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Research Article

Changing Nonstuttering Preschool Children's Stuttering Attitudes

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Purpose: Negative or uninformed stuttering attitudes proliferate among the general public, and bourgeoning research has shown that such attitudes might emerge as early as the preschool years. Much remains unknown about young children's stuttering attitudes, and conclusive recommendations to improve attitudes toward stuttering have yet to be advanced. This study sought to determine the effect of a new educational program on improving stuttering attitudes among preschool children using objective measures.
Method: Thirty-seven preschool children learned about stuttering and sensitive peer interactions by participating in the newly developed Attitude Change and Tolerance program. The program teaches children about human differences with an emphasis on stuttering and how to interact with people who stutter. Children's stuttering attitudes were measured using the Public Opinion Survey of Human Attributes–Stuttering/Child (Weidner & St. Louis, 2014) before and after the program.
Results: Pre–post comparisons showed statistically significant improvements in children's overall stuttering attitudes. In particular, children demonstrated gains relative to their perceptions of and reactions toward people who stutter.
Conclusion: This study provides empirical evidence that young children's stuttering attitudes can be improved using the Attitude Change and Tolerance program. In addition, it supports previous research that negative stuttering attitudes emerge as early as preschool.

Stuttering has long been misunderstood by the general public, which has contributed to the unfavorable stereotyping, stigma, and bullying of people who stutter (Boyle & Blood, 2015; Langevin, 2015). Hundreds of studies from around the world have confirmed that negative stuttering attitudes (i.e., persons' beliefs, feelings, and reactions toward the disorder or the stuttering speaker) transcend culture, race, sex, education level, income level, profession, and religious affiliation and can have serious social ramifications on the lives of people who stutter (see St. Louis, 2015a, for a review). Negative public stuttering attitudes can impede the ability of people who stutter to form meaningful relationships, advance in their careers, and maintain a high quality of life (e.g., Boyle & Blood, 2015; Craig, Blumgart, & Tran, 2009; Gabel, 2015; Klompas & Ross, 2004). In a recent study of 310 adults who do not stutter, a majority reported that the general public might experience discomfort talking to people who stutter and would recommend that people who stutter pursue careers that do not require high speaking demands (Boyle, 2017). Negative beliefs about stuttering and people who stutter have been clearly documented among older children and adults (see Hughes, 2015, for a review) and have been suggested to emerge during early childhood (Ambrose & Yairi, 1994; Langevin, Packman, & Onslow, 2009; Weidner, St. Louis, Burgess, & LeMasters, 2015).

Stuttering Attitudes in Early Childhood

Even though children may not be able to accurately define the word "stuttering" until the later school-age years (Culatta & Sloan, 1977; Mowrer, Fairbanks, & Cantor, 1980; Putorek, Myers, Hall, St. Louis, & Weidner, 2018), it has been consistently shown that young children who do and do not stutter have awareness of the disorder (Ambrose & Yairi, 1994; Ezrati-Vinacour, Platzky, & Yairi, 2001; Griffin & Leahy, 2007). Using videos of characters who do and do not stutter, Ezrati-Vinacour and colleagues (2001) asked children ages 3–7 to judge whether or not the characters talked the same way. From a sample of 79 children, approximately 25% of 3-year-olds, 56% of 5-year-olds, and 63% of 7-year-olds accurately remarked that the characters spoke differently. Importantly, children's acuity in detecting speech fluency patterns often accompanies their

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development of attitudes toward them. In a study that examined preschool children's attitudes toward their own speech, children who stutter held significantly worse attitudes compared to fluent children compared to a speaker who stutters (Vanryckeghem, Brutten, & Hernandez, 2005). In addition, Griffin and Leahy (2007) used videos of puppets who did and did not stutter to gauge stuttering awareness and attitudes of eighteen 3- to 5-year-old children. Results revealed that 78% of children reported that the stuttered speech was "different," and nearly half of the children reacted negatively when listening to the puppet who stutters.

Langevin and colleagues (2009) used a qualitative approach to investigate the reactions among typically fluent preschoolers toward their stuttering peers. The researchers video-recorded the interactions of four preschool children who stutter with their fluent peers during play. Of the four children, one child did not experience any negative reactions. For the other three children, peer reactions toward instances of stuttering were generally positive or neutral (ranging from 71.4% to 97.2%). There were also notable negative responses (ranging from 2.8% to 28.6%), which involved the nonstuttering peer changing the topic or activity, exhibiting outward confusion, walking away, interrupting, mocking, and ignoring the stuttering child. In such cases, the preschoolers who stuttered were judged to have a disadvantage in leading play activities, participating in dramatic play, and resolving conflicts.

Weidner and St. Louis (2014) advanced a quantitative approach to measure young children's stuttering attitudes, the Public Opinion Survey of Human Attributes–Stuttering/Child (POSHA-S/Child). Preliminary use of the POSHA-S/Child among 27 nonstuttering preschool-age children and 24 nonstuttering kindergarten children from a mid-Atlantic state in the United States showed that negative or uninformed stuttering attitudes are detectable by the age of 4 years (Weidner, St. Louis, et al., 2015). Children expressed little knowledge about the causes of stuttering and how to appropriately interact with a person who stutters. For example, most children reported they would say, "slow down," and would finish the words of a peer who stutters. In studies of preferences of adults and children who stutter regarding the type of support they desired, these responses were regarded as undesired (St. Louis et al., 2017; Weidner, Coleman, et al., 2015). The young children also noted they would be "worried" if they, their family, or their friends stuttered. A replication study of preschoolers' stuttering attitudes was carried out with 31 Turkish children using a Turkish translation of the POSHA-S/Child (Weidner, St. Louis, Nakisci, & Özdemir, 2017). The Turkish preschoolers' stuttering attitudes were compared to the results of the American preschool sample from the aforementioned study. Despite the obvious cultural differences between the samples, the American and Turkish preschoolers had the exact same overall stuttering attitude score. Results suggested that young children's stuttering attitudes might not be influenced by one's culture but rather may accompany their developmental ability to perceive differences in others.

Importantly, there seems to be a progression in the intensity and magnitude of negative stuttering attitudes as children mature. In preschool, children who stutter may be at risk for occasional social distancing or exclusion and undesired listener responses (Ezrati-Vinacour et al., 2001; Griffin & Leahy, 2007; Langevin et al., 2009; Weidner, Coleman, et al., 2015). By the school-age years, however, it has been shown that over 80% of children who stutter experience overt teasing and bullying secondary to their stuttering (Langevin, Bortnick, Hammer, & Wiebe, 1998; Mooney & Smith, 1995). This may involve mocking stuttered speech, name calling, social exclusion, and attributing low social status (Blood & Blood, 2004; Davis, Howell, & Cooke, 2002; Evans, Healey, Kawai, & Rowland, 2008; Hartford & Leahy, 2007; Langevin, 2015; Yaruss, Murphy, Quesal, & Reardon, 2004). In three different retrospective studies, adults who stutter recounted the challenges they experienced as a child who stutters, which collectively included physical and verbal bullying, difficulty in making friendships, decreased classroom participation, fear of being negatively evaluated, and low self-image (Blood & Blood, 2016; Daniels, Gabel, & Hughes, 2012; Hugh-Jones & Smith, 1999). These experiences can have long-lasting negative effects on one's psychosocial well-being and self-image. In fact, "self-stigma" may arise if people who stutter internalize the negative stereotypes and discrimination they experience (Boyle, 2013).

Stuttering Attitude Change in Children and Adolescents

Some studies have shown promise in improving adults' stuttering attitudes through education, videos, and personal contact (e.g., Abdalla & St. Louis, 2014; Boyle, Dioguardi, & Pate, 2016, 2017), but only a few studies have sought to improve stuttering attitudes among typically fluent children and adolescents. In a study by Flynn and St. Louis (2011), high school students filled out the Public Opinion Survey of Human Attributes–Stuttering (POSHA-S; St. Louis, 2011) questionnaire before and after an oral presentation by a person who stutters or after watching MTV *True Life: I Stutter*, which was followed by a shortened oral presentation. Both conditions evoked about equally significant attitude improvement. A 7-year follow-up study with 37 of the original 84 participants indicated that their positive stuttering attitudes remained improved, compared to a control group, since the intervention (St. Louis & Flynn, 2018). By contrast, two recent studies, also using the POSHA-S, showed that middle school, high school, and university students experienced little to no attitude change following video-based stuttering interventions (Kuhn & St. Louis, 2015; Węsierska, Błachnio, Przepiórka, & St. Louis, 2015). It is unclear what variables may have accounted for the equivocal findings (e.g., intervention methodology), but these preliminary studies offer evidence that adolescence might not be an optimal period to effect a desirable degree of improvement in stuttering attitudes.

There are only a few known studies that have investigated attitude change among school-age and preschool-age children. In a large-scale feasibility study by Langevin and Prasad (2012), over 600 school-age children participated in a multimodal educational program, the Teasing and Bullying: Unacceptable Behavior (TAB) program. The program is composed of classroom lessons, a video of a child who stutters, a guided discussion, as well as take-home activities. Changes in stuttering attitudes were determined using the Peer Attitudes Toward Children Who Stutter Scale (Langevin, 2009). The study showed that the TAB program resulted in better stuttering attitudes, increased interest in stuttering, as well as improved attitudes toward bullying among school-age children (Langevin, 2000, 2015; Langevin & Prasad, 2012). The TAB program was among the first to show that school-age children's stuttering attitudes are amenable to change.

Recognizing that stuttering attitudes emerge prior to the school-age years, Weidner and St. Louis (2015) carried out a pilot study aimed to improve preschool children's stuttering attitudes using a newly developed education program. The program, which is the Attitude Change and Tolerance (InterACT) program (Weidner, 2015), teaches young children about the nature and causes of stuttering and how to appropriately respond to peers who stutter. Preliminary results using the POSHA-S/Child revealed notable improvement in preschoolers' stuttering attitudes following the program, but the small sample size ($N = 6$) prevented the researchers from drawing confident conclusions about the nuances of children's attitude change. Nevertheless, the pilot provided compelling support for the study's expansion with a larger sample size.

Purpose

Studies have consistently shown that young children hold unfavorable attitudes toward people who stutter, and without an educational intervention about stuttering, such attitudes are likely to persist. Given that negative stuttering attitudes emerge during the preschool years, it is logical to assume that efforts to mitigate those attitudes should be carried out during that same period. Doing so will help determine the malleability of young children's attitudes and potentially advance effective interventions that might be used in clinical or educational contexts. Teaching children about stuttering and differentiating between helpful and unhelpful responses to stuttered speech could potentially lead to better communication and social experiences for people who stutter.

The purpose of this study was to measure and compare nonstuttering preschoolers' stuttering attitudes before and after an educational program. Similar to Weidner and St. Louis (2015), the researchers administered the POSHA-S/Child before and after the InterACT program. Although methodologically similar, none of the children in the pilot were included in the analysis of the current study. It was hypothesized that preschool children would hold negative or uninformed stuttering attitudes prior to the InterACT program. Specifically, it was expected that children would have little knowledge about the causes of stuttering and how to appropriately react to people who stutter. It was also expected that children's overall stuttering attitudes would improve following the InterACT program, with notable gains relative to more accurate knowledge about stuttering and improved reactions toward people who stutter.

Method

Design

This study was carried out using a pre–post design over a 3-week period in six different preschool classrooms. Children's stuttering attitudes were measured quantitatively using the POSHA-S/Child before and after the InterACT program.

Attitude Instrument: The POSHA-S/Child

Overview

The POSHA-S/Child, which is an extension of its adult counterpart, the POSHA-S, measures young children's beliefs about stuttering and self-reactions toward people who stutter. It can be used with children 3–10 years of age and is administered verbally (i.e., for nonreaders or novice readers), or filled out online or hard copy (i.e., for proficient readers). It includes a demographic section to gather information about the child (e.g., health and abilities, number of siblings, and participation in school or day care) and the child's family (e.g., income and parent education level), which is filled out by a parent or guardian. Children's exposure to or personal experience with stuttering, obesity, and wheelchair use is also reported. Obesity and wheelchair use are easily recognized by children (e.g., Bell & Morgan, 2000; Hong, Kwon, & Jeon, 2014) and have been historically viewed as stigmatizing conditions. Accordingly, the obesity and wheelchair items were included to better understand children's stuttering attitudes relative to other stigmatizing human attributes.

Stimulus Video

The child portion of the POSHA-S/Child begins with a 1.25-min stimulus video featuring two animated stuttering avatars, one girl and one boy. The avatars engage in a brief conversation about their interests (i.e., five lines each) at a language level appropriate for young children. Each of the avatars' stuttering was recorded by the first author. The (pseudo-)stuttering consists of initial sound and syllable repetitions, prolongations, and blocks. Physical tension is marked using unnatural prosody, including rising pitch changes. The avatars' stuttering is severe. Following the video, the administrator defines the term stuttering, "These children stutter. Stuttering is what happens when a person's words or sounds bounce l-l-l-ike this, or stretch liiiiiike this, or when no words or sounds come out l———ike this."

Scoring

After showing and explaining the video, the examiner proceeds to ask the child 40 "yes/no" questions about stuttering. The items are grouped into seven components, namely "Traits," "Who Should Help," "Cause," "Potential," "Accommodating/Helping," "Distance/Sympathy," and "Knowledge" (refer to Table 2 for a list of the items within each component). The first four of the above-listed components are clustered into a "Beliefs" subscore, and the remaining three components are clustered into a "Self-Reactions" subscore. The Beliefs and Self-Reactions subscores are averaged into an Overall Stuttering Score (OSS). An Obesity and Wheelchair subscore is also measured, which reflects children's preference and experience with those conditions. As previously stated, these scores help to interpret children's stuttering attitudes in the context of other stigmatizing human attributes. Responses are assigned a value where "no" = 1, "not sure" = 2, and "yes" = 3. After that, scores are converted to a −100 to +100 scale, wherein "no" responses are assigned a value of −100 and "yes" responses are assigned a value of +100, which yields a possible 201-unit range of scores. "Unsure" responses are assigned a value of "0" as they represent a neutral rating that is neither positive nor negative. The scores of some items (e.g., "I would laugh at a child who stutters") are inverted so that, for all items, negative or uninformed attitudes correspond to lower scores and positive or more informed attitudes correspond to higher scores. The valence of items as being either positive/informed or negative/uninformed was based on preceding literature relative to our current understanding of stuttering symptomology and causes (Yairi & Ambrose, 2013) as well as guidelines for supporting people who stutter (St. Louis et al., 2017; Weidner, Coleman, et al., 2015).

Psychometric Properties

Substantial evidence supports the POSHA-S/Child's psychometric properties. The test–retest reliability of the instrument was recently confirmed in a study of 99 children (St. Louis & Weidner, 2018). Children in each grade level between preschool and fifth grade completed the POSHA-S/Child 1–2 weeks apart without receiving an educational intervention. Across all respondents, the pre–post test administrations yielded the same OSS (i.e., 10 at pretest and 10 at posttest), an 82% absolute agreement on the 40 individual test items, and a correlation of .65. These results showed adequate test–retest reliability for preschool- and school-age children. The concurrent and construct validity of the instrument was further established in a study in which 378 adults took both child and adult versions of the POSHA-S (St. Louis, Weidner, & Mancini, 2016). The OSSs on the two versions were nearly equivalent (POSHA-S OSS = 30, POSHA-S/Child = 31) and provided additional evidence of the POSHA-S/Child's sound psychometric properties.

Intervention: The InterACT Program

Overview

The overarching goal of the InterACT program is to increase children's knowledge about stuttering and people who stutter. Other conditions, such as wheelchair use, are also discussed. This provides a multidisability context that promotes understanding and tolerance of differences that are obvious to an observer (i.e., wheelchair use) and differences that may be less obvious (i.e., stuttering). The program was designed for young children ranging from 3 to 7 years old and can be conducted with small groups or in a full-classroom setting. The rationale for the framework of the program (e.g., the delivery modality, frequency of lessons, use of puppets) was based on related educational programs that have successfully improved children's sensitivity to disabilities (e.g., Dunst, 2014; Lindsay & Edwards, 2013). Preferences of teachers for frequency of delivery were also considered.

Framework

The program is composed of two 30-min lessons, which each include (a) a 10-min puppet video, (b) a small group discussion, and (c) a custom coloring/activity book.

The videos feature five puppets, two boys and three girls. One puppet stutters, which is based on the higher prevalence of stuttering in boys than girls (Yairi & Ambrose, 2013), one puppet is in a wheelchair, and the others represent typically developing children. The first author recorded the speech of the stuttering puppet using pseudostuttering. The stuttered speech consists of prolongations, part- and whole-word repetitions, and blocks, with an average rate of 20% syllables stuttered. Pitch breaks were included in the stuttered speech to convey significant physical effort during speaking tasks. Other speakers provided the voices for the other puppets. Throughout the videos, the puppet who stutters educates peers about what stuttering is and is not. Subsequent scenes portray both positive and negative interactions with his peers, and a narrator points out what are helpful versus unhelpful peer reactions. Characters' differences were overtly acknowledged in a positive yet matter-of-fact manner, which is an effective approach to help children learn about and accept human differences (Derman-Sparks, 1989). Appendix A provides select excerpts from the script that highlight main themes.

A group discussion follows each video. Six still photographs from the videos (three from each video) were printed on separate 15.5 × 8.7 in. placards, examples of which are provided in Appendix A. The images represent critical segments in the videos during which a prominent theme was discussed (e.g., interacting with a person who stutters). On the reverse side of the placard is a scripted one- to three-sentence summary of the scene followed by a series of questions aimed to facilitate group discussion. The examiner shows the group the placard and reads the summary and questions verbatim. During the discussion,

the facilitator can further emphasize or clarify important terminology and themes.

At the end of each lesson, the children complete a section of the InterACT coloring/activity book. The book illustrations depict scenes, characters, and direct quotes from the videos. In addition, there are dedicated pages on which the children are prompted to draw a picture that reinforces the target themes such as, "Draw how you would interact with a someone who is different." The children take home their completed book at the end of the program.

Participants

After obtaining institutional review board approval, the researchers directly contacted administrators via convenience sampling within a small university town in north-central West Virginia. Once permission was obtained from the administrators, classroom teachers assisted in recruiting parents and children for the study. Candidacy for inclusion was based on children's age (i.e., 3–5 years old), attendance at each lesson, having typically fluent speech, their compliance during testing administration and InterACT lessons, and their ability to reliably understand and respond to the POSHA-S/Child survey items. The researchers met with a total of 69 children one-on-one to conduct the POSHA-S/Child and video-recorded all interactions. One open-ended question, "what does the word *stuttering* mean?" was added at the beginning and end of the survey; however, those qualitative results are not reported in this article. A participant screening instrument was used with each child to assess intelligibility, ability to understand and follow directions, hearing, and attention to task. If there were reported concerns in any area, the child was either immediately excluded for the study or judged by another trained examiner. Based on the aforementioned criteria, 15/69 were excluded because they were not present for both lessons, 4/69 were excluded due to poor attention to task, and 10/69 were excluded due to observed difficulty in following directions. Based on parent and teacher report and a screening performed by the examiner, three of the children stuttered and were excluded from the study. Therefore, a total of 37 children were retained. Children were neither excluded nor stratified on the basis of race, reported family income, parent education, sex, or reported health or ability status.

Table 1 provides a comprehensive summary of the children's demographic information. The average age of the children was 4.9 years and included 14 boys (38%) and 23 girls (62%). All children spoke English as their primary language. The group's average Health and Abilities score, rated on a −100 to +100 continuum by parents, was 88, with physical health = 92, mental health = 89, ability to learn = 89, and speaking ability = 80. According to parental report, 19 children had prior exposure to a person who is obese, five children had prior exposure to a person in a wheelchair, and three children had prior exposure to a person who stutters. None of the children were reportedly obese or used a wheelchair.

Experimental Procedure

On average, pretesting took place 4 days prior to the first InterACT lesson. An examiner met with each child individually and conducted the POSHA-S/Child. The children watched the POSHA-S/Child stimulus video on an iPad Mini tablet and wore over-the-ear headphones to diminish ambient noise. Children's responses to the POSHA-S/Child survey items were recorded on a paper version of each instrument and video-recorded. Posttest procedures were carried out in a similar manner and were primarily conducted within an hour after the second InterACT lesson.

The two 30-min lessons were delivered 5–7 days apart in six different preschool classrooms with a range of 2–10 children from each classroom. While seated in small groups on the floor or in chairs, the children watched one of the educational videos on a 24-in. television provided by the examiner. After each video, the children remained seated while the examiner led the small group discussion using the placards previously described. After the discussion, the children walked to a nearby table to complete three pages of their activity books (six pages total over the two lessons). The examiner and a trained research assistant circulated to pass out coloring materials and to write down each child's description of their drawings, which corresponded to the open-ended prompts in the book (e.g., "Draw one way that makes you special").

Analysis of Results

Quantitative statistical analyses were carried out using Excel and IBM SPSS software. Because of the nonnormal distribution of the data, pretest and posttest scores were compared using the nonparametric, paired difference Wilcoxon signed rank test. In order retain a conservative analysis and thereby avoid Type I error, Wilcoxon comparisons were only carried out for the stuttering summary scores (i.e., seven components, three subscores, and the OSS). A Bonferroni correction was applied for those 11 analyses, resulting in an alpha level of $p \leq .0045$. Changes in the survey item responses were compared descriptively. Cohen's d effect sizes were calculated for statistically significant differences and interpreted as follows: .2 is "small," .5 is "moderate," and .8 is "large" (Cohen, 1988, 1992).

Results

Figure 1 is a radial graph showing pre–post results for the POSHA-S/Child's components, subscores, and OSS. The OSS increased significantly ($p = .002$), which is indicative of a moderate positive effect ($d = .58$) of the InterACT program on children's overall stuttering attitudes. The Self-Reactions subscore increased significantly by ($p = .001$), with a moderate effect ($d = .63$). The Beliefs subscore increased but did not reach significance ($p = .025$). These summary scores suggest that children held generally positive or informed attitudes about stuttering and people

Table 1. Public Opinion Survey of Human Attributes–Stuttering/Child mean demographic characteristics.

Demographic variable	*M* (*SD*)
Sample size	*N* = 37
Age: mean years	4.9 (0.5)
Education level by person child is with most often: mean years	18 (3)
Composite family income (–100 to +100)	10 (40)
Sex: male/female	38%/62%
Native language English	100%
Knows >1 language	11%
Has siblings: yes/no/not reported	62%/16%/22%
Attends day care regularly: yes/no	81%/19%
Attends school regularly: yes/no	46%/54%
Parent rating of child's health and abilities (–100 to +100)	88 (20)
Physical health	92 (18)
Mental health	89 (21)
Ability to learn	89 (25)
Speaking ability	80 (33)

Note. Means are shown and followed, where relevant, by standard deviations in parentheses.

who stutter following the program and their knowledge of how to interact with people who stutter improved.

Figure 1 also shows mean profiles for the seven components, which are made up of clusters of the various item ratings. Compared to the pretest, POSHA-S/Child posttest means for the 37 children increased (improved) for 35/56 ratings (63%), decreased (worsened) for 16/56 ratings (29%), and remained the same for 5/56 ratings (9%). Compared to the pretest, the average change across the 56 POSHA-S/Child ratings was +15 units. Table 2 displays the changes in all POSHA-S/Child mean ratings as well as the significance and effect sizes for summary scores.

Based on mean scores, children demonstrated greatest improvement in the Traits component ($p = .001$), and the magnitude of change was moderate to large ($d = .76$). After the InterACT program, children were less likely to describe children who stutter as being shy and at fault for their stuttering. They were also less likely to describe children who stutter as being nervous and having a bad problem. Although somewhat improved, children's belief that children who stutter are able to talk well remained low.

The Accommodating/Helping component was the second most improved component ($p = .000$), which yielded a large magnitude of change ($d = .84$). Of particular note,

Figure 1. Pre– and post–POSHA-S/Child component, subscore, and overall stuttering score ratings for 37 participants.

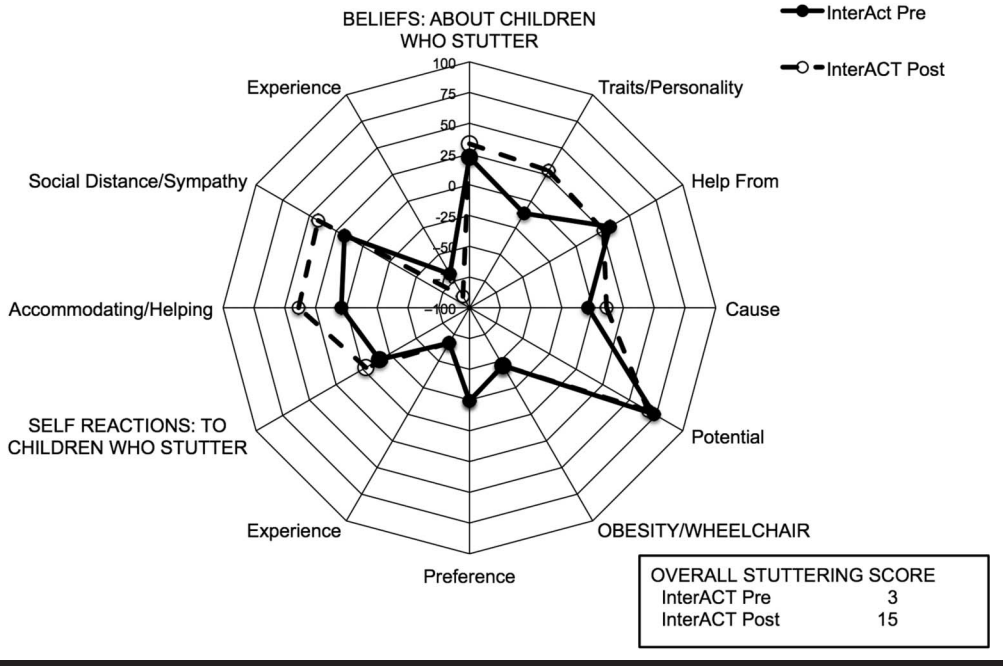

Table 2. Pre– and post–POSHA-S/Child means and standard deviations (in parentheses), units of change, significance values for summary scores, and Cohen's *d* effect sizes for significant differences for 37 participants.

POSHA-S/Child variable	Pre (*N* = 37)	Post (*N* = 37)	Units of change	*p*	Effect size
Overall Stuttering Score	***3 (18)***	***15 (23)***	*+12*	*.002*	*.58*
Beliefs About Children Who Stutter	22 (21)	33 (34)	+11	.025	
Traits/Personality	**–11 (50)**	**29 (57)**	+40	.001	.76
Are at fault[a]	–11 (99)	57 (83)	+68		
Nervous[a]	–5 (97)	35 (95)	+40		
Shy[a]	–22 (98)	30 (97)	+52		
Have a bad problem[a]	8 (98)	35 (95)	+27		
Can talk well	–27 (96)	–14 (100)	+13		
Stuttering Should Be Helped by…	32 (26)	26 (44)	–6	.413	
Speech-language pathologist	78 (63)	73 (69)	–5		
Other people who stutter	54 (80)	19 (100)	–35		
Medical doctor[a]	–84 (55)	–51 (87)	+33		
Parent	78 (63)	62 (79)	–16		
Stuttering Is Caused by…	–4 (43)	11 (48)	+15	.071	
Came from their mom or dad when they were born	38 (92)	16 (99)	–22		
Learning[a]	–30 (97)	8 (101)	+38		
Something bad that happened [a]	19 (100)	30 (97)	+11		
God/Allah[a]	–57 (83)	–41 (93)	+16		
Germs like those that make you sick[a]	–19 (100)	30 (97)	+49		
Something we can't see[a]	27 (96)	24 (98)	–3		
Potential	73 (38)	68 (57)	–5	.627	
Can make friends	95 (33)	62 (79)	–33		
Do same thing as others	19 (100)	59 (80)	+40		
Have any job as adult	89 (46)	70 (70)	–19		
Make good choices	89 (46)	78 (63)	–11		
Self-Reactions to Children Who Stutter	**–16 (23)**	**–3 (18)**	+13	.001	.63
Accommodating / Helping	**4 (43)**	**39 (40)**	+35	.000	.84
Ignore	–24 (98)	–3 (101)	+21		
I should help	51 (87)	30 (97)	–21		
Finish the person's words[a]	–22 (98)	46 (90)	+68		
Tell the person to "Slow down"[a]	–73 (69)	19 (100)	+92		
Laugh[a]	57 (83)	84 (55)	+27		
Should try to hide their stuttering[a]	35 (95)	57 (83)	+22		
Social Distance / Sympathy	**17 (50)**	**42 (51)**	+25	.001	.50
Fun to play with	73 (69)	76 (64)	–3		
Be bothered	51 (87)	62 (79)	+11		
Feel sorry for them	73 (69)	73 (69)	±0		
Feel patient[a]	89 (46)	100 (0)	+11		
Worried about my doctor[a]	–38 (92)	41 (93)	+79		
Worried about my teacher[a]	–8 (101)	14 (100)	+22		
Worried about my neighbor[a]	–14 (100)	19 (100)	+33		
Worried about my brother or sister[a]	–14 (100)	24 (98)	+38		
Worried about me[a]	–8 (101)	24 (98)	+32		
Worried about a friend	–35 (95)	14 (100)	+49		
Worried about a parent	–14 (100)	8 (101)	+22		
Preference	49 (69)	49 (61)	±0		
Experience	**–68 (40)**	**–89 (26)**	–21	.001	.63
Persons known who stutter (informant report)	–97 (6)	–97 (58)	±0		
Persons known who stutter (child report)	–46 (71)	–83 (46)	–37		
Obesity/Wheelchair Subscore	–46 (23)	–46 (20)	±0		
Preference	–24 (35)	–24 (30)	±0		
Obesity	–63 (60)	–81 (46)	–18		
Wheelchair	14 (55)	32 (53)	+18		
Experience	–67 (25)	–67 (25)	±0		
Obesity	–51 (35)	–51 (35)	±0		
Wheelchair	–83 (29)	–83 (29)	±0		

Note. Statistically significant differences ($p \leq .0045$) are indicated by bold emphasis. POSHA-S/Child = Public Opinion Survey of Human Attributes–Stuttering/Child.

[a]Mean ratings were inverted so that higher scores reflect more accurate, sensitive attitudes.

children were less inclined to tell children who stutter to "slow down." Scores for that item increased by 92 units, which was the largest change across all survey items. They were also less likely to finish words of a child who stutters and laugh at a person who stutters. Furthermore, children more frequently reported that stuttering should not be hidden and that they would act like there is nothing wrong with the way children who stutter talk. At the same time, however, children scores on the "I should help" component decreased.

Social Distance/Sympathy was the component with the third highest unit change ($p = .001$), with a moderate effect ($d = .50$). Children expressed less worry if someone they knew stuttered (e.g., parent, teacher, doctor, sibling, friend, or they themselves). The average unit change for the seven "worry" items was +39, which is much higher than their mean POSHA-S/Child rating change of +15. It should be noted that children held quite positive attitudes for many of the Social Distance/ Sympathy items prior to the program. Not surprisingly, therefore, ratings for those items changed only marginally following the program. For example, before the program, most children reported that children who stutter are "fun to play with," which only increased by 3 units following the program. This was also the case for the items "I would feel sorry for children who stutter," in which no change occurred, and "I would be patient when talking to children who stutter," which improved by 11 units. Notably, the latter item is the only item for which all 37 participants had a uniformly "yes" response following the program.

The Cause of stuttering component was the fourth most improved, which increased by 15 units, but not to a significant degree. Children were much less likely to attribute stuttering to germs, a learned behavior, and something bad that happened. At the same time, they became less likely to indicate that stuttering is a genetic trait and slightly more likely to note that stuttering comes from something we cannot see. Although slightly more accurate, their belief that stuttering comes from God persisted following the program.

Although the Potential component did not improve, it remained the highest rated component both before and after the program. Importantly, children's belief that children who stutter can do the same things as others increased by 50 units. Their belief that children who stutter can be anything they want to be when they grow up, make good choices, and make friends remained positive, even though the means decreased.

The Who Should Help component also decreased marginally following the program, but not significantly. Respondents' beliefs about who should help children who stutter were fairly well informed both before and after the program. In general, they reported that help should come from the parents of children who stutter and a speech-language pathologist. Although they generally believed that other people who stutter could help, that item decreased.

Finally, the Experience component remained the lowest component at pre- and posttest, but the mean score significantly decreased following the program ($p = .001$). Parents' initial report of people who stutter known to the child was used for both the pre- and posttest analyses; therefore, that item mean did not change. However, children became less inclined to report that they stutter, have a family member or friend who stutters, or know anyone else who stutters.

Children's pre- and poststuttering attitudes were further analyzed relative to their perceptions of obesity and wheelchair use. The Obesity/Wheelchair subscore reflects the means of children's preferences for each attribute along with their experience with persons who are obese or use a wheelchair, as reported by a parent. At pretest, children had the most experience with obesity, followed by stuttering, and then wheelchair use. At posttest, reports indicated most experience with obesity, followed by wheelchair use and then stuttering. Before and after the program, the children indicated a moderately high preference for stuttering, followed by a somewhat high preference for wheelchair use and very low preference for obesity.

Discussion

The impetus for this study was to respond to calls for attitude change among young children and to examine the degree to which young children's attitudes are responsive to change. It was hypothesized that prior to an intervention, children would hold unfavorable attitudes, particularly dealing with their knowledge about stuttering causes and what to do when talking with a stuttering peer. Children's attitudes were predicted to improve following the InterACT program, especially with regard to their knowledge about the disorder and skills when interacting with a person who stutters. As hypothesized, children held generally negative or uninformed attitudes prior to the educational program but demonstrated significant improvement in those attitudes following the InterACT program.

Beliefs About Stuttering

Children's poor baseline knowledge about stuttering was not surprising, given that most children had limited to no exposure to people who stutter prior to the intervention. Following the program, however, children appeared to have better knowledge overall about the causes of stuttering. The item "stuttering comes from germs" notably improved (decrease in "yes" responses), which is not surprising, given that the "germs" item was directly addressed in the video. Both prior to and after the program, children were likely to report that stuttering is an inherited trait. This is somewhat surprising, given that it typically is not until the school-age years that children understand that a person can be born with a disorder or disability (Tamm & Prellwitz, 2001). Children's improved knowledge about stuttering is particularly important, as it has been suggested that children's basic knowledge about a disorder promotes more effective socialization with peers who are different (Hong et al., 2014).

Before and after the program, children maintained highest preference for being a person who stutters, followed by being obese and being in a wheelchair, which upholds previous comparisons (Weidner, St. Louis, et al., 2015, 2017). Interestingly, children's preferences for the three attributes were inversely associated with their parent-reported experiences with those conditions. That is, the more experience children had with a condition, the lower their preference rating. This is surprising, given that personal contact has been shown to play an important role in improving attitudes toward persons with various conditions and disabilities, including stuttering (e.g., Boyle et al., 2016, 2017; Flynn & St. Louis, 2011). Information about the duration and quality of those interactions, as well as the frequency and nature of how those conditions are discussed in the children's environments, would help explain why this may have occurred.

Beliefs About People Who Stutter

Results of this study further support that a stuttering stereotype exists among children as early as the preschool years prior to an educational intervention. Before the InterACT program, children in this study frequently expressed "worry" if anyone close to them stuttered. In addition, they consistently affirmed that people who stutter are "unable to talk well, nervous, and shy," similar descriptions generated by 6- to 13-year-olds (Franck, Jackson, Pimentel, & Greenwood, 2003; Hartford & Leahy, 2007; Panico, Healey, & Knopik, 2015). Of all of the components, children experienced largest positive changes relative to their perceptions of the traits of people who stutter. Following the program, they were less inclined to describe children who stutter as "shy" and at fault for their stuttering. They were also less likely to indicate that children who stutter are nervous or have a bad problem. Respondents' belief that people who stutter are "able to talk well" improved, but their ratings remained low following the program. It seems, therefore, that the program helped children to distinguish between the personality characteristics of a stuttering speaker from that of speech characteristics.

Self-Reactions Toward People Who Stutter

Prior to the InterACT program, children reported they would not laugh at a person who stutters, would be patient when talking with a person who stutters, and did not believe that stuttering should be hidden. They reportedly would not be bothered by stuttering, a finding that was confirmed in older children (Panico et al., 2015). On the other hand, they reported inclinations to finish their words and tell them to "slow down." Such responses are reportedly common among nonstuttering listeners (Reitzes, 2012), but generally undesired by children and adults who stutter (St. Louis et al., 2017; Weidner, Coleman, et al., 2015). After the program, children's initially positive attitudes (i.e., being patient, not laughing, not being bothered) became even more positive. In addition, they showed increased knowledge about helpful and unhelpful listener supports and became less worried if persons close to them stuttered, such as a sibling, friend, or parent.

Children's reported experience with stuttering (i.e., persons known or personal experience) more closely aligned with parental reports following the InterACT program. This suggests that their ability to accurately differentiate between stuttered and fluent speech in both themselves and others improved. Although this study cannot definitively confirm or reject the possibility of negative social consequences for preschoolers who stutter, it certainly underscores the need to educate young children about specific social considerations when talking with a person who stutters.

Implications

It was clear that the nonstuttering preschoolers held negative or uninformed attitudes about stuttering prior to the educational program, even when their first exposure to the disorder was a short video portraying stuttering characters. Importantly, however, their attitudes became increasingly more sensitive and informed following the InterACT program. Children were motivated to learn about stuttering and other conditions and expressed a strong desire to help children who stutter. If we wish to capitalize on those factors, educational programming to improve stuttering attitudes might be maximized during the preschool years. It is hoped that such efforts will help typically fluent children to become more tolerant and accepting of people who stutter and perhaps even extend those improved attitudes toward persons with other disorders.

It is inevitable that children who stutter must deal with their peers' stuttering attitudes, whether or not those attitudes are desired. This study supports the claims that if peers are not educated about stuttering, they may react to stuttering in unhelpful ways and/or misunderstand the reasons why people stutter (Ezrati-Vinacour et al., 2001; Griffin & Leahy, 2007; Langevin et al., 2009). It also confirms that, as early as preschool, children who stutter are likely to be classified as being nervous and shy and as having inferior speaking abilities. If they endure these pejorative stereotypes long term, they are at risk for becoming targets of social distancing and/or teasing and bullying (Blood & Blood, 2004; Langevin, 2015; Langevin et al., 1998; Mooney & Smith, 1995; Yaruss et al., 2004), which can have long-lasting effects on their overall well-being in adulthood (Blood & Blood, 2016; Daniels et al., 2012). However, if peers' negative stuttering attitudes are mitigated during their formative preschool years, negative or undesired reactions directed toward children who stutter might be prevented altogether. A supportive communication environment could facilitate improvement in the quality and quantity of the social interactions of people who stutter. This could have a profound impact not only on their communication skills but also on their social and emotional well-being.

Limitations and Future Directions

Several caveats pertaining to the methodology and instrumentation used in the study warrant discussion so that future research in children's stuttering attitude research may progress efficiently and effectively. This study was carried out via convenience sampling in one university city, which prohibits generalization of the results to a broad population. Future studies should involve children from different geographic regions, cultures, languages, and socioeconomic statuses. Research with adults has reported that nonprobability convenience sampling is an adequate means by which to collect data initially (St. Louis, 2015b), but probability sampling schemes, such as those described by Özdemir, St. Louis, and Topbaş (2011) and Valente, St. Louis, Leahy, Hall, and Jesus (2017), will be an important longer-term goal.

This study utilized one experimental group to investigate the impact of the InterACT program. In future studies, other interventions might be included to further evaluate change in stuttering attitudes as measured by pre- and postadministrations of the POSHA-S/Child. These might involve including a control group that is randomly assigned to receive no intervention as well as a group that randomly receives an intervention in which stuttering is not mentioned. In addition, follow-up data at various intervals (e.g., 6 months, 1 year, 3 years) should be collected to determine the stability and maintenance of children's attitude change as was carried out for adolescents (St. Louis & Flynn, 2018). Children with varying levels of exposure to or experience with stuttering should also be compared to further elucidate the impact of experience on attitudes. It is only through the continued implementation of the program with larger groups that conclusions about its efficacy can be confidently reached.

Although the impact of the program was favorable overall, some constructs did not improve. For example, children's belief that children who stutter can "make friends" decreased. This is particularly puzzling, given that the InterACT puppetry videos stress that children who stutter (or who are different) are able to make friends. Factors that might have contributed to this finding, such as preschoolers' preference for same-sex friends (Hilliard & Liben, 2010), should be considered. In addition, other potentially influential variables such as method of delivery, size of groups, and/or amount of exposure to stuttering in the videos should be examined.

Because of the scope of this study, it is uncertain whether or not improvements in children's reactions to stuttering characters would translate to real-life interactions with actual persons who stutter. Two suggestions to address this issue are advanced. First, it is recommended that an additional qualitative component be included that prompts children to explain their responses to survey items. Open-ended prompts would help to elucidate children's cognitive processes involved in attitude change and explain how and why those changes occurred. Second, future research to investigate children's application of the knowledge and skills gained from the InterACT program will likely unfold in a series of carefully planned longitudinal case studies. As conducted by Langevin and colleagues (2009), naturalistic interactions between children who stutter and typically fluent peers should be observed before and after the InterACT program. Qualitative observations would serve to corroborate quantitative POSHA-S/Child findings. In addition, it would bolster the InterACT program as having evidenced-based applicability to children's actual social interactions with stuttering peers. Until then, however, much of the groundwork for this line of research needs to be laid.

Conclusion

This study is among the first to examine the feasibility of improving nonstuttering preschoolers' stuttering attitudes, so that their beliefs about stuttering and social acceptance of stuttering peers might be strengthened. Based on the findings of this study, it is clear that young children's negative or uninformed attitudes about stuttering and people who stutter are amenable to improvement. Children had a significant positive response to the InterACT program, as evidenced by their increased knowledge about stuttering and how to interact with stuttering peers. Results of this study strongly support the continued expansion of this line of research and suggest that efforts to improve stuttering attitudes might be particularly effective during the preschool years.

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Appendix A

Excerpts From the Attitude Change and Tolerance Program Puppetry Videos (Weidner, 2015)

Target Theme or Construct	Script Excerpts and Still Images From Video	
Defining stuttering	**Rosie:** I noticed that the way you talk is, well, *different*. **Ben**: You're right. I talk differently because I stutter. **Rosie:** *Stutter*? What does *that* mean? **Ben**: Stuttering is what happens when my words or sounds get stuck. Sometimes my words are b-b-b-ouncy or streeeetchy. Sometimes, no words c–ome out at all.	
Stuttering causes	**Rosie:** Does stuttering mean you're nervous or shy? **Ben**: No, stuttering doesn't mean that I am nervous or shy. **Rosie:** So, why do you stutter? **Ben**: Stuttering happens because I was born this way. Even some grown-ups stutter! Don't worry, even though I stutter, I can still do all of the same things other people can do. **Rosie:** I understand now! It's okay that you stutter! You are fun to play with!	
Unhelpful reactions to stuttering	**Ben**: Look at this cool t-t-t- **Hannah**: (giggles) Truck, silly! **Ben**: It is so sh sh shiny and rrrrr **Hannah**: (finishes word) Red? (no eye contact) **Ben**: yeah, rrrred. I like the cool whee— **Hannah**: (laughing at him) Wheels! **Ben**: I bet it goes really fa-fa-fa-fa- **Hannah**: Fast. Speaking of fast, I think you talk too fast! You should slow down. **Ben**: Well, I ju-ju-ju want to tell you th-th-th **Hannah**: (Annoyed sigh). I can't understand you when you talk. (walks away) **Ben**: (Begins to cry). My feelings got hurt. Hannah finished my words for me and didn't give me time to say what I want to say. (Sniffle). No one understands what it's like to stutter.	
Helpful reactions to stuttering	The above script is played out with Hannah providing good eye contact, being patient, allowing Ben to finish his words, not laughing, and not walking away.	
Acceptance of human differences	**Rosie:** I love that even though we are all different on the outside, we are the same on the inside. **Hannah**: What do you mean? **Rosie:** Well, we all look, and move, and talk differently from each other. But, we are also the same. We all like to play and have fun! **Hannah:** Our differences make us special in our very own way! **Max:** Yes! We can all learn from each other about ways people are different!	

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