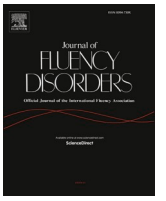
Journal of Fluency Disorders 81 (2024) 106074

Contents lists available at ScienceDirect

Journal of Fluency Disorders

journal homepage: www.elsevier.com/locate/jfludis



Italian normative data for the Unhelpful Thoughts and Beliefs about Stuttering (UTBAS) Scales for adults who stutter

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ARTICLE INFO

Keywords:
UTBAS scales
Reliability
Validity
Adults who stutter
Negative thoughts

ABSTRACT

Purpose: This study aimed to assess the reliability and validity of the Italian translation of the Unhelpful Thoughts and Beliefs about Stuttering (UTBAS) scales for adults who stutter, as there are no assessment tools currently available in Italy. The UTBAS scales provide a comprehensive stuttering-specific measure of the unhelpful thoughts and beliefs that can be used to screen for indicators of social anxiety in adults who stutter. Additionally, the UTBAS scales also allow the identification of negative thoughts and beliefs that negatively impact speech treatment outcomes.
Method: The translation of the UTBAS scales into Italian (UTBAS-ITA) was completed using the forward-backward translation process and it was administered to 98 adults who stutter (AWS) and 98 adults who do not stutter (AWNS). Both groups were matched for gender and age. We also administered the UTBAS-ITA to 76 AWS a second time within a two-week interval to assess test-retest reliability. Additionally, we administered the State-Trait Anxiety Inventory and the Fear of Negative Evaluation Scale to 20 AWS to assess concurrent validity.
Results: The UTBAS-ITA showed good power of discrimination between AWS and AWNS, high internal validity, high internal consistency, good construct validity, and good test-retest reliability.
Conclusion: Since there is a scarcity of clinical assessment tools for adults who stutter in Italy, the UTBAS-ITA could serve as an assessment tool and outcome measure for clinical and research environments.

1. Introduction

In the past, developmental stuttering was seen as a communication disorder entirely characterized by disturbance of the fluent rhythm of speech. However, over the last decades fluency specialists have emphasized that focusing solely on dysfluency is not enough to determine if someone is starting to stutter because to do so "*it ignores the person; it ignores his feelings about himself; it ignores the significance of stuttering in his life*" (Sheehan, 1984, p. 226). In this light, developmental stuttering can be considered a speech-motor disorder that involves affective, behavioral and cognitive components (Yaruss & Quesal, 2006; Guitar, 2014) which can significantly impact functioning across various areas of a person's daily life (Craig & Tran, 2014; Messenger, Onslow, Packman & Menzies, 2004).

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https://doi.org/10.1016/j.jfludis.2024.106074
Received 27 June 2023; Received in revised form 27 February 2024; Accepted 7 March 2024
Available online 25 June 2024

Healey et al. (2004) proposed a multidimensional model called "CALMS" to better understand the different facets of stuttering. This model suggests that stuttering results from a complex interplay of five factors: cognitive, affective, linguistic, motor, and social. All these components, along with their interactions, trigger disfluencies and influence stuttering in different ways. Thus, people who stutter may experience varying degrees of influence on the frequency, type, and duration of their speech disfluencies. The CALMS model hypothesizes that the cognitive component could play an adverse role in stuttering, as illustrated by the examples in brackets. It includes thoughts (which may be negative for people who stutter), perceptions (which could be associated with negative views of their own stuttering or people's reactions to their stuttering), awareness (which may increase sensitivity to stuttering and make it worse), and knowledge and understanding of stuttering. By focusing on this component, it is possible to investigate dysfunctional thoughts, beliefs, and attributional styles related to the nature of the disorder (Healey et al., 2004, p. 9). These elements can impact an individual's mental health, generate negative emotional reactions such as anxiety, lead to avoidance behavior, and contribute to the persistence of disfluency (St. Clare, Menzies, Onslow, Packman, Thompson & Block, 2009). Adults who stutter (AWS) have reported that stuttering had effects on their social and emotional functioning (Hayhow, Cray, & Enderby, 2002; Hugh-Jones & Smith, 1999) and that the disorder can affect their quality of life (Craig, Blumgart, & Tran, 2009). Therefore, it is important to explore these elements to have a complete understanding of stuttering.

1.1. Stuttering and mental health

Mental health disorders are more prevalent in persons who stutter (PWS) compared to those who do not (PWNS) (Menzies et al., 1999). According to Iverach et al. (2009), individuals who stutter and seek treatment are 4.5 times more likely to have generalized anxiety disorder, 2.1 times more likely to have a mood disorder, 1.9 times more likely to experience major depression, and 3.0 times more likely to have a personality disorder than control groups. Furthermore, the presence of mental health disorders among AWS (including anxiety disorders) has been shown to interfere with recovery processes (Craig & Hancock, 1995; Belanger et al., 2016; Iverach et al., 2009) and have the potential to negatively impact the maintenance of fluency after a speech restructuring treatment; the presence of a mental health diagnosis is associated with higher rates of relapse six months after speech treatment (Iverach et al., 2009).

1.2. Stuttering and anxiety

Anxiety can be a complex psychological experience that involves feelings of fear and apprehension about a potential negative event. Anxiety is usually a helpful emotion as it aids in avoiding danger. However, if it becomes excessive in terms of frequency, severity, or persistence, and starts interfering with daily functioning, it may be considered problematic. In the context of stuttering, research suggests that the act of stuttering is commonly associated with elevated levels of anxiety, especially when speaking in social situations that are perceived as challenging (Craig et al., 2014; Jackson, Yaruss, Quesal, Terranova & Whalen, 2015). One key question is whether the anxiety experienced by PWS is a specific condition only related to speech, or if it is a symptom of a more broader anxiety disorder, such as social anxiety disorder. The *Diagnostic and Statistical Manual of Mental Disorders- Fifth Edition* (DSM-5, APA, 2013) defines social anxiety disorder as a type of anxiety disorder characterized by "*marked fear or anxiety about one or more social situations in which the individual is exposed to possible scrutiny by others*." In addition, it is reported that "*the individual fears that he or she will act in a way or show anxiety symptoms that will be negatively evaluated*" and that "*the fear, anxiety, or avoidance is persistent, typically lasting for 6 months or more*" (p. 202–203). This discomfort differs from developmentally normative fear or anxiety, as it is out of proportion to the actual threat posed by the social situation and to the sociocultural context. People with Social Anxiety Disorder may also experience physical symptoms such as arousal, including diaphoresis, apnea, tremors, tachycardia, and nausea. The discomfort that people with Social Anxiety Disorder experience can be triggered by routine activities such as eating in front of others, or using a public bathroom. Social anxiety disorder can have adverse effects on the lives of those affected: fear and anxiety can result in social avoidance and isolation. Severe stress can affect relationships, daily routines, work, school or other activities (American Psychiatric Association, 1980). According to DSM-5, it is important to note that in order to diagnose Social Anxiety Disorder, any other medical condition present, such as stuttering, must not be the sole cause of anxiety, fear, or avoidance.

Analyzing the relationship between stuttering and anxiety, a meta-analysis by Craig and Tran (2014) highlighted that the majority of AWS have at least moderately elevated trait anxiety and substantially elevated social anxiety. Moreover, some studies have found that, in general, AWS have higher anxiety scores than control groups, but slightly lower than those with psychiatric conditions (Kraaimaat et al., 1991; Vanryckeghem, Matthews, & Xu, 2017; Mahr, & Torosian, 1999). Other studies showed that up to 60 % of adults seeking treatment for stuttering may also meet a diagnosis of social anxiety disorder (Blumgart et al., 2010b; Menzies, O'Brian, Onslow, Packman, Clare & Block, 2008; Stein et al., 1996). This percentage was found to be higher compared to a healthy control group (Craig et al., 2014; Iverach & Rapee, 2014; Smith, 2017). However other researchers have questioned the idea that stuttering might be related to chronic anxiety (Attanasio, 2000; Miller & Watson, 1992). Even the research on stuttering in children is limited and the findings are mixed (Brundage et al., 2021; Bernardini et al., 2016; Craig & Hancock, 1996; Iverach et al., 2016; Ortega & Ambrose, 2011; Rodgers et al., 2022; Smith et al., 2017). A recent systematic review and meta-analysis led by Bernard et al. (2022) suggests that children and adolescents who stutter experience higher levels of anxiety symptoms when compared to their non-stuttering peers. Moreover, a recent study by Eggers et al. (2022) suggests that even in children who stutter, levels of anxiety that reach clinical threshold are more prevalent than would be expected based on population data. To sum up, consistent findings from multiple studies suggest that in individuals who stutter, anxiety often develops during childhood and may continue or reappear over time (Eggers et al., 2022). However, while it is generally accepted that AWS experience clinically relevant speech-related anxiety when compared to the control group, there is still an ongoing debate about the possible comorbidity between anxiety disorders and stuttering.

It is well known that anxiety has various components. These include cognitive factors, such as mental activities characterized by anticipation, apprehension, worry, and obsessive ideas. Additionally, psychophysiological factors, such as the activation of the autonomic nervous system and the production of vegetative symptoms, as well as behavioral factors, such as facing or escaping reactions to re-establish the optimal conditions of wellbeing, are also involved (Galeazzi & Meazzini, 2004). Unhelpful thoughts and irrational beliefs are significant factors in creating and maintaining anxiety, as well as applying safety behaviors. Research indicates that AWS tend to have more unhelpful thoughts and irrational beliefs related to their stuttering and the negative consequences it may have on their social interactions (St. Clare et al., 2009; Iverach, Menzies, Jone, O'Brian, Packman & Onslow, 2011; Chu, Sakai, Mori & Iverach, 2016; Uysal & Ege, 2019). Consequently, it is vital to use assessment tools that can identify these dysfunctional cognitive patterns during the assessment process.

1.3. Psychological measures in standard speech assessment

These pieces of evidence suggest the need to include and integrate psychological measures and strategies into standard speech assessment and treatment in order to understand the cognitions, beliefs, and anxiety experienced by adults who stutter (Bloodstein et al., 2021; Blumgart, Tran & Craig, 2010a, 2010b; Messenger et al., 2004; Menzies et al., 2008; Bernardini, Lanfranchi, Di Gregorio & Irovec, 2022) and to manage their social anxiety and speaking fears (Craig, 1998; Bernstein Ratner, 2005; Susca, 2006). Moreover, there is also a need to identify tools able to assess the presence and frequency of cognitive component of social anxiety among adults who stutter which relate predominantly to unhelpful thoughts and beliefs about the perceived threat of negative evaluation by others (Hoffman & Barlow, 2002). This is particularly important considering standard measures of social anxiety do not specifically target the unique, speech-related anxieties experienced by people who stutter (St. Clare et al., 2009). In this sense we believe that UTBAS can effectively capture unhelpful thoughts, beliefs and anxiety associated with stuttering.

1.4. The UTBAS scales for assessing adults who stutter: an overview

The first scale that was directly obtained from responses involving adults who stutter undergoing psychiatric interviews and treatment for anxiety was the Unhelpful Thoughts and Beliefs About Stuttering Scale (UTBAS, St. Clare et al., 2009), a comprehensive self-report measure of the negative thoughts and beliefs associated with social anxiety in stuttering. The UTBAS scale was developed by clinical psychologists and speech-language pathologists from a review of audio files of treatment of adults who stutter that were involved in a Cognitive Behaviour Therapy program for social anxiety over a 10-year period in a clinic in Sydney, Australia. The first version of UTBAS (St. Clare et al., 2009) contained only one scale and was made up of a list of 66 commonly occurring negative thoughts experienced by adults who stutter such as "*people focus on every word I say*".

Two years later, Iverach et al. (2011) developed and validated the original UTBAS scale as a measure of unhelpful thoughts and beliefs about stuttering among a large sample of adults who stutter (140 subjects) seeking speech treatment for stuttering. They also extended the original UTBAS scale to include the assessment of the frequency of negative thoughts and beliefs (UTBAS I); beliefs in these thoughts (UTBAS II); anxiety associated with these thoughts (UTBAS III); and the total frequency, beliefs and anxiety associated with these thoughts (UTBAS Total).

The UTBAS scales demonstrated strong internal consistency, test-retest reliability, and convergent and discriminant validity (Chu et al., 2016; Iverach et al., 2011; Uysal & Ege, 2019). In particular, the measure was found to discriminate between the unhelpful cognitions related to social anxiety for stuttering and control participants, with large effect sizes (Iverach et al., 2011). Higher UTBAS scores are associated with an increased likelihood of meeting DSM-5 diagnostic criteria for anxiety disorders (Iverach et al., 2011). Therefore Iverach et al. (2016) created a brief version of UTBAS scales (UTBAS-6) to be used as a screening instrument.

The UTBAS scales can be downloaded from the website of the Australian Stuttering Research Centre, along with its translation into 15 languages, therefore it can be used by clinicians around the world to screen for indicators of social anxiety in adults who stutter. The UTBAS scales are a reliable, valid and fast way to explore the inner cognition of persons who stutter; it may also identify negative thoughts and beliefs which have the potential to negatively impact speech treatment outcomes.

1.5. The present study

The adaptation of the UTBAS scales in different countries should contribute to establishing the UTBAS as a cross-cultural tool used in clinical settings. At present, only Japanese and Turkish versions of the UTBAS scales have been validated (Chu et al., 2016; Uysal & Ege, 2019). As far as the Italian population is concerned, only a few standardized assessment tools are available to assess cognitive aspects in children and adults who stutter. For children, there are the Behavior Assessment Battery for school-age children who stutter (Vanryckeghem & Brutten, 2017) and the KiddyCAT Communication Attitude Test for Preschool and Kindergarten children who stutter (Vanryckeghem, & Brutten, 2022). Moving to adulthood, there is the Overall Assessment of the Speaker's Experience of Stuttering (Accornero, Del Gado, Marchetti, Strangis & Tomaiuoli, 2023). However the UTBAS scales are unique self-report scales that can identify negative thoughts and beliefs related to speech anxiety, while also screening for indicators of social anxiety in AWS. For this reason, the UTBAS scales have been translated into Italian in order to be used in the Italian context.

The aim of the present study is to examine the psychometric properties of the Italian version of the UTBAS scales (UTBAS-ITA). Appropriate assessment tools are fundamental for obtaining information and creating an individualized and successful treatment plan for people who stutter. Having the Italian version of a self-report measure for evaluating the thoughts, beliefs, and anxiety of adults who stutter would benefit both researchers and clinicians by informing research-based assessments and clinical decision-making.

Additionally, it would facilitate the utilization of Cognitive Behaviour Therapy programs for AWS that show social anxiety symptoms and consequently enhance the effectiveness of therapy.

2. Method

2.1. Participants

A total of 196 participants took part in the study. This pool of participants was divided into two groups.

The first group included 98 adults who stutter (AWS), aged between 18 and 68 years (mean age 37.02 years; sd= 11.94); 57 of the participants (58.1 %) were male and 41 of them (41.84 %) were female. These participants were recruited across Italy through psychologists, psychotherapists and speech therapists specialized in stuttering, as well as through the Italian Association on Stuttering and Communication.

The second group which consisted of 98 adults who do not stutter (AWNS), matched to the AWS group for gender and age, was considered as a control group. They were aged between 19 and 68 years (mean age 37.01 years; sd= 12.00). 57 of the participants (58.1 %) were male and 41 of them (41.84 %) were female. Participants were recruited through personal contacts of the authors.

All participants in both of these groups were Italian and spoke Italian as their first language.

2.2. UTBAS I, II, III scales

The UTBAS is a self-report questionnaire which measures unhelpful thoughts, beliefs, and anxiety associated with stuttering (Iverach et al., 2011). It is made up of 66 items divided in three scales that assess: (I) frequency of negative thoughts and beliefs (UTBAS I), (II) how realistic, accurate and correct these thoughts are considered (UTBAS II), and (III) anxiety associated with these thoughts (UTBAS III). For UTBAS I, participants are asked to rate how frequently they experience each thought using a 5-point Likert scale (1 = 'never have the thought', 2 = 'rarely have the thought', 3 = 'sometimes have the thought', 4 = 'often have the thought', 5 = 'always have the thought'). For UTBAS II, participants are asked to indicate how much they believe in each thought using a 5-point scale (1 = 'I don't believe this at all', 2 = 'I believe this a little', 3 = 'I believe it somewhat', 4 = 'I believe this a lot', 5 = 'I believe this totally'). For UTBAS III, participants are asked to indicate how anxious each thought makes them feel using a 5-point scale (1 = 'does not make me anxious at all', 2 = 'makes me a little anxious, 3 = "makes me somewhat anxious", 4 = 'makes me very anxious, 5 = "makes me extremely anxious"). Of these 66-items, 27 make a specific reference to stuttering (e.g., "People who stutter are boring"), and 39 make no direct reference to stuttering (e.g., "People will laugh at me"). Item responses are summed to calculate the total score of each scale (ranging from 66 to 330) and the Total UTBAS score (that range from 198–990). Higher scores indicate greater negative thoughts, beliefs, and anxiety associated with stuttering.

2.3. Translation of the UTBAS into Italian

Translation of the original English version of the UTBAS scales into Italian was based on a standard forward-backward translation process (Herdman, Fox-Rushby, Rabin, Badia & Selai, 2003) to ensure clear comprehensibility. First, the UTBAS original version was translated into Italian by a native Italian speaker who was fluent in English. In the translation process, we carefully chose our wording to avoid using offensive terms in our language. Then, the Italian version of the UTBAS was back-translated into English by a professional translator. The research team of the original version then compared the back translation with the original version. Discrepancies were discussed through emails with one of the authors of the UTBAS development and validation (Iverach et al., 2011) and an agreement was found. The final version of the UTBAS was approved by one of the authors of the original version.

2.4. Validity measures

To assess the validity of the UTBAS-ITA the correlation with the Italian version of the State-Trait Anxiety Inventory (STAI, Spielberg, Gorsuch, Lushene, Vagg & Jacobs, 1993) and the Fear of Negative Evaluation Scale (FNE, Watson & Fiend, 1969) was calculated.

The STAI is one of the most commonly used self-report anxiety scales for rating the severity of anxiety symptoms. It includes two subscales, STAI Y1 and STAI Y2, with a total of 40 items. The STAI Y1 subscale (20 items) measures state anxiety, while the STAI Y2 subscale (20 items) assesses trait anxiety.

State anxiety refers to a transient emotional state or condition of the human organism which is characterized by subjective feelings, perceived at a conscious level, of tension and apprehension and by the amplified activity of the autonomic nervous system. It can vary and fluctuate in time. It reflects an individual tendency to reply with higher or lower levels of anxiety to a variety of situations.

Trait anxiety refers to a collection of stable individual differences in the tendency to experience anxiety. It refers to the variation amongst people in their inclination to react to threatening situations with heightened levels of state anxiety (Spielberger, 1970).

State anxiety items include: "I am tense; I am worried" and "I feel calm; I feel secure." Trait anxiety items include: "I worry too much over something that really doesn't matter" and "I am content; I am a steady person". Participants are asked to rate how they feel while completing the questionnaire (state anxiety) and how they usually feel (trait anxiety) on a 4-point Likert scale (1=not at all, 2=a little, 3=somewhat, 4=very much). The total score is the sum of the score for each item. The scores of each subscale range between 20 and 80, the higher score indicating higher levels of anxiety. A score above 40 is considered clinically relevant (Julian, 2011).

The FNE is a 30-item questionnaire which assesses social anxiety. Social anxiety is characterized by exceedingly high levels of fear or anxiety about social situations in which the person is exposed to possible scrutiny by others, such as during social interactions, being observed, or performing in front of others (American Psychiatric Association, 1980). Each item on the FNE is a statement about a specific aspect of social anxiety and participants are asked to decide whether each statement is true or false. Some examples of the FNE items are: "I am often afraid that I may look ridiculous or make a fool of myself"; "If someone is evaluating me I tend to expect the worst".

The questionnaire assigns one point for each answer that indicates excessive concern for others' opinions. The total score ranges from 0 to 30, and a score greater than 19 is considered clinically relevant.

2.5. Procedure

Due to the pandemic, we created an online questionnaire and demographic form using the Qualtrics platform. Participants, who agreed to take part in the study, received an email invitation with a link and a password to access and fill the questionnaire.

In order to assess the UTBAS-ITA reliability a subsample of 76 AWS (mean age=38.29: sd= 11.80) filled the UTBAS-ITA two times, 15 days apart. In addition, to assess construct validity, a subsample of 20 AWS filled also the STAI and FNE questionnaires. The subsample consisted of 16 males (80 % of the total sample), aged 19 to 18 years (mean age=29.25: sd= 8.00). All the participants gave their written consent to take part in the research.

2.6. Data analysis

The normality of scores distribution was tested using the Shapiro-Wilk test, which indicated that the scores of the three scales and total scores were not distributed normally in both groups. Both of them tended to be skewed to lower scores. Therefore, non-parametric statistics were used.

2.6.1. Validity

To determine the effectiveness of UTBAS-ITA in discriminating between AWS and AWNS, Mann-Whitney Us for independent samples were conducted on the UTBAS scales and total scores. This analysis was carried out both considering all the 66 UTBAS items and also considering only the 39 general items that do not directly refer to stuttering.

To assess the UTBAS-ITA internal validity for both the AWS and AWNS groups separately, Spearman correlations were conducted across the three scales (I, II, III), as well as between the scales and the UTBAS-ITA total score.

To evaluate the UTBAS-ITA construct validity, Spearman correlations were run between UTBAS-ITA and other questionnaires assessing state and trait anxiety (STAI) and social anxiety (FNE). This analysis was run in a subsample of 20 AWS.

To determine the comparability between the original and the Italian version of the UTBAS, Australian and Italian AWS data (both scales and UTBAS Total) were compared using the Wilcoxon signed-rank test.

Finally, to examine the differences between male and female participants, the Mann-Whitney U for independent samples was conducted on the UTBAS scales and total score. This analysis was carried out for both AWS and AWNS groups.

2.6.2. Reliability

The internal consistency (i.e. the reliability of a test based on the correlations among all items) of the UTBAS-ITA was evaluated with Cronbach's alpha coefficient. A coefficient above 0.70 suggests a good internal consistency and reliability (Nunnally, 1978); when 0.80–0.85 or higher, it may be considered sufficiently reliable for a clinical use (Rosenthal & Rosnow, 1991).

In order to evaluate the test-retest reliability, a subsample of 76 AWS completed the Italian version of the UTBAS on two occasions 15 days apart. Spearman correlations between UBAS I, II, III and Total scores at Time 1 and Time 2 were calculated.

2.6.3. Clinical interpretation

Decile ranges for the UTBAS-ITA scales were computed to facilitate a clinical interpretation of the data. Deciles were calculated

Table 1
M (SD) for the UTBAS-ITA scores are reported for both the AWS (n = 98) and AWNS (n = 98) group.

	AWS M (SD)	AWNS M (SD)	U-Mann-Withney test
66 items			
UTBAS-ITA I	134.55(43.45)	88.23(26.24)	U= 1454.50, $p < 0.001$, r_{pb}=0.68
UTBAS-ITA II	130.49(39.23)	91.79(30.33)	U= 1692.50, $p < 0.001$, r_{pb}=0.65
UTBAS-ITA III	144.67(49.33)	98.29(39.99)	U= 1967.50, $p < 0.001$, r_{pb}=0.59
UTBAS-ITA Total	409.71(128.33)	278.32(87.52)	U= 1674.50, $p < 0.001$, r_{pb}=0.65
39 items			
UTBAS-ITA I	78.13(26.79)	54.21(17.29)	U= 1988.50, $p < 0.001$, r_{pb}=0.58
UTBAS-ITA II	76.10(24.84)	55.76(19.71)	U= 2136, $p < 0.001$, r_{pb}=0.56
UTBAS-ITA III	84.89(30.84)	60.59(25.75)	U= 2350, $p < 0.001$, r_{pb}=0.51
UTBAS-ITA Total	239.12(80.11)	170.56(56.69)	U= 2158, $p < 0.001$, r_{pb}=0.55

Note: U=U-Mann-Withney test, p = p-value, r_{pb}=rank biserial correlation (measure of effect size).

based on the scores of the AWS group. The fifth decile in the UTBAS-ITA Total score was established as the cut-off point for defining the clinical range, in accordance with the procedure outlined by Iverach et al. (2016). This decision aligns with findings from a previous study where AWS diagnosed with social anxiety exhibited higher UTBAS scores compared to AWS without a social anxiety diagnosis (Iverach et al., 2011).

3. Results

3.1. Validity

Table 1 shows descriptive statistics of the AWS and AWNS groups, together with the results of the Mann-Whitney U test which was conducted to compare AWS and AWNS scores. This analysis was carried out for all 66 UTBAS items and the 39 general items that do not directly refer to stuttering.

AWS scored higher than AWNS in UTBAS-ITA I, II, III, and total score, both considering all the 66 items and considering only the more general items. The total score took into account both the 66 UTBAS items and the 39 more general items.

To assess internal validity, Spearman correlation tests were conducted across the three scales and the total score of the UTBAS-ITA, separately for the AWS and AWNS groups (Table 2).

In both groups all inter-correlations between UTBAS-ITA scales, as well as between the scales and the UTBAS-ITA total score were strong, confirming good internal validity.

To assess construct validity, Spearman correlation tests were conducted across the UTBAS-ITA scales and the anxiety questionnaires (STAI and FNE) in a subgroup of 20 AWS participants. Descriptive statistics of the STAI and FNE scores are reported in Table 3, along with the percentages of participants falling in the clinical range. Correlations are reported in Table 4.

Among the group of 20 individuals who completed the STAI and FNE assessments, 45 % fell in the clinical range for state and social anxiety, while 90 % fell in the clinical range for trait anxiety. Moreover 89 % of those who fell in the clinical range in STAI or FNE also fell in the clinical range for UTBAS-ITA.

Moderate significant correlations emerged between all the UTBAS-ITA scales and the social anxiety scale (FNE). However, a strong correlation emerged when considering the UTBAS-ITA Total score. Regarding the other two scales assessing state (STAI Y1) and trait (STAY Y2) anxiety, only a moderate significant correlation emerged between the UTBAS-ITA Total score and STAI Y2.

To assess validity, scores of the Australian (Iverach et al., 2011) and the Italian version of the UTBAS Scale were compared. Table 5 shows descriptive statistics and the results of the comparison between the two groups.

Significant differences between the Italian and Australian group emerged in all of the UBAS I scores. The Italian group presented lower scores than the Australian group, indicating less negative thoughts, beliefs, and anxiety associated with stuttering.

The Mann-Whitney U test was carried out to compare the UTBAS scores between male and female participants in both the AWNS and AWS groups, as shown in Table 6.

Significant differences between male and female participants were found in UTBAS-ITA scores in the AWS group in UTBAS-ITA III ($p = 0.04$), with female participants presenting higher scores. No significant differences were found within the AWNS group results.

3.2. Reliability

Cronbach's alpha scores for the UTBAS-ITA total score were found to be 0.99 for both AWS and AWNS groups. The alpha scores for each of the three subscales were 0.97 for the AWS group and ranged from 0.97 to 0.98 for the AWNS group. These alpha scores suggest a very high internal consistency.

To determine test-retest reliability, correlations were observed on a subsample of 76 AWS considering Time 1 and Time 2. High correlations were found between scores at Time 1 and Time 2 for the UTBAS-ITA I (rho=0.93), UTBAS-ITA II (rho=0.93), UTBAS-ITA III (rho=0.95), UTBAS-ITA Total (rho=0.95).

3.3. Clinical interpretation

Decile ranges for the UTBAS-ITA scales were calculated in order to allow a clinical interpretation of the data (Table 7). These deciles were calculated based on the scores of the AWS group. Scores falling in the fifth or above decile in the UTBAS-ITA Total are considered in a clinical range. This cutoff was established following the method outlined by Iverach et al. (2016), who considered the mean UTBAS score of AWS diagnosed with social anxiety to establish this threshold (Iverach et al., 2011).

Table 2
Correlations. AWS below the diagonal (N = 98), AWNS above the diagonal (N = 98).

	UTBAS-I I	UTBAS-I II	UTBAS-I III	UTBAS-I TOTAL
UTBAS-ITA I	—	0.818	0.755	0.849
UTBAS-ITA II	0.897	—	0.822	0.905
UTBAS-ITA III	0.914	0.889	—	0.961
UTBAS-ITA Total	0.968	0.948	0.971	—

Table 3
Descriptive statistics for the STAI and FNE in the AWS group (n = 20).

	M (DS)	% (n) in the clinical range	% (n) in the STAI/FNE clinical range that are also in the UTBAS-ITA clinical range
STAI Y1	41.85 (11.02)	45 % (n = 9)	89 % (n = 8)
STAI Y2	48.00 (9.03)	90 % (n = 18)	89 % (n = 16)
FNE	19.20 (6.53)	45 % (n = 9)	89 % (n = 8)

Note. The clinical range for the STAI is represented by a score above 40, and for the FNE, a score above 19.

Table 4
Correlations between UTBAS-ITA scales and STAI and FNE in the AWS group (n = 20).

	STAI Y1	STAI Y2	FNE
UTBAS-ITA I	-0.082	0.421	0.667***
UTBAS-ITA II	0.098	0.412	0.534**
UTBAS-ITA III	-0.046	0.426	0.691***
UTBAS-ITA Total	-0.046	0.466*	0.730***

Note. *p < .05, **p < .01, ***p < .001

Table 5
Comparison between Italian (n = 98) and Australian normative sample (n = 140). Wilcoxon signed-rank test results are reported in the last column, together with a measure of effect size (r_{pb}=rank biserial correlation).

	Italian M (SD)	Australian M (SD)	Wilcoxon-test
UTBAS I	134.55(43.45)	164.80(52.20)	W=735.00, p < 0.001, r_{pb}=0.70
UTBAS II	130.49(39.23)	145.20(52.90)	W =1291.00, p < 0.001, r_{pb}=0.47
UTBAS III	144.67(49.33)	159.10(61.90)	W =1500.00, p = 0.002, r_{pb}=0.38
UTBAS Total	409.71(128.33)	468.50(160)	W =1144.00, p < 0.001, r_{pb}=0.53

Note: W=Wilcoxon signed-rank test, p = p-value, r_{pb}=rank biserial correlation (measure of effect size).

Table 6
M (SD) for the UTBAS-ITA scores are reported for the male and the female groups in both the AWS and AWNS groups. U-Mann-Withney test results are reported in the last column, together with a measure of effect size (r_{pb}=rank biserial correlation).

	Males M (SD) (n = 57)	Females M (SD) (n = 41)	U-Mann-Withney test
AWS			
UTBAS-ITA I	127.35 (39.34)	144.56 (47.29)	U= 899.50, p = 0.05, r_{pb}=0.23
UTBAS-ITA II	125.42 (34.86)	137.54 (44.07)	U= 972.50, p = 0.16, r_{pb}=0.16
UTBAS-ITA III	134.58 (43.70)	155.58 (53.16)	U= 885.00, p = 0.04, r_{pb}=0.24
UTBAS-ITA Total	387.35 (113.91)	437.68 (140.93)	U= 926.00, p = 0.08, r_{pb}=0.21
AWNS	(n = 57)	(n = 39)	
UTBAS-ITA I	82.76 (15.49)	86.67 (17.94)	U= 950.50, p = 0.35, r_{pb}=0.12
UTBAS-ITA II	85.13 (16.89)	93.23 (33.50)	U= 999.50, p = 0.59, r_{pb}=0.07
UTBAS-ITA III	88.27 (24.28)	100.67 (42.15)	U= 911.00, p = 0.22, r_{pb}=0.15
UTBAS-ITA Total	256.16 (50.35)	280.56 (79.02)	U= 902.50, p = 0.19, r_{pb}=0.16

4. Discussion

This study aimed to explore the psychometric properties of the Italian version of the UTBAS scales for adults who stutter. Based on the validity and considering both the general and subscale scores, our data indicate that the UTBAS-ITA can effectively discriminate between AWS and AWNS. The scores of AWS are higher than those of AWNS, suggesting that negative thoughts are more frequent and perceived as realistic and anxious in this group. These results are consistent with other studies that used the original version of the UTBAS (Iverach et al., 2011) or a translation in another language (Chu et al., 2016; Uysal and Ege, 2019). Moreover, the three UTBAS-ITA scales were all strongly inter-correlated (0.82–0.96), which suggests a good internal validity of the UTBAS-ITA scales. Construct validity was also assessed by examining the correlations between the UTBAS-ITA scales and scales measuring anxiety (i.e.,

Table 7
Decile ranges for the UTBAS-ITA scales, for the AWS.

Decile	UTBAS-ITA I	UTBAS-ITA II	UTBAS-ITA III	UTBAS-ITA Total
1	68-83	71-84	71-82	212-251
2	84-94	85-93	83-99	252-283
3	95-108	94-111	100-111	284-330
4	109-120	112-119	112-125	331-372
5	121-130	120-126	126-139	373-412
6	131-138	127-135	140-153	413-427
7	139-155	136-145	154-167	428-457
8	159-169	146-159	168-184	458-505
9	179-186	160-181	185-207	506-561
10	187-295	182-287	208-299	562-881

state, trait, and social anxiety).

The results showed a significant correlation between trait anxiety (but not state anxiety) and the UTBAS-ITA total score. This association aligns with the findings of Iverach et al.'s study (2011), while Uysal and Ege (2019) indicated an association with state anxiety but not trait anxiety. Moreover, upon examining the percentages of participants within the clinical ranges (45 % for state and social anxiety and 90 % for trait anxiety), it became evident that the majority of those in the clinical range for trait, state and social anxiety also fell within the UTBAS-ITA clinical range. The presence of state and trait anxiety in people who stutter has been studied, but the findings are mixed. Some studies report the presence of state anxiety (Craig, 1990; Gabel, Colcord, & Petrosino, 2002; Peters & Hulstijn, 1984) while others report the presence of trait anxiety (Craig & Tran, 2014; Ezrati-Vinacour & Levin, 2004). These mixed findings might be explained by the multidimensional model of trait and state anxiety. For instance, when investigating the relationship between anxiety and stuttering, Ezrati-Vinacour and Levin (2004) found that people who stutter exhibited higher levels of anxiety compared to normally fluent speakers.They found that both trait and state anxiety were associated with situations requiring speech. Hence, the anxiety experienced by individuals who stutter can be considered a generalized stress trait, potentially specific to speech communication.

In addition to state and trait anxiety, Craig and Tran's meta-analysis (2014) revealed that elevated levels of social anxiety were observed in adults who stutter. This finding was also evident in the present study, as higher levels of negative thoughts, perceived as realistic and leading to anxiety, were correlated with increased social anxiety, as assessed with the FNE. This association between UTBAS and FNE was also identified in the study by Iverach et al. (2011). These findings are consistent with existing literature indicating that individuals with stuttering often experience social anxiety (e.g., Kraaimaat et al., 2002; Iverach & Rapee, 2014; Messenger et al., 2004). In particular, Messenger et al. (2004) observed that individuals who stutter have higher negative social evaluation than individuals who do not stutter, therefore perceiving danger or harm in social context.

This study also compared data collected in Italy and Australia. Significant differences were found between the Australian and Italian samples for the UTBAS I, UTBAS II, UTBAS III, and UTBAS Total scores. The results from the Italian group in all three scales (less negative thoughts, beliefs, and anxiety associated with stuttering) were lower than the results from the Australian group. The most significant difference was apparent in UTBAS I: the Australian group's data showed a higher frequency of negative thoughts and beliefs about stuttering than the Italian group. Our results are consistent with previous research on the Turkish and Japanese version of the UTBAS (Chu et al., 2016; Uysal and Ege, 2019). It is possible that this result is due to different characteristics of the two samples. On the one hand, the majority of the Australian sample was assessed while waiting to start a speech treatment for stuttering or received cognitive behavioral therapy (CBT) for anxiety. This suggests that they may have been experiencing higher distress.

On the other hand, a substantial number of Italian participants in this study were active members of an Italian self-help group, which could have helped them express their thoughts and feelings about stuttering and become more self-aware (Murgallis et al., 2015). Therefore, a high rate of support group attendance in the Italian sample may have contributed to lower negative thoughts and beliefs about stuttering. Furthermore, as most of the Italian participants had undergone speech therapy for stuttering or received CBT for anxiety, it is possible to assume that these therapies have equipped them with effective coping strategies to manage stressful situations associated with stuttering.

Finally, the AWS group showed some differences between male and female participants. The present research shows that female participants experience more anxiety connected with dysfunctional and unhelpful thoughts (UTBAS-III-ITA) in comparison to the male participants. This is in line with previous studies reporting women as more likely to be affected by anxiety disorders than men (McLean, Asnaani, Litz & Hofmann, 2011; Javaid, Hashim, Hashim, Stip, Samad & Ahbabi, 2023). Moreover, a similar trend was observed in the data collected for the Italian standardization of the Behavior Assessment Battery for School-Age Children Who Stutter (BAB - Vanryckeghem & Brutten, 2017), where both females who stuttered and those who did not stutter scored significantly higher than males in the Speech Situation Checklist-Emotional Reaction (SSC-ER), a questionnaire that investigates speech-associated negative emotional reactions. However, other studies did not reveal any significant differences on the anxiety scales with regard to gender differences in people who stutter (Blumgart et al., 2010b; Chu et al., 2016). More studies are needed in order to understand whether these results are more culturally specific or could be generalized to the general AWS population.

Focusing on reliability, the data suggest that UTBAS-ITA has a high internal consistency, with the three scales assessing related constructs. In addition, a high test-retest correlation was found which indicated the scale's stability of scores over time.

Finally, we have provided data in Table 6 for clinical practice. Clinicians can use this table to determine whether individuals with

stuttering require a psychological assessment that delves deeper into the dimension of anxiety. However, it should be noted that total scores falling below the fifth decile do not exclude the presence of clinically significant disorders.

4.1. Limitations and future direction

It is important to acknowledge the limitations of the present study. In terms of the study sample, all participants were recruited through professionals that treat stuttering or through the Italian Association on Stuttering and Communication. As previously mentioned, it is possible that this sample has particular characteristics in terms of self-perceptions and self-esteem. Therefore, it is recommended to expand this investigation by enlisting more participants from various sources, including those who do not seek clinical services. This will enable the findings to be generalized to the broader population of individuals who stutter.

Another limitation of this study is the particular historical period in which the data was collected. There is evidence suggesting that during the pandemic years the level of anxiety of the adult population had increased (Daly & Robinson, 2022). Although we have no indication that the chosen method and approach of data collection affected the results, it would be advisable to repeat the study and compare the online version with the traditional paper and pencil version of the UTBAS to be certain.

4.2. Conclusion

In summary, our findings support that UTBAS-ITA is a reliable and valid assessment tool that can be used in research and clinical settings. In research, UTBAS-ITA can help identify areas where interventions can be targeted and evaluate treatment outcomes in studies assessing intervention programs' efficacy. From a clinical perspective, the UTBAS-ITA could be a useful tool for speech-language pathologists and psychologists allowing the identification of covert aspects related to stuttering, such as negative thought patterns. Additionally, a UTBAS-ITA total score above the 5th decile indicates the need for a more in-depth assessment of social anxiety and, if necessary, specific treatment. Furthermore, UTBAS-ITA proves to be a useful tool in planning personalized interventions for AWS. Interventions can take into account fluency changes and the modification of cognitive reactions, such as negative speech-related beliefs and attitudes.

Funding

The research was co-funded by the Italian Complementary National Plan PNC-I.1 "Research initiatives for innovative techonologies and pathways in the health and welfare sector" D.D. 931 06/06/2022 "DARE - DigitAl lifelong pRevEntion" initiative code PNC0000002, CUP: B53C22006450001. Fundings of S.O. derived from this co-financing.

CRediT authorship contribution statement

Simona Bernardini: Writing – original draft, Supervision, Investigation, Data curation, Conceptualization. **Sara Onnivello:** Writing – original draft, Methodology, Formal analysis. **Silvia Lanfranchi:** Writing – original draft, Supervision, Methodology, Investigation, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare no conflict of interest.

Data availability

The data that has been used is confidential.

Acknowledgements

We are extremely grateful to all the participants in this study. We thank Agnese Romboli, Vanessa Irovec and Valentina Di Gregorio for their help in the data collection.

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