Test-Retest Reliability of the *POSHA–S/Child* in 4- to 11-Year-Old Schoolchildren

La fiabilité test-retest du sondage *POSHA–S/Child* chez des élèves âgés de 4 à 11 ans

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Abstract

The *Public Opinion Survey of Human Attributes–Stuttering/Child (POSHA–S/Child)* was developed to measure attitudes of young nonstuttering children toward stuttering. Initial studies with the instrument have shown promise in its ability to do so. The purpose of this study was to estimate the test-retest reliability of the *POSHA–S/Child*. From one school in the Mid-Atlantic region of the USA, 99 children from 7 academic levels (preschool through the 5th grade) were administered the *POSHA–S/Child* orally and face-to-face twice (test and retest), 1 to 2 weeks apart. Answers to questions related to stuttering of "no", "I don't know", or "yes" were converted to a 1–3 scale. Correlations between test and retest ratings ranged between .51 and .75 or from moderate to high, with older children being generally more consistent in their ratings than younger children. Absolute agreement between test and retest ratings ranged from 76% to 87%. We concluded that test-retest reliability of the *POSHA–S/Child* is satisfactory.

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Abrégé

Le sondage *Public Opinion Survey of Human Attributes–Stuttering/Child (POSHA–S/Child)* a été élaboré pour mesurer l'attitude de jeunes enfants non bègues envers le bégaiement. Les premières études ayant été effectuées avec cet instrument ont par ailleurs montré des résultats prometteurs. L'objectif de la présente étude était d'estimer la fiabilité test-retest du *POSHA–S/Child*. Pour ce faire, le POSHA–S/Child a été administré en personne et à l'oral à 99 enfants répartis dans sept niveaux académiques différents (de la maternelle à la 5e année); ces derniers fréquentaient une école de la région Mid-Atlantique des États-Unis. Le sondage a été administré à deux reprises (test et retest), avec une ou deux semaines d'intervalle entre les deux administrations. Les réponses « non », « ne sait pas » ou « oui » aux questions portant sur le bégaiement ont été converties sur une échelle s'étendant de 1 à 3. Les corrélations entre les cotations du test et du retest variaient entre 0,51 et 0,75 (modérées à élevées). La cotation des enfants plus âgés était généralement plus constante que celle des enfants plus jeunes. Le taux d'accord absolu entre les cotations du test et du retest s'étalait entre 76% et 87%. Il a donc été conclu que le *POSHA–S/Child* avait une fiabilité test-retest satisfaisante.

The Public Opinion Survey of Human Attributes–Stuttering (*POSHA–S*), a paper-and-pencil or online measure of public attitudes toward stuttering, has been widely used around the world. This emerged in response to the need for a standard instrument of public attitudes that would be comparable across studies (St. Louis, 2005, 2011). The *POSHA–S* contains a demographic section, a general section that compares stuttering to four other human attributes (intelligent, left handed, obese, and mentally ill), and a detailed stuttering section. Forty-five item ratings are combined into 11 components, and the components are combined into three subscores (Beliefs about People Who Stutter, Self Reactions to People Who Stutter, and Obesity/Mental Illness). The mean of the two stuttering subscores is the Overall Stuttering Score. For the sake of ease of interpretation, all ratings are converted to a scale from -100 to +100, with 0 being neutral. Also, values for some items are inverted so that, uniformly, higher scores reflect more positive attitudes and vice versa. The instrument's sociometric properties have been carefully evaluated. Test-retest reliability, concurrent validity, and construct validity of an experimental prototype, containing 1–9 ratings, were reported, respectively, by St. Louis, Lubker, Yaruss, and Aliveto (2009) and St. Louis, Reichel, Yaruss, and Lubker (2009) to be satisfactory. To enhance user-friendliness, the 1–9 ratings in the final version of the *POSHA–S* were changed to 1–5 scales or to "yes", "no", and "not sure" choices. Test-retest reliability of the final *POSHA–S* utilizing 1–3 and 1–5 ratings was also reported to be satisfactory (St. Louis, 2012b). The instrument's discriminative validity and construct validity were further documented (St. Louis, Williams, Ware, Guendouzi, & Reichel, 2014), and acceptable internal consistency of the instrument was reported by Al-Khaledi, Lincoln, McCabe, Packman, and Alshatti (2009) and by St. Louis (2012b). Finally, the construct validity of the *POSHA–S* is supported by positive changes after attempts to improve negative public attitudes in several investigations (Abdalla & St. Louis, 2014; Flynn & St. Louis, 2011; Junuzović-Žunić et al., 2015; Węsierska & St. Louis, 2014). Other studies documented the instrument's readability (St. Louis, Lubker, Yaruss, Adkins, & Pill, 2008), translatability (St. Louis & Roberts, 2010; St. Louis, Sønsterud et al., 2016; Valente, St. Louis, Leahy, Hall, & Jesus, 2017), equivalence in paper versus online administration (St. Louis, 2012a), and use with and without a definition of stuttering provided (St. Louis, Sønsterud et al., 2016). It should be noted that the *POSHA–S* has been used successfully not only with adults but with adolescents and children as young as 12 years old (i.e., sixth grade; Flynn & St. Louis, 2011; Kuhn & St. Louis, 2015; Özdemir, St. Louis, & Topbaş, 2011).

The need has been recognized to evaluate public attitudes toward stuttering in younger children as well. For example, the *Peer Attitudes Toward Children who Stutter Scale (PATCS)* (Langevin & Hagler, 2004) is a survey instrument that has been used to examine stuttering attitudes of older school-aged children. The *Communication Attitude Test for Preschool and Kindergarten Children (KiddyCAT*; Vanryckeghem & Brutten, 2007) is another questionnaire that has been used to examine young children's perceptions of their own communication skills. These well-researched instruments do not cover the entire age range from preschool through elementary school and, more importantly for our purpose, are not directly comparable to the *POSHA–S*. Accordingly, Weidner and St. Louis (2014) developed a parallel version of the *POSHA–S* for children from 3 to 11 years old, known as the *POSHA–S/Child*. Such a measure would foster comparative studies of various age groups to better understand the development of negative attitudes toward stuttering as well as intervention studies using a standard instrument to document changes in children after programs designed to improve their stuttering attitudes.

The *POSHA–S* administration was changed from written to oral because, except in rare cases, young children cannot read. The demographic section is filled out by a parent, and separately, yes/no questions are asked orally of the child. Items are as similar as possible to those in the adult version; thus, summary subscores for stuttering—i.e., Beliefs and Self Reactions—and an Overall Stuttering Score (OSS) are generated for both. In scoring the *POSHA–S/Child*, an "I don't know" response is recorded if the child says or indicates that he or she does not know or, after the examiner repeats the question, the child does not respond. The rationale for this "I don't know" option is that the instrument's authors judged that many 3- to 5-year-olds could not be expected to respond accurately to a three-choice option. Scoring of these three choices is the same as for the *POSHA–S*. Because it cannot be assumed that a child would know what stuttering is, the *POSHA–S/Child* begins with a 1.5-minute video of two child avatars (or computer-generated cartoon characters), a boy and a girl, talking about themselves and playing. Each stutters moderately to severely, but the stuttering is not acknowledged in the video. Thereafter the examiner points out that the children stuttered, identifying bouncy (repetitious), stretchy (prolonged), and stopped (blocked) speech. The examiner then asks subsequent yes/no questions aimed to measure children's beliefs about stuttering and people who stutter (e.g., "Do you think children who stutter… are nervous? Are shy? Can talk

well? Can make friends?"), as well as their self reactions to people who stutter (e.g., "If you were talking to a person who stutters would you… finish the person's words? Tell the person to 'slow down?' Laugh?").Two recent investigations utilized the *POSHA–S/Child*, wherein American preschoolers were compared with American kindergarten children (Weidner, St. Louis, Burgess, & LeMasters, 2015) and with preschoolers from Turkey (in Turkish; Weidner, St. Louis, Nakıscı, & Özdemir, 2017). Preschoolers' attitudes were more negative than those of kindergarten children, but essentially equivalent in the two countries. These studies provide preliminary evidence that the *POSHA–S/Child* appears to be robust with respect to a translation to an entirely different language and sensitive to attitudes in widely different cultures. Weidner administered a slightly modified version of the *POSHA–S/Child* before and after an intervention study of 34 preschool children utilizing the newly-developed InterACT (Attitude Change and Tolerance) program (Weidner, 2015), which is designed to help children identify, understand, and accept stuttering. The program consists of two group lessons featuring puppet-based videos, discussion, and take-home material. Children's parents were asked to fill out the *POSHA–S*. In addition to major findings of the positive impact of the InterACT program on the children's measured attitudes, Weidner found that the parents' attitudes were much more positive than those of the children (Weidner, 2016). In another study wherein more than 300 adults filled out both an online version of the *POSHA–S* and an online version of a written *POSHA–S/Child*, in counterbalanced order, respondents generated subscores and Overall Stuttering Scores that were very similar (St. Louis, Weidner, & Mancini, 2016). The child video was embedded in the online version, and the respondents were asked to click on it and watch it at the beginning of the *POSHA–S/Child*. Notably, their standard *POSHA–S* Obesity/Mental Illness subscore on the *POSHA–S* was the same as their Obesity/Wheelchair subscore on the *POSHA–S/Child*.

Authors of the aforementioned studies have called for additional research to document additional sociometric properties of the *POSHA–S/Child*. This is a critical next step to justify the instrument's utility for clinical and research purposes. Accordingly, this study's purpose was to determine the test-retest reliability of the instrument.

Method

Recruitment

This research was approved by the Institutional Review Board (IRB) at West Virginia University (Protocol No. 1311141510A005) on September 28, 2016. One hundred children in seven grade levels were recruited from one elementary school in West Virginia. Parents signed IRB approved consent forms and filled out the demographic section of the *POSHA–S/Child* as well as the *POSHA–S*. The children were enrolled in preschool, kindergarten, and first, second, third, fourth, and fifth grades.

Respondents

From the 100 children recruited, one 3-year-old preschool child was removed from consideration because she was scored as 1 (concern) regarding her intelligibility, ability to follow directions, and attention on the first (test) *POSHA–S/Child*, and direction-following and attention on the second (retest) administration. All the others presented with no validity concerns; therefore, the dataset consisted of 99 children and their parents. As seen in Table 1, 13 children were in preschool, 17 were in kindergarten, 16 each were in the first and second grades, 13 were in the third grade, and 12 each were in the fourth and fifth grades. The children ranged in age from 5.15 years to 10.48 years, with a mean age of 7.74 years. Fifty-three percent were boys and 47% girls, with percentage of boys/girls ranging from 44%/56% in grade 1 to 75%/25% in grade 2. Percentages of those having at least one sibling ranged from 50% to 100%. Only two children were identified as stuttering, generating a stuttering prevalence rate of 2%, or within the expected range for this age group (Logan, 2015). Two percent were wheelchair users, and 5% were obese. The percentages reported as knowing no one who stuttered, was wheelchair bound, or obese were 48%, 41%, and 18%, respectively. Parental reports of experience with these three attributes, converted to -100 to +100 mean ratings, were as follows: stuttering, -90; wheelchair use, -58; and obesity, -35. The children's mean physical health, mental health, ability to learn, and ability to speak were all rated quite similarly and positively, i.e., 74 to 78 (-100 to +100 scale) for the combined sample. The range within grade-specific samples was 65 for speaking ability to 88 for mental health and ability to learn, both occurring within the preschool sample.

[1]Weidner and St. Louis (2016) revised the *POSHA–S/Child* slightly after discerning that one item, "Children who stutter are different", wherein agreement would constitute a less accurate/positive attitude than disagreement, was potentially confusing. Instead the authors substituted "Stuttering is bad" for that item.

Table 1. Demographics of Children Administered the *POSHA-S/Child*

	Preschool	Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	All
Number	13	17	16	16	13	12	12	99
Age (years)	5.15	5.75	6.74	7.87	9.24	9.30	10.45	7.62
DESCRIPTORS FROM PARENTS/INFORMANTS								
Male (%)	46	59	44	75	46	50	42	53
Female (%)	54	41	56	25	54	50	58	47
Multilingual (%)	8	0	13	0	0	0	0	3
≥1 Sibling (%)	92	76	81	75	69	50	100	78
Regular Daycare (%)	23	6	6	0	8	0	0	6
Regular School (%)	85	88	81	81	100	100	67	86
IDENTIFICATION								
Obese (%)	0	0	0	13	8	8	8	5
Wheelchair (%)	8	0	0	0	8	0	0	2
Stuttering (%)	0	0	6	0	8	0	0	2
NO PERSONS KNOWN								
Obese (%)	8	29	13	31	15	50	17	23
Wheelchair (%)	15	53	38	38	23	58	67	41
Stuttering (%)	31	41	50	81	31	50	50	48
HEALTH & ABILITIES (-100 to +100)	**81**	**81**	**78**	**70**	**76**	**85**	**81**	**78**
Physical Health (-100 to +100)	81	79	87	75	81	83	83	81
Mental Health (-100 to +100)	88	85	77	75	75	86	83	81
Ability to Learn (-100 to +100)	88	82	73	69	69	83	79	78
Ability to Speak (-100 to +100)	65	76	73	63	79	86	79	74

Notes. Demographic results for seven grade levels of children (preschool through the 5th grade) administered the *POSHA–S/Child* on two occasions, test and retest, are shown.. Demographic data reported by parents or informants are listed only for the first (test) administration. Bolded numbers are means of the unbolded ratings below them.

Of the parents who filled out the children's demographic profiles, nearly all (85%) were women (73% to 100%). Almost all of the parents were mothers (78%), but it should be noted that 12% self-identified as fathers, and 9% identified as "other", e.g., a guardian or adult relative. Their mean ages ranged (as a function of their children's grades) from 34 to 42 years, and their mean years of education ranged from 13 to 14. Sixty-two percent to 83% reported being gainfully employed. None of the parents stuttered or used a wheelchair, but one parent reported being mentally ill. Obesity was self-identified by 8–38%. Zero to 38% knew no one who stuttered, compared to 0–33% not knowing anyone in a wheelchair, 8–29% not knowing anyone who was mentally ill, and 0–8% not knowing anyone who was obese. Overall, only 14% regarded themselves as intelligent, which is comparable to findings from several other studies (e.g., St. Louis et al., 2016; Valente et al., 2017). Their relative incomes ranged from -36 to +6, with a mean of -16. Relative income on the -100 to +100 scale is derived from a weighted formula comparing ratings of one's income with (a) one's family and friends and (b) all the people in one's country. Relative income is close to zero for most adults around the world (St. Louis, 2015); thus, this sample has a lower-than-average income.

Experimental Procedures

Five student research assistants were all trained in oral administration of the *POSHA–S/Child*. They travelled to the school and administered the instrument twice, one to two weeks apart, to each child. Children whose parents had consented and filled out the demographic section and the adult questionnaire were taken from their classes to a quiet place and given the *POSHA–S/Child*. Third through fifth grade students also personally assented to the research. Two additional procedures were undertaken. First, before each *POSHA–S/Child* administration, examiners asked each child, "What is stuttering?" and wrote the verbal answer verbatim. (These responses were not analyzed for this report.) Subsequently, the instrument was administered, beginning with the video shown on a laptop computer to the child. Second, at the end of each administration, four items were judged by the examiners relating to their appraisal of the child's intelligibility, ability to follow directions, hearing, and attention, as well as any other comments about the child. The four ratings were used to inform decisions about a child's candidacy for inclusion in the study and were scored 1 = concern, 2 = possible concern, and 3 = no concern.

The *POSHA–S* was modified slightly to add the attribute "wheelchair use" to the other five, i.e., intelligence, left handedness, obesity, mental illness, and stuttering. The rationale was that it would thereby be possible to compare parents' Obesity/Wheelchair items, components, and subscores to those of their children and also to compare their Obesity/Mental Illness subscore to that in previous research. Except for relevant demographic data, the *POSHA–S* responses were not analyzed in this report.

Data Analysis

The test-retest reliability of the *POSHA–S/Child* was first measured by comparing changes in mean scores of the 40 yes/no items. Next, Pearson product-moment correlation coefficients were calculated to provide insight into the extent that individual test and retest scores increased or decreased proportionally. We also calculated difference scores between test and retest scores for each respondent and then summed all of the plus, minus, and zero differences. The difference scores provide an index of potential overall improvements or declines in attitudes scores from test to retest conditions. Finally, we examined the absolute agreement of test and retest ratings in order to determine the consistency of responses between the two test administrations.

Results

Test Versus Retest Comparisons

Table 2 summarizes the test versus retest results for each twice-rated item on the *POSHA–S/Child*. Shown are the instrument's items, components, subscores, and Overall Stuttering Scores (OSSs). Although a pattern of improvements in attitudes appears from grade to grade, mean test versus retest values are generally quite similar. By grade, the OSS unit differences between retest minus test mean ratings were: preschool = +8, kindergarten = 0, first grade = -2, second grade = +3, third grade = +3, fourth grade = -1, and fifth grade = -4. Differences for Beliefs ranged from 7 units in the second grade to 0 units (or no change) in the first and fifth grades. All but one of the differences was in the direction of better scores in the retest, except for a 1-unit decline in the fourth graders. The mean change for Beliefs was a 3-unit improvement from test to retest. Differences in Self Reactions were more variable. Except for the second and fourth graders, whose scores did not change, retest values were 5 to 7 units lower than the test values for the kindergarteners, first graders, third graders, and fifth graders. By contrast, the retest values for the preschoolers increased by 16 units. Overall, Self Reactions reduced by 2 units from -4 to -6. As noted, the OSS did not change overall, with a score of 10 for test and retest, with a range of 4 units lower for fifth graders to 8 units higher for preschoolers.

Table 2. *POSHA-S/Child* Mean Ratings on a -100 to +100 Scale for Seven Grade Levels of Children (Preschool Through the 5th Grade) Administered on Two Occasions, Test and Retest

	Preschool Test	Preschool Retest	Kindergarten Test	Kindergarten Retest	1st Grade Test	1st Grade Retest	2nd Grade Test	2nd Grade Retest	3rd Grade Test	3rd Grade Retest	4th Grade Test	4th Grade Retest	5th Grade Test	5th Grade Retest	All Test	All Retest
OVERALL STUTTERING SCORE	*3*	*11*	*2*	*2*	*13*	*11*	*-1*	*2*	*15*	*12*	*15*	*14*	*26*	*22*	*10*	*10*
BELIEFS: ABOUT PEOPLE WHO STUTTER	19	20	18	24	26	26	17	24	28	30	23	22	36	36	23	26
Traits/Personality	5	-8	7	1	-20	-8	-20	-5	-12	-14	-30	-20	7	17	-9	-5
Their Own Fault*	23	31	76	41	88	100	88	100	100	69	50	83	100	100	76	75
Nervous*	-8	-8	-6	-18	-38	-38	-75	-25	-77	-69	-83	-100	-17	-33	-42	-39
Shy*	23	-54	-6	6	-75	-38	0	-25	-54	-38	-67	-67	-50	-17	-31	-31
Are Different*	-54	-54	-41	-18	-38	-50	-50	-25	23	23	0	0	50	50	-19	-13
Can Talk Well	38	46	12	-6	-38	-13	-63	-50	-54	-54	-50	-17	-50	-17	-28	-16
Help From	21	31	16	29	36	34	13	6	29	19	29	27	33	13	25	23
SLP	54	69	24	65	100	88	88	88	77	100	100	100	100	100	76	86
Others Who Stutter	15	38	41	53	20	38	13	0	23	-23	0	-8	0	-33	17	12
Parent	69	85	53	65	88	75	50	13	82	54	83	83	83	17	71	56

Doctor*	-54	-69	-53	-65	-63	-63	-100	-75	-67	-54	-67	-67	-50	-33	-65	-62
Cause	**-8**	**-5**	**-12**	**14**	**27**	**13**	**21**	**15**	**18**	**28**	**15**	**-3**	**22**	**17**	**12**	**11**
Genetic	54	23	18	29	31	13	0	-13	-23	0	17	0	17	17	16	10
Learning*	-23	-23	-65	-18	0	13	50	25	8	38	0	-17	50	50	1	9
Something Bad*	15	8	6	6	44	25	0	-25	8	38	0	17	17	33	13	13
Act of God*	-54	-23	-29	-6	-13	25	-25	13	-23	0	-8	-17	-17	-17	-24	-2
Germs*	-8	-8	-18	41	31	0	50	50	85	54	33	17	67	50	32	29
Something Invisible*	-31	-8	18	29	69	0	50	38	54	38	50	-17	0	-33	31	9
Potential	**58**	**62**	**62**	**53**	**59**	**66**	**56**	**81**	**77**	**85**	**79**	**83**	**83**	**100**	**67**	**74**
Make Friends	100	100	88	88	88	88	63	88	100	100	100	100	100	100	90	94
Do Same Things as Others	23	-8	18	-18	-13	38	25	63	54	54	50	67	67	100	29	39
Any Job as Adult	38	85	76	76	75	63	69	88	54	85	83	83	83	100	69	82
Make Good Choices	69	69	65	65	88	75	69	88	100	100	83	82	83	100	79	82
SELF REACTIONS: TO PEOPLE WHO STUTTER	**-14**	**2**	**-14**	**-19**	**1**	**-5**	**-20**	**-20**	**2**	**-5**	**7**	**7**	**15**	**8**	**-4**	**-6**
Accommodating/Helping	**-4**	**14**	**8**	**6**	**45**	**44**	**32**	**26**	**43**	**44**	**69**	**61**	**75**	**50**	**36**	**33**
Ignore	-31	-31	-65	-88	-6	25	0	-25	23	38	100	67	100	83	11	4
Me	54	69	29	53	88	50	44	-6	17	38	67	67	50	-33	50	34
Finish Words*	8	23	-6	-6	13	-13	-25	-38	8	8	33	17	17	17	5	-1

Say "Slow Down"*	-85	-69	-76	-88	13	13	-13	25	23	-8	67	50	83	33	-3	-9
Laugh*	38	69	88	88	88	100	88	100	100	100	100	100	100	100	86	94
Hide*	-8	23	76	76	75	88	100	100	85	85	50	67	100	100	70	78
Social Distance/Sympathy	**27**	**37**	**18**	**9**	**32**	**14**	**3**	**11**	**32**	**23**	**35**	**33**	**49**	**53**	**27**	**24**
Fun to Play With	100	54	41	88	88	88	63	81	85	100	58	83	83	100	73	85
Bothered*	69	69	53	29	63	63	88	88	100	85	67	82	100	100	76	71
Pity	85	69	88	88	100	100	75	88	85	85	83	50	50	17	82	74
Patient	85	100	100	53	88	100	88	100	100	100	100	100	100	100	94	92
Doctor*	-8	-8	-18	-18	25	-25	-25	-25	23	-23	17	-33	0	0	1	-19
Teacher*	-23	23	-18	-41	0	-38	-50	-25	-23	-38	-17	0	17	17	-17	-17
Neighbor*	8	38	-18	-18	0	-25	-13	-38	54	8	0	17	50	33	9	-1
Friend*	8	23	-18	-41	0	-38	-38	-19	-23	-23	17	17	17	50	-7	-8
Parent*	-38	-8	-6	-18	-13	-38	-50	-50	-8	-54	0	0	33	33	-13	-21
Sibling*	-8	23	-29	-41	-13	-38	-50	-50	-23	-8	17	0	33	50	-13	-13
Myself*	-8	8	6	-18	-13	-13	-63	-50	-23	-38	0	-17	0	50	-15	-13
Preference Stuttering	54	54	35	47	56	31	13	31	42	85	75	92	100	92	52	59
Experience Stuttering	**-64**	**-45**	**-67**	**-73**	**-73**	**-73**	**-94**	**-96**	**-70**	**-81**	**-82**	**-74**	**-78**	**-81**	**-76**	**-76**
Experience Stuttering (Informant)[a]	-92	-92	-91	-91	-80	-80	-97	-97	-90	-90	-92	-92	-83	-83	-90	-90

Experience Stuttering (Respondent)	-32	0	-48	-60	-69	-70	-92	-96	-57	-76	-74	-60	-74	-79	-64	-64
OBESITY/WHEELCHAIR	**-29**	**-29**	**-39**	**-45**	**-37**	**-30**	**-27**	**-29**	**-27**	**-37**	**-50**	**-54**	**-50**	**-48**	**-37**	**-38**
Experience Obesity /Wheelchair (Informant)[a]	**-31**	**–**	**-61**	**–**	**-45**	**–**	**-43**	**–**	**-32**	**–**	**-62**	**–**	**-50**	**–**	**-47**	**–**
Experience Obesity (Informant)[a]	-30	–	-48	–	-33	–	-30	–	-26	–	-50	–	-23	–	-35	–
Experience Wheelchair (Informant)[a]	-32	–	-74	–	-57	–	-55	–	-38	–	-73	–	-77	–	-58	–
Preference Obesity /Wheelchair	**-27**	**-27**	**-18**	**-28**	**-28**	**-16**	**-11**	**-16**	**-21**	**-42**	**-38**	**-46**	**-50**	**-46**	**-27**	**-30**
Preference Obesity	-31	-38	-53	-56	-81	-81	-86	-88	-33	-69	-67	-58	-75	-58	-61	-65
Preference Wheelchair	-23	-15	18	0	25	50	64	56	-8	-15	-8	-33	-25	-33	8	5

Note. * = Ratings on item inverted to render higher scores more positive and lower scores more negative. [a] = Part of the Experience components are rated by the parent/informant. Although not judged by the respondent, they are factored into the component scores. Bolded numbers are means of the unbolded, indented ratings below them. Italicized items are for the Overall Stuttering Scores.

The Obesity/Wheelchair scores changed from test to retest from a decline of 10 units in the third grade to 7-unit improvement in the first grade. Overall, the score declined 1 unit from -37 to -38.

Figure 1 provides a graphic representation of the various components and subscores for the test and retest administrations for all 99 children. It clearly illustrates that the traces were virtually superimposed. The OSS was 10 for both test and retest.

Correlations Between Test and Retest Ratings

The Pearson product-moment correlation coefficient (shown in the top section of Table 3) between 40 test versus retest ratings for all 99 children was .65. It is clear that agreement increased with age, since preschool and kindergarten children's correlations were .56 and .51 while fourth and fifth graders' correlations were .75 and .73. These are moderate to high correlations, and similar to a correlation of .69 for the 1–3 ratings on the *POSHA–S* (St. Louis, 2012b).

Difference Between Test and Retest Ratings

Across all 99 respondents, the sum of all differences was -0.008, or essentially zero (second section of Table 3). By class level, these ranged from -0.4 to +0.5. In other words, there were no overall trends for improvement or decline in the retest ratings compared to the test ratings.

Absolute Agreement Between Test and Retest Ratings

The third section of Table 1 summarizes the absolute agreement of test and retest ratings for the 40 1–3 rated *POSHA–S/Child* items. Identical ratings occurred in 82% of the cases, changes from "yes" to "no" or "no" to "yes" (i.e., 3-1; 1-3 or ±2) occurred in 17% of the cases, and changes from either "yes" or "no" to "I don't

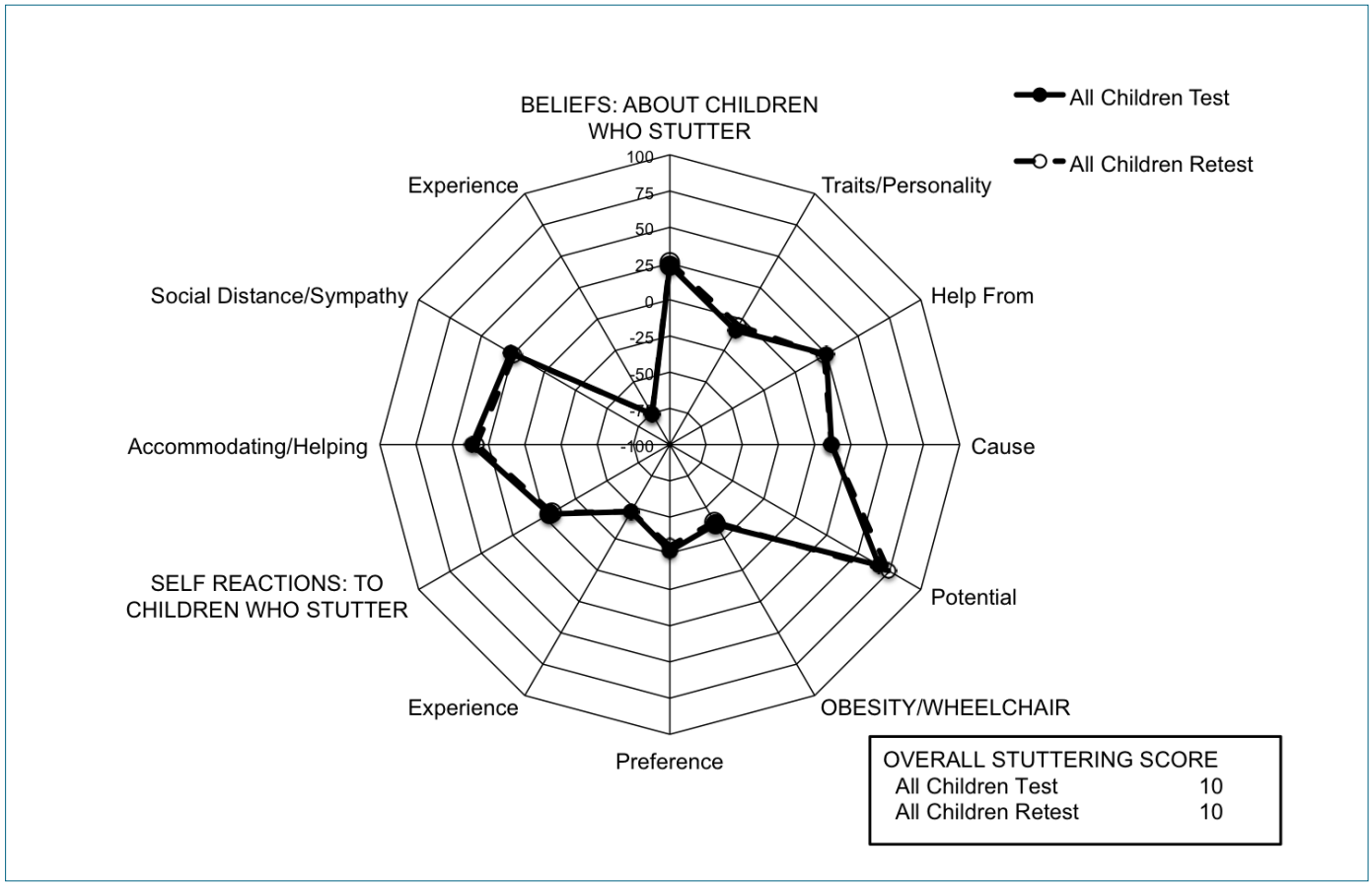

Figure 1. Radial graph showing test and retest results for components, subscores, and Overall Stuttering Scores of the *POSHA–S/Child* for all children combined.

Table 3. Test-Retest Results for (a) Correlations, (b) Sum of all Difference Scores, (c) Absolute Agreement for Ratings, and (d) Absolute Agreement for Attribute Choices

	Preschool	Kinder-garten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	All
Correlations Between Test and Retest Ratings	.56	.51	.65	.68	.71	.75	.73	.65
Sum of All Difference Scores	0.010	0.001	-0.070	0.036	-0.033	-0.040	0.046	-0.008
Absolute Agreement Between Test and Retest Ratings								
Identical (%)	77.9	75.7	82.0	83.4	85.0	87.2	86.5	82.2
±1 Difference (%)	1.3	0.4	0.8	0.8	1.0	0.6	0	0.7
±2 Difference (%)	20.8	23.8	17.2	15.8	14.1	12.1	13.5	17.1
Absolute Agreement Between Binary Attribute Choices								
Identical (%)	64.1	74.5	83.3	79.2	71.8	83.3	88.9	77.8
±1 Difference (%)	35.9	25.5	16.7	20.8	28.2	16.7	11.1	22.2

know" or vice versa, (i.e., 3-2; 2-1; 2-3; 1-2 or ±1) occurred in 1% of the cases. This compares to identical = 76%, ±2 = 10%, and ±1 = 13%, in the *POSHA–S* (St. Louis, 2012b). It should be noted that few "I don't know" responses result from the oral administration of the *POSHA–S/Child*. Therefore, a substantially higher percentage of adults score "not sure" in the *POSHA–S* than are scored "I don't know" by examiners in the *POSHA–S/Child*. By grade, it can be seen that absolute agreement increased by about 10% from the younger to the older children.

The children were also asked to indicate their preference for stuttering, obesity, or wheelchair use by choosing which they would rather be after being presented with three pairs of line drawings of children (of their sex) who were identified with these three attributes. Each attribute is presented twice in the three trials, once on the left with first mention and once on the right with second mention. Comparing each trial in the last section of Table 3, 78% of the choices were the same in test versus retest administrations, and 22% were different. Compared to preschoolers, who chose the same attribute 64% of the time, a developmental trend toward more consistency occurred up to fifth graders, who selected the same attribute on 89% of retests.

The screening form asked about any examiner concern on the 1–3 scale regarding the child's intelligibility, ability to follow directions, hearing, and attention. Changes in the child's behaviour, testing environment, level of fatigue, and so on could affect the judgments. Nevertheless, 91.5% of the ratings were identical after the two administrations, 7.2% differed by ±1, 0.3% differed by ±2, and 1.0% differed by ±3. This suggests strongly that the results were unaffected by extraneous variables unrelated to the *POSHA–S/Child* itself.

Discussion

Results of this study indicate that the test-retest reliability of the *POSHA–S/Child* (Weidner & St. Louis, 2014) can be considered satisfactory for use with preschool through elementary school-aged children. In a sample of preschool through fifth grade children from one school in a small town in a rural Mid-Atlantic region, students were administered the instrument in their school orally by one of five research assistants on two occasions, one to two weeks apart. Except for a possible slight learning effect for the preschoolers, there were no consistent improvements or declines in measured attitudes from the test to the retest administration (Table 2). The Overall Stuttering Scores (OSSs) were identical for combined test and retest comparisons (Figure 1). The correlation between ratings for the seven grade levels increased from .51 to .75, in the moderate to high range, with a combined group r = .65 (Table 3). These correlations are consistent with the r = .69 reported for the 1–3 ratings of the *POSHA–S* for adults and older children (St. Louis, 2012b). Additionally, no consistent differences occurred with regard to direction of change from test to retest across the grade levels or overall. Absolute agreement of the ratings were all above 75% (76% to 87%) as well as for the choice of attributes (75% to 89%), except for the preschoolers in the latter case, with 64% agreement.

Following the development of the *POSHA–S* as a standard instrument that could be utilized in epidemiological investigations of public attitudes toward stuttering (St. Louis, 2015), the *POSHA–S/Child* was developed to extend the range of such investigations to young children. It is at this period when stuttering attitudes are generally first detected (Langevin, Packman, & Onslow, 2009; Weidner et al., 2015; Weidner et al., 2017). It was designed specifically to measure attitudes toward stuttering in children as young as 3 years of age, and has appeared to do so effectively in previous investigations (Weidner, 2016; Weidner et al., 2015; Weidner et al., 2017). The current study's findings enhance confidence in the results of these studies and supports expanded use of the *POSHA–S/Child* in future investigations. They also justify the broader use of the *POSHA–S/Child* in measuring the effects of educational programs aimed to improve young children's stuttering attitudes (e.g., Weidner & St. Louis, 2016).

The following cautions and future research suggestions are advanced regarding the results of this study. First, the children in our study sample were taken from one region of one rural area in the mid-Atlantic region of the USA. Accordingly, it would not be appropriate to assume that the same degree of reliability would appear in studies elsewhere in the USA, especially in urban areas. Selected studies utilizing the *POSHA–S/Child* in other settings, geographic regions, and in other languages would confirm or disconfirm that children give reliable responses to the questions in the instrument.

Second, the sample sizes for the seven grade levels are small. Although the purpose of this study was to estimate test-retest reliability, the differences in attitudes were observed in the seven grade levels. Yet, based on the limited sample sizes, one cannot generalize to each grade level. Individual grade results must be considered tentative, pending further confirmation in other studies. That has partly occurred. For example, the mean OSS of preschoolers in West Virginia (Weidner et al., 2015) and in Turkey (Weidner et al., 2017) was -7, compared to 3 for the first (test) administration of the *POSHA-S/Child* in this study.

One hypothesis drawn from child development literature was advanced by Weidner et al. (2015) to explain why preschool children had more negative stuttering attitudes than kindergarteners. It suggests that preschool-aged children may not have the nuanced cognitive flexibility to understand and appropriately respond to others' differences (Killen & Rutland, 2011). The mean ages of the American and Turkish preschool samples were 4.5 years and 4.3 years, respectively. In the current study, the mean preschooler's age was 5.2 years. The OSS = 3 in our study was the same as for 37 preschool children from several private preschools in a larger, university city in West Virginia (Weidner, 2016) whose mean age was 4.9 years. Kindergarteners in Weidner et al.'s (2015) West Virginia sample, aged 6.2 years, had an OSS = 7 compared to OSS = 2 in our study of 5.8-year-old kindergarten children. Additional comparisons for grades 1 though 5 in future studies would be especially useful.

In contrast, a strength of the current study is the fact that all grade levels were able to complete the *POSHA–S/Child* with moderate to high test-retest correlations, and acceptably high agreement indicates that it is robust with respect to growing maturity and cognitive abilities of children. Trends toward better attitudes with age should be explored further in comparison with parental stuttering attitudes.

Finally, further evaluation of the *POSHA–S/Child*'s construct validity should be undertaken. Weidner (2016) showed that puppet-based lessons directed to small groups of preschoolers could improve their measured attitude on the *POSHA–S/Child*, indicating that it measures constructs related to better attitudes. Additional studies of this type will bolster the instrument's construct validity. Relatedly, the St. Louis, Weidner et al. (2016) study showed that the *POSHA–S/Child* generated quite similar results in a large sample of adults to results from the same adults taking the *POSHA–S*, providing preliminary evidence of its concurrent validity.

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Authors' Note

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