

Validity and Reliability of the Social Skill Scale (SSS) as an Index of Social Competence for Preschool Children

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Abstract The purpose of this study was to validate the Social Skill Scale (SSS) as an evidence-based practical index of social competence. In total, 30,993 preschool children participated in the study. Childcare professionals evaluated participants with the SSS. Results indicated a highly rigid structure of 3 factors corresponding to social competence. Cronbach's alpha coefficients ranged from 0.91 to 0.93 across the sampled age groups. These factors also positively correlated with the Child Development Scale. The SSS is able to measure social competence with high validity and reliability. Thus, the SSS is a helpful tool for understanding the development of social competence.

Keywords Social competence, Children, Evaluation, Scale

1. Introduction

Social competence has been an area of research interest in the field of child development [1]. This growing interest stems from studies observing that effective social skill development confers a wide range of interpersonal, academic, and mental health benefits for children [2][3]. Given these benefits, center-based social skill training has become an increasingly common component of children's preschool experience [4][5].

Social competence is determined by complex interactions between the individual, home and school environments, peer relationships, and the larger sociocultural context [6]. Given the increased number of children displaying impulsive behaviors and social maladjustment, societal preparedness for appropriate education and environments to foster pro-social behaviors among these children are needed.

Social competence is defined by how well an individual functions in relation to other people, particularly with respect to getting along with others and forming close relationships [7].

From early dyadic relationships with caregivers, and play and social interactions with peers during the preschool years, to the formation of peer networks and close friends, social competence is viewed as a primary component of healthy functioning and development [8][9].

Social relationships established through interactions are a

major source of security and a sense of belonging [10].

Social competence is also viewed as the ability to understand others in the context of a social interaction and engage in smooth communication with others. Thus, social competence should be evaluated by the interaction between a person and their social environment [11]. However, methodologies that consider people in conjunction with their social environment across developmental stages have not been well developed.

Assessments of early interactions have focused on measuring the quality of a child's home environment and parenting, based on the theory that an early child-rearing environment greatly influences child development. Two instruments, namely the Home Observation for Measurement of the Environment (HOME) [12] and the Index of Child Care Environment (ICCE) [13], are often used in research on child development.

The Interaction Rating Scale (IRS) was developed to measure a child's social skills and a caregiver's childrearing skills through observations of caregiver-child interactions, which is based on the HOME [12], SSRS (Social Skills Rating Systems) [14], and NCAST (Nursing Child Assessment Satellite Training) teaching scales [15]. The IRS contains 70 items for computing a behavioral score and 11 items for computing an impression score; these items are grouped into the following 10 subscales (the first 5 focus on a child's social skills while the latter 5 assess a caregiver's parenting skills): autonomy, responsiveness, empathy, motor regulation, emotional regulation, respect for autonomy development, respect for responsiveness development, respect for empathy development, respect for cognitive development, and respect for social-emotional development. This measure is used to evaluate, in less than

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5 min, an observation appropriate for the assessment of interactions between caregivers and children from birth to 8 years of age. The reliability of the IRS is 0.91, and the IRS's validity with the NCAST is, $r = .89$ [16-18].

Even though these studies enhance the methods of evaluating social competence, it is useful to develop a scale via a questionnaire. We developed the Social Skill Scale for Preschool Children (SSS; see Appendix) as a questionnaire measure of social competence. The SSS is able to evaluate children's social competence in a short period of time during daily situations.

Several studies assessing social competence have included common factors related to "empathy/cooperation," "self-control," and "assertion." These 3 factors have been found to be stable between the ages of 1 and 6 among Japanese children in a longitudinal study [18].

It is essential to develop methods to evaluate social skills relevant to peer relationships among children in order to promote healthy development. No other study has done similar research as developing a practical index of social competence which is structurally valid over six age groups.

The purpose of this study was to clarify the constructive validity and reliability of the SSS as an evidence-based practical index of social competence.

2. Methods

2.1. Participants

Participants were children enrolled in a longitudinal study of social development ("Japan Child Care Cohort") from 58 government authorized childcare centers all over Japan from 2000 to 2009. Data were obtained from 30,993 children (1-year-olds: 4,012, 2-year-olds: 5,758, 3-year-olds: 5,758, 4-year-olds: 5,762, 5-year-olds: 5,682, and 6-year-olds: 4,021), and usable data were obtained from 29,617 children (those whose social skills could be measured).

In order to comply with ethical standards prior to conducting the research, all parents signed informed consent forms and were made aware that they had the right to withdraw from the experiment at any time. A personal ID system was used to maintain confidentiality of personal information. Furthermore, all data were stored on a disk, which was password protected; only researchers who were granted permission had access to the data.

The ethics committee of the University of Tsukuba approved this study.

2.2. Measures

The SSS was used to assess children's social competence. It was developed as a questionnaire version of the IRS [16-18], which evaluates child-caregiver interactions by observations available for children under the age of 8.

The SSS measures social competence through 24 questions. The evaluator completes the checklist composed of 24 items focusing on a child's behavior in the class (e.g.,

"Cheers up and comforts a person who is missing someone").

Each item within the subscales is assessed in a Yes or No (1 = Yes, 0 = No or not sure) format, and the sum of all items in the subscale provides the overall score.

A higher score indicates a higher level of social competence.

In previous studies, social competence from infancy to adolescence had been classified into 3 core dimensions [14, 19, and 20], which are cooperation, self-control, and assertion. The SSS consists of 3 subscales that measure cooperation (8 items), self-control (8 items), and assertion (8 items). Scores for all SSS subscales are derived from professionals who care for children in childcare centers. We also referred to the Interaction Rating Scale between Children (IRSC) [21], which evaluates children's peer interactions by observations available for children between 3- and 18-years-old.

The Child Development Scale [22], which is widely used among government authorized center-based care centers across Japan, was used to investigate relationships with the SSS. The Child Development Scale is constructed from 4 subscales: social competence, communication skills, vocabulary development, and intelligence development.

2.3. Analysis

Factor analysis using a maximum-likelihood oblique rotation method was conducted to assess the factor structure of the SSS over our 6 age groups. Statistical Analysis System software (SAS version 9.1) was used for data analysis.

3. Results

Table 1 shows standardized regression coefficients of the factor pattern matrix of the SSS. The 3 dimensions extracted were consistent with those of previous studies on social competence (i.e., cooperation, self-control, and assertion).

Table 2 indicates that factor loadings of the SSS were consistent across the 1–6-year-old age range.

The Cronbach's alpha coefficients ranged from 0.91 to 0.93 across the 6 age groups (1-year-olds: 0.91, 2-year-olds: 0.93, 3-year-olds: 0.93, 4-year-olds: 0.93, 5-year-olds: 0.93, and 6-year-olds: 0.93).

Table 3 and Figure 1 show mean scores on the SSS for each age group. The scores on each subscale increased with increasing age.

Table 4 shows significant, positive correlations between the SSS subscales (cooperation, self-control, and assertion) and the Child Development Scale (social competence, communication skills, vocabulary development, and intelligence development).

4. Discussion

Consistent with a main principle of developmental task theory[23], results of this study demonstrate continuity within domains of social skills assessed by developmentally appropriate indices across time. Our analysis revealed a highly rigid structure of 3 factors, which were valid, universal components of social competence. However, it is important to keep in mind that this finding is equally consistent with the possibility that effective social competence with peers is affected by general child development[24]. Nevertheless, our results suggest that the SSS is a reliable and valid measure of social competence in young children.

The social competence scale for child-caregiver interactions (IRS), and for adult interactions, referred to as the Interaction Rating Scale Advanced (IRSA), have previously been found to be reliable, valid, feasible, and practical tools for assessing social interactions over time[16-18, 21]. Three strengths of the SSS, which is derived from the IRS, are described below.

First, we used a large number of participants to clarify the stability of the SSS factors. This helps validate the ease of using this measure in practice; the SSS is highly adaptable because the subscale framework can be used across several age groups.

Second, the SSS can be used for comparative studies across international samples given that the measure is based

on a universal framework of social competence. The subscales are based on several categories, which have been widely used in research assessing social competence indicators.

Third, we have evidence that the SSS has adequate construct and concurrent validity given the positive correlations observed between the SSS and the Child Development Scale.

However, limitations of this study should be noted. First, the SSS subscales might not cover all the dimensions of social competence, even though we used some of the most common frameworks of social competence to develop this scale. Second, while the SSS uses the same scoring standard as a standardized tool, different developmental features of certain items across developmental stages might need further assessment. Third, the present study focused on observed social skills. The social skill strategies that would be effective for coping with others are not necessarily the same strategies that would best allow children to cope with themselves[25]. Future research should examine strategies for regulating social skills, such as anger and fear. Overall, our findings suggest that reframing an upsetting outcome, whether by reappraising its importance or outcome, is an effective approach for evaluating social skill development across childhood.

Table 1. Factor pattern matrix of SSS rotated to three direct oblimin (standardized regression coefficient)

	Factor1	Factor2	Factor3
Cheers and comforts a person who is missing someone	0.906	-0.005	-0.068
Helps friends when they get hurt	0.683	0.119	0.003
Brings cheer to friends who look lonely	0.884	-0.014	-0.062
Applauds friend who has done something well	0.766	0.048	0.033
Praises a friend's success	0.812	-0.048	0.088
Pleased at others' successes	0.824	-0.070	0.076
Helps friends when asked	0.563	0.215	0.096
Helps friends without encouragement from others	0.717	0.079	0.006
Waits to ask for something	-0.028	0.731	0.071
Shares toys or food with others	0.208	0.588	0.021
Borrows toys from others	0.112	0.617	0.114
Behaves well as required by the situation	0.064	0.661	-0.037
Postpones gratification when requested	0.026	0.783	-0.050
Waits for his/her turn	-0.035	0.574	0.226
Listens to someone till the last	0.091	0.548	0.036
Does not throw temper tantrums in public	0.014	0.695	-0.057
Evidences happiness when someone does something for him/her	-0.010	-0.028	0.676
Shows his/her feelings on his/her face	0.094	-0.172	0.551
Expresses appropriate greetings to others	0.099	0.123	0.472
Initiates talk with another person	0.093	0.012	0.578
Makes eye contact when speaking with others	-0.067	0.278	0.543
Displays strong reaction when he/she is spoken to	0.012	0.027	0.699
Makes eye contact when someone speaks to him/her	-0.061	0.147	0.633
Participates in a play group (company) when asked	0.011	0.292	0.389

Table 2. Factor analysis of SSS by age(Likelihood Method Oblimin)

Items	1y (N=3914)			2y (N=4887)			3y (N=5604)			4y (N=5651)			5y (N=5612)			6y (N=5949)		
	Cooperation	Self-control	Assertion	Cooperation	Self-control	Assertion	Cooperation	Self-control	Assertion	Cooperation	Self-control	Assertion	Cooperation	Self-control	Assertion	Cooperation	Self-control	Assertion
Chairs and comforts a person who is missing someone Helps friends when they get hurt Brings cheer to friends who look lonely	0.750	-0.043	-0.002	0.850	-0.062	-0.017	0.863	-0.041	0.002	0.902	-0.050	-0.021	0.905	-0.046	-0.031	0.906	-0.005	-0.068
	0.647	0.041	0.018	0.699	0.081	0.022	0.696	0.063	0.069	0.684	0.094	0.054	0.727	0.079	0.011	0.683	0.119	0.003
	0.657	0.079	-0.003	0.805	-0.017	0.023	0.835	-0.027	0.015	0.862	-0.040	0.004	0.872	-0.049	-0.004	0.884	-0.014	-0.062
Applauds friend who has done something well Praises a friend's success Pleased at others' successes	0.604	0.245	-0.028	0.757	0.067	0.008	0.789	0.069	-0.024	0.784	0.080	-0.019	0.781	0.069	-0.001	0.766	0.048	0.033
	0.674	0.090	0.003	0.795	0.032	0.020	0.867	-0.017	0.005	0.868	-0.027	0.019	0.848	-0.041	0.044	0.812	-0.048	0.088
	0.761	-0.099	0.006	0.836	-0.062	-0.005	0.842	-0.015	-0.026	0.861	-0.025	-0.015	0.844	-0.036	0.022	0.824	-0.070	0.076
Helps friends when asked Helps friends without encouragement from others Waits to ask for something	0.765	-0.034	0.028	0.766	0.073	-0.003	0.649	0.206	0.020	0.610	0.210	0.047	0.616	0.188	0.027	0.563	0.215	0.096
	0.657	0.025	0.033	0.726	0.020	0.015	0.694	0.074	0.022	0.687	0.092	0.019	0.686	0.093	-0.006	0.717	0.079	0.006
	-0.093	0.719	0.172	-0.096	0.776	0.102	-0.088	0.738	0.092	-0.033	0.722	0.054	-0.025	0.705	0.090	-0.028	0.731	0.071
Shares toys or food with others Barrows toys from others Behaves well as required by the situation	0.038	0.674	0.114	0.065	0.638	0.073	0.141	0.577	0.077	0.185	0.569	0.057	0.233	0.536	0.044	0.208	0.588	0.021
	0.106	0.763	-0.013	0.114	0.714	-0.003	0.161	0.629	0.045	0.139	0.609	0.059	0.200	0.503	0.097	0.112	0.617	0.114
	0.015	0.840	-0.041	0.056	0.772	-0.073	0.021	0.742	-0.036	0.014	0.702	-0.027	0.022	0.674	0.000	0.064	0.661	-0.037
Posesposse gratification when requested Waits for his/her turn Listens to someone till the last	0.116	0.722	-0.084	0.101	0.752	-0.117	0.071	0.767	-0.101	0.037	0.782	-0.089	0.013	0.821	-0.063	0.026	0.783	-0.050
	0.053	0.736	0.012	0.079	0.698	0.056	0.073	0.640	0.105	0.077	0.546	0.148	0.086	0.468	0.218	-0.035	0.574	0.226
	-0.026	0.778	0.046	-0.019	0.743	0.072	-0.022	0.672	0.123	-0.012	0.649	0.085	0.080	0.589	0.042	0.091	0.548	0.036
Does not throw temper tantrums in public Evidences happiness when someone does something for him/her Shows his/her feelings on his/her face	0.108	0.681	-0.088	0.088	0.674	-0.123	0.055	0.695	-0.106	0.013	0.700	-0.045	-0.013	0.740	-0.054	0.014	0.695	-0.057
	0.025	-0.041	0.408	0.049	-0.073	0.653	0.110	-0.032	0.640	0.009	-0.025	0.608	0.023	-0.041	0.664	-0.010	-0.028	0.676
	0.020	-0.062	0.389	0.074	-0.112	0.615	0.109	-0.160	0.568	0.088	-0.179	0.578	0.085	-0.170	0.572	0.094	-0.172	0.551
Expresses appropriate greetings to others Initiates talk with another person Makes eye contact when speaking with others	-0.012	0.134	0.652	0.067	0.227	0.409	0.134	0.133	0.411	0.141	0.108	0.394	0.139	0.137	0.346	0.099	0.123	0.472
	0.002	0.147	0.744	0.048	0.199	0.553	0.158	0.002	0.564	0.149	-0.026	0.545	0.142	0.012	0.531	0.093	0.012	0.578
	-0.048	0.178	0.741	-0.048	0.264	0.556	-0.053	0.227	0.586	-0.037	0.212	0.575	-0.025	0.243	0.526	-0.067	0.278	0.543
Displays strong reaction when he/she is spoken to Makes eye contact when someone speaks to him/her Participates in a play group (company) when asked	0.013	-0.048	0.419	-0.019	-0.074	0.761	-0.095	-0.008	0.776	-0.097	0.020	0.765	-0.068	0.007	0.754	0.012	0.027	0.699
	0.018	-0.054	0.404	-0.046	-0.033	0.692	-0.131	0.071	0.725	-0.132	0.130	0.698	-0.114	0.129	0.687	-0.061	0.147	0.633
	-0.035	0.252	0.620	0.013	0.386	0.395	0.058	0.245	0.454	0.071	0.219	0.458	0.022	0.231	0.436	0.011	0.292	0.389
factor	0.89	0.92	0.81	0.93	0.91	0.83	0.94	0.90	0.84	0.94	0.89	0.83	0.94	0.88	0.83	0.93	0.89	0.84
all		0.91			0.93			0.93			0.93			0.93			0.93	
Cronbach's coefficient α		0.92			0.93			0.93			0.93			0.93			0.93	
Inter-factor Correlations	Cooperation	1		1	1		1	1		1	1		1	1		1	1	
	Self-control	0.53	1		0.60	1	0.57	1		0.54	1	0.51	0.54	1		0.51	1	
Assertion	0.15	0.31	1	0.22	0.34	1	0.32	0.38	1	0.30	0.42	1	0.45	0.46	1	0.47	0.48	1

Table 3. Means of SSS

age	Cooperation	Self-control	Assertion	n
1y	0.18	1.02	10.03	3914
2y	2.18	5.84	13.36	4887
3y	6.12	10.04	14.48	5604
4y	9.58	12.60	14.98	5651
5y	11.87	13.93	15.26	5612
6y	13.27	14.62	15.43	3949

Table 4. Significant correlations between SSS and Child Development Scale

Child Development Scales		<u>SSS</u>		
		Cooperation	Self-Control	Assersion
1y	Social competence	0.23	0.50	0.22
	Communication skills	0.31	0.48	0.32
	Vocabulary development	0.39	0.45	0.27
	Intelligence development	0.22	0.29	0.35
2y	Social competence	0.24	0.29	0.15
	Communication skills	0.29	0.16	0.31
	Vocabulary development	0.35	0.35	0.35
	Intelligence development	0.31	0.30	0.33
3y	Social competence	0.02	0.14	0.23
	Communication skills	0.39	0.46	0.38
	Vocabulary development	0.26	0.32	0.36
	Intelligence development	0.26	0.37	0.31
4y	Social competence	0.23	0.31	0.19
	Communication skills	0.34	0.39	0.29
	Vocabulary development	0.36	0.36	0.27
	Intelligence development	0.35	0.34	0.22
5y	Social competence	0.20	0.24	0.28
	Communication skills	0.30	0.36	0.36
	Vocabulary development	0.39	0.37	0.32
	Intelligence development	0.34	0.35	0.26
6y	Social competence	0.14	0.24	0.24
	Communication skills	0.21	0.31	0.34
	Vocabulary development	0.23	0.30	0.27
	Intelligence development	0.15	0.25	0.28

note : Polychoric Correlation, P<0.001

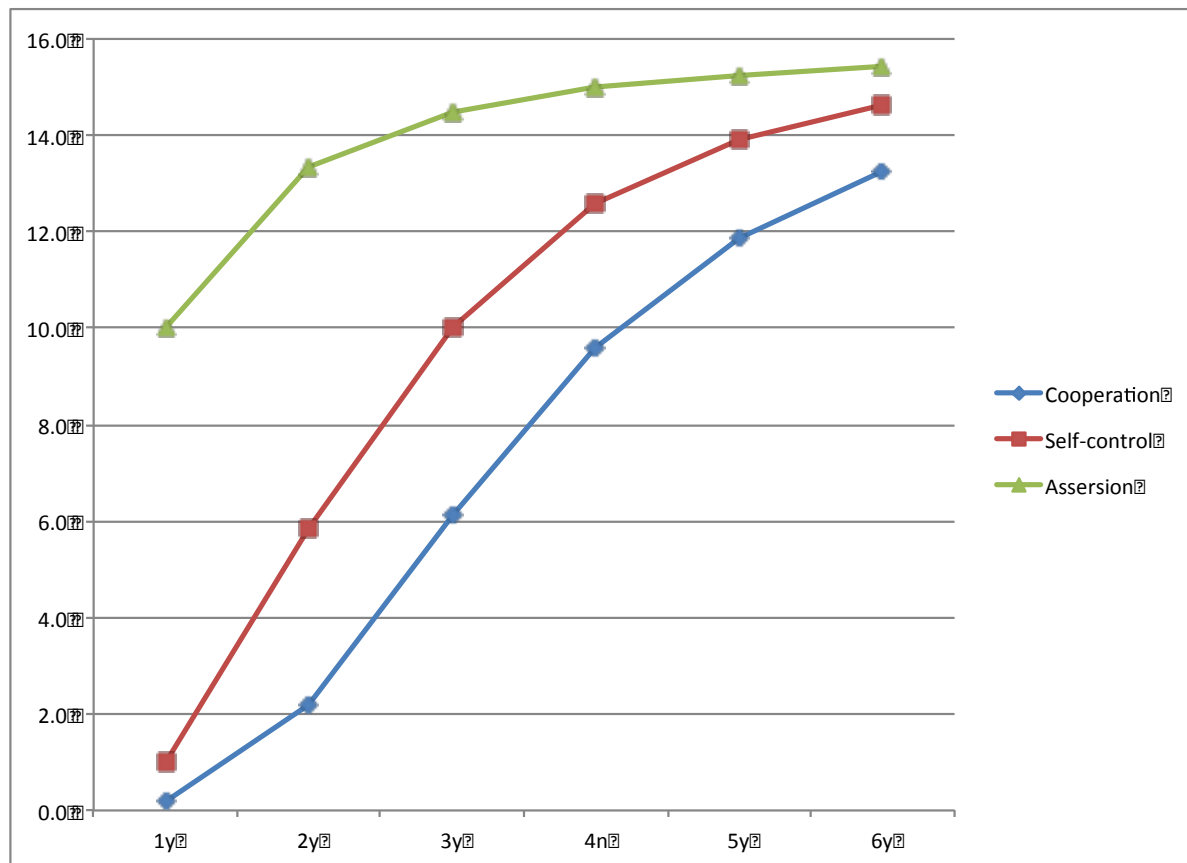


Figure 1. Means of score by age

5. Conclusions

This study provides evidence of a simple measure that is able to validly and reliably assess children's social competence. The SSS can be considered as an established, valid screening instrument that reflects attributes of social competence. This measure helps provide further evidence of the development of social competence, which enhances our knowledge of the practicality of the SSS for practitioners and caregivers.

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Appendix: Social Skill Scale (SSS)

1. Cooperation: children's cooperative and empathetic behaviors

- (1) Cheers up and comforts a person who is missing someone
- (2) Brings cheer to friends who look lonely
- (3) Praises a friend's success
- (4) Applauds a friend who has done something well
- (5) Pleased at others' successes

- (6) Helps friends without encouragement from others
- (7) Helps friends when friends get hurt
- (8) Helps friends when asked

2. Self-Control: children's behaviors that emerge in conflict situations

- (1) Postpones gratification when requested
- (2) Behaves well as required by the situation
- (3) Waits to ask for something
- (4) Does not interrupt another's speech
- (5) Borrows toys from others
- (6) Shares toys or food with others
- (7) Does not throw temper tantrums in public
- (8) Waits for his/her turn

3. Assertion: children's initiating behaviors

- (1) Displays strong reactions when he/she is spoken to
- (2) Evidences happiness when someone does something for him/her
- (3) Makes eye contact when someone speaks to him/her
- (4) Shows his/her feelings on his/her face
- (5) Initiates talk with another person
- (6) Makes eye contact when speaking with others
- (7) Participates in a play group (company) when asked
- (8) Expresses appropriate greetings to others

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