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Subjective Screening of Stuttering severity, locus of control and avoidance: research edition

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Abstract

This article describes the Subjective Screening of Stuttering (SSS): research edition that is designed to quantify the selected self-reports of people who stutter (PWS) prior to, during, and following their treatment. The three areas screened by the SSS are perceived stuttering severity, the level of internal or external locus of control, and reported word or situation avoidance. Each of the areas has two or three items rated for three audiences on a one to nine rating scale. Other available measures were reviewed and the need for a single instrument that provides quantified screening of each of the areas was recognized.

Results of a research project using the SSS with 16 PWS indicated that percent of syllables stuttered correlated with stuttering severity ($r = 0.75$) and with locus of control ($r = 0.43$) but did not correlate with avoidance. These results were interpreted to indicate a need for other types of therapy following the experimental treatment studied.

Reliability and validity of the SSS were judged adequate for research and clinical screening. The possible role of screening self-reports of PWS in combination with more extensive self-report instruments and with objective measures of stuttering is discussed.

Educational objectives: The reader will be able to (1) assess the perception of stuttering severity, avoidance and locus of control of people who stutter (PWS), and (2) determine from the PWS the self-reported outcome of treatment.

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Clinicians who treat people who stutter (PWS) often employ formal or informal self-reporting to measure selected aspects of stuttering and track changes during treatment. Listener's judgments are commonly used in research designs, however, there is an increased interest in self-reporting as a basic measure of stuttering treatment outcome. [Ingham and Cordes \(1999\)](#) reviewed the usefulness of complaint driven measurement and concluded, "Ultimately, the self-judged acceptability of fluency may be not only an important part of normal fluency, but perhaps the most critical goal of stuttering treatment" (p. 423).

The need for obtaining self-evaluations was advocated more than 70 years ago by [Willoughby \(1932\)](#). His approach was expanded by [Wolpe \(1958, 1969\)](#) who developed the subjective units of distress (sud) which provided a 0–10 interval scale for the self-rating of anxiety.

Self-reporting protocols have been used in treatment and research with PWS. [Manning \(2001\)](#) described 51 tests or protocols that have been used to evaluate various aspects of stuttering since 1944. Of these, 24 involved self-reports of older children or adults. Most of the instruments were multi-dimensional but some targeted a single factor such as locus of control of behavior (LCB) ([Craig, Franklin, & Andrews, 1984](#)), or speaking situations related to avoidance ([Cooper, 1985](#)). [Manning \(1994\)](#) developed a self-efficacy scale for adolescents who stutter to measure their confidence levels in varying situations. It is a useful tool paralleling and following treatment. Clinicians can choose one or more of these protocols to suit their treatment or research goals.

Two scales commonly used in research designs to quantify selected elements of stuttering using self-reporting are the S-24 scale ([Andrews & Cutler, 1974; Erickson, 1969](#)) and the Perception of Stuttering Inventory (PSI) ([Woolf, 1967](#)). Eleven items of the S-24 assess situation avoidance and one assesses word avoidance. The remaining 12 items deal with making a favorable impression, feelings during talking, and self-control during talking. The PSI targets struggle, avoidance, and expectancy about equally. Seventeen of the 60 items deal with situation avoidance and seven with word avoidance.

Two general self-report scales, not specifically related to stuttering, were developed that measured aspects of locus of control. The LCB is widely used. [Rotter \(1966\)](#) developed an earlier scale to measure the locus of control. An internal perception of control is an indication that the individual feels personal power; a perception of external control can result in feelings of powerlessness. Treatment goals can include shifting the locus of control from primarily external to internal.

None of the subjective scales described provides sub-tests to assess several selected factors in a single protocol. Factors that are often targeted in treatment and in research include perceived severity, locus of control, and avoidance. We have observed that these aspects of stuttering change differentially. For example, perceived and observed severity may improve but the level of word avoidance may remain the same.

1. Rationale for Subjective Screening of Stuttering

The success of stuttering treatment has predominantly been evaluated and assessed by the listener. The criteria often have referred to the degree of perceived fluency and level of naturalness. Although the people who stutter (PWS) may be determined to be "fluent" by

listeners, they might report feeling “very disfluent.” In addition, the PWS may be achieving the sound of fluency by careful monitoring, at the cost of intense effort, avoiding dreaded and feared words and situations, and experiencing a sense of anxiety and feelings of being out of control. The PWS may even view fluent speech as being disfluent. These internal perceptions and dynamics could contribute to the difficulty of achievement and maintenance of fluency. There is a need to have instruments of self-reporting by people who stutter in order to determine their perception as well as the listener’s. Perhaps, ultimately, the most important opinion concerning satisfaction with speech production will be that of the speaker.

It may be useful to determine which individuals who stutter retain anticipatory anxiety, e.g., feared word substitution even after achieving behavioral fluency. The Subjective Screening of Stuttering (SSS) provides a simple procedure for recognizing the internal processes experienced by the PWS. The recognition that these processes are present can be therapeutic and provide an outlet for other aspects of stuttering/fluency. If the screening is used in clinical work, the PWS can communicate to themselves as well as to the clinician, the perceived level of functioning and the direction of change. It can be used for the PWS to set a mental goal of change, such as, reducing avoidance from an 8 to a 7 then to a 6. These numbers don’t represent magnitude, but direction and a perceived interval.

The screening of the areas of severity, locus of control and avoidance can indicate if further evaluation is needed. The severity rating can be correlated with such instruments as the percent syllables stuttered (%SS), duration, or the Stuttering Severity Instrument, third edition (SSI-3) (Riley, 1994). Locus of control can be further assessed using selected items of the PSI or the LCB. Avoidance can be measured in more detail using selected items of the PSI or the S-24.

The purpose of this project was to design a self-report protocol that provides a screening of each of three aspects of stuttering, (1) perceived severity, (2) perceived locus of control (or sense of effort), and (3) perceived avoidance. Treatment that incorporates the person’s self-reporting and self-evaluating recognizes the internal processes of the person who stutters. It also provides information to the clinician, which might not be known otherwise.

2. Development of the scales

2.1. Selection of areas and items

The areas for screening were selected based on long-term experience of the first author, other clinicians, and people who stutter. Reduction in observed stuttering severity was not always accompanied by reductions in the reported amount of effort. Effort seems to represent the perceived influence of external locus of control so that outside forces are perceived to impose pressure during speaking. Therefore, we considered the locus of control paradigm to best represent these perceptions. Reduction in stuttering severity does not eliminate word or situation avoidance in many cases. Often specific procedures are needed to modify avoidance behaviors and attitudes. We concluded that most treatment changes could be captured using subjective reports in three areas, (1) stuttering severity, (2) locus of control, and (3) avoidance.

Items were selected for each area of the SSS during 4 years of clinical trials. This article describes a research edition of the SSS. The research scales consist of eight items of which

two measure severity (SEV), three measure locus of control (LOC) and three measure avoidance (AVD). [Appendix A](#) contains a copy of these scales. The following oral instructions were provided to clients, “The questions are self-explanatory. Please base your answers on your speech during the last week.” In clinical practice, interaction with a clinician during the scoring provides additional, useful information that may be difficult to quantify. Each item is rated on a 1–9, equal appearing scale in which 1 represents “normal” or target level and 9 is the most severe. Item number 1 requires a rating of the stuttering severity “today.” All items after number 1 are rated for three audiences: a close friend, an authority figure, and use of the telephone. They are based on speech “during the last week.” The rating of the close friend is used for comparison purposes but is not included in the quantification of the data because it is consistently the lowest of the ratings. The ratings based on an authority figure and use of the telephone seem to provide data that are more representative of the level of difficulty perceived by the PWS and more comparable to other measures of severity. Please refer to [Appendix A](#) for forms that facilitate administration and scoring of the SSS.

3. Reliability

The degree of stability of the scale scores was examined in three ways. First, the SSS was administered twice with 2 weeks between the testing sessions. The percents of agreement and the correlation of the two sets of scores were computed. Second, the correlations of items to their related areas were computed. Third, the correlations of each area to the SSS total score were computed.

3.1. Test–retest agreement

The SSS was administered twice to 16 adults who stutter during the baseline condition in an investigation of the usefulness of a medication to augment the treatment of stuttering (Maguire, Riley, Franklin, & Gottschalk, 2000). Percentages of agreement were obtained by dividing the smaller of the two scores by the larger and multiplying by 100 for each subtest for each client. The severity subtest had an average percentage agreement of 88% (S.D., 7.5) and a Pearson product correlation of r , 0.90. The locus of control subtest had a percent of agreement of 89% (S.D., 8.5) and r , 0.93. The avoidance subtest had a percent agreement of 84% (S.D., 16.8) and r , 0.79.

3.2. Item to area correlations

In order to examine the contribution of each item to the overall measures of severity, locus of control, and avoidance, its correlations to the total scores of the three areas were calculated. [Table 1](#) displays the results of this analysis. The correlations of each item to its related area ranged from r , 0.81 to r , 0.97. All were high enough to justify their inclusion in the SSS. In fact, four of the correlations were 0.95 or above so an even shorter version of the scale could be justified by these correlations. However, in each case there were individual clients whose ratings were not evenly distributed between or among the related items. For these individuals the total area scores would have been less reliable if the redundant items were deleted.

Table 1

Pearson correlations of each item to the total scores of the severity, locus of control, and avoidance subtests ($N = 32$)

Item	Severity	Locus of control	Avoidance
SEV 1	0.86	0.68	0.61
SEV 2	0.97	0.88	0.85
LOC 3	0.89	0.95	0.84
LOC 5	0.87	0.96	0.81
LOC 6	0.85	0.96	0.81
AVD 4	0.52	0.55	0.81
AVD 7	0.81	0.81	0.86
AVD 8	0.67	0.65	0.81

3.3. Subtests to total SSS correlations

The mean scores and standard deviations for this population were as follows: severity 15.0 (5.1); locus of control 32.3 (12.8); avoidance 26.8 (11.9); and total SSS 73.4 (28.6). Severity correlated r , 0.92 with the total SSS score; locus of control correlated r , 0.92 with the total; and avoidance correlated r , 0.95 with the total.

4. Validity

4.1. Content validity

This scale seems to have reasonable content validity because the content of each item is clear and seems appropriate to its area category. The items were selected during 10 years of clinical experience by a person with both speech and psychology certifications during treatment sessions that were designed to reduce the areas relevant to the SSS (stuttering severity, locus of control, and avoidance). This item selection procedure assures that each item is closely related to the commonly accepted meanings of the behaviors and concepts being screened. In addition, the input of other clinicians who used earlier versions of the scale was used to improve the selection or wording of some items.

Using a 1–9 scale may be less accurate than direct magnitude estimations (Schiavetti, Sacco, Metz, & Sitler, 1983). Specifically, the milder ratings at the lower end of the scale (ratings 1, 2, and 3) will probably be more closely spaced and represent less difference than the equal appearing scale implies compared with ratings of 4 or higher. However, most clinicians are familiar with the 1–9 scale because of its use in naturalness ratings. The appropriateness of the 1–9 scale compared with direct magnitude estimates was examined by Schiavetti, Martin, Haroldson, and Metz (1994). They concluded that either procedure is valid for quantification of naturalness judgments. In addition to familiarity and ease of use, the equal appearing scale data would seem to facilitate comparisons of SSS data between clinicians, clinics, and other measures. These practical considerations seemed to be more important to the usefulness of this screening procedure than the loss of some statistical accuracy.

4.2. Criterion-related validity

The SSS is designed to be a useful screening procedure that employs a few direct, well-chosen statements to predict the need for further assessments using other more comprehensive instruments or using clinical interviews. If the SSS provides an estimate of the concern that a PWS has in each of the areas, then it is likely to be reasonable valid as a screening procedure. Criterion-related validity was examined by comparing the SSS scores with more extensive, related assessment instruments.

4.2.1. Stuttering severity area

Correlations of each area of the SSS to percent syllables stuttered (%SS) and to duration of the longest stutters at baseline were calculated for 16 PWS. Perceived severity area of the SSS correlated with %SS ($r, 0.75; P, 0.01$) and with duration ($r, 0.69; P, 0.01$).

4.2.2. Locus of control and avoidance areas

Subjective Screening of Stuttering scores for the areas of locus of control and avoidance were compared with appropriate items on the Perceptions of Stuttering Inventory (PSI) (Woolf, 1967). Each of the 60 items of the PSI was categorized as either locus of control or avoidance by the first author. Thirty-six of the items described locus of control and 24 described avoidance. In the area of locus of control, (effort) the SSS correlated significantly with the PSI items ($r, 0.70; P, 0.05$). In the area of avoidance, the correlation was $r, 0.83, P < 0.01$. The higher correlation for avoidance seems reasonable because it is more specific (less ambiguous) than locus of control.

5. Applications of the Subjective Screening of Stuttering

5.1. Research applications

The research edition of the SSS has adequate reliability and validity for use in research designs for which it is appropriate. The SSS provides PWS the opportunity to assess their stuttering via self-report in three areas, stuttering severity, locus of control, and avoidance. For example, changes in stuttering during and following a given type of treatment can be described, quantified and subjected to appropriate qualitative and quantitative analysis.

The SSS was included in the design of a recent double blind, placebo controlled, study of the effects of olanzapine on various aspects of stuttering (Maguire et al., submitted). Twelve PWS were assigned randomly to the active medication group and 12 to the placebo group. One of the persons in the placebo group did not complete the study. The active medication subjects had significantly more improvement than those in the placebo group on the Clinical Global Impressions (CGI, a measure used by physicians to report overall impressions of the severity of an illness from 1, normal to 7, very severely ill), $df, 9; t, 2.5, P, 0.04$ and on the SSI-3 (Riley, 1994), an instrument that combines percent syllables stuttered, duration of the three longest stuttering events, and a rating of the physical concomitants ($df, 20; t, 2.2, P, 0.04$).

The self-reports of PWS who were in the active medication group indicated their stuttering severity was reduced; the SSS severity area was reduced an average of 22.4% and

the PWS in the placebo group reported less than 1% reduction. This difference was statistically significant ($df, 20; t, 2.6; P, 0.02$). The amount of effort expended to accommodate the stuttering as measured by the locus of control area of the SSS was reduced 13% in the medication group and 5% in the placebo group. This difference was not statistically significant. Avoidance was reduced 11% by the medication and 17% by the placebo and was not significant. These data can be helpful in describing the usefulness and limitations of medication as an adjunct to other stuttering treatment approaches.

Existing self-report measurements could have been used in this research but they would employ separate instruments for severity, locus of control, and avoidance. The SSS provided measures that are more convenient.

6. Clinical implications

The SSS can be used for clinical purposes without the constraints of the research edition. For example, PWS who are in therapy can rate each item for a variety of audiences that are specific to their needs, e.g., wife or husband, other relative, a particular friend, an associate at work, ordering at a restaurant, etc. In addition, a given item may be used for clinical discussion without reference to other items or scores.

Underlying purposes of the clinical scales include (1) increase awareness of internal feelings and of behaviors, (2) define to client and clinician the degree of severity of feelings and behaviors, (3) recognize his/her power to gain control over severity, (4) take responsibility for changes. The 1–9 rating system is used to communicate to the client and clinician the perceived degree of changes experienced by the client. It also provides incremental targets for change (e.g., moving from 9 to 8).

In addition, the SSS, when used clinically, can increase a client's motivation. As clients' experience progress toward locus of control or avoidance goals, they can observe the reduction of the related SSS ratings. Bandura (1997) states, concerning motivational aspects of self-direction learning, that "... self-monitoring, self-efficacy appraisal, personal goal setting, outcome expectations, and affective self-reactions" are encompassed in motivation (p. 228). The screening subtests can reveal accompanying areas that internally change when the stuttering behaviors improve as well as the areas requiring further clinical treatment.

It may be instructive to the PWS to compare the self-reported measurement of fluency to the clinician's overall judgment and to standardized scoring, such as percent syllables stuttered or the SSI-3 score. A person who stutters who has not previously verbalized how much emotional energy is expended on thinking, fearing, anticipating stuttering may experience a shift to hope for change. When a number is attached to the feeling, the PWS has a cognitive goal toward which to work.

7. Conclusion

The Subjective Screening of Stuttering, research edition can provide useful information for stuttering treatment planning. The medication study reviewed above indicated that the effects were not parallel for severity, locus of control, and avoidance so measures in all three areas were needed.

At times, treatment programs that primarily provide behavioral changes in stuttering may result in changes in perceived locus of control and the use of avoidance, however, when that does not take place, further treatment may be required. Guitar (1998) viewed avoidance as a special type of learned behaviors and describes treatment procedures to modify them (p. 100). Failure to address these fears and avoidance plants the “seeds of relapse” (p. 143).

CONTINUING EDUCATION

Subjective Screening of Stuttering severity, locus of control and avoidance: research edition

1. Stuttering treatment efficacy was measured by:
 - a. percent stuttered syllables as determined by the listener’s judgment
 - b. subjective (PWS) and listener judgment
 - c. subjective judgment
 - d. degree of naturalness as determined by the listener’s judgment
2. Two of the areas screened by the SSS, are:
 - a. stuttering severity and judgment of an authority figure
 - b. avoidance and naturalness
 - c. locus of control and stuttering severity
 - d. stuttering severity and naturalness
3. Test–retest agreement for the SSS administered 2 weeks apart was:
 - a. greater than 80% for all subtests
 - b. 75–79% for all subtests
 - c. 60–74% for all subtests
 - d. less than 60% for all subtests
4. Which area(s) improved significantly ($P \leq 0.05$) following 12 weeks of dopamine blocking medication?
 - a. avoidance and severity
 - b. avoidance and locus of control
 - c. only avoidance
 - d. only locus of control
 - e. only stuttering severity
5. The level of correlation of the SSS with related items on the Perceptions of Stuttering Inventory was:
 - a. very low
 - b. low
 - c. about 0.50
 - d. high
 - e. very high

Acknowledgments

Our thanks go out to the 100 or more people who stutter who were participants in treatment or served as participants in the various research projects in which the SSS were used. We want

to express our appreciation to the clinicians in the United States and Europe who used earlier versions of this instrument and provided feedback in item selection and wording of some items. Participation of the people who stuttered and the clinicians helped produce more user-friendly subtests. The careful work of the stuttering research team at the University of California, Irvine was very valuable. We especially want to thank Dave Franklin and Tony Ortiz.

Appendix A

Subjective Stuttering Scales—research edition

Client _____ Case # _____ Sampled @ _____ Date _____

- How would you score your fluency during the session today?

Relatively fluent 1 2 3 4 5 6 7 8 9 Severe stuttering

- How would you score your speech with the following audiences during the last week?

Relatively fluent Severe stuttering

Close friend 1 2 3 4 5 6 7 8 9

Authority figure 1 2 3 4 5 6 7 8 9

Telephone 1 2 3 4 5 6 7 8 9

- How much time during conversation during the last week did you think about stuttering with the following audiences?

Never Constantly

Close friend 1 2 3 4 5 6 7 8 9

Authority figure 1 2 3 4 5 6 7 8 9

Telephone 1 2 3 4 5 6 7 8 9

- How often did you change words during the last week when you thought you might get stuck, with the following audiences?

Never Always

Close friend 1 2 3 4 5 6 7 8 9

Authority figure 1 2 3 4 5 6 7 8 9

Telephone 1 2 3 4 5 6 7 8 9

- To what extent did you feel internally hurried during conversation this past week with the following audiences?

Never Always

Close friend 1 2 3 4 5 6 7 8 9

Authority figure 1 2 3 4 5 6 7 8 9

Telephone 1 2 3 4 5 6 7 8 9

- 6. How much energy did you expend this week on how you speak rather than on what you wanted to say with the following audiences?

	0%				100%				
Close friend	1	2	3	4	5	6	7	8	9
Authority figure	1	2	3	4	5	6	7	8	9
Telephone	1	2	3	4	5	6	7	8	9

- 7. During the past week how often did you refrain from a conversation because of fear of stuttering with the following audiences?

	Seldom				Frequently				
Close friend	1	2	3	4	5	6	7	8	9
Authority figure	1	2	3	4	5	6	7	8	9
Telephone	1	2	3	4	5	6	7	8	9

- 8. During the past week how much choice did you feel you had to take part in a conversation with the following audiences?

	A great deal				Very little				
Close friend	1	2	3	4	5	6	7	8	9
Authority figure	1	2	3	4	5	6	7	8	9
Telephone	1	2	3	4	5	6	7	8	9

Subjective Screening of Stuttering—research edition
SCORING FORM

Client _____ Case # _____ Sampled @ _____ Date _____

Stuttering Severity Subtest

- | | | |
|-----------------------|-------------------------------|-------------------------|
| 1. (1-9) _____ | Severity total (3 – 27) _____ | Other Measures
_____ |
| 2. CF (1-9) [_____] * | | _____ |
| AF (1-9) _____ | | _____ |
| TE (1-9) _____ | | _____ |

Locus of Control Subtest

- | | |
|---------------------------|---------------------------------------|
| 3. CF (1-9) [_____] _____ | Locus of control total (6 – 54) _____ |
| AF (1-9) _____ | |
| TE (1-9) _____ | |
| 5. CF (1-9) [_____] _____ | |
| AF (1-9) _____ | |
| TE (1-9) _____ | |
| 6. CF (1-9) [_____] _____ | |
| AF (1-9) _____ | |
| TE (1-9) _____ | |

Avoidance

- | | |
|---------------------------|--------------------------------|
| 4. CF (1-9) [_____] _____ | Avoidance total (6 – 54) _____ |
| AF (1-9) _____ | |
| TE (1-9) _____ | |
| 7. CF (1-9) [_____] _____ | |
| AF (1-9) _____ | |
| TE (1-9) _____ | |
| 8. CF (1-9) [_____] _____ | |
| AF (1-9) _____ | |
| TE (1-9) _____ | |

Total score: Severity ____ + Locus of Control ____ + Avoidance ____ = Total _____

* Scores with a close friend are not used to calculate the total scores.

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