



Study of the Communication Attitude of Slovenian Children Who Do and Do Not Stutter

Mateja Gačnik^{[a], [b]}, Martine Vanryckeghem^{[c], [d]*}

^[a]Center for the Correction of Hearing and Speech Portorož, Slovenia.

^[b]University of Primorska, Faculty of Education, Koper, Slovenia.

^[c]University of Central Florida, USA.

^[d]University of Gent, Belgium.

*Corresponding author.

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Abstract

Data of investigations with the Communication Attitude Test (CAT) have shown this standardized test to be an internally reliable and valid instrument for differentiating children who stutter (CWS) from those who do not (CWNS). The present study's aim was to obtain preliminary normative and comparative data of the communication attitude of fluent and stuttering grade-school children using a Slovenian version of the CAT (CAT-SLO). In addition, the effect of stuttering severity and age on the CAT scores were investigated. Preliminary data on item and discriminant analysis are presented. The CAT-SLO was administered to 136 CWNS and 58 CWS. The Stuttering Severity Instrument (SSI) was used to determine stuttering severity. The CWS scored statistically significantly higher on the CAT-SLO than the CWNS. Stuttering severity did not seem to play a role in the extent of the negative speech-associated attitude. Communication attitude was differentially affected by age among the CWS, but not for the CWNS. Four items did not discriminate significantly between the two participant groups. Overall, the CAT-SLO has shown to have a high discriminant power. This test is a useful tool in the assessment of grade-school CWS as the first Slovenian calibrated instrument for the evaluation of communication attitude.

Key words: Communication attitude test; CAT; Stuttering; Speech-associated attitude; Children

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INTRODUCTION

In recent years, it has been increasingly clear that stuttering is a multi-dimensional disorder that involves affective, behavioral and cognitive components for children and adults (Brutten & Vanryckeghem, 2003a, b, 2007; Conture, 2001; Curlee, 1993; Gregory, 2003; Guitar, 2014; Manning, 2010; Vanryckeghem & Brutten, 1997; Watson, 1995). The reactive aspects related to stuttering provide critical information on which clinical decisions are based. As Bloodstein and Bernstein Ratner (2008) have pointed out, "in addition to what is ordinarily considered stuttering behavior, there is a pattern of attitudes, assumptions..." (p.23), which "... often constitute a major part of the problem of stuttering" (p.23). Nevertheless, for some years, attention was predominantly given to the reactive aspect of stuttering among adults who stutter. In part, this was because research showed that they evidenced a significant amount of negative speech-associated attitude compared to their nonstuttering peers (Andrews & Cutler, 1974; Erickson, 1969; Miller & Watson, 1992; Silverman, 1980; Vanryckeghem & Brutten, 2011, 2012). Less information was available relative to the reactive aspects of stuttering among children, because it was assumed that children were more vulnerable than adults, and the belief that reactive studies might worsen their dysfluent condition. This concern has dissipated with time (Clark, Conture, Frankel, & Walden, 2012; Cooper, 1979; Guitar, 2014; Logan & Yaruss, 1999). As a result, research evidence

has been accumulated which documents the existence of a difference in the communication attitude between school-age children who stutter (CWS) and their fluent speaking peers (CWNS) (Brutten & Vanryckeghem, 2003a, 2007; De Nil & Brutten, 1991; Vanryckeghem & Brutten, 1997). Indeed, research has made it clear that preschool children tend to show an awareness of dysfluency (Ambrose & Yairi, 1994; Ezrati-Vinacour & Yairi, 2001). Taking this a step further, research utilizing the Communication Attitude Test for Preschool and Kindergarten Children who Stutter (or KiddyCAT) has revealed that, in addition to being aware of their stuttering, CWS as young as three, have a speech-associated belief that is significantly more negative compared to their nonstuttering peers (Clark, Conture, Frankel & Walden, 2012; Vanryckeghem & Brutten, 2007; Vanryckeghem, Brutten, & Hernandez, 2005).

1. PREVIOUS INVESTIGATION

Since the 1980's cross-cultural research investigations world-wide have repeatedly shown that the CAT scores of school-age CWS are statistically significantly higher than that of CWNS (Bernardini, Vanryckeghem, Brutten, Cocco & Zmarich, 2009; Brutten & Vanryckeghem, 2003a, 2007; De Nil & Brutten, 1991; Jelčič Jakšič & Brestovci, 2000; Kawai, Healey, Vanryckeghem, & Nagasawa, 2012; Vanryckeghem, 1995; Vanryckeghem & Brutten, 1992, 1996, 1997). In general, the average score of CWS on the CAT was approximately 2 SD above that of CWNS. In addition, aside from the fact that a negative belief among CWS was documented as of the age of six (the youngest age at which the CAT could be administered), it was evidenced that the speech-related negativity of CWS increased with age. An opposite trend was found to exist among the group of CWNS (Brutten & Vanryckeghem, 2003a, 2007; Vanryckeghem & Brutten, 1997). Other investigations pointed to a statistically significant relationship between stuttering severity and speech-associated belief (Vanryckeghem & Brutten, 1996), and the fact that speech-related attitude and negative emotional reaction are related to a statistically significant extent (Vanryckeghem, Hylebos, Brutten & Peleman, 2001).

Aside from its discriminative power, the CAT has been shown to have good internal reliability (Brutten & Dunham, 1989; Brutten & Vanryckeghem, 2003a, 2007) and solid test-retest reliability (Vanryckeghem & Brutten, 1992). In addition, the test's content, criterion and construct validity have been documented (De Kort, 1997; Brutten & Vanryckeghem, 2003a, 2007). Based on several internal reliability investigations (Brutten & Dunham, 1989; Brutten & Vanryckeghem, 2003a; De Nil & Brutten, 1991; Johannisson et al., 2009), the CAT has been modified from its original version that consisted of 35 items to the current 33 item CAT (Brutten & Vanryckeghem, 2003a, 2007).

2. RESEARCH

Until now, Slovenian speech-language pathologists have been limited in their ability to assess the communication attitude of children who are thought to stutter. An evidence-based self-report test has not been available to them for the purpose of evaluating speech-associated belief, assisting in differential diagnosis, and determining the effect of treatment. To help fill this void, Slovenian speech-language pathologists have recently adopted and translated the CAT. Because of possible cultural differences in communication attitude between Slovenian children and those of children in other nations, the Slovenian CAT (CAT-SLO) was given to a representative sample of stuttering and nonstuttering Slovenian school-age children. In this regard, it was the purpose of the present study to obtain preliminary norms on the Slovenian CAT, which will allow for a data-bound comparison between CWS and CWNS. In part, too, this study was designed to explore the possible relationship between the CAT results, age and stuttering severity. The test's item and total score discriminative power were also examined.

2.1 Method

2.1.1 Participants

The control group in this study consisted of 136 nonstuttering grade-school children who ranged in age from 7 years 1 month to 13 years 11 months. The group consisted of 56 boys and 79 girls. The school that was chosen to sample our nonstuttering participants was thought to be representative for Slovenian children because it is a suburban school attended by predominantly Slovenian children and very few immigrant children. The parents were asked to sign a consent form for their child to participate in the study. For the potential sample of CWNS who were given permission to be participants, the school records as well as teacher and/or speech-language pathologist reports were checked for possible speech and/or language disorders. In addition, the speech and language adequacy of the control participants was made evident by the first author's evaluation of their current conversational speech based on a 10-15 minutes long interview. From this speech sample, the first 50 words were eliminated and the next 150 words were observed. Speech was evaluated for voice, articulation and fluency problems. Language comprehension and production were appraised according to developmental milestones. 26 children of the initial pool of potential participants were removed because they evidenced some type of speech and/or language problem: 15 had an articulation problem, 3 exhibited voice problems and 8 children had a language delay, most likely due to second language acquisition because of a recent move to Slovenia. Those children with speech and/or language disorders were excluded, which led to the final group of participants.

The experimental group consisted of 58 children who stutter. They also ranged in age from 7 years 0 months to 13 years 11 months. In this sample of CWS, 44 participants were boys and 14 girls. At the time of data collection, 35 children were in the diagnostic phase of treatment and 23 children had received one or two treatment sessions. During the diagnostic phase, a case history form is being obtained from the parents, and the children were administered the SSI and the CAT. The 23 children who were in the beginning phase of treatment had received an additional one or two treatment sessions. Initial treatment sessions are devoted to documenting the results of the assessment and explaining the treatment purpose, options and methods to the parents. Keeping in mind the age of the children, some information relative to respiration, phonation and articulation is provided. The child might be introduced to relaxation and the production of sounds.

In order to analyze the impact of stuttering severity on the CAT results, stuttering severity for the group of CWS was determined by means of the Stuttering Severity Instrument (SSI 1) (Riley, 1972). On the basis of this test procedure, 6 children were considered to be mild, 25 to be moderate, 10 to be severe and 17 to be very severe CWS. No participants fell into the 'very mild' group.

2.1.2 Materials

The participants of the present investigation were administered the 33-item Slovenian version of the Communication Attitude Test (CAT-SLO). This standardized self-report test (Brutten & Vanryckeghem, 2007) is composed of 33 assertions. Eighteen of the test items if answered True by a respondent and 15 if answered False are considered indicative of a negative attitude toward speech and the way of speaking, and receive a score of 1. The total score on the CAT-SLO can range from 0 to 33.

The first author, who is bilingual (Slovenian – English) translated the English form of the CAT (Brutten & Vanryckeghem, 2007). This translation was then independently translated by a linguist who is fluent in Slovenian, English and Italian. Following this, a comparison was made of the two translations, and a consensus of the translation was reached in case of disagreement. The first author then engaged in a back translation of the Slovenian CAT's test instructions and items with the test authors, via skype. In case the content of an item did not capture its intent, the first author discussed a better translation with the linguist, a follow-up meeting was arranged with the test authors, and the final test version was agreed upon.

2.1.3 Procedure

The first author collected all data for the CWNS and 36% for the group of CWS. For the data collection of the other 64% of the CWS group, three other test administrators collaborated in this investigation. They were all speech-

language pathologists who administered the CAT to the clients on their caseload. Prior to data collection, they were trained by the first author in the administration of the CAT, using the very same test protocol, and were instructed to adhere strictly to the procedures. All participants were administered the CAT on an individual basis.

3. RESULT ANALYSES

3.1 Total Score Analyses

3.1.1 Normative and Comparative Data

As can be seen in Table 1, the mean CAT score for the group of CWNS ($N = 136$) was 6.10 with a SD of 3.64. The scores ranged from 0 to 20 with a median score of 5 and a mode of 4. In contrast, the scores of the CWS ($N = 58$) ranged from 7 to 31. The median score was 18.00, and the mode was 22. The average score for CWS was 18.29 ($SD = 5.85$). Comparison of the averages of the two groups by means of ANOVA indicated that their CAT-SLO scores differed to a statistically significantly extent ($F = 310.906, p = .000$). The large (Cohen, 1988) effect size of 2.75 ($p = .000; CI = 2.340/3.163$), and the distribution of the CWS and CWNS' CAT scores as shown in Figure 1, further quantify the group differences.

Table 1
CAT-SLO Descriptive Statistics for Experimental (CWS) and Control (CWNS) Group

	CWNS	CWS
<i>N</i>	136	58
Mean	6.10	18.29
Median	5.00	18.00
Mode	4	22
<i>SD</i>	3.64	5.85
Min	0	7
Max	20	31

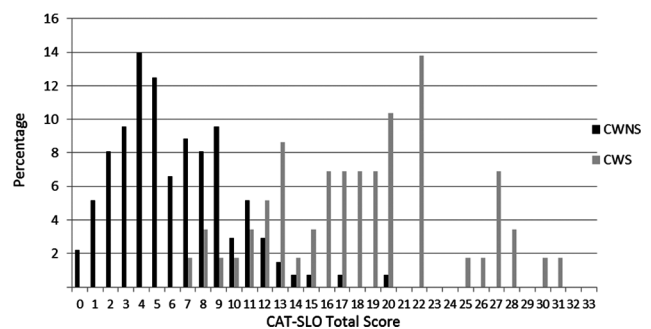


Figure 1
Distribution of CAT-SLO Scores for CWS and CWNS

3.1.2 The Relationship Between Speech-Associated Attitude and Stuttering Severity

In order to determine whether or not the speech-associated attitude of the CWS, as measured by the CAT-SLO, was affected by stuttering severity, the participants were divided into four groups on the basis of the SSI score. As

Table 2 indicates, the mean CAT-SLO scores ranged from 18.50 ($SD = 7.45$) for the children with a relatively ‘mild’ stuttering problem (SSI level 2) to 19.88 ($SD = 5.87$) for those who were considered ‘very severe’ CWS (SSI level 5). Analysis of Variance revealed that severity of stuttering did not have a statistically significant effect on speech-associated attitude ($F = .739, p = .533$).

Table 2
Measures of Central Tendency and Variation of CAT-SLO Scores for CWS in Relation to SSI-Determined Severity Level

	<i>N</i>	Mean	<i>SD</i>	Min	Max
Severity 2	6	18.50	7.45	8	31
Severity 3	25	17.84	5.58	8	28
Severity 4	10	16.60	5.76	7	27
Severity 5	17	19.88	5.87	9	30
Total	58	18.29	5.85	7	31

3.1.3 The Relationship Between Speech-Associated Attitude and Age of CWS and CWNS

In order to determine if age had a differential effect on communication attitude, the two groups of participants were separately divided into a younger (ages 7 to 10) and older (ages 11 to 13) sample. For the experimental group, the mean score for the younger group ($N = 32$) was 16.91 ($SD = 5.20$). For the older group ($N = 26$), the average score was 20.00 ($SD = 6.26$). These mean differences in the speech-associated attitude of the two age groups were found to be statistically significant ($F = 4.237, p = .044$). Specifically, the older group of CWS had a statistically significantly greater increase in their negative speech-associated attitude than the younger children did.

For the CWNS, the CAT-SLO average of the younger children ($N = 69$) was 5.97 ($SD = 3.70$), whereas the older group ($N = 67$) had a mean score of 6.22 ($SD = 3.59$). This difference in scores did not prove to be statistically significant ($F = .163, p = .687$). Taken together, these data indicate that there was a group by age interaction ($F = 4.301, p = .039$). As seen in Figure 2, while age plays a statistically significant role in the communication attitude of CWS, it does not for CWNS.

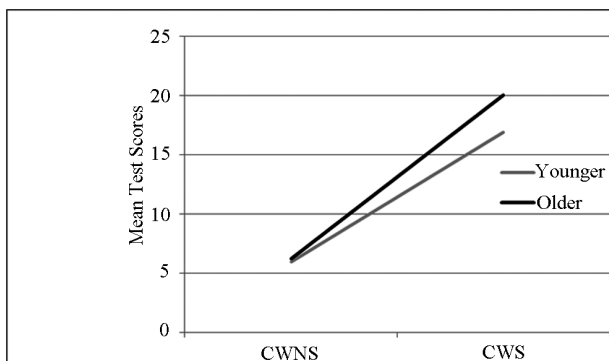


Figure 2
CAT-SLO Group by Age Interaction

3. ITEM ANALYSES

3.2.1 Item Comparison CWS Versus CWNS

In order to determine if each of the CAT-SLO items contributed to the differentiation between CWS and CWNS, a between-group item analysis was performed. Figure 3 represents, for every item, the average item score (between 0 and 1) for CWS and CWNS. A statistically significant between-group difference in the average score was found for all except four items. For items 6, 17 and 25, the CWS’ scores were descriptively, though not statistically significantly higher compared to the scores of the CWNS [item 6 ($F = 1.785, p = .183$), item 17 ($F = 2.029, p = .156$), item 25 ($F = 1.491, p = .224$). CWNS scored descriptively higher on item 32 ($F = .127, p = .722$).

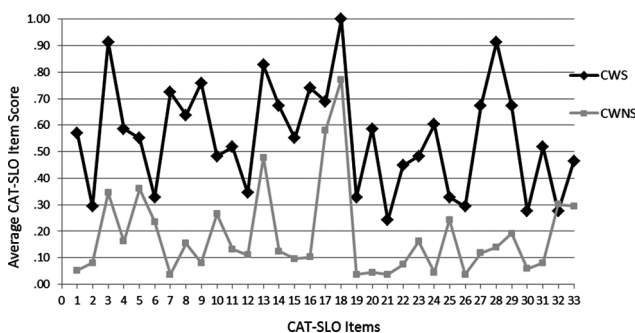


Figure 3
CAT-SLO Item Means for CWS and CWNS

3.2.2 Discriminant Analysis

134 of the 136 CWNS were correctly identified. Only two of the members of this group were seen as having a communication attitude like that of CWS. Furthermore, 55 of the original group of participants who stutter were correctly distinguished as members of this group. The communication attitude of only three CWS was like that of CWNS. That is to say that the CAT-SLO accurately distinguished 98.53% of the CWNS and 94.83% of the CWS who were originally identified as members of these two sample groups. In sum, more than 97% of the originally grouped cases were correctly classified.

4. DISCUSSION

The results shown above clearly indicate that the CAT-SLO is capable of differentiating the CWS from CWNS who participated in this study, on the basis of their speech-associated attitude. These data are consistent with those of previous cross-cultural investigations involving the CAT. As Table indicates, internationally-based studies have indicated that CWS’ CAT scores were consistently at least 1 ½ standard deviations above those of CWNS. The data of the current study pull the two subject groups even further apart, given that the average score for the CWS was 3 SD above that of the CWNS. As such, the present data suggest that the CAT-SLO can serve to help determine if a respondent’s attitude toward his or her

Table 3
Comparison Between Research Investigations Employing the CAT

Study	Child who does not stutter			Child who stutters		
	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>
De Nil & Brutton, 1991 (Belgium) (32-item CAT)	271	8.71	5.53	70	16.69	7.29
Vanryckeghem & Brutton, 1992 (Belgium) (35-item CAT)	201	10.41	5.70	44	17.30	6.85
Vanryckeghem & Brutton, 1997 (Belgium) (35-item CAT)	55	7.05	4.69	55	17.44	6.81
Brutton & Vanryckeghem, 2003a (Belgium) (33-item CAT)	271	5.78	4.84	90	15.31	7.37
Jelčić Jakšić & Brestovci, 2000 (Croatia) (35-item CAT)	58	6.98	4.40	78	20.23	7.04
Brutton & Vanryckeghem, 2007 (USA) (33-item CAT)	578	6.38	5.21	139	16.83	7.47
Bernardini, Vanryckeghem, Brutton, Cocco & Zmarach, 2009 (Italy) (35-item CAT)	148	6.93	3.23	149	20.21	6.25
Kawai, Healey, Nagasawa & Vanryckeghem, 2012 (Japan) (35-item CAT)	80	9.59	3.02	80	14.68	5.45

speech is like that of one who stutters or one who does not.

Within the current sample of Slovenian CWS, stuttering severity, as determined by the SSI, did not seem to play a role in the extent to which the children reported the existence of a negative speech-associated attitude. It needs to be pointed out, however, that the sample was limited to the extent that none of the participants fell into the very mild group, and only six of the 58 CWS (10%) were categorized as having a mild level of stuttering. In part, the absence of a relationship between stuttering severity and speech-associated attitude found in the present study may be attributable to the fact that the current sample did not span the full severity spectrum of the population of CWS. The present results are different from data previously found (Kawai, Healey, Nagasawa, & Vanryckeghem, 2012; Vanryckeghem & Brutton, 1996). In the Kawai et al. (2012) Japanese study with the CAT, a significant main effect of stuttering severity was found. Their sample of CWS more evenly spanned the mild (39%), moderately severe (31%) and severe or very severe (39%) stuttering spectrum, based on the SSI-3 criteria. In an investigation with a Dutch version of the CAT on a Belgian sample of CWS, Vanryckeghem and Brutton (1996) determined stuttering severity based on percentage fluency failure during a reading and conversational task. The Belgian study pointed to the existence of a low but significant correlation between stuttering severity and CAT scores. Clearly, the relationship between communication attitude and stuttering severity remains uncertain. An element to be considered is the fact that severity, as determined by the SSI, is based on a confound of stuttering behaviors (frequency and duration) and behaviors secondary to stuttering. As such, the severity rating score obtained is influenced by both stuttering and coping behaviors. Related to this, the inconsistency in the relationship between severity data and CAT scores might, in part, be due to cultural differences. Future research investigating a possible link between stuttering severity and speech-associated attitude might be best served by employing stuttering behaviors as the sole measure of severity.

In the past, various cross-cultural investigations with the CAT have pointed to the fact that, with age, the

scores of CWS and CWNS tend to diverge (Brutton & Vanryckeghem, 2003a, 2007; De Nil & Brutton, 1991; Vanryckeghem & Brutton, 1997). The finding of a statistically significant group by age interaction was, however, absent in the Bernardini et al. (2009) study. In the same vein, Kawai et al. (2012) indicated that the CAT scores of CWS increase significantly as they move from first to sixth grade. The present data, once again, showed that the older CWS had statistically significantly more in the way of a mal-attitude toward their speech compared to the younger ones. In contrast, the communication attitude of the CWNS tended to stay essentially constant across the ages sampled. The data, yet again, point to the need for vigilance on the part of the speech-language pathologist relative to the existence of a negative belief that the child who stutters might have about his or her speech. If left undiagnosed and untreated, the negative thinking about speech and the act of speaking might just exacerbate and, with time, add to the complexity of the disorder.

As far as each item's contribution to the differentiation between CWS and CWNS is concerned, four items in the present investigation failed to statistically significantly distinguish the members of these two groups. They were items 6 (the kids in class don't think I talk funny), 17 (my speech is worse when I talk with people I don't know), 25 (I would rather talk than write) and 32 (I let others talk for me). If, in a replication study, it is confirmed that one or more of these statements are not helpful in distinguishing CWS from CWNS, a decision might be made to remove these items from the test in order to increase the differentiating power of the CAT-SLO. Removal of the four items in the current study led to a mean score for the control group of 4.74 (*SD* = 3.09) and for the experimental group of 16.67 (*SD* = 5.85), a difference of almost 4 standard deviations.

Based on the assumption that the current sample of participants is truly random, the CAT-SLO is discriminatively powerful in differentiating between CWS and CWNS group membership. This finding adds to the usefulness of this test procedure as a differential diagnostic tool. The extent to which this may be true will

be determined by the use of the current discriminative item weights in subsequent follow-up studies of the speech-associated attitude of a hold-out group of CWS and CWNS. In any event, the present data are consistent with those of Brutton and Vanryckeghem (2003a). In this investigation with Dutch speaking, Belgian children, 86% of CWS were correctly classified. For CWNS, this percentage was 93. Overall, with its 97%, the CAT-SLO discriminant form descriptively surpasses the accuracy with which CWS and CWNS can be correctly categorized compared to 89% in the Brutton and Vanryckeghem (2003a) investigation.

CONCLUSION

Slovenian CWS showed a negative speech-associated attitude that was similar to the profile of their peers in other European countries, Japan and the United States of America. The present data, once again, confirm the findings of previous investigations which indicate that CWS' negative communication attitude only increases over time. This would lead us to concur with the conclusion drawn from previous CAT studies that the attitude of a CWS towards his or her speech requires the attention of the speech-language pathologist. The inclusion of the CAT-SLO in the assessment of CWS will enable the stuttering therapist to examine an important dimension of the stuttering syndrome. It makes for a more elaborate and integrated diagnostic assessment. Moreover, the addition of the CAT-SLO will allow for a more detailed and multi-modal individualized treatment planning and will assist in the monitoring of therapy progress.

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