



Premonitory awareness scale in children who stutter: PAIS-TR

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ABSTRACT

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Anticipation of stuttering is defined as the speaker's proprioceptive and/or cognitive sense that he or she is about to stutter and prevalent among people who stutter PWS. This research was motivated by the importance of the measurement of the anticipation effect in stuttering. Premonitory Awareness Scale in Stuttering (PAIS) was adapted to Turkish and psychometric properties of the scale in Turkish population was investigated. After the translation of the PAIS to Turkish, The PAIS-TR was administered to 60 children who stutter between 6-16 years of age and their age, gender, educational matched non-stutterer peers. Results showed that the PAIS-TR had a high level of internal consistency. The reliability and validity measurements demonstrate that the Turkish version of the PAIS is a psychometrically valid and reliable instrument that can be used both for research and clinical practices.

Keywords:

Anticipation
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1. Introduction

Stuttering is a multidimensional disorder characterised by involuntary prolongations, repetitions, pauses and blocks which interrupt the flow of speech and effect the person's quality of life in a negative way (Craig et al., 2002; Yairi and Ambrose, 2013).

One of the characteristics of stuttering is the anticipation of the stuttering moment and can be defined as the speaker's proprioceptive and / or cognitive sense that he or she is about to stutter. Anticipation of stuttering in early childhood is reported to be lower than in adolescence and adulthood and correlated with stuttering awareness (Alm, 2004; Jackson et al., 2015). Recent research suggest that children who stutter (CWS)

become aware of stuttering as early as after 2 years of the onset but having difficulty describing avoidance behaviors. Although it is apparent that awareness increases with age, life experiences and cognitive development, the cause and effect relationship between these variables has been difficult to establish. In other words, it is not clear whether avoidance behaviors appears later in development or, alternately, with adulthood, awareness of avoidance behaviors increases due to cognitive development (Boey et al., 2009).

Premonitory awareness is one of the awareness types seen in stuttering. It refers to an uneasy sensation inside the body or feelings of physical discomfort, pressure before a stuttering comes (Cholin et al., 2016).

Palms, shoulders and throat are reported to be the most common localisations of premonitory urges (Rajagopal et al., 2013). Given the central role of awareness in stuttering therapies, especially the ones focusing on avoidance reduction techniques (desensitisation) like in Fluency Modification therapies, additional studies of this phenomenon are needed.

Cholin et al. (2016) adapted Premonitory Awareness in Stuttering Scale (PAIS) which is derived from a questionnaire assessing premonitory awareness in people with Tourette syndrome in a detailed way (Premonitory Urge for Tics Scale (PUTS) (Woods et al, 2005). Stuttering and Tourette Syndrome share many similarities like the onset age of the disorders, sex ratio of the incidence and prevalence or the abnormal dopamine utilization in speech motor control areas of the brain. One of the other similarities is that both groups report that most of their stutterings / tics are preceded by a premonitory urge. But while PWS can stop a stuttering event by entirely refraining from any speech action, it is not possible to refrain a tic in Tourette syndrome (Leckman and Cohen, 2003).

The current study was motivated by the theoretical and clinical importance of the evaluation of premonitory awareness in children and adolescents. So, the aim of this study is to adapt PAIS to Turkish as PAIS-TR and to investigate the psychometric properties of the scale in Turkish population between the ages of 6-16.

2. Materials and methods

Participants

Participants were recruited from consecutive patients with stuttering at the Samsun Ondokuz Mayıs University Hospital, Speech and Language Therapy clinic. All the participants were diagnosed by a speech and language therapist. Diagnoses of the participants were based on a detailed clinical interview and Stuttering Severity Instrument IV (SSI-IV). Approval of the Ethical Committee of Ondokuz Mayıs University is obtained to conduct the study and based on the committee requirements, written informed consents of all the participants were collected.

The sample consisted of 60 children who stutter (CWS) (48 male and 12 female) and their age, gender and educational status matched non stutterer peers. The mean age of the first group was 10.5 years (SD= 3.1 years, range = 6-16 years). The age of the second group ranged from 6 to 16 (M = 10.3 years, SD= 3.3 years). None of the participants had a comorbid diagnosis of any neurological, psychiatric, hearing, visual or any speech and language disorder other than stuttering.

None of the participants have received any kind of treatment related to stuttering nor had any experience of stuttering self-help or support groups during the measurements were administered. Demographics of the participants can be seen in Table 1.

Table 1. Demographics and mean (variance scores) of the participants on all tasks.

	PWS (N = 60) Mean (variance)	Control Group (N=60) Mean (variance)
Age (years)	10.5 (3.1)	10.3 (3.3)
Gender (boy/girl)	48/12	48/12
PAIS-TR	30.6 (7.6)	0.18 (.43)
SSI-IV		
Duration	11.8 (1)	0.2 (0.6)
Frequency	7.6 (0.8)	0.25(0.7)
Concomitant Disorders	1.5 (1.5)	0.0(0.0)
SSI-IV Total	21 (2.6)	0.45(1.2)
Percentage of Stuttered syllables	8.9 (4.7)	0.0 (0.0)
Subjective Stuttering Severity		
Instrument	4.9 (2.2)	0.0 (0.0)

Measures

Percentage of stuttered syllables

Spontaneous speech samples of CWS were collected by an experienced speech and language therapist. The duration of the recordings was of minimum 5 minutes in which children were suggested to talk about their daily routines, favorite movies, school, friends and such like topics. Percentage of stuttered syllables was obtained by taking the percentage of stuttered syllables to total syllables.

Stuttering severity instrument IV

In this study, the Turkish version of Stuttering Severity Instrument (SSI-4) (Mutlu, 2014) was administered to all participants in order to determine the frequency, duration and observed physical concomitants of the stuttering. The original version of SSI-IV was developed by Riley (2009) to determine the severity of overt features of stuttering. It provides a more comprehensive portrait of overt features of stuttering compared to measures including only the percentage of stuttered syllables alone. Another advantage of SSI-4 is using more than one speech sample since stuttering has been shown to vary from one time to other.

Subjective stuttering severity measurement

The Subjective Stuttering Severity Measurement was also evaluated because internal perceptions and dynamics of PWS like anxiety or being out of control could also contribute to premonitory awareness. This self-report measurement was based on a 9 item Likert type frequency scale (1= very mild to 9= very severe).

Translation of the PAIS-TR

Translation of the original English version of the PAIS into Turkish was based on a standard forward-backward translation process (Herdman et al., 2003). An additional question was added between 10 and 11 in the original one as suggested by the authors of the PAIS ("The anticipatory sensation allows me to avoid

the upcoming stutter by changing how I am talking”) (Cholin et al., 2016).

A native Turkish linguist who is fluent in English translated the scale items to Turkish. The second examiner who is also a native Turkish speaker and fluent in English revised the translated version. Then the back translation process of the Turkish version of the scale to English was completed by a bilingual (Turkish-English) professional translator. The last comparisons between the original version and the back translation were made. Research team discussed the potential items that may lead to different meanings and the final version of the PAIS-TR was adapted.

Data analysis

Reliability

Test-retest reliability and internal consistency of the PAIS-TR was completed for the reliability analyses. For test-retest reliability, the PAIS-TR has completed by 20 CWS on two occasions 2 weeks apart. Mean age of the test-retest reliability group was 10.3 years (SD =36 ; range =6-182 years). PAIS-TR Total scores at Time 1 and Time 2 was calculated with the Spearman correlation and a paired t-test was conducted to test whether any differences in the scores existed between two-time points. For internal consistency of the PAIS-TR, inter-item correlations were evaluated by calculating Cronbach’s alpha coefficient.

Validity

The validity of the scale was analyzed using Pearson’s correlation analysis in order to investigate correlations between PAIS-TR, Self-Report Scale Score, Stuttering Severity Instrument IV (SSI-IV) and Percentage of Stuttered Syllables (SS%). Pearson’s correlation coefficient over 0.6 was defined as strong correlation while values between 0.3 and 0.6 were defined as moderate correlations (Hinkle et al., 1998). Independent t-tests were conducted in order to compare gender and previous or current speech treatment experience. The data were analyzed using Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA) 22 package program.

3. Results

Descriptive statistics

The mean score of the PAIS-TR was 30.63 (SD=7.68) for the group of CWS and 0.18 (SD=0.43) for their age and gender-matched peers. The mean score of the Self Report Scale Score, Stuttering Severity Instrument IV (SSI-IV) and Percentage of Stuttered Syllables (SS%) was 4.9, 21, 8.9 respectively which implied mild to severe disfluency in the participants. The correlation between PAIS-TR total score and age was significant ($r = , p < .$).

Reliability

In evaluating the test-retest reliability, high correlations were found between scores at Time 1 and Time 2 for the PAIS-TR ($r = 0.99, p < .01$). Cronbach’s alpha value of the scale was 0.98, indicating a high level of internal consistency.

Validity

Table 2 shows the correlations between the PAIS - TR, Self Report Scale Score, Stuttering Severity Instrument IV (SSI-IV) and Percentage of Stuttered Syllables (SS%). All of the correlations between scales were significant. The highest correlation was observed between scales Stuttering Severity Instrument and PAIS-TR total score ($r = 0.927, p < 0.01$) while the lowest was between Subjective Stuttering Severity Measurement and PAIS-TR ($r = 0.79, p < 0.01$).

Table 2. Correlations (pearson product moment) between PAIS-TR Total score and SSI-IV, Subjective Stuttering Severity Measurement, and Percentage of Stuttered Syllables.

	TR-PAIS	SSI-IV	Subjective Stuttering Severity Measurement	Percentage of Stuttered Syllables
PAIS-TR	1	0.92(**)	0.79(**)	0.92(**)
SSI-IV	0.92(**)	1	0.86(**)	0.98(**)
Subjective Stuttering Severity Measurement	0.79(**)	0.86(**)	1	0.83(**)
Percentage of Stuttered Syllables				1

** $p < 0.01$ level (2-tailed).

4. Discussion

The importance of detecting and monitoring premonitory awareness in children who stutter highlights the need for a valid and reliable instrument that can be used widely from clinic to research purposes. Although premonitory awareness has been proved to be a valuable clinical and research concept there are very few valid and reliable instruments that measure it in this way.

Recently, Cholin et al. (2016) developed the PAIS which contains items derived from the PUTS (Assessing Premonitory Awareness in Tic Disorders) (Woods et al., 2005). Most of the items were directly translated and the word “tic disorder” was changed with “stuttering” assuming that the two groups having some phenomenological similarities. Although initial psychometric properties of the PAIS were good, additional psychometric data are needed to replicate the study with an independent sample.

With regard to the reliability of the PAIS-TR, test-retest analyses and Cronbach alpha level were

measured. The correlation between PAIS-TR total score and each item showed also strong correlations as described and discussed below. Cronbach alpha level of the PAIS-TR was 0.97 which indicates a high internal consistency and also higher than the original one (Cholin et al., 2016).

The correlations between scales were high and similar to the original PAIS. Unlike, Cholin's et al.(2016)'s findings, correlations between PAIS-TR and Percentage of Stuttered Syllables and Subjective Stuttering Severity was positive. Although PAIS-TR appears to be less correlated with Subjective Stuttering Severity than the other measures correlational degree was still strong.

The correlation between PAIS-TR total score and age in CWS was also significant. A possible explanation of this can be the increase in the consistency of reporting of preliminary urges.

Anxiety disorders, obsessive-compulsive disorder (OCD) and Attentional Deficit and Hyperactivity Disorder (ADHD) are found to be strongly correlated with premonitory urges in Tourette Syndrome and other chronic tic disorders. A growing body of research has also demonstrated a high rate of ADHD (Riley and Riley, 2000; Ardnt and Healey, 2001; Conture, 2001),

anxiety (Bloodstein and Bernstein Ratner, 2008) and obsessive-compulsive disorders (Murphy et al., 1989) among PWS. Given the comorbidity of all these disorders, it may be an interesting question to evaluate the relationship between anxiety-related physiologic or cognitive symptoms which can be an underlying phenomenon of all these disorders and premonitory urges in the future studies.

The main limitation of the study is the small sample size. Future studies with larger samples and longitudinal designs are needed to understand the dynamic properties of age and therapy on premonitory awareness abilities. Stuttering heterogeneity can also be investigated in relation to different responses to different items of the PAIS-TR. Responses of PWS with different etiologies (e.g., psychogenic stuttering, neurogenic stuttering etc.) is another interesting research question to be investigated.

In summary, the present study replicates the findings of Cholin's et al.(2016)'s findings among a Turkish sample. The reliability and validity measurements demonstrate that the Turkish version of the PAIS is, like the original one, a psychometrically valid and reliable instrument that can be used both for research purposes and in healthcare practice.

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