Quality of Life in adults who stutter

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Abstract

Although persistent developmental stuttering is known to affect daily living, just how great the impact is remains unclear. Furthermore, little is known about the underlying mechanisms which lead to a diminished quality of life (QoL). The primary objective of this study is to explore to what extent QoL is impaired in adults who stutter (AWS). In addition, this study aims to identify determinants of QoL in AWS by testing relationships between stuttering severity, coping, functioning and QoL and by testing for differences in variable scores between two AWS subgroups: receiving therapy versus not receiving therapy. A total of 91 AWS filled in several questionnaires to assess their stuttering severity, daily functioning, coping style and QoL. The QoL instruments used were the Health Utility Index 3 (HUI3) and the EuroQoL EQ-5D and EQ-VAS. The results indicated that moderate to severe stuttering has a negative impact on overall quality of life; HUI3 derived QoL values varied from .91 (for mild stuttering) to .73 (for severe stuttering). The domains of functioning that were predominantly affected were the individual's *speech*, *emotion*, *cognition* and *pain* as measured by the HUI3 and *daily activities* and *anxiety/depression* as measured by the EQ-5D. AWS in the therapy group rated their stuttering as more severe and recorded more problems on the HUI3 speech domain than AWS in the non-therapy group. The EQ-VAS was the only instrument that showed a significant difference in overall QoL between groups. Finally, it was found that the relationship between stuttering severity and QoL was influenced by the individual's coping style (emotion-oriented and task-oriented). These findings highlight the need for further research into stuttering in relation to QoL, and for a broader perspective on the diagnosis and treatment of stuttering, which would take into consideration quality of life and its determinants.

KEY WORDS: stuttering; quality of life; EQ-5D; HUI3; coping.

1. Introduction

How stuttering affects the overall quality of life (QoL) of adults who stutter (AWS) has not yet been extensively researched. This is surprising since about 1% of the adult population stutters (Bloodstein & Bernstein-Ratner, 2008) and because it is known that AWS often experience negative affective, behavioral, and cognitive reactions. Moreover, stuttering significantly limits the speaker's ability to participate in daily activities (Yaruss & Quesal, 2006). AWS frequently experience disabling levels of social anxiety (Kraaimaat, Vanryckeghem, & Van Dam-Baggen, 2002; Messenger, Onslow, Packman, & Menzies, 2004, Schneier, Wexler, and Liebowitz 1997). Whether this occurs, depends on their fear of a negative evaluation in social relations because of their stuttering, and whether or not they act upon that fear by adoption of a strategy of avoidance (Menzies, Onslow, Packman, & O'Brian, 2009). Recognizing the complexity of the stuttering disorder in adults, researchers have established the need to document not only speech symptoms, but also broad-based outcome parameters such as QoL (e.g. Craig, Blumgart, & Tran, 2009; Franic & Bothe, 2008; Ingham, 2003; Yaruss & Quesal, 2006). Recently, a special edition of the Journal of Fluency Disorders dedicated to the QoL of people who stutter also raised awareness for the topic (e.g. Craig, 2010; Cruice, Worrall, & Hickson, 2010; Yaruss, 2010). Until now, the magnitude of and mechanisms underlying the QoL effects of stuttering in adults have not been fully explored. The purpose of this study is to evaluate QoL in AWS by means of a comprehensive assessment.

A review of existing literature with respect to the QoL in AWS revealed that the majority of studies use a narrow conceptualization of QoL. That is, most studies investigated the QoL of AWS by focusing on the influence that stuttering has on the specific life domains which are believed to be most affected by stuttering (e.g. Andrade, Sassi, Juste, & Ercolin, 2008; Crichton-Smith, 2002; Hayhow, Cray, & Enderby, 2002; Klein & Hood, 2004; Klompas & Ross, 2004). For example, Hayhow et al. (2002) showed the major adverse effects of stuttering on school life and occupational choice. The negative impact of stuttering on school performance, relationships with teachers and classmates, and

performance at work was confirmed by Klompas and Ross (2004), who interviewed 16 AWS. Klein and Hood (2004) found that the majority of the AWS perceived their stuttering to be a handicap in relation to employment opportunities and job performance. By exploring specific life domains potentially affected by the condition stuttering, these studies provide significant, but only limited, information on QoL. A disadvantage of such *condition-specific* QoL studies is that little insight is gained into the *overall* QoL (e.g. Brazier, Ratcliffe, Tsuchiya, & Salomon, 2007; Craig et al., 2009; Franic & Bothe, 2008). In other words, although these studies provide insight into problems associated with stuttering, not all aspects of QoL relevant to a person are taken into account. In addition, due to the incorporation of dissimilar domains, condition-specific QoL instruments cannot be used to compare different health conditions.

In contrast to condition-specific QoL instruments, generic QoL instruments embrace a broad conceptualization of QoL by measuring a comprehensive set of domains. A common element in these generic QoL instruments is the incorporation of physical, emotional and social domains of health. These domains are relevant for anyone, irrespective of the specific health problem. As a result, generic QoL instruments are suitable for comparison of stuttering to other health states. Well-known examples are the Medical Outcomes Study Short Form 36-Item Health Survey (SF-36) and the Nottingham Health Profile (NHP). A limitation of these descriptive generic QoL instruments is that they do not quantify how each dimension contributes to overall well-being. That is, if some domains are significantly affected but others are not, the effect on overall QoL cannot be established. To overcome this problem, QoL researchers frequently move beyond a multidimensional generic description of health by attaching a single value to the overall health status (Brazier et al., 2007). This value or 'utility' summarizes all the positive and negative aspects of health into one single QoL index, which is usually set between 0, which corresponds to a health state valued as equivalent to death, and 1, which corresponds to perfect health. Such QoL values can be established in two ways. Firstly, health states can be estimated by using validated 'preference based' techniques (Torrance, Furlong, & Feeny, 2002): Visual

Analogue Scale (VAS), Time Trade-Off (TTO) or Standard Gamble (SG). Alternatively, a special class of generic QoL instruments can be used, for which QoL values are available for all health states described by the instrument (Coons, Rao, Keininger, & Hays, 2000). Well known examples are the EQ-5D, Health Utilities Index (HUI) and the SF-6D (derived from the SF-36 by Brazier, Roberts, & Deverill, 2002).

So far, only two studies have attempted to gain insight into overall QoL of AWS by using generic QoL instruments or by preference based techniques. Craig et al. (2009) used the SF-36 to explore the negative impact caused by stuttering in a population of AWS and adults who do not stutter (AWNS). The authors showed that, compared to a non-stuttering control group, stuttering affects social and emotional functioning, as well as vitality and mental health status. The effect sizes (standardised mean difference between the groups) on these domains varied between .28 and .59, indicating small to moderate QoL impairments in AWS. Because the associated SF-6D utilities were not reported by Craig et al. (2009), the effect on overall QoL remains unclear. The study by Bramlett, Bothe, and Franic (2006) is the only study that we are aware of that adopted a preference based approach to estimate utilities. Bramlett et al. (2006) obtained overall QoL values for mild, moderate and severe stuttering from 75 AWNS using the three validated preference based techniques mentioned before: VAS, TTO and SG. The results suggested that QoL is negatively affected by stuttering. Using the TTO method, non-stuttering adults valued their own health at .98 (SD .07), while they rated mild, moderate and severe stuttering at respectively .93 (SD .14), .85 (SD .18) and .63 (SD .24) (Bramlett et al., 2006, Table 2). Considering that a QoL weight of .63 has been found for living with home dialysis (Sackett and Torrance, 1978 in Bramlett et al., 2006), the results suggest that severe stuttering has a substantial impact on a person's overall QoL. However, the differences in QoL values between methods were substantial: VAS and SG resulted in QoL values of .44 (SD .20) and .81 (SD .19) respectively for severe stuttering. In addition, the applied methods provided little or no insight into the determinants (i.e., the underlying mechanisms) that lead to QoL impairments.

Thus the purpose of this study is to explore to what extent overall QoL is impaired in AWS and to investigate the determinants of such QoL impairment. Based on the conceptualization of QoL by Wilson and Cleary (1995), the determinants measured in this study are stuttering severity, functioning and coping. Differences in stuttering severity, functioning, coping and QoL are examined between AWS who were in therapy and those who were not. Both groups are included because we hypothesize that studying QoL solely in a clinical population might lead to observing a greater reduction in QoL than when also taking into account the QoL of AWS who do not seek therapy. In terms of impaired quality of life, AWS who present themselves to a clinic might be those who are most severely affected by their condition. This could either be because their level of stuttering is more severe or because they have poorer coping skills and are more bothered by the effect of stuttering on their social interactions. Busschbach, Rikken, Grobbee, De Charro, and Wit (1998) observed a lower QoL for adults with a short stature who had presented themselves to a clinic compared with a population based sample of short adults. It is thus considered important to include both AWS who were in therapy and AWS who were not in order to account for variability in the determinant variables of QoL in both groups and to provide a broad view of QoL. These insights could provide valuable support in designing possible starting-points for diagnosis, therapy, and measuring end points in clinical trials (Guyatt, Veldhuyzen Van Zanten, Feeny, & Patrick, 1989; Guyatt et al., 1997).

2. Conceptualization of QoL

The empirical evaluation of QoL in AWS in this study is based on the theoretical conceptualization of QoL published by Wilson and Cleary (1995). This conceptual framework shows how different health measures can be combined to constitute a *broad* assessment of QoL. This section will explain how the QoL model extracted from the original Wilson and Cleary (1995) model is built up.

The core of the model (Figure 1) is the relationship between symptoms, functioning and general health perception, the latter often referred to as health related quality of life

(HrQoL) or briefly as QoL (in this paper). *Symptoms* are defined as perceptual judgments of an abnormal physical, emotional, or cognitive state. *Functioning* refers to the ability of the individual to perform particular defined tasks. Basic domains of functioning that are commonly measured are physical, social, role and psychological functioning (Coons, Rao, Keininger, & Hays, 2000). By measuring functioning on generic domains, the impact of a condition can be assessed in terms that are relevant to any individual. *General health perception* or *(Hr)QoL* reflects an overall, subjective evaluation of health status, in relation to symptoms and functional problems.

The model highlights the direct and indirect relationships between the adjacent outcome levels (how symptoms impact on functioning, and functioning on QoL), which can be assessed using condition-specific and generic outcome measures. In addition, the model takes into account that *characteristics of the individual* as well as *characteristics of the environment* might impact on the experience of symptoms, daily functioning and QoL and their relationships. These factors may have a direct or indirect impact on QoL. Examples of individual characteristics that affect QoL are psychological characteristics, personality and individual expectations. Examples of environmental characteristics are social support and the employment environment. The model does not precisely prescribe which of these factors may be relevant for exploration of QoL.

Insert Fig. 1. Conceptualization of determinants of quality of life, adapted from "Linking clinical variables with health-related qualify of life. A conceptual model of patient outcomes," by I.B. Wilson and P.D. Cleary, 1995, *JAMA, 273(1),* p. 60.

3. Operationalization of QoL in AWS

This section indicates and motivates the selection of instruments for the operationalization of the Wilson and Cleary (1995) model in this study. The instruments will be described in more detail in section 4.3.

3.1. Overall QoL

To address the first aim of this study, to measure to what extent overall QoL is impaired in AWS, we assessed the primary outcome level ('Quality of Life') by measuring QoL values for the health states reported by the participants. As described in section 1, these values can be obtained by using generic QoL instruments for which QoL values for all health states are available. We decided to use two widely applied the Health Utility Index 3 (HUI3; Feeny et al., 2002), the EuroQoL EQ-5D and the EuroQoL EQ-VAS (EuroQoL Group, 2009). These are brief and easy to use self-completed questionnaires.

3.2. Symptom status

The symptom status level can be assessed by measuring the level of stuttering severity experienced (e.g. O'Brian, Packman, & Onslow, 2004). In the current study, the level of stuttering severity was rated using two self-assessment scales. Self-assessment scales have shown to be correlated well with objective stuttering measures and other self-evaluation instruments (Huinck & Rietveld, 2007) and rating by speech-language pathologists (O'Brian et al., 2004). In addition to the self-assessment scales, a comprehensive stuttering instrument was applied; the Overall Assessment of the Speaker's Experience of Stuttering for adults (OASES, Yaruss & Quesal, 2006).

3.3. Functioning status

In line with the Wilson and Cleary (1995) model, functioning status was also measured in a generic way. The functional profiles provided by the HUI3 and EQ-5D were used as indicators of functioning. The domains that are measured by these instruments were considered as potentially relevant with regard to stuttering. That is, functioning restraints in AWS could be expected in the social, role and psychological domains, for instance communication in social situations or at work (e.g. Yaruss & Quesal, 2006).

3.4. Characteristics of the individual

With respect to the individual and environmental characteristics, various studies suggest that coping style is an important determinant in QoL in AWS (e.g. Crichton-Smith, 2002; Plexico, Manning, & Levitt, 2009; Plexico, Manning, & Levitt, 2009; Vanryckeghem, Brutten, Uddin, & Van Borsel, 2004). Coping refers to the conscious response or reaction to events that are perceived as stressful (Parker & Endler, 1992). An association between coping and QoL in AWS may be expected because individuals can adopt different strategies to reduce stress levels caused by their diminished ability to speak fluently. These coping styles may differ in their effectiveness to prevent negative QoL effects. Coping models have been frequently used to explain successful adjustment to chronic diseases (De Ridder, Geenen, Kuijer, & van Middendorp, 2008), by showing the active role that patients may exert in managing the challenges that emanate from their condition (De Ridder et al., 2008). Stuttering might well be a condition for which the applied coping style strongly influences the experienced QoL, since AWS are frequently confronted with their speech limitations (Dolan, 2008). In the current study, coping style was analyzed using the *Coping Inventory for Stressful Situations* (CISS, De Ridder & van Heck, 2004). Environmental characteristics were not explicitly measured in this study, since it was argued that the main environmental factors related to QoL in AWS are also related to coping. That is, the social environment can be perceived as more or less demanding with regard to fluent speech and therefore influence coping ability, and, adversely, coping styles could influence how people choose their current environment.

4. Method

4.1. Participants

The study population consisted of AWS who were not receiving therapy and AWS who either had just started therapy or were on a waiting list for therapy at the time of the investigation. AWS in therapy (the T group) were recruited from 14 stuttering and/or speech and language therapy centres throughout the Netherlands and from a family system therapy

program for persons who stutter. AWS not receiving treatment (the NT group) were recruited informally, by asking relatives and acquaintances of the researchers to invite individuals who stutter and who were currently not in treatment to participate in the study. In addition, a Dutch social networking website for persons who stutter (Hyves-stuttering) was used for recruitment of this group.

4.2. Data collection

All data were collected between February and November, 2008. Study questionnaires were distributed by mail. All participants received a small gift for their participation. Besides the outcome measures listed below, all participants were asked to complete a socio-demographic checklist.

4.3. Measurement

4.3.1. Symptom status

4.3.1.1. Self-assessment scale of speech (SA scale)

The primary instrument to assess symptom status was a self-assessment scale of speech (SA scale, Huinck & Rietveld, 2007). 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 (see appendix). No normative score is available for this SA scale. Instead, the instrument is criterion-referenced in relation to the Dutch standards (e.g. for school performances) with 1 being the worst and 10 being the best score. A SA score of 6 can be interpreted as speech being sufficiently good.

4.3.1.2. Speech satisfaction scale

In addition to the SA scale, participants rated their speech satisfaction on a Likert scale with five response categories ranging from 'not at all satisfied' to 'very satisfied' (see

appendix). This speech satisfaction scale takes into account more explicitly that symptom status is influenced by intra-individual characteristics.

4.3.1.3. Overall Assessment of the Speaker's Experience of Stuttering for adults (OASES)

Finally, the OASES (Yaruss & Quesal, 2006) was used to assess symptom status. The OASES is a validated questionnaire which evaluates the experience of the stuttering disorder from the perspective of the AWS. It consists of four parts, each of which examines different aspects of the stuttering disorder: (I) general perspectives about stuttering, (II) affective, behavioral and cognitive reactions to stuttering, (III) functional communication difficulties and (IV) impact of stuttering on the speaker's quality of life. Impact ratings scores can be calculated for each individual section and for all sections in total and provide an indication of the impact of stuttering on various aspects of the speaker's life. Although it is emphasized that the impact ratings are not exchangeable with stuttering severity ratings, they may provide an indication of the severity of stuttering (Yaruss & Quesal, 2006). Yaruss and Quesal (2006) also presented normative scores. Impact scores between 20.0 and 29.9 refer to mild stuttering, scores of 30.0-44.9 to mild-to-moderate stuttering, 45.0-59.9 to moderate, 60.0-74.9 to moderate-to-severe and 75.0-100 to severe stuttering (Yaruss & Quesal, 2006). For this study, the OASES was translated into Dutch, using the well-established method of forward-translation and back- translation. While sections III and IV of the OASES include outcomes pertaining to functioning and overall QoL, in this study the instrument is classified as a symptom measure, because the OASES has a condition-specific focus; it does not tap *all* aspects of functioning and QoL.

4.3.2. Functioning status and QoL

4.3.2.1. Health Utility Index 3 (HUI3), EuroQoL EQ-5D and EQ-VAS

General functioning and QoL were measured simultaneously using two widely applied generic instruments that measure functioning and provide a QoL value for the

health states that could be described by the instrument: The HUI3 (Feeny et al., 2002) and EQ-5D (EuroQoL Group, 2009). Both instruments generate a descriptive health profile of a person's functioning in society on generic, basic domains of life (i.e. physical, mental and social domains). As such, the results of these descriptive systems display a profile of functioning. In addition, a population-weighted health index (or 'value') is produced, based on the descriptive system. This value reflects the general population's perception of the desirability of a health status. In other words, it represents how good or how bad a health state is according to the general population. Values range from -.59 (worst imaginable health state) to 1 (full health) for the EQ-5D (Dolan, 1997), and from -.36 to 1 for the HUI3 (Feeny et al., 2002). The values represent overall QoL scores.

Both the HUI3 and EQ-5D were included because their responsiveness to stuttering has not yet been explored. Although these instruments *conceptualize* health and QoL similarly, the health concept is *operationalized* differently so that differences in responsiveness may be expected. The EQ-5D consists of five domains: mobility, self-care, usual activities, pain/discomfort and anxiety/depression, with three response levels for each domain. The HUI3 incorporates eight domains: vision, hearing, speech, ambulation, dexterity, emotion, cognition and pain and discomfort (not specified), with five to six response levels for each domain. While, in general, the two descriptive systems lead to similar conclusions about QoL, differences between instruments on QoL values in AWS could be expected. This is because the HUI3 explicitly deals with QoL problems related to speech, while for the EQ-5D inferences about the impact of stuttering on QoL could only be inferred from reduced functioning in other domains like for example anxiety/depression. Although the EQ-5D is currently the most used instrument of the two, the HUI3 is considered preferable in studies focusing on vision, speech or hearing, since these domains are included in the HUI3 and not in the EQ-5D (Oostenbrink, Moll, & Essink-Bot, 2002). For stuttering, however, evidence as to the performance of these instruments is lacking.

The EQ-5D was administered in conjunction with the *EQ-VAS* (EuroQoL Group, 2009). The EQ-VAS is a visual analogue scale (similar to a thermometer) for recording an

individual's rating for his or her current health state. Valuations range from 0 (worst imaginable health) to 100 (best imaginable health). A relevant distinction between the EQ-VAS versus the EQ-5D and HUI3 is that the EQ-VAS values QoL from the perspective of the respondent himself instead of the general population.

4.3.3. Characteristics of the individual: coping

4.3.3.1. Coping Inventory for Stressful Situations (CISS)

Coping style was measured using the Dutch version of the CISS (De Ridder & van Heck, 2004). Like other coping instruments, the CISS explores an individual's ability to cope with problems by measuring the extent to which that individual applies the various coping styles generally available (De Ridder et al., 2008). Three coping styles are identified by the CISS: task-oriented (T) coping style, emotion-oriented (E) coping style, and avoidance-oriented (A) coping style. The distinction between task and emotion-oriented coping is generally accepted. Task-oriented coping is aimed at actively managing the stressful situation itself, while emotion-oriented coping is aimed at thinking or feeling in a different way about the stressful situation and so reducing the negative emotional consequences (Lazarus, 1993). Both types of coping are important, if used properly (Lazarus, 1993). The avoidance-oriented coping style refers to the actions aimed at avoiding or withdrawing from the stressor or the feelings that are evoked by the stressor (e.g. daydreaming about other things or meeting friends) (De Ridder & van Heck, 2004).

Each coping style is assessed according to 16 items, making a total of 48 items. For each item, respondents indicate on a Likert scale ranging from 1 (not at all) to 5 (very much) to what extent they apply a certain coping strategy during a stressful situation. An example item for T coping in the CISS is "Think about the event and learn from my mistakes", an example item for E coping is "Blame myself for being too emotional about the situation" and an example item for A coping is "Take some time off and get away from the situation".

Studies of the construct validity of the CISS have shown that CISS T reflects an active and adaptive coping strategy, while CISS E reflects a more negative way of dealing with emotions. CISS A could be considered as an active coping strategy (De Ridder & van Heck, 2004). Raw scores can be transformed into normative scores, which are available for the working population and students. Normative scores for the Dutch CISS are classified into seven categories, ranging from 1 (very low use of coping style) to 7 (very high use of coping style). Internal consistency and validity of the CISS is reported to be satisfactory (De Ridder & van Heck, 2004).

4.4. Analysis

SPSS software version 15.0 (SPSS Inc., Chicago, IL, USA) was used for all the statistical analyses. Categorical variables were described by tabulations and percentages and tested for differences between the T and NT group by Chi-square tests. Continuous variables were described by means and standard deviations and tested for group differences by independent samples T-tests (2-tailed). Cohen's d was used to interpret effect sizes. Cohen defined effect sizes as "small, d=0.2; medium = 0.5 and large = 0.8" (Cohen, 1988).

The primary research question in this study ("To what extent is overall QoL impaired in AWS?") was addressed by calculating the scores on the HUI3, EQ-5D and EQ-VAS. In addition, QoL scores were calculated for and compared between stuttering severity groups. For this analysis, the following stuttering severity categories were created: SA scale: mild = score 8-10; moderate = score 5-7; severe = score 1-4; and for the speech satisfaction scale: mild = score 5 (reflecting high speech satisfaction), moderate = score 2-4 (reflecting low to normal speech satisfaction), severe = score 1 (reflecting very low speech satisfaction). For the OASES, the original normative categories were applied.

To answer the second research question ("What are the determinants of QoL in AWS?") correlation analyses were conducted to explore the relationships between self-

assessment of speech, speech satisfaction, OASES Total impact score, coping style, functioning and QoL. Speech satisfaction and coping style utilized Spearman rank correlations; all other comparisons utilized Pearson product-moment correlations. Multiple linear regression analyses were performed to explore the associations of the explanatory variables with QoL. Three regression analyses were run, with respectively the HUI3, EQ-5D and EQ-VAS as dependent variables. In the first step, the SA score (representing symptom status) was entered. To determine the effect of self-assessment of stuttering on QoL with and without the influence of demographic variables, the second step included adding demographic variables (age, gender, education level, marital status), which were entered all at once. In step three, the coping scores for CISS-E, CISS-T and CISS-A were entered. Lastly, the grouping variable (T-NT) was entered. The adjusted r-square value reflects how well the model fits the data. In addition to the correlation and regression analyses, comparison of the T and NT group scores provided insight into the determinants of QoL in AWS.

5. Results

5.1. Characteristics of participants and response rate

A total of 91 AWS participated in this study: 38 AWS in the NT group and 53 AWS in the T group (Table 1). Significant group differences were found for age (t(89) = 2.390, p = .019) and gender (χ^2(1)= 4.670, p = .031). The response rate for the NT group contacted informally was 92%. In addition, four people responded to the appeal on the Hyves-stuttering website. Two of them were added to the NT group. The other two people were currently in treatment, and consequently added to the T group. Twenty-nine participants in the T group had just started conventional stuttering therapy (mean number of sessions 2.1; S.D. 1.9); six were on a waiting list. Ten people had just entered a family system therapy program for persons who stutter and eight were still on a waiting list for this program.

Insert Table 1. Demographics.

5.2. Symptom status

5.2.1. SA scores and speech satisfaction scores

The results for the SA scale and the speech satisfaction scale are displayed in Table 2. For the total group, the mean SA score of 6 corresponds to a rating of speech being sufficiently good. The mean satisfaction score was close to the category neither 'satisfied nor dissatisfied'. There was a significant group difference (T versus NT) for both the SA scores, $t(89) = 3.235$, $p = .002$, effect size = .27, and the speech satisfaction scores, $t(89) = 4.136$, $p < .001$, effect size = .43.

Insert Table 2. Speech characteristics.

5.2.2. OASES Impact scores

Table 2 also presents the OASES Impact scores. The mean Total Impact score of 48.4 in the total group represent moderate stuttering. The range of 25.6 to 74.4 indicates that the study population did not contain people with severe stuttering according to the OASES. The OASES Total Impact scores differed significantly between the T and NT group, $t(89) = -3.728$, $p < .001$, effect size = .80.

Significant differences were also found for the individual OASES sections, with higher Impact scores for the T group: Section I: $t(89) = -2.380$, $p = .019$, effect size = .51; Section II: $t(89) = -3.044$, $p = .003$, effect size = .64; Section III: $t(88) = -3.580$, $p = .001$, effect size = .76; Section IV: $t(89) = -3.382$, $p = .001$, effect size = .73.

5.3. Functioning status and QoL

5.3.1. Descriptive dimensions of functioning

Table 3 displays the health profiles for the EQ-5D and the HUI3 by means of frequencies of AWS reporting no problems on the dimensions. The distribution on the speech domain of the HUI3 differed significantly between groups (χ^2(1)= 7.595, p = .006), with the T group reporting more problems. For the domains pain/discomfort and anxiety/depression of the EQ-5D and vision, emotion, cognition and pain and discomfort of the HUI3 no significant group differences were established. For the domains mobility, self-care and usual activities of the EQ-5D and hearing, ambulation and dexterity of the HUI3 the number of people in the 'problems' cells was too small to allow statistical analyses.

5.3.2. QoL values

Table 3 also displays the overall QoL scores for the HUI3, EQ-5D and EQ-VAS. There were no significant differences between the T and NT group for the HUI3 and EQ-5D. However, both groups differed significantly on the EQ-VAS: t(89) = 2.772, p = .007, effect size = .81, with a lower score for the T group.

Two people in the T group had a very low HUI3 score (.09 and .17), indicating a very low QoL. Removing these outliers did not result in a change in the mean scores for HUI3, EQ-5D and EQ-VAS.

Insert Table 3. Functioning profiles and Quality of Life scores.

5.3.3. QoL scores differentiated by stuttering severity levels

To explore differences in QoL scores due to stuttering severity, the QoL scores for the total group, differentiated by stuttering severity level, are displayed in Table 4. Compared with perfect health (valued at 1), the HUI3 and EQ-VAS scores show a reduction in QoL for adults with mild stuttering (reflected as a high score on the SA scale, a high satisfaction score and a mild OASES Impact score). Furthermore, Table 4 shows that QoL reduces with increasing stuttering severity level, irrespective of how stuttering severity was quantified. The HUI3 shows a larger reduction of QoL than the EQ-5D and EQ-VAS.

Insert Table 4. Quality of Life scores by stuttering severity level.

5.4. Characteristics of the individual: coping scores

The internal consistency of the CISS in this study was satisfactory (Cronbach's alpha ranging from .78 to .90). The mean transformed coping scores for the total group for CISS-T were 3.3 (SD = 1.67), for CISS-E 3.9 (SD = 1.65), and for CISS-A 2.4 (SD = 1.37). The mean scores for CISS-E coping are close to average, while the other coping style scores appear to be below average. There were no significant differences between the T and NT group.

5.5. Association between symptom status, coping, functioning and QoL

Exploration of the relationships between SA score, speech satisfaction score, OASES Total Impact score, coping and QoL (Table 5) revealed that all stuttering symptom measures correlated significantly with each other. In addition, all QoL measures correlated significantly with one or more stuttering symptom measures, with a lower QoL score reflecting more severe stuttering. Overall, the strongest correlations were established for the HUI3, which correlated significantly with all three subjective stuttering measures. The mean EQ-5D QoL score was related to the mean SA score and OASES Total Impact score, but not to the mean speech satisfaction score. The EQ-VAS score only correlated significantly with the OASES Total Impact score. CISS-E was negatively associated with speech satisfaction and the OASES Total Impact score, and was the single coping style significantly related to all QoL measures. CISS-A was positively associated with speech satisfaction, while CISS-T did not correlate significantly with any of the subjective stuttering measures.

Correlations between symptoms and relevant subscales of the HUI3 and EQ-5D (representing functioning) are shown in Table 6. The speech and emotion domains of the HUI3 correlated significantly with all three stuttering measures. The cognition and pain

domains of the HUI3 and the domains daily activities and anxiety/depression of the EQ-5D all significantly correlated with one stuttering symptom measure.

Insert Table 5. Correlations between SA score, speech satisfaction score, OASES Total Impact score, coping and overall Quality of Life.

Insert Table 6. Correlations between SA score, speech satisfaction score, OASES Total impact score and domains of functioning.

5.6. Regression analysis

The regression model which was used to simultaneously evaluate the effect of each determinant on QoL (Table 7) explained 36% of the variation in HUI3 scores (adjusted R^2 full model). Significant independent explanatory variables were SA score (p = .006), age (p = .003), gender (p = .001), marital status (p = .045), CISS-T score (p = .023) and CISS-E score (p = .000). Group identification (Group ID) did not contribute to the variation in HUI3 score. The same regression analyses with the EQ-5D score as dependent variable showed only a significant effect of CISS-E (p = .000, total adj. R^2 = .186). Regression analyses run with the EQ-VAS as dependent variable showed, in addition to CISS-E, also a significant effect of age (p =.001), gender (p = .000), marital status (p = .005) and group ID (p = .000). The total adjusted R^2 was .312.

Insert Table 7. Multiple regression analysis for HUI3, EQ-5D and EQ-VAS.

6. Discussion

The objectives of the present study were (1) to investigate to what extent QoL is impaired in AWS and (2) to identify determinants of QoL in AWS. The latter was pursued by exploring relationships between stuttering severity, coping, functioning and QoL and by testing for differences in variable scores in two subgroups: the NT group and the T group. The results of this study show that stuttering severity affects overall QoL considerably. HUI3 derived QoL values were .91 for mild stuttering and .73 for severe stuttering. AWS who had

just begun or were about to begin therapy rated their stuttering as more severe and recorded more problems on the HUI3 speech domain than AWS who were not in therapy. However, the results with respect to the differences in overall QoL between the T and NT group varied. While differences in overall QoL were not significant according to the HUI3 and the EQ-5D, according to the EQ-VAS they were. The effect size was .81, which can be considered as large (Cohen, 1988). The correlation analysis between stuttering severity and domains of functioning in the total group showed that a higher stuttering severity was mainly associated with limitations in the domains of speech and emotion. Lastly, regression analysis showed that the relationship between stuttering severity and overall QoL was influenced by task-oriented and emotion-oriented coping style.

With regard to the extent to which QoL in AWS is affected, our study could not confirm that the impact of severe stuttering on overall QoL was as great as suggested by Bramlett et al. (2006). QoL values for severe stuttering in our study ranged from .73 to .88, while Bramlett et al. (2006) found QoL values between .44 and .81 for severe stuttering. There could be two reasons for this difference. Firstly, this might be related to the somewhat wider range of stuttering severity in the Bramlett et al. (2006) study. Although a substantial number of participants in the current study had low scores on the SA-scale, which represents severe stuttering, none of the participants was classified as severe stuttering by the OASES. Secondly, the difference in QoL values may be due to differences in the way QoL values were obtained. Bramlett et al. (2006) derived their QoL values by *direct* valuation of vignettes describing stuttering: AWNS rated hypothetical states of stuttering and their own health state. In the current study, QoL was *indirectly* assessed by using the HUI3 and EQ-5D. In this way QoL values (from the general public) were derived by applying a mathematical algorithm to the health states that were described by the AWS. These health states were generic, that is, they had no specific reference to stuttering. Therefore, the indirect instruments applied in the current study might not have been responsive enough to stuttering, resulting in an upward bias. In other words, the impact of stuttering on QoL might actually be greater than found in our study. Alternatively, it could be hypothesized that

the absence of anchor points referring to other conditions worse than severe stuttering led to a downward bias in the direct assessment approach by Bramlett et al. (2006). This is known as contextual bias (Doctor, Bleichrodt, & Lin, 2008). The two studies have no single measure in common to explore whether the negative impact on QoL has been underestimated in our study or overestimated in the Bramlett et al. (2006) study, or both.

In the current study, as in the study of Bramlett et al. (2006), substantial differences in QoL values were established using different instruments. Comparing the three QoL measurements for the most severe stuttering state, the impairment on the HUI3 was greater than on the EQ-5D and EQ-VAS. This difference may be explained by inclusion of the speech domain in the HUI3, which improves its responsiveness to stuttering. This might also clarify why the HUI3 measurement showed QoL impairment for the mildest forms of stuttering, but EQ-5D measurement showed relatively little or none. Ceiling effects for the EQ-5D, as reported in other relatively healthy populations (Kopec & Willison, 2003; Lamers, Bouwmans, van Straten, Donker, & Hakkaart, 2006), may have contributed to a limited responsiveness of this instrument in AWS. Accordingly, the EQ-5D might have overestimated QoL, although the alternative hypothesis, that the HUI3 has underestimated QoL, cannot easily be abandoned. By inclusion of speech as a domain, the emphasis on the speech problems may be larger than their impact on QoL warrants.

In theory, EQ-VAS outcomes could help to identify whether QoL was underestimated by the HUI3 or overestimated by the EQ-5D, since the EQ-VAS measures QoL directly and not via its impact on basic domains of functioning. Therefore, the VAS scale is not prone to possible misrepresentation of QoL, which could occur if the HUI3 and the EQ-5D do not include all the relevant domains. In addition, the EQ-VAS values QoL from the perspective of the respondent himself instead of the general population. However, neither hypothesis could be supported, since the results indicate that the EQ-VAS was less responsive than *both* the EQ-5D and HUI3 for changes at the symptom level. An 'end of scale' bias might have limited the responsiveness of the EQ-VAS. Subjects tend to avoid using scale ends (Drummond, Sculpher, Torrance, O'Brien, & Stoddart, 2005; McCabe et

al., 2006), which implies that the QoL effect of mild health problems is difficult to measure on a VAS scale. Support for this hypothesis is found in the result that EQ-VAS scores were limited to a smaller range of the scale than HUI3 and EQ-5D scores. Thus, unfortunately, the EQ-VAS does not provide the key to whether the EQ-5D overestimated QoL, or the HUI3 underestimated it.

Our findings that stuttering affects functioning in a negative way are in line with the results of other studies (e.g. Andrade et al., 2008; Craig et al., 2009; Klompas & Ross, 2004). The domains that significantly correlate to stuttering severity in our study correspond to a great extent with the domains affected in the Craig et al. (2009) study, that is mainly social and psychological dimensions. An interesting finding of the current study is the positive correlation between stuttering severity as measured by the OASES and the pain domain of the HUI3. This result may reflect the broad definition of the HUI3 pain domain, which covers pain *and discomfort*. Alternatively, AWS reporting physical pain, especially in the breast region, when asked what they feel in their body when they speak, stutter or try to avoid stuttering, is a quite common response in the clinical experience of the third author. Besides, it may be hypothesized that stuttering affects physical well-being because of higher stress levels associated with the experience of social anxiety (Menzies et al., 2009). There is evidence for a common neural basis for regulating social pain and physical pain (Macdonald & Leary, 2005). As a result, the physical pain threshold can be triggered by social pain.

The regression analyses into the relationships between stuttering severity, coping and overall QoL identified coping as a mediating factor in QoL in AWS, in addition to stuttering severity and demographic variables. The results of the HUI3 regression analysis suggested that both stuttering severity and coping style can be directly related to QoL in equal measure. Two types of coping were associated with QoL. Higher scores on the CISS-E (emotion-oriented coping) were correlated with lower QoL. While it is known that dealing with emotions in a constructive way positively influences the adjustment to a chronic disease (De Ridder et al., 2008), higher CISS-E scores reflect a more negative way of

dealing with emotions (e.g. denial, mental or behavioral distance, brooding), presumably resulting in a greater psychological impact and a lower QoL (De Ridder & van Heck, 2004). The regression analysis also revealed that higher task-oriented coping scores were associated with better QoL, reflecting that task-orientation is an active and adaptive way of coping which influences QoL in a positive way (Lazarus & Folkman, 1984). QoL might be maximized by individuals who apply the various strategies flexibly depending on the circumstances that they have to deal with (Lazarus, 1993).

The differences in the results between the therapy group and non-therapy group in this study provide further insight into the underlying mechanisms of QoL in AWS. The groups differed significantly in stuttering severity, in score on the speech domain of the HUI3 and in overall QoL as assessed by the EQ-VAS. There were no group differences in coping scores. The regression analysis with the EQ-VAS as dependent variable was the only analysis that revealed group ID as a significant predictor of overall QoL. These results suggest that AWS who seek treatment do this because they desire symptom relief, and not because they are poor at coping.

Elements in our study design that might evoke questions about the external validity are related to the choice of including a T and NT group of AWS and to the use of self-assessed measures to establish stuttering severity. The NT group was included because we wanted to cover the maximum range of QoL values in the group of AWS and hypothesized that QoL might be higher in AWS not seeking treatment and/or that relationships between stuttering, coping and QoL might differ between groups. The representativeness of the NT group cannot be established, due to the lack of detailed information about the Dutch AWS population not receiving treatment. Furthermore, the results show that there are between group differences, namely a lower stuttering severity and a better subjective QoL, as measured with the EQ-VAS, for the NT group. The difference in stuttering severity was also reflected in a better HUI3 speech QoL value for the NT group. These results imply that outcomes obtained in clinical populations cannot simply be generalised to the population of AWS as a whole and vice versa. With regard to the

applied speech measures, we are confident that self-identification of stuttering in the NT group and self assessed stuttering severity has not negatively affected the external validity, because 81% of the AWS in the study reported having been previously diagnosed as stuttering by a professional. Furthermore, Huinck and Rietveld (2007) showed that correlations between a self-assessment scale of speech satisfaction and measures which reflect overt stuttering behavior are relatively strong, indicating a high validity of a simple and cost-effective speech rating scale. This suggests that our study results would provide a valid estimation of QoL in all AWS.

Our study presents evidence that stuttering in adults is a serious problem affecting health. A broadly-based outcome measure such as QoL could provide a means of evaluating the impact of stuttering on daily life. QoL measures could therefore be applied in therapy evaluation studies, or in evaluating the relationship between the cost and benefit of stuttering interventions. Furthermore, the relevance of coping for QoL in AWS, which was demonstrated in this study, shows that a good understanding of the determinants of QoL is essential to develop rational and cost-effective treatments: *"The development of treatment strategies requires not only that we identify the key factors that combine to determine function and quality of life, but also that we understand their relative importance and the degree to which they can be altered or modified"* (Wilson & Cleary, 1995, p. 63). Our study is a first step in exploring the determinants of QoL in relation to stuttering. The effect of coping on the relationship between stuttering severity and QoL which was established in this study suggests that addressing coping style could be a useful component in the process of diagnosing and selecting treatment approaches for AWS. Using a coping instrument during the assessment phase indicates how an individual copes with stressful situations in daily life. If an AWS is using an inadequate coping pattern, therapeutic goals could be identified which would enable the AWS to change his personal coping style to deal more effectively with stressors that provoke stuttering or the stuttering behavior itself, thereby reducing its negative impact on QoL. For instance, if a client displays relatively high scores on the emotion-oriented coping scale and low task-oriented coping scores, treatment

goals might be focused on learning task-oriented coping strategies and becoming less dependent on emotional ways of dealing with stress. This idea is supported by Hayhow et al. (2002) who showed that AWS have the desire to get help in managing their stuttering and in developing coping strategies. We would therefore recommend that more studies be done on coping in relation to stuttering, such as the ones recently reported by Plexico and colleagues (Plexico et al., 2009a; Plexico et al., 2009b).

In conclusion, by using generic QoL measures, it was shown that the health condition of moderate to severe stuttering substantially reduces the QoL in AWS as compared to the perfect health state. This result, and the significant relationship between stuttering severity, coping style and QoL, highlights the need for further research in order to clarify the conceptualization of QoL in relation to stuttering, as a foundation for the further development of effective therapies for the disorder of stuttering.

Acknowledgments

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Table 1.

Demographics.

		Total group (N=91)	T group (N=53)	NT group (N=38)	Significance
		N (%)	N (%)	N (%)	
Gender[*]					.031
Male		63 (69.2)	32 (60.4)	31 (81.6)	
Female		28 (30.8)	21 (39.6)	7 (18.4)	
Age in years[*]	Mean (SD)	36 (14.68)	33 (12.43)	40 (16.59)	.019
Educational level					.900
Low		8 (8.8)	5 (9.5)	3 (7.9)	
Middle		28 (30.8)	17 (32.1)	11 (28.9)	
High		55 (60.4)	31 (58.4)	24 (63.2)	
Marital status					.172
Single / divorced		46 (50.6)	30 (56.6)	16 (42.1)	
Married		45 (49.4)	23 (43.4)	22 (57.9)	
Job status					.191
Paid work		60 (65.9)	33 (62.3)	27 (71.1)	
Student		20 (22.0)	15 (28.3)	5 (13.2)	
Other		11 (12.1)	5 (9.4)	6 (15.7)	
Stuttering ever diagnosed by a SLT[a]					.872
Yes		74 (81.3)	44 (83.0)	30 (78.9)	
No		14 (15.4)	8 (15.1)	6 (15.8)	
Unkown		3 (3.3)	1 (1.9)	2 (5.3)	
Onset of stuttering					.066
Onset before 7 years		69 (75.8)	37 (69.8)	32 (84.2)	
Onset ≥ 7 years		22 (24.2)	16 (30.2)	6 (15.8)	
Age of onset in years if onset ≥ 7 years	Mean (SD)	10.8 (5.34)	11.7 (6.10)	8.7 (1.40)	.307

[*] = *p* < .05 (difference T-NT group, 2-tailed).

[a] *SLT= Speech-language therapist*

Table 2.

Speech characteristics.

	Total group (N=91)	T group (N=53)	NT group (N=38)	Significance
	Mean (SD)	Mean (SD)	Mean (SD)	
SA score**	6.0 (1.48)	5.6 (1.44)	6.6 (1.35)	.002
Speech satisfaction score**	2.9 (0.97)	2.5 (0.89)	3.3 (0.90)	.000
OASES Total Impact score**	48.4 (10.88)	51.8 (10.39)	43.7 (9.86)	.000
Impact score Section I*	58.0 (9.68)	60.0 (9.23)	55.2 (9.71)	.019
Impact score Section II**	51.9 (13.64)	55.4 (12.68)	47.0 (13.56)	.003
Impact score Section III**	45.6 (12.32)	49.3 (11.91)	40.5 (11.10)	.001
Impact score Section IV**	39.3 (13.35)	43.1 (12.98)	34.0 (12.10)	.001

* = $p < .05$ (difference T-NT group, 2-tailed), ** = $p < .01$ (difference T-NT group, 2-tailed).

Table 3.

Functioning profiles and Quality of Life scores.

	Total group (N=91)	T group (N=53)	NT group (N=38)	Significance
HUI3 dimension	N (%) reporting no problems	N (%) reporting no problems	N (%) reporting no problems	
Vision	48 (52.7)	30 (56.6)	18 (47.4)	.384
Hearing	88 (96.7)	51 (96.2)	37 (97.4)	a
Speech**	65 (71.4)	32 (60.4)	33 (86.6)	.006
Ambulation	88 (96.7)	52 (98.1)	36 (94.7)	a
Dexterity	88 (96.7)	51 (96.2)	37 (97.4)	a
Emotion	38 (41.8)	21 (39.6)	17 (44.7)	.626
Cognition	68 (74.7)	39 (73.6)	29 (76.3)	.768
Pain and discomfort	53 (58.2)	28 (52.8)	25 (65.8)	.216
EQ-5D dimension	N (%) reporting no problems	N (%) reporting no problems	N (%) reporting no problems	
Mobility	88 (96.7)	52 (98.1)	36 (94.7)	a
Self-care	90 (98.9)	52 (98.1)	38 (100)	a
Usual activities	86 (94.5)	48 (90.6)	38 (100)	a
Pain/discomfort	75 (82.4)	42 (79.2)	33 (86.8)	.348
Anxiety/depression	73 (80.2)	43 (81.1)	30 (78.9)	.796
Overall QoL score	Mean (SD)	Mean (SD)	Mean (SD)	
HUI3	.85 (.16)	.84 (.19)	.88 (.12)	.355
EQ-5D	.93 (.12)	.92 (.14)	.94 (.10)	.520
EQ-VAS**	83.2 (11.9)	80.4 (12.9)	86.9 (9.3)	.007

** = $p < .01$ (difference T-NT group, 2-tailed).

a Chi-square tests could not be performed because the number of people in the 'problems' cell was too small.

Table 4.

Quality of Life scores by stuttering severity level.

		HUI3 score	EQ-5D score	EQ-VAS score
SA score				
Mild (score 8, 9)[a] n=11	Mean (SD)	.91 (.13)	.96 (.09)	85.9 (10.17)
Moderate (score 5, 6, 7) n=65	Mean (SD)	.88 (.13)	.93 (.13)	83.1 (11.54)
Severe (score 2, 3, 4)[a] N=15	Mean (SD)	.73 (.24)	.88 (.14)	81.4 (14.94)
Speech satisfaction score				
Mild (score 5) N=4	Mean (SD)	.95 (.07)	1.00 (.00)	96.3 (4.11)
Moderate (score 2, 3, 4) N= 72	Mean (SD)	.86 (.16)	.93 (.12)	82.6 (11.76)
Severe (score 1) n=5	Mean (SD)	.73 (.24)	.88 (.17)	82.0 (14.47)
OASES Total impact rating				
Mild n=5	Mean (SD)	.96 (.07)	1.0 (.00)	92.0 (7.29)
Mild-to-moderate n=30	Mean (SD)	.92 (.08)	.96 (.09)	84.3 (12.60)
Moderate n=45	Mean (SD)	.83 (.15)	.91 (.14)	82.3 (10.31)
Moderate-to-severe n=11	Mean (SD)	.74 (.28)	.88 (.15)	79.6 (16.51)

[a] No respondents rated their speech with a score of 1 or 10

Table 5.

Correlations between SA score, speech satisfaction score, OASES Total impact score, coping and overall Quality of Life.

	SA score	speech satisfaction score	OASES Total Impact score	CISS-T	CISS-E	CISS-V	HUI3 score	EQ-5D score
SA score								
speech satisfaction score	0.724**							
OASES Total Impact score	-0.701**	-0.638**						
CISS-T	-0.053	0.034	-0.074					
CISS-E	-0.197	-0.251*	0.483**	-0.041				
CISS-V	0.193	0.253*	-0.083	0.240*	0.090			
HUI3 score	0.365**	0.357**	-0.483**	0.159	-0.395**	0.012		
EQ-5D score	0.206*	0.194	-0.336**	0.030	-0.367**	-0.210	0.713**	
EQ-VAS score	0.058	0.137	-0.218*	0.063	-0.382**	-0.029	0.548**	0.451**

* = p< .05. ** = p < .01 (2-tailed).

Table 6.

Correlations between SA score, speech satisfaction score, OASES Total impact score and domains of functioning.

	HUI3 speech	HUI3 emotion	HUI3 cognition	HUI3 pain and discomfort	EQ-5D daily activities	EQ-5D anxiety/depression
SA score	0.327**	0.274**			-0.207*	
speech satisfaction score	0.294**	0.324**				
OASES Total impact score	-0.307**	-0.384**	-0.324**	-0.254*		0.346**

* = p< .05. ** = p < .01 (2-tailed).

Note: Only significant correlations are displayed

Table 7.

Multiple regression analysis for HUI3, EQ-5D and EQ-VAS.

	HUI3				EQ-5D				EQ-VAS			
	adjusted R^2	delta R^2	Unstandardised B	P-value	adjusted R^2	delta R^2	Unstandardised B	P-value	adjusted R^2	delta R^2	Unstandardrsized B	P-value
(Constant)			.674	.000			.826	.000			107.14	.000
Step 1	.123	.133			.032	.043			-.008	.003		
SA score			.032	.006**			.009	.329			-1.119	.185
Step 2	.190	.103			.012	.024			-.002	.050		
Age			-.004	.003**			.000	.406			-.320	.001**
Gender			.117	.001**			.028	.330			9.386	.000**
Educational level			.004	.648			.001	.863			-.625	.326
Marital status			.071	.045*			.039	.183			7.323	.005**
Step 3	.358	.181			.195	.200			.169	.190		
CISS-T			.004	.023*			.002	.163			.210	.056
CISS-E			-.006	.000**			-.005	.000**			-.491	.000**
CISS-V			-.002	.283			-.002	.234			-.098	.437
Step 4	.361	.010			.186	.001			.312	.137		
Group ID			-.037	.257			-.009	.747			-10.036	.000**

Note. * = p< .05. ** = p < .01

Appendix

Judgment of speech

1. If you had to score your own speech (range 1-10), how would you score it? <u>Circle a</u>

    <u>score</u>

    1   2   3   4   5   6   7   8   9   10

    1= very bad

    10= very good

2. How satisfied are you with your speech?

    Mark the corresponding box with a cross.

    Not satisfied   Not satisfied   Satisfied nor   Satisfied   Very satisfied
    at all   dissatisfied