4.11	<0.001***
Engagement	14.9	3.9	14.32	3.28	–1.86	0.06
Self-control	13.4	3.9	13.92	3.61	1.58	0.12
Problem Behavior	13.3	12.5	23.70	13.88	8.69	<0.001***
Externalizing	4.9	5.0	8.22	5.42	7.05	<0.001***
Bullying	1.0	1.8	1.96	2.20	5.20	<0.001***
Hyperactivity	3.7	3.5	6.66	3.64	9.26	<0.001***
Internalizing	4.4	4.4	7.17	4.44	7.02	<0.001***
Autism Spectrum	7.8	5.5	11.82	5.80	7.92	<0.001***

Remark: Data for the American sample are extracted from the SSIS manual.

* p < 0.05 in bold.

*** p < 0.001 in bold.

4.1. Children with autism spectrum disorder (ASD) group

The results of the current study (see Table 4) demonstrated that samples from the ASD group scored significantly lower overall on the SSIS-RS-C Social Skills scale domain subscales than the matched TD participant group. The largest SD differences (1.9 SD difference) were noted on the SSIS-RS-C Engagement and Communication subscales. According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed. [DSM-V]; American Psychiatric Association [APA], 2013), persons with ASD demonstrate deficits in the nonverbal communicative behaviors used for social interaction. Behaviors range from poorly integrated verbal and nonverbal communication, to abnormalities in eye contact and body language or deficits in understanding and use of gestures, to a total lack of facial expressions and nonverbal communication (APA, 2013). The SSIS-RS-C was able to pick up a number of these notable differences between the two groups of children and adolescents.

Furthermore, individuals with ASD may have significant difficulty in developing, maintaining, and understanding relationships, ranging from difficulties adjusting their behavior to suit various social contexts, to difficulties in sharing imaginative play or in making friends, to the absence of interest in peers. The results indicated that the ASD samples scored significantly higher on all the five subscales of the SSIS-RS-C Problem Behavior scale domain compared to the matched TD sample, with the highest scores noted on the SSIS-RS-C Internalizing and Autism Spectrum subscales. These results are consistent with other completed studies which found that individuals with ASD demonstrate more internalizing behaviors such as feeling anxious and lonely as a result of social skills problems (Bauminger & Kasari, 2000). This demonstrates that the SSIS-RS-C is able to differentiate between two participant groups with a known diagnostic difference and has positive implications for its use in Hong Kong Chinese contexts.

4.2. Children with attention deficit hyperactivity disorder (ADHD) group

Findings from the current study indicated that the ADHD sample obtained statistically significant lower scores than the TD participant group on all the SSIS-RS-C Social Skills subscales except for Assertion and Engagement (refer to Table 4).

Previous research supports the fact that children with ADHD are more likely to evoke peer rejection (Lahey & Wilcutt, 1998) and to have difficulties with skill performance rather than skill knowledge (Wheeler & Carlson, 1994).

In terms of problem behavior, the results indicated that the ADHD sample obtained significantly higher scores than the TD sample for all SSIS-RS-C subscales that fell under the Problem Behavior category, with the largest SD difference being observed on the SSIS-RS-C Hyperactivity/Inattention and Externalizing subscales. The result was similar to the diagnostic criteria for ADHD (APA, 2013). Again, this provides additional evidence of the SSIS-RS-C's ability to discriminate between a typically developing group of children and adolescents and those with a known diagnosis.

4.3. Children with developmental delay (DD) group

The results showed that the DD sample had significantly lower scores on the SSIS-RS-C Social Skills subscales and significantly higher scores on the problem behavior subscales than the matched TD sample. Merrell and Holland (1997) reported that children with DD with poor social interaction skills are four to five times more likely to exhibit problems with anxiety, depression, or aggression because the social demands they face become more complex as children with delays become more aware of their differences and as peers exhibit rejecting behaviors more frequently.

4.4. Children from Hong Kong and the United States

It is not surprising that what are considered to be socially adaptive and maladaptive behaviors are defined differently in Hong Kong (e.g., non-Western) and American (e.g., Western) contexts (Chen et al., 1999; Chen, Rubin, & Sun, 1992). Behaviors that are perceived as atypical and problematic in non-Western cultures may be acceptable in other cultures. For example, Chinese culture encourages students to sit properly at all times and moving out of their seats is viewed as a problematic behavior by some Hong Kong parents. On the other hand, behaviors that are valued in Western contexts may be regarded as maladaptive in other cultural contexts (e.g., being assertive with one's elders or having a highly individualistic view of life). Some primary schools in the United States stress the importance of managing one's emotions, expressing one's needs in a direct and polite manner, and emotional resilience and thus incorporate these into their curricula. However, in Hong Kong, there is a strong emphasis on academic skill development whereas empathy and communication skills are usually not areas of focus. Therefore, it is important to understand how cultural factors may influence children's and adolescents' social behaviors in different daily life environments.

Also, when using assessment scales developed in one cultural context in other settings, it is also important to examine their suitability and appropriateness for translation and use in other social and ethnic environments. In the case of the SSIS-RS-C, it was developed in the United States and reflects the social skills norms and what are considered to be the challenging behaviors that American children and adolescents might exhibit. The assumption that these cultural norms and social expectations are generalizable to other non-Western environments is problematic and fraught. Therefore, comparing the SSIS-RS American norms with the Hong Kong participant sample SSIS-RS-C scores provides helpful insights into the cross-cultural utility and applicability of the SSIS-RS-C subscales and the constructs they measure in a Hong Kong setting with children and adolescents.

4.5. Clinical implications

The SSIS-RS-C not only provides information about the prosocial behavior of children and adolescents but is also able to assess the presence of any co-occurring externalizing or internalizing problem behaviors (Gresham & Elliott, 2008). The presence (or absence) of such problem behaviors is important since they are known to interfere with the production of prosocial behaviors (Gresham & Elliott, 2008). Thus, from a theoretical standpoint, it is important to have assessment data that describes both the quality of prosocial behaviors (e.g., strengths, acquisition or performance deficits) and the presence of problem behaviors in order to develop a comprehensive overview of children's social functioning that explains and predicts behavior across multiple contexts (Elliott, Gresham, Frank, & Beddow, 2008). The results of this study also provide cut-off scores for the SSIS-RS-C Problem Behavior scale and subscales which can help clinicians to quickly identify social skill deficits in children presenting with ASD, ADHD, or DD in Hong Kong settings. This will greatly assist therapists, practitioners, and educators working with children and adolescents in the Hong Kong region who are presenting with known or suspected social skill problems.

4.6. Future research

For several reasons, a future aim would be to create a larger norm standardization sample for the SSIS-RS-C. Another idea would be to complete a factor analysis that would investigate the dimensional structure of the SSIS-RS-C scale domains and subscales in a more conclusive fashion. Also, comparisons of factor loadings from an American study could further explore metric equivalence. Test-retest reliability is also of interest in order to examine the SSIS-RS-C's stability over time.

Moreover, since the SSIS-RS is a multi-informant assessment tool, norms and psychometric properties for the teacher and student forms could be established and examined after these questionnaires are translated into Chinese. Teachers contribute an important perspective in judging the symptoms and social competence of the students they interact with in classroom

settings, particularly given the tasks and demands associated with school. Therefore, although informative, only having included parent reports may have affected the study's results (Gresham, Elliott, Cook, Vance, & Kettler, 2010). Future studies should include the perspective of teachers and educators who are familiar with the child in the classroom setting.

4.7. Limitations

Two limitations are acknowledged in this study. A convenience sampling approach was used to recruit participants to complete the SSIS-RS-C. Given the SSIS-RS-C is a self-report scale completed by children's parents who volunteered to take part in the study, the responses provided by the participants may have been biased. In other words, the issues of social desirability and biased responding need to be considered. Also, the sample sizes of the various disability groups were relatively small, which made interpreting the differences between scores more challenging.

5. Conclusion

This study examined the content validity, internal consistency, and validity of the SSIS-RS-C scale domains and subscales using SEN and TD samples. In addition, data for the parent form of the SSIS-RS-C were collected for a sample of typically developing children from Hong Kong and compared to the normative sample data of the American version of the SSIS-RS. There is the possibility that socially adaptive and maladaptive behaviors are viewed differently in American and Hong Kong Chinese cultures. The results show that the SSIS-RS assessment tool has demonstrated reasonable psychometric properties. With this validated and reliable tool, therapists can effectively assess suspected social skill difficulties and problem behaviors among children and adolescents in Hong Kong and provide them with specific, appropriate, and early intervention if needed.

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