

**Psychometric evaluation of the Dutch translation of the Overall Assessment of  
the Speaker's Experience of Stuttering for adults (OASES-A-D)**

Journal of Fluency Disorders

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## **Abstract**

The Overall Assessment of the Speaker's Experience of Stuttering for adults (OASES-A; Yaruss & Quesal, 2006, 2010) is a patient-reported outcome measure that was designed to provide a comprehensive assessment of "the experience of the stuttering disorder from the perspective of individuals who stutter" (Yaruss & Quesal, 2006, p.90). This paper reports on the translation process and evaluates the psychometric performance of a Dutch version of the OASES-A. Translation of the OASES-A into Dutch followed a standard forward and backward translation process. The Dutch OASES-A (OASES-A-D) was then administered to 138 adults who stutter. A subset of 91 respondents also evaluated their speech on a 10-point Likert scale. For another subset of 45 respondents, a clinician-based stuttering severity rating on a 5-point Likert scale was available. Thirty-two of the respondents also completed the Dutch S-24 scale (Brutten & Vanryckeghem, 2003). The OASES-A-D showed acceptable item properties. No ceiling effects were observed. For 30 out of 100 items, most of which were in Section IV (Quality of Life), floor effects were observed. Cronbach's alpha coefficients for all sections and subsections surpassed the 0.70 criterion of good internal consistency and reliability. Concurrent validity was moderate to high. Construct validity was confirmed by distinct scores on the OASES-A-D for groups with different levels of stuttering severity as rated by the speakers themselves or by clinicians. These results suggest that the OASES-A-D is a reliable and valid measure that can be used to assess the impact of stuttering on Dutch adults who stutter.

**Educational objectives:** The reader will be able to: (a) describe the purpose of the Overall Assessment of the Speaker's Experience of Stuttering for adults (OASES-A) measurement tool; (b) summarize the translation process used in creating the Dutch version of the OASES-A (OASES-A-D); (c) evaluate the psychometric properties of the OASES-A-D; and (d) compare the psychometric properties of the OASES-A-D with those of the original American English OASES-A.

**Keywords:** Stuttering; Measurement; Questionnaires; ICF; Psychometric analysis

## 1. Introduction

Research in recent decades has shown that stuttering is often associated with negative impact on various aspects of a speaker's life (e.g. Craig, Blumgart, & Tran, 2009; Klein & Hood, 2004; Klompas & Ross, 2004; Koedoot, Bouwmans, Franken, & Stolk, in press). This has led to greater awareness among many researchers and clinicians of the need to adopt broad-based measures that reflect the broader stuttering *disorder* (i.e., the difficulties a person may experience as a result of producing stuttering behaviors, including negative impact on quality of life and subjective well-being), in decision-making, clinical practice, and research (e.g. Cummins, 2010; Franic & Bothe, 2008; Ingham, 2003; Yaruss, 2010; Yaruss & Quesal, 2006). One measure that was designed for comprehensively assessing the stuttering disorder is the *Overall Assessment of the Speaker's Experience of Stuttering* (OASES; Yaruss & Quesal, 2006, 2010). This questionnaire evaluates "the experience of the stuttering disorder from the perspective of individuals who stutter" (Yaruss & Quesal, 2006, p. 90). The design of the OASES was based on the World Health Organization's *International Classification of Functioning, Disability, and Health* (ICF; WHO, 2001). There are three versions of the OASES: The OASES-A was designed for adults, ages 18 and above; the OASES-T (Yaruss, Quesal, & Coleman, 2010) was designed for teenagers, ages 13-17; and the OASES-S (Yaruss, Coleman, & Quesal, 2010) was designed for school-age children, ages 7-12.

Empirical data have provided preliminary support for the reliability and validity of the OASES-A, based on samples collected in the United States (Yaruss & Quesal, 2006). However, analyses conducted to date have not thoroughly examined several aspects of the psychometric properties of the instrument, one of which is convergent validity (Franic & Bothe, 2008). Further, data from individuals residing in locations other than the United States have only recently become available (e.g., Bricker-Katz, Lincoln, & McCabe, 2009; Chun, Mendes, Quesal, & Yaruss, 2010; Cream et al., 2010; Metten, Zückner, & Rosenberger, 2007; Mulcahy, Hennessey, Beilby, & Byrnes, 2008). The adult version of the OASES has been translated into Spanish (Yaruss & Quesal, 2010) and, at the time of this writing, there

are ongoing efforts to translate the various versions of the OASES into approximately 15 other languages worldwide (Yaruss & Quesal, 2009). Key aspects of the translation process involve validation of the translation and evaluation of the psychometric data that result from administration of the translated version to native speakers of the target languages.

Among researchers and clinicians in the Netherlands, a desire exists to have a well-functioning Dutch patient-reported outcome measure in order to be able to assess those aspects of the stuttering disorder that are directly relevant to the lives of people who stutter. To fulfill this need, we translated the English OASES-A into Dutch. In the present study, we describe the translation process and evaluate the psychometric performance of the Dutch version of the OASES-A. We aim to contribute to the evidence base of the performance of the OASES-A in general, and the Dutch translation in particular.

## **2. Method**

The OASES-A questionnaire was first published in 2006 (Yaruss & Quesal, 2006) based on preliminary research that had been conducted over the prior 10 years (e.g., Yaruss, 2001). Below, we describe the characteristics of the original instrument, the translation process of the Dutch version and the psychometric evaluation.

### **2.1. OASES-A**

The OASES-A is a 100-item, self-report questionnaire that aims to measure the experience of the stuttering disorder from the perspective of adults who stutter. It consists of four sections, each of which examines different aspects of the stuttering disorder: (I) general perspectives about stuttering (20 items); (II) affective, behavioral and cognitive reactions to stuttering (30 items); (III) functional communication difficulties (25 items) and (IV) impact of stuttering on the speaker's quality of life (25 items). Responses are rated on a Likert scale with response choices ranging from 1 to 5. Higher scores indicate a greater impact of the

disorder. Impact rating scores can be calculated for each individual section and for all sections in total. These scores provide an indication of the degree of negative impact experienced by a speaker as a result of stuttering. As a self-report measure, the OASES-A is designed to supplement clinician-based measures of observable stuttering severity. Although it is emphasized that the impact ratings are not exchangeable with stuttering severity ratings, they may provide an indication of the overall severity of the speaker's experience of stuttering (Yaruss & Quesal, 2006).

In this paper, the Impact scores for the Dutch version of the OASES-A were calculated in accordance with the first version of the OASES-A, published by Yaruss and Quesal (2006), except where indicated otherwise. Scoring for the 2006 version of the OASES-A involved three steps. First, the number of points the respondent indicated was calculated for each section. Second, the total number of items completed by the respondent was computed and multiplied by 5 (since each item is based on a 5-point scale) to obtain the total number of possible points in each section. Third, the number of points was divided by the number of possible points and multiplied by 100. Impact scores were categorized as follows: 20.0-29.9 refer to mild impact, 30.0-44.9 to mild-to-moderate impact, 45.0-59.9 to moderate impact, 60.0-74.9 to moderate-to-severe and impact, 75.0-100 to severe impact. The scoring system in the current versions of the OASES-A (beginning with the 2008 version and continuing with the 2010 publications) is different, in that the section and overall impact scores are based on the same 1 to 5 range as the individual item scores. Note that it is possible to convert between the two scoring systems by simply dividing the scores from the 2006 version by 20 to yield scores on the 1 to 5 scale used in the 2008 and 2010 versions. Detailed background information and explanations about the development of the OASES-A can be found in Yaruss and Quesal (2006, 2010).

## *2.2. Translation of the OASES-A*

The original published English version of the OASES-A (2006) was translated into Dutch following a standard forward and backward translation process (Herdman, Fox-Rushby, Rabin, Badia, & Selai, 2003) to ensure conceptual equivalence and clear and easy understanding of the Dutch version of the OASES-A. Initially, items and response choices in the American version of the OASES-A were translated into Dutch independently by two native Dutch speakers who were fluent in English. Then, a first consensus version was produced from the two forward translations. This Dutch consensus version was back-translated into English independently by two qualified translators who are native English-speakers and fluent in Dutch. The research team, which had requested the translation, then compared the back translations with the original version. Problematic items or response choices were discussed in a meeting by the translators and the research team.

A linguistically and conceptually comparable translation generally requires that careful attention be paid to cultural differences that might lead to different meanings in the target and original language (Beaton, Bombardier, Guillemin, & Ferraz, 2000; Herdman et al., 2003). Three items were identified as potentially reflecting conceptual differences between the OASES-A and the Dutch translation. These items were carefully discussed in the meeting and consensus was reached regarding the most appropriate translation. The second consensus version of the Dutch OASES-A (hereafter referred to as the OASES-A-D) was pilot tested in a sample of six individuals who stutter. In keeping with recommendations for creating a valid translation (Herdman et al., 2003), pilot testing was also completed with three individuals who did not stutter to ensure that the comprehensibility of the translation was not limited only to people who already possessed some understanding of the stuttering disorder. Participants were asked to complete the questionnaire and comment on the questions if necessary. As a result of the pilot testing, a missing word was added to question II.B.6. No other problems were detected in terms of item acceptance, comprehensibility, or wording or in the consistency of response patterns. This version was used in all subsequent testing.

### *2.3. Data collection procedures*

For the psychometric evaluation of the OASES-A-D, we made use of two existing datasets in which the OASES-A-D had been administered to adults who stutter. All data were collected between February 2008 and April 2009. The first dataset (N=91) originated from a study into the quality of life in adults who stutter (hereafter referred to as the 'QoL study'). The QoL study included both people who were not receiving therapy and people who had just registered for therapy at the time of the investigation. Demographic characteristics (gender, age, educational level, marital status and job status), OASES-A-D data, and a self-assessment score of speech (SA scale score; Huinck & Rietveld, 2007) were available from that study. The SA scale was applied to evaluate the participant's perception of his or her stuttering severity. Participants were asked to rate their speech on a scale ranging from 1 (very poor) to 10 (very good). Only the endpoints of the scale were defined. Further details of the QoL study can be found in Koedoot et al. (in press).

The second dataset (N=51) originated from stuttering therapists working in clinics throughout the Netherlands. The therapists asked adults who stutter who had registered for or who were involved in therapy to complete the OASES-A-D and the Dutch S-24 Modification of the Andrews and Cutler (1974) adaptation of Erickson's (1969) scale of communication attitudes (S-24; Brutten & Vanryckeghem, 2003). The S-24 is a self-completed questionnaire which measures the communication attitudes of persons who stutter. Besides the two self-reported questionnaires, the therapists also rated the stuttering severity of their clients on a 5-point Likert scale with the following categories: 1 = mild, 2 = mild-moderate, 3 = moderate, 4 = moderate-severe, 5 = severe stuttering. When rating severity, the therapists were asked to take into account the speaker's total experience of the disorder, including cognitive, emotional, motor and social aspects. In the rest of the paper this scale is referred to as the Clinical Assessment (CA) scale. Since all therapists had many years of experience in diagnosing and treating people who stutter and because they are accustomed to classifying stuttering severity of clients in terms of mild, moderate and severe stuttering, the CA scale was considered an appropriate measure of stuttering severity. The S-24 data were available for 32 participants and the CA scale data for 45 participants.

In total, 142 people who stutter completed the OASES-A-D (91 participants in the QoL study and 51 participants recruited by therapists). The data from four participants were excluded in the present study because they were less than 18 years of age. Thus, this study was based on the responses of 138 participants. Demographic characteristics of these participants are presented in Table 1. More men than women participated in our study. The male: female ratio of 2.7:1 is generally comparable with ratios presented in literature (e.g. Bloodstein & Bernstein Ratner, 2008). Compared to data of Statistics Netherlands (CBS, <http://www.cbs.nl/en-GB/menu/home/default.htm>) a relatively high proportion (that is, 50%) of the participants had received higher education. There were no respondents with a minority ethnic background (e.g. Moroccan, Turkish or Surinamese).

Insert Table 1. Demographics.

#### *2.4.1. Item characteristics*

The OASES-A-D item performance characteristics that were studied included item distributions and percentage floor and ceiling effects (i.e. the percentage of respondents scoring at respectively the lowest and highest scale level).

#### *2.4.2. Reliability*

Internal consistency refers to the extent to which items within each domain are interrelated, thus reflecting the degree to which they measure the same concept. Cronbach's  $\alpha$  coefficient is the most widely applied method to assess internal consistency (e.g. Peterson, 1994). A coefficient of above 0.70 suggests a good internal consistency and reliability (Nunnally, 1978), however, if  $\alpha$  is too high, this may suggest a high level of item redundancy (Streiner & Norman, 2003). In addition to the Cronbach's  $\alpha$  scores of Sections I to IV, we assessed each subsection of Section II to IV individually, since pooling the scores within a



section could inflate Cronbach's  $\alpha$  due to the large number of items. The division of Section I ('General information') in three subsections was done merely for convenience in scoring the record form; the items are not conceptually related. Therefore, Cronbach's alpha values were not calculated for these subsections.

#### *2.4.3. Validity*

In keeping with the original validation process of the English version of the OASES-A, concurrent validity was evaluated by calculating Spearman correlation coefficients for each section of the OASES-A-D and for the Total Impact score with the Dutch version of the S-24. Based on the results of Yaruss and Quesal (2006), the S-24 scores were expected to have high correlations with the OASES-A-D Impact scores from Section II, and moderate correlations with the other sections. In addition, the correlation between the OASES-A-D, the SA, and the CA scores were used for assessing concurrent validity. A strong correlation was considered to be over .60, a moderate correlation between .30 and .60, and a low correlation below .30 (Hinkle, Wiersma, & Jurs, 1998).

The method of known-groups comparisons was used to evaluate the construct validity of the OASES-A-D. Known-groups validity is defined as the ability to distinguish between clinically relevant subgroups of respondents. We tested if OASES-A-D Total Impact scores could discriminate between participants with different stuttering severity levels. Severity levels were determined by both self-assessed severity (SA scale score) and clinician-assessed severity (CA scale score). Because of the relatively small sample sizes for some categories of stuttering severity, the following categories of the SA scale were merged to reach a sufficient number of respondents in each category: mild = score 7 - 10; moderate = score 4 - 6; severe = score 1 - 3. For the CA scale, the categories were combined as follows: mild = score 1 - 2; moderate = score 3, severe = score 4 - 5.

We also tested whether the OASES-A-D Total Impact score was dependent on the demographic characteristics age and education. For the variable age, a correlation

coefficient was calculated. For *educational level*, three groups were compared: low (primary education), middle (secondary education) and high (advanced degree).

2.5. Statistical methods

Values are reported as mean +/- 1 SD or as absolute number and percentage. One-way analysis of variance (ANOVA) and Tukey post-hoc tests were employed to evaluate the statistical significance of differences in OASES-A-D Impact scores for groups with different levels of stuttering severity and different educational levels. All correlations were based on non-linear Spearman rank correlations, and a Bonferroni correction was applied to maintain an overall alpha of .05. Analyses were performed in SPSS version 17.0 (SPSS Inc., 2008).

3. Results

3.1. Stuttering characteristics

Table 2 presents the mean scores on the OASES-A-D and the other stuttering measurement instruments (i.e. the SA scale and CA scale) applied in this study. To facilitate comparison of results from the OASES-A-D with the current version of the OASES-A, as well as results obtained from translations of the OASES-A in other languages, Table 2 also report the mean scores in accordance with the 5-point scale scoring system introduced in Yaruss and Quesal (2008) and used in all three of the current OASES record forms (Yaruss & Quesal, 2010). All other tables and results in this paper use the scoring system from the original 2006 publication, as described above in Section 2.1.

Insert Table 2. Stuttering characteristics.

### 3.2. Item characteristics

All but 15 of the 100 items of the OASES-A-D exhibited ranges from the minimum possible score of 1 to the maximum possible score of 5. The mean score across items ranged from 1.32 to 3.74 (SD ranging from 0.65 to 1.46). No ceiling effects (defined as > 30 % of patients having the maximum score of 5) were observed. Floor effects were observed for 30 out of 100 items, most notably in Section IV (Quality of Life) with 14 items. Section IV.D (which measures the impact of stuttering on job and education) showed floor effects for four out of five items, indicating that respondents experienced relatively little negative impact from stuttering in these settings. Section IV.E (which measures the impact of stuttering on overall well-being) showed floor effects for six out of eight items.

### 3.3. Reliability

Cronbach's  $\alpha$  scores for Sections I through IV, as well as for the subsections of Section II to IV, of the OASES-A-D are presented in Table 3. Cronbach's  $\alpha$  scores for the four sections were between 0.84 and 0.96. The subsections showed Cronbach's  $\alpha$  values between 0.78 (Section III.C) and 0.92 (Section IV.E).

Insert Table 3. Cronbach  $\alpha$  of the OASES-A-D sections.

### 3.4. Validity

The Total OASES-A-D Impact score, as well as the Impact scores on the four sections, correlated significantly with the S-24, SA and CA scale scores (Table 4). For the S-24 and the CA scale, the lowest correlations were established for Section I and the highest for Section IV. For the SA scale, the pattern was reversed, with a slightly lower correlation for Section IV.

Table 5 shows that all sections of the OASES-A-D questionnaire were able to discriminate between groups of participants with different stuttering severity levels (according

to the SA score or the CA score), with the exception of discriminating between participants with moderate and severe stuttering as assessed by the SA scale.

The OASES-A-D Total Impact score, as well as the Impact scores on the sections I, II and IV, did not correlate significantly with age (see Table 6,  $p > .10$ ). There was a very small relationship between the Impact score on Section III and age ( $r = -.173$ ,  $p = .04$ ), but after Bonferroni adjustment for the significance level ( $1/5 * .05 = .01$ ) this was not significant. No significant differences in impact score were detected based on level of education (see Table 7,  $p > .10$ ).

Insert Table 4. Correlations (Spearman rho) between OASES-A-D Impact scores and S-24, SA scale and CA scale scores.

Insert Table 5. Mean OASES-A-D Total Impact scores for participants with mild, moderate and severe stuttering according to the SA scale and CA scale, standard deviation (SD) and  $p$ -value of ANOVA-analysis for differences of means.

Insert Table 6. Correlations (Spearman rho) between OASES-A-D Impact scores and age ( $p > .10$ ).

Insert Table 7. Mean OASES-A-D Impact scores for participants with low, middle and high education, standard deviation (SD) and  $p$ -value of ANOVA-analysis for differences of means.

#### **4. Discussion**

In this article, we have reported on the translation and psychometric characteristics of the Dutch version of the OASES for adults (OASES-A-D). The OASES-A-D showed acceptable item properties, a good internal consistency and moderate-to-high significant correlations with other existing instruments. The translated questionnaire showed no ceiling effects, and the majority of the items exhibited ranges from the lowest possible score of 1 to the highest possible score of 5. For fifteen out of 100 items, the maximum score did not reach 5, which can be explained by the relatively small number of participants in this study with severe stuttering. The mean scores across items ranged from 1.32 to 3.74 ( $SD$  ranging from 0.65 to 1.46), showing similar variability as that seen in Yaruss and Quesal (2006), who

found a range of the mean from 1.7 to 3.5 (*SD* 0.75 to 1.6). Floor effects were observed most frequently in Section IV (Quality of Life). This may suggest that the OASES-A-D questionnaire lacks some sensitivity on the lower end of the scale, especially in the sections on job and education (IV.D) and overall well-being (IV.E). However, as our sample included mainly people with mild or moderate stuttering, the item scores probably adequately represent the impact of relatively mild stuttering on these aspects of quality of life. The findings regarding potential floor effects thus need further empirical evaluation.

The reliability of the translated questionnaire was assessed using only internal consistency. All four sections of the OASES-A-D demonstrated strong internal consistency, with Cronbach's  $\alpha$  scores greater than 0.90 for Sections II to IV, and a Cronbach's  $\alpha$  score of 0.84 for Section I. Scores were thus well above the 0.70 required to support internal consistency (Nunnally, 1978). They were also in line with the results on the internal consistency reported by Yaruss and Quesal (2006), who found Cronbach's  $\alpha$  values between 0.92 and 0.97. Cronbach's  $\alpha$  scores for each subsection were also above 0.70.

To assess concurrent validity, correlations between Impact scores and the Dutch S-24, SA and CA scores were calculated. Overall, concurrent validity was moderate to strong. The highest values were obtained for the correlations between the OASES-A-D and the S-24. Correlations between the OASES-A-D sections with the S-24 in our study ranged from .59 to .85. This range was in line with values found for preliminary versions of the OASES-A in the United States, i.e. .68 to .83 (Yaruss & Quesal, 2006). However, in our study, the highest correlation was established for Section IV ('Quality of Life') and not, as was anticipated, for Section II ('Reactions to Stuttering'). The correlations between the Total Impact score and the two different measures of stuttering severity applied in this study (the SA scale, measuring subjective stuttering severity, and the CA scale, measuring the clinician's rating of stuttering severity) were both approximately .60. Since there are fundamental differences between the instruments in the way stuttering is evaluated (i.e., the SA scale measures stuttering severity by means of a self-rating of speech on a 10-point scale, the CA scale represents a clinician-based judgment, and the OASES-A-D

comprehensively assesses the participant's experience of the stuttering disorder), these correlations are judged to represent adequate relationships. Finally, age and educational level had little or no influence on the OASES-A-D Impact scores. The lack of a correlation between OASES-A-D scores and chronological age is consistent with prior preliminary reports (Kim & Yaruss, 2008). These findings support the concurrent validity of the OASES-A-D.

Another way to measure validity is to compare groups known to differ on relevant features (known-group or construct validity). All sections of the OASES-A-D were able to differentiate between groups of participants with different levels of stuttering severity. Only the moderate and severe categories of the SA scale did not show significant differences in mean OASES-A-D Impact score. However, this may be due to the fact that this test was underpowered, since only four participants in this sample reported severe stuttering problems.

Our study has several limitations. First, test-retest reliability of the OASES-A-D was not assessed. Prior research (Yaruss & Quesal, 2006, 2010) has revealed high test-retest reliability for the original English version of the OASES-A, though further research will be needed to determine the test-retest reliability of the Dutch version. Second, not all of the questionnaires that were used in our psychometric analyses were available for all participants. For the participants recruited by therapists, no SA score was reported. Due to the fact that the data for the other participants were extracted from an ongoing QoL study, not all instruments that were relevant for the current study were applied. As a result, the CA scale scores and S24 scores were missing for those participants. Third, to perform a known-group analysis, categories of the SA scale were combined to create three groups (mild – moderate – severe stuttering), since we did not have enough data to perform the analysis with five groups. The same was done for the CA scale. Even after combining categories, however, the distribution of stuttering severity scores on the SA scale remained skewed, with only four people reporting severe stuttering. In future studies, it would be recommended to include a more balanced sample with respect to stuttering severity. Even with these

limitations, however, results support the general conclusion that the Dutch translation of the OASES-A exhibits appropriate psychometric properties.

The current study yielded some results that point to areas for improvement in future revisions of the OASES-A-D in particular and the OASES-A in general. Particularly, Cronbach's  $\alpha$  values for Section II, III and IV were above 0.90, indicating that there might be redundant items in these sections. Although it typically requires only 15 or 20 minutes to complete, the OASES-A is a relatively long questionnaire. The potential benefit of this is that it provides detailed information to clinicians about their clients' experience of the stuttering disorder (Yaruss & Quesal, 2006, 2010). Still, for some clients, the length of the form may cause some concern. To reduce this burden and for reasons of parsimony, a shorter questionnaire targeted particularly for use in research may also be beneficial (though some of the detail inherent in the tool that helps clinicians with treatment planning and goal setting may be diminished). Future research could provide more insight into the possible redundancy of some items. Shortening the questionnaire could be based on several arguments. First, additional analysis may reveal that reducing the number of items with high correlations within a subsection may not reduce the sensitivity of the instrument. Second, item response theory might provide evidence for the redundancy of items and answer categories. A preliminary Rasch analysis (Pallant & Tennant, 2007; Tennant, McKenna, & Hagell, 2004) that we performed suggested that Sections I and II had a better fit to the Rasch model when the answer categories were rescored to a four point scale. Thus, in addition to considering the length of the questionnaire, the number of response categories could be evaluated. Such modifications to the questionnaire are beyond the scope of this paper, as any adaptation would require renewed psychometric testing. Therefore, these and other improvements to the OASES-A remain an interesting avenue of future research.

To conclude, this study provides preliminary results that the Dutch language version of the OASES-A is a reliable and valid instrument for providing a comprehensive assessment of how stuttering affects the lives of individuals who stutter. Findings are relevant both to individuals who are in therapy as well as to those who are not. The fact that translations of

the various versions of the OASES are being developed for several languages will, in the future, facilitate the comparability of OASES results in cross-cultural settings. Furthermore, it provides an excellent opportunity for collaborative research between nations.

## **CONTINUING EDUCATION**

### **QUESTIONS**

1. The OASES-A:

- (a) aims to comprehensively assess the stuttering disorder;
- (b) is a patient-reported outcome measure;
- (c) is based on the ICF model;
- (d) is designed for use in people of 18 years and above;
- (e) all of the above are true.

2. A forward and backward translation process:

- (a) is a way to ensure conceptual validity of the translated questionnaire;
- (b) requires the translators to be native speakers of the target language and to be fluent in the original language;
- (c) requires at least two independently working qualified translators;
- (d) requires the translated questionnaire to be tested in a pilot sample;
- (e) all of the above are true.

3. In this study a clinician-based judgment of stuttering (CA scale) was used to:



- (a) assess the reliability of the OASES-A-D;
  - (b) assess the concurrent validity of the OASES-A-D;
  - (c) assess the construct validity of the OASES-A-D;
  - (d) b and c are true;
  - (e) a and c are true.
4. Examination of the item characteristics of the OASES-A-D revealed:
- (a) no floor effects but ceiling effects for 30 out of 100 items;
  - (b) floor effects in Section IV and ceiling effects in Section III;
  - (c) floor effects mainly in Section IV;
  - (d) ceiling effects mainly in Section II;
  - (e) no floor effects and no ceiling effects.
5. The results of this study indicate that:
- (a) the internal consistency of the OASES-A-D is good;
  - (b) the OASES-A-D can discriminate between people with different levels of stuttering severity;
  - (c) the scores on the OASES-A-D were not influenced by age;
  - (d) the scores on the OASES-A-D were not influenced by educational level;
  - (e) all of the above are true.

ANSWERS

1. e
2. e
3. d
4. c
5. e

## **Acknowledgments**

We would especially like to thank all respondents and clinicians who have participated in this study. Furthermore, we would like to thank Lianne Hartog and Nicole van der Weele for their contribution to the collection of the data in this project. We thank Marie-Christine Franken and Elly Stolk for their comments on an earlier version of the manuscript. Portions of this research were supported by a University of Pittsburgh Central Research Development Fund grant to the third author.

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Table 1

## Demographics.

	N	Dutch population norms <sup>a</sup>
Gender		
Male	101 (73.2%)	49.5%
Female	37 (26.8%)	50.5%
Age (years)		
Mean (SD)	34.5 (12.8)	40.1
Range	18-74	-
Educational level <sup>*</sup>		
Low	6 (6.8%)	33%
Middle	36 (40.9%)	31%
High	44 (50%)	27%
Missing	2 (2.3%)	9%
Marital status <sup>*</sup>		
Single / divorced	43 (48.9%)	-
Married	45 (51.1%)	-
Job status <sup>*</sup>		
Paid work	60 (68.2%)	-
Student	17 (19.3%)	-
Other	11 (12.5%)	-

<sup>\*</sup> Only available for participants in the QoL study.

<sup>a</sup> Statistics Netherlands, 2009 Figures.

Table 2

Stuttering characteristics.

Stuttering instrument	Mean, SD based on original scoring procedures described in Yaruss & Quesal (2006)	Mean, SD based on revised scoring procedures described in Yaruss and Quesal (2010)
OASES-A-D Impact scores		
Section I	56.8 (10.37)	2.84 (0.52)
Section II	52.2 (12.66)	2.61 (0.63)
Section III	46.5 (11.86)	2.32 (0.59)
Section IV	40.1 (13.21)	2.00 (0.66)
Total	48.7 (10.45)	2.44 (0.52)
SA score <sup>*</sup>	6.11 (1.41)	
CA score <sup>**</sup>	3.09 (1.12)	

\* Only available for participants in the QoL study.

\*\* Only available for participants recruited by therapists.



Table 3

Cronbach  $\alpha$  of the OASES-A-D sections.

OASES-A Section	Number of items	Cronbach's $\alpha$
I	20	0.84
II	30	0.93
II.A	10	0.9
II.B	10	0.82
II.C	10	0.81
III	25	0.94
III.A	10	0.84
III.B	5	0.86
III.C	5	0.78
III.D	5	0.8
IV	25	0.96
IV.A	3	0.8
IV.B	4	0.84
IV.C	5	0.89
IV.D	5	0.9
IV.E	8	0.92

Table 4

Correlations (Spearman rho) between OASES-A-D Impact scores and S-24, SA scale and CA scale scores.

OASES-A Section	S-24 (N=32)	SA scale (N=91)	CA scale (N=45)
Impact score Section I	.587**	-.609**	.357*
Impact score Section II	.641**	-.507**	.561**
Impact score Section III	.761**	-.543**	.494**
Impact score Section IV	.854**	-.516**	.572**
Total Impact score	.838**	-.615**	.594**

\* $p < .05$  level (2-tailed).

\*\*  $p < .01$  (2-tailed).

Table 5

Mean OASES-A-D Total Impact scores for participants with mild, moderate and severe stuttering according to the SA scale and CA scale, standard deviation (SD) and  $p$ -value of ANOVA-analysis for differences of means.

Stuttering severity level (SA scale)			F-ratio	Significance ( $p$ )		
Mild (N=38)	Moderate (N=46)	Severe (N=4)		Mild vs. moderate stuttering	Mild vs. severe stuttering	Moderate vs. severe stuttering
41.7 (9.2)	51.6 (8.5)	58.4 (9.5)	16.336	<.001	.002	.314
Stuttering severity level (CA scale)						
Mild (N=13)	Moderate (N=17)	Severe (N=14)		.027	<.001	.037
43.1 (6.4)	51.4 (10.0)	59.2 (7.9)	12.381			

Table 6

Correlations (Spearman rho) between OASES-A-D Impact scores and age ( $p > .10$ ).

OASES-A section	age (N=138)
Impact score Section I	-.039
Impact score Section II	-.055
Impact score Section III	-.173
Impact score Section IV	-.112
Total Impact score	-.111

Table 7

Mean OASES-A-D Impact scores for participants with low, middle and high education, standard deviation (SD) and *p*-value of ANOVA-analysis for differences

OASES-A section	Educational level			F-ratio	Significance ( <i>p</i> )		
	Low (N=6)	Middle (N=36)	High (N=44)		Low vs. middle education	Low vs. high education	Middle vs. high education
Impact score Section I	55.9 (8.6)	57.5 (10.9)	58.5 (8.9)	.222	.925	.821	.906
Impact score Section II	55.3 (6.9)	52.4 (14.3)	49.9 (12.7)	.649	.868	.613	.682
Impact score Section III	49.1 (6.5)	45.7 (12.4)	43.8 (11.8)	.649	.795	.562	.755
Impact score Section IV	39.2 (4.2)	40.8 (13.5)	36.5 (12.2)	1.207	.953	.871	.274
Total Impact score	49.8 (4.3)	49.0 (11.4)	46.7 (9.9)	.602	.982	.768	.587
of means.							