THE EFFECT OF SITUATIONAL SPEAKING ANXIETY ON STUTTERING FREQUENCY IN ADULTS WHO STUTTER

by

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Abstract

The purpose of this study was to examine whether there is a relationship between degree of speaking anxiety, pressure to not stutter, and stuttering in varying speaking situations using two different methodologies. In Study I, 99 adult stutterers rated 30 hypothetical speaking situations on expected speaking anxiety, expected pressure to not stutter, and expected stuttering. A strong positive relationship was found between all pairs of variables. Correlations were significantly stronger for subjects who had participated in therapy but there were no marked gender differences. In Study II, 8 adult stutterers participated in two live speaking situations to examine whether stuttering frequency differs for speech produced in high vs low anxiety situations. While the study fell short of accomplishing the high versus low anxiety contrast, significant correlations were found between the three variables of stuttering, anxiety, and effort to control stuttering.

Acknowledgements

Introduction

A common and long-standing observation about stuttering is that it is related to anxiety. The nature of a connection between stuttering and anxiety has been viewed in different ways over the decades. In the 1950s and 1960s, for example, theorists developed specific postulations for the notion that stuttering is a direct expression of anxiety, or results directly from anxiety. Most of these theorists expressed the idea that the anticipation or experience of a speech situation induces anxiety, which results in the breakdown of the persons' speech. For example, Brutten and Shoemaker (1967) proposed that "…stuttering is that form of fluency failure that results from conditioned negative emotion" (p. 61). Sheehan (1953) viewed stuttering as being closely connected to an internal conflict within the person who stuttered. He proposed that stuttering is " the result of approach-avoidance conflict, of opposed urges to speak and to hold back from speaking…due to learned avoidances or unconscious motives" (p. 27).

Bloodstein (1995) reviewed the literature and summarized several different theories together under the general heading of 'anticipatory struggle hypothesis'. The underlying idea for these theories is that "…people who stutter interfere in some manner with the way they are talking because of their belief in the difficulty of speech" (p. 63). Johnson's anticipatory avoidance theory (as cited in Bloodstein, 1995) is perhaps the best-known form of the anticipatory struggle hypothesis. In Johnson's view, stuttering is what one does when he/she is trying not to stutter. He believed that stuttering occurs when a person anticipates a stuttering moment, gets anxious and tenses up in an attempt to avoid it. "Stuttering appears to be an anxiety-motivated avoidant response that becomes 'conditioned' to the cues or stimuli associated with its occurrences" (Johnson,

1955 p.23). Van Riper also proposed a theory of anticipation anxiety leading to stuttering. In his view, prior to attempting a word perceived as difficult, the person who stutters places him/herself in a muscular and psychological set to properly pronounce the feared sound. This 'preparatory set', however, has the opposite effect of placing so much stress on the stuttering moment that the person has little hope of producing the desired sound normally (Bloodstein, 1995). Bloodstein also claimed that many clinical workers have a strong impression that stuttering itself is a type of speech anxiety reaction.

More recently, the interest in a possible relationship between stuttering and anxiety has resulted in fewer theoretical postulations and has turned instead to a search for an empirical basis to the relationship between stuttering and anxiety. The type of anxiety experienced by people who stutter, its pervasiveness in the stuttering population, and whether it is causally related to or results from stuttering is of prime interest to researchers.

Trait Versus State Anxiety

Trait Anxiety

Several survey studies on the opinions of people who stutter and normally fluent speakers alike have shown that the prevailing view of people who stutter is a negative one. They are seen as more anxious, tense, nervous, and sensitive than normally fluent speakers (Woods & Williams, 1976; Kalinowski, Armson, Stuart, & Lerman, 1993; Doody, Kalinowski, Armson & Stuart, 1993, Kalinowski, Lerman & Watt, 1987). In light of this widespread opinion, many studies have addressed the question, "Are people who stutter more anxious than normally fluent speakers?". Much of this research has focused on the trait anxiety of people who stutter versus normally fluent speakers. Trait anxiety is

the "habitual tendency to be anxious over a long period of time in many situations" (Marks, 1987, p. 6). Despite the general opinion that people who stutter are more anxious than normally fluent speakers, the majority of the trait anxiety research found that people who stutter appear to be no more anxious, as a personality trait, than normally fluent speakers (Van Riper, 1982; Miller and Watson, 1992, Peters and Hulstijn, 1984; Bloodstien, 1995; Craig, 1990, Cox, Seider & Kidd, 1984; Molt & Guilford, 1979). Craig (1992) tested trait anxiety before and after a speaking situation using the State-Trait Anxiety Inventory (STAI)- trait anxiety inventory (Spielberger, Gorsuch, & Lushene, 1970) and found that following the speaking situation, trait anxiety for people who stutter was no higher than for normally fluent speakers. Trait anxiety was found to be higher prior to a speaking situation in this study; however, it is probable that the results of this test were affected by the state anxiety being experienced at the time by the people who stutter. The subjects were anticipating an impending difficult speaking situation, thus their state anxiety level may have been raised, which may have had an effect on the trait anxiety measures. Cox et al. looked at families with multiple people who stutter and examined, among many things, general anxiety levels of the stuttering and non-stuttering family members using the Taylor Manifest Anxiety Scale (as cited in Cox et al., 1984). No significant differences were found between the stuttering and non-stuttering family members.

State Anxiety

Researchers have also looked at the possibility that people who stutter experience higher state anxiety than normally fluent speakers. State anxiety is a measurable increase in one or more components of anxiety at any given moment (Menzies, Onslow &

Packman, 1999). It refers to situation-specific anxiety. According to a survey conducted by Lincoln, Onslow & Menzies (1996), clinicians, people who stutter, and the general public believe that the prominent kind of anxiety associated with stuttering is state anxiety about speaking, not trait anxiety. This situation-specific form of anxiety may be more likely than trait anxiety to contribute in some way to stuttering. However the research into a connection between state anxiety and stuttering to date has had mixed results.

Physiological measures of state anxiety

Anxiety can be said to be a multidimensional construct involving verbal-cognitive, behavioural, and physiological components (Menzies et al. 1999; Peters & Hulstijn, 1984). The majority of studies examining state anxiety in people who stutter have used physiological measures and have typically produced negative findings. Researchers have examined anxiety experienced during different speaking tasks using a variety of physiological measures such as heart rate, vasomotor responses, electro-dermal activity, salivary cortisol levels, and skin conductance. Very little difference in autonomic nervous system (ANS) arousal during speaking tasks has been found between people who stutter and normally fluent speakers (Baumgartmer & Brutten, 1983; Blood, Blood, Bennett, Simpson, & Susman, 1994; Peters & Hulstijn, 1984; Weber & Smith, 1990). Peters and Hulstijn compared the ANS arousal levels of people who stutter and normally fluent speakers during speech and non-speech tasks and found no significant differences between the two groups. Weber and Smith compared people who stutter and normally fluent speakers on electro-dermal activity, peripheral blood flow, and heart rate for

reading, speech, and non-speech activities. Few differences in ANS arousal were found between the two groups during reading and spontaneous speech tasks.

This lack of empirical evidence to demonstrate that people who stutter are generally more physiologically anxious than normally fluent speakers, or have higher ANS arousal during speaking tasks has led many researchers in the area to believe that while "stutterers may appear to be anxious, even fearful, with respect to speaking situations, … it seems unlikely that variations in their speech problem are directly related to this fear or anxiety", (Ingham, 1984, p. 133). However, Menzies et al. (1999) suggested that there are several sources of bias in the literature that may provide an explanation for the lack of evidence of a relationship between anxiety as measured by ANS arousal and stuttering. They argued that the physiological component is the "least useful indicator of anxiety" of the three components of anxiety (Menzies et al., 1999, p. 5). Marks (1987) stated that different autonomic measures correlate poorly with each other and with other cognitive and behavioural indicators of anxiety. Individuals may reflect anxiety in different manners, such as changes in heart rate, blood pressure differences, or changes in skin conductance measures (Marks, 1987). Due to individual differences in physiological response patterns, interpretation is difficult and researchers may fail to properly identify anxiety present in subjects, which would lead them to miss any significant relationships between stuttering and anxiety (Menzies et al., 1999).

Verbal-cognitive measures of state anxiety

While many of the studies investigating the connection of stuttering to state anxiety have measured ANS arousal, some have used verbal cognitive measures, such as self-report tools. These studies have also resulted in mixed findings. For example, Miller

and Watson (1992), examined self-perceptions of state anxiety of a group of people who stutter and a group of normally fluent speakers through questionnaires distributed during self-help meetings or through the mail. State anxiety was measured using the STAI- state anxiety inventory (Spielberger et al., 1970), a reliable measure of state anxiety that asks the subject to rate how they are feeling "right now…at this moment" (p. 20). The researchers found that people who stutter did not report higher state anxiety than normally fluent speakers. However, the researchers did not specify to the participants to complete this questionnaire in reference to a specific situation, such as a speaking situation. As such it cannot be assumed that subjects' responses correspond to a state in which they would experience heightened anxiety. While not specifying the situation in question in a mail-out questionnaire is an acceptable way to collect information on trait anxiety, which is one's general ever-present level of anxiety, it is not a valid measure of state anxiety, which is situation-specific. To measure the state anxiety that a subject might experience, the subject must either be in, or at least be referred to a specific situation.

Blood et al. (1994) tested the state-trait anxiety levels of people who stutter and normally fluent speakers. Subjects participated in three sessions: a baseline session, a low stress session where the subject selected a stress-free day for testing, and a high stress session where the subject chose a day when they were feeling overly stressed. None of these testing sessions were speaking specific. During the sessions, subjects filled out the STAI (Spielberger et al., 1970), and McCrosky's Personal Report of Communication Apprehension (PRCA) (as cited in Blood et al, 1994). No significant differences between

people who stutter and normally fluent speakers were found on the subjective anxiety reports.

Some studies of state anxiety that have used verbal-cogitive measures have reported positive findings. Craig (1990) had stuttering and non-stuttering subjects complete the STAI- state anxiety inventory (Spielberger et al., 1970) before a speaking task consisting of speaking to a stranger on the telephone for 5 minutes. It was found that the state anxiety was very high for the subjects who stuttered, but within normal limits for the controls. Peters and Hulstijn (1984) examined stuttering and non-stuttering subjects on verbal state anxiety in speech and non-speech tasks. For the speech tasks, subjects were asked to read aloud five times a text in which they had marked words where stuttering was expected. Subjects also had a two-minute conversation with the researcher. The non-speech tasks consisted of a mirror writing tasks and an intelligence task taken from the Raven intelligence test. The verbal-cognitive measure of state anxiety was a subjective rating of anxiety experienced following completion of each task (5-point scale ranging from 1 (calm) to 5 (very tense)). People who stutter rated their subjective anxiety experienced during the speech tasks as higher than that of normally fluent speakers. Peters and Hulstijn concluded that "stutterers' reports of speech-related anxiety must be considered as limited to the cognitive component of anxiety"(p. 82). Poulton and Andrews (1994) conducted a study of people who stutter and social phobics' reactions to public speaking. Fifteen minutes before giving a 5-minute speech to a small audience, subjects were asked to complete measures of state anxiety (the Endler Multidimentional Anxiety Scales (EMAS), a self-report measure of state anxiety) and danger appraisal (the "Negative Social Evaluation" scale and the "Loss of control" scale). Subjects also

completed these scales immediately following the speaking situation. The people who stutter scored higher on the state anxiety measures before and during the speech than following it.

Each of these state anxiety studies using verbal-cognitive measures have employed similar measurement techniques, that being self report of a variety of anxiety scales. However, not all used these measurements in combination with a speech-specific situation. Only those studies that measured anxiety in relation to actual speaking situations resulted in positive findings. Those studies that did not find that people who stutter have higher state anxiety than normally fluent speakers failed to employ a speaking situation as a context for anxiety measurements. From the state and trait anxiety findings, both positive and negative, it is clear that if anxiety does contribute in some manner to stuttering it is most likely state anxiety and is best measured by cognitive means (self-report). The specific type of state anxiety that affects stuttering appears to be situational speaking anxiety, that is, anxiety experienced in relation to a speaking situation.

Situational Speaking Anxiety

The situational speaking anxiety that people who stutter experience may be a form of social anxiety. Social anxiety arises "when people become concerned about how they are being perceived and evaluated by others" (Leary & Kowalski, 1995, p. 6). According to this view, social anxiety can be defined as the "prospect or presence of interpersonal evaluation in real or imagined settings" (Leary & Kowalski, 1995, p. 6). In particular, it is the anticipation or experience of negative evaluation that occurs as a reaction to specific social episodes that causes the fears people experience as social anxiety. In this respect

everybody experiences social anxiety at some time or other. However, the fears of negative evaluation that people who stutter experience are based on real episodes of being ridiculed while stuttering, that is when speaking (Stein et al,1996). Poulton and Andrews (1994) claimed that this anxiety experienced by people who stutter in the face of a social speaking situation is a reasonable reaction to the debilitating effects of the condition. As a result, it is common for a person who stutters to avoid public speaking situations (George and Lydiard, 1994). Activities such as speaking in front of a class, speaking to a stranger, making purchases in a store, or speaking on the telephone can be highly stressful to a person who stutters. Like many clinicians, Craig (1990) noted that many people who stutter have reported that they do experience high levels of anxiety, especially when speaking and interacting socially.

Mahr and Torosian (1999) compared measures of social anxiety and avoidance obtained for people who stutter and for previously gathered data on social phobic and non-patient controls. They concluded that "the specific fears of many of the stuttering group appear to involve speaking situations" (p. 124) and further that "stutterers' avoidant behaviour is related to the stuttering itself, rather than to more pervasive social anxiety and avoidance" (p. 125). Therefore, it is logical that the kind of social anxiety that people who stutter experience is specifically situational speaking anxiety. Hence, it is suggested that situational speaking anxiety may be defined as the fear of negative evaluation experienced in a speaking situation. In support of this description of situational speaking anxiety, Poulton and Andrews (1994) found that people who stutter rated danger of negative social evaluation and loss of control as higher during a public speaking situation than before or following the task.

Menzies et al. (1999) state, "It is important that negative social evaluation be addressed in future research because it is the most likely mediator of speech related anxiety in social situations. This lack of systematic assessment of experiences of negative evaluation has led to the selection of inadequate experimental tasks…and this has hampered attempts to identify a role for anxiety in stuttering " (p. 6).

Difficult Speaking Situations and Stuttering Frequency

This situational speaking anxiety that people who stutter experience in speaking situations may have an effect on the frequency of stuttering demonstrated in the situation. It might be predicted that when a speaking situation is considered difficult and evokes more situational speaking anxiety, the frequency of stuttering will be elevated. If the speaking situation is easy for the person who stutters, they may experience little or no fear of negative evaluation, and the frequency of stuttering during the situation may be lower than usual.

There is a body of research that employed speaking tasks that have typically been seen as difficult for people who stutter, although participants did not directly evaluate degree of difficulty. These studies have focused on the relationship between various speaking situations and stuttering frequency. The situations found to evoke increases in stuttering frequency have been ones that tend to be very anxiety-arousing for stuttering subjects. In a review of this literature, Leary and Kowalski (1995) found that speech dysfluencies are increased in situations such as speaking in front of large audiences, the presence of authority figures, and unfavorable reaction from listeners. Conversely, dysfluencies appear to decrease in situations associated with little social pressure, such as speaking to a child or to one-self (Bloodstein, 1950).

Audience Size

Porter (1939) conducted a study of audience size and its relationship to stuttering frequency. Subjects were asked to read 500 word essays to audiences of differing sizes, ranging from 0 to 8 listeners. Subjects were told of the audience size before each trial and asked to estimate the percentage of words on which they would stutter. It was found that the expected frequency of stuttering increased as the size of the audience increased. As well, an actual increase in stuttering was associated with an increase in the size of the audience. Martin and Haroldson (1988) examined stuttering frequency under the conditions of speaking while alone, then conversing with one person, then speaking alone again. Stuttering was found to have a higher frequency in the conversational period than in either speaking-while-alone situation. In a review of the literature, Young (1985) concluded that *"The evidence generally supports the conclusion that an increased number of listeners does increase stuttering frequency"* (p. 284).

Audience Status

Another speech situation with anxiety-producing social pressure attached to it is speaking in front of persons of authority. The social hierarchy of the speaker and the audience may play a role in the experience of speaking-related anxiety, as people who stutter seem to have less difficulty in situations where the audience is close to or lower than the speaker in the dominance hierarchy (George and Lydiard, 1994). According to Sheehan, Hadley and Gould (1967), people who stutter seem particularly sensitive to the authority variable. Authority figures may pose more of a threat of negative evaluation than those on a peer level or lower, thus may be seen as more difficult as communication partners. Sheehan et al. investigated the effect of authority on stuttering by having people

who stutter read to authority figures and to peer listeners. It was found that the subjects experienced more difficulty in speaking to authority listeners than to peer listeners. Sheehan et al. concluded that stuttering appears to vary as a function of the perceived status of the self as the speaker, and the status of listener. The results of this study attest to the idea that stuttering frequency increases with increased penalty in a situation, as authority figures may be perceived as more of a potential source of penalty than a peer figure (Sheehan et al., 1967).

Porter (1939) also had subjects evaluate audience members as "hard" to read to, "neutral" to read to, or "easy" to read to. Reading to persons judged as "hard" was associated with higher stuttering frequency than reading to those labeled "neutral" or "easy".

Communicative Responsibility and Social Pressure

Bloodstein (1950) examined conditions under which stuttering is reduced or absent. Subjects were asked to rate their stuttering in 115 situations representing conditions where a reduction in stuttering was expected. Bloodstein interpreted the results as demonstrating that stuttering appears to diminish in "conditions of reduced communicative responsibility, reduced need to make a favourable impression, and absence of unfavourable listener reactions" (p. 35). Examples are 'speaking to your children', or 'speaking when no one else is present'. In other words, stuttering decreased as a function of lessening social pressure in the speaking situation. We can view these results as supporting a relationship between speaking-related anxiety and stuttering frequency. Lower frequency of stuttering may be associated with situations in which there is low social pressure and less fear of being negatively evaluated. Conversely, a

high frequency of stuttering may be associated with situations in which there is increased social pressure and a greater fear of negative evaluation.

Pressure to Not Stutter

The pressure to not stutter in a speaking situation may play a role in exacerbating the speaking-related anxiety experienced by the person who stutters. This idea relates back to Johnsons' concept of stuttering being what one does when one is trying not to stutter (Bloodstein, 1985). Depending on the social importance of a speaking situation, the person who stutters may experience pressure to not stutter because any stuttering behaviour may lead to negative evaluation on the part of the listener. If the speaker believes it is important that he/she not stutter in a speaking situation, the situation may be perceived as difficult. It is possible that some of the anxiety a person who stutters experiences in the face of a speaking situation centres on the importance of not stuttering in the situation. If a person perceives that it is important to not stutter in a given situation for fear of being negatively evaluated, there will be more pressure placed on that person to not stutter, hence anxiety will be raised. Further, if anxiety plays a role in mediating stuttering frequency, then the opposite of what was intended, that is more stuttering, may be the result. When one does not feel pressure to not stutter, she/he thinks little of her/his speech, anxiety is lowered, and the result may be less stuttering.

Summary

The belief that there is a connection between anxiety and stuttering is widely held by both those who stutter and clinicians who deal with these people on a daily basis (Lincoln et al. 1996; Kalinowski et al., 1993; Woods & Williams, 1976, Kalinowski et al., 1987). However, much of the research in the area has failed to produce positive

results. The literature suggests that if people who stutter are more anxious than normally fluent speakers, it is in the realm of state anxiety related to speaking situations. In other words, it is a situational speaking anxiety that is experienced when there is the potential for scrutiny and embarrassment. Situational speaking anxiety, then, may be conceptualized as the fear of negative evaluation by others experienced in relation to a speaking situation.

Stuttering frequency appears to be related to the speaking situation. Some situations seem to be associated with increased stuttering, others with a decrease in stuttering. It is suggested that those situations associated with an increase in stuttering may be perceived as difficult or anxiety-producing for the speaker, while those associated with a decrease in stuttering may be seen as easier and less anxiety-producing. This perceived difficulty or ease might in turn reflect the pressure the speaker feels to not stutter in a given situation.

Objectives

The purpose of the present investigation was to examine whether there is a relationship between levels of speaking anxiety, pressure to not stutter, and amount of stuttering exhibited in different speaking situations. In Study I, a large pool of adults who stutter was recruited to provide self-reports of degree of speech anxiety, pressure to not stutter (two presumably highly related cognitive-affective measures) expected in each of 30 different hypothetical speaking situations that were chosen to represent a wide range of difficulty levels. The subjects were also asked to provide self-reports of amount of stuttering expected in each of the same 30 hypothetical situations. The researcher was interested in determining if there is a relationship between each cognitive-affective variable and stuttering frequency and between the two cognitive-affective variables. It was hypothesized that each of the paired variables would be at least moderately correlated. The researcher was also interested in discovering whether there is a variation in ratings of speech anxiety, pressure to not stutter, and stuttering frequency as a function of situational factors. It was hypothesized that there would be a variation in these variables as a function of situational factors.

In Study II, a small number of subjects (n=8) was used to directly examine the question of whether stuttering frequency differs significantly for speech produced in situations judged by the speakers as moderately-to-highly anxiety-arousing compared to speech produced in situations judged as eliciting low levels of anxiety. In this study, adults who stutter were asked to speak in two different situations: one that they had personally identified as eliciting low anxiety and one that they had identified as eliciting moderate-high anxiety. It was hypothesized that stuttering frequency would be

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significantly higher in the moderate-high anxiety condition than in the low anxiety condition.

Method

Participants

One hundred and fifteen responses to the survey were received from subjects in Canada and the United States either through completing an Internet-based version of the questionnaire or returning a mail-out option. To be eligible to take part in the survey, participants had to be persons who stutter and had to be over the age of 18. To be considered as a person who stutters, each subject had to indicate that they currently experience, or had previously experienced one or more of the core stuttering behaviours (repetition or prolongation of a sound/syllable and/or silent blocks) in their day-to-day speech. Three subjects indicated that they had not experienced either behaviour, however, the responses of two of these subjects were retained because their answers on sections relating to therapy participation and techniques was sufficient to satisfy the researcher that they were indeed people who stutter. The survey data for the third subject was discarded because several other answers on the demographic section led the researcher to doubt the veracity of his responses. The data of nine subjects was discarded either because the survey was incomplete, or there was a lack of variation in the answers provided. Using a date-time stamp for the Internet-based surveys, four additional entries were determined to be repeats and were also removed from the data set. After the responses from these subjects were removed, the data from 99 participants remained for full analysis.

Questions on the demographic background of participants were included at the beginning of the survey. The purpose of collecting this information was two-fold; firstly,

it was to describe the sample population, and secondly, to aid in looking for explanations for any patterns or anomalies in data that should arise upon analysis.

The 99 subjects ranged in age from 18 to 65, and included 69 men and 30 women. These numbers are an appropriate reflection of the stuttering population, as stuttering prevalence is higher in males than females. The present gender ratio of 2.3:1 is similar to that of Kidd, Kidd, and Records (1978) who found a ratio of 2.93:1 in favour of males in a study of possible causes of the sex ratio in stuttering.

Of the subjects, 84 were either participating in therapy at the time of the study or had previously participated in therapy and 65 participants have been involved with self-help groups. Fourteen had never received therapy, and one participant did not answer this section. Subjects chose from four categories of therapy strategies: stuttering modification, fluency shaping, voluntary stuttering, and/or fear reduction strategies. Of the 84 subjects who underwent therapy, 28 indicated that the therapy consisted only of fluency shaping techniques. Another 28 subjects used fear reduction strategies along with some other technique, or as a therapy strategy on its own. The remaining 28 indicated therapy was composed of some other combination of the various types of strategies described. Overall, 62 subjects indicated that therapy was successful, either in the long term or short term, 21 felt that it was not successful, and 1 participant did not respond to this item.

The data on the education levels of participants breaks down as follows: 25 participants have attained a post graduate (masters or doctoral) degree; 42 have a bachelor's or college degree; 19 have had some post secondary education; 12 hold a high school diploma; and 1 person had not completed high school. Overall, the population

sample was quite skewed in terms of education level, with two thirds of participants having obtained at least a bachelor's or college degree. The researcher also asked the participants how often they spoke in public. Of the total group, 29 participants regularly took part in public speaking, 37 reported sometimes speaking in public, 22 indicated they rarely did, and 11 subjects reported never speaking in public.

Materials

The Situational Speaking Anxiety and Stuttering Questionnaire (see Appendix A) was designed by the researcher to examine the relationships between expected speaking anxiety, expected amount of stuttering, and the expected pressure to not stutter in 30 hypothetical speaking situations. Several of these speaking scenarios were adapted from previously constructed questionnaires (Bloodstein, 1950; Hanson, Gronhovd, & Rice, 1981; Trotter & Bergmann, 1957) and from literature describing speaking situations that are often difficult for people who stutter (Porter, H.K., 1939; Ingham, 1984;Sheehan et al., 1967; Young, 1985; Hanson et al, 1981; Bloodstein, 1950, Silverman, 1996). The situations were chosen to cover a range of levels of situational speaking anxiety experienced by a person who stutters. Based on the literature on stuttering and various speaking situations cited above, nine of the situations were expected to be associated with no or very mild speech anxiety, seven situations thought to produce a medium amount of speech anxiety, and 14 situations considered to be associated with high speech anxiety (See Appendix B for classification of specific speaking situations according to anxiety level). Items were presented in random order on the questionnaire. Because these situations were hypothetical, participants did not have to have had experience with them all, but were asked to imagine how they would react to each one.

Participants were expected to rate each speaking situation on three dimensions: expected speaking anxiety, expected stuttering frequency, and expected pressure to not stutter. They were asked to assign ratings using three separate Likert-type 7-point scales, with 1 indicating no, or very low, levels, and 7 indicating very high levels of the dependent variable in question.

Procedure

The researcher set up a website dedicated solely to the Situational Speaking Anxiety and Stuttering Questionnaire because it was believed that this would be the most time-efficient manner to collect information. To access participants, the researcher contacted the Canadian Association for People who Stutter (CAPS) in Canada and the National Stuttering Association (NSA) in the United States for assistance in reaching large numbers of people who stutter. CAPS agreed to assist the researcher in reaching potential participants by placing a link to the survey website on their own website. The NSA allowed the researcher to access an email discussion forum that they sponsor. In this discussion forum the researcher explained the purpose of the study and provided the website address for those interested in taking part. The researcher also contacted smaller self-help groups across Canada and clinicians who work with people who stutter for assistance in reaching potential subjects. This contact information was obtained from Internet searches, and from clinician profiles which are available to the public on the Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA) website. These clinicians or self-help group contacts were provided with the website address and also with paper copies of the survey, if requested.

When a potential participant accessed the survey website, they were asked to read an informed consent section prior to entering the full website (see Appendix C for informed consent section). This section stated that the act of submitting the survey was considered as the participant giving his/her consent.

Instructions were provided at the top of the questionnaire. Subjects were asked to respond to each item truthfully. Subjects provided the answers to the survey and demographics sections online by clicking the mouse over the desired response, or typing in a response as required. After completing the survey, the subject clicked the 'submit' button and the data was sent to a file only the investigators were able to access. Only three paper versions of the survey were returned, which was not surprising, as there were fewer than 10 clinicians or self help group contacts who requested paper copies to pass on to potential participants. For these participants, the process was similar, except that they filled in the responses by hand and returned the survey in the self-addressed stamped envelope that had been provided by the researcher.

For the internet-based survey, a date-time stamp was used to indicate when each participant submitted their questionnaire. The possibility of a repeat entry was investigated when responses for entire questionnaires were identical. The date-time stamp helped to determine if the duplicate entry was made within a small enough timeframe to indicate that it was really a duplicate. Only one set of results was kept when a duplicate was found. Data from the online survey was converted programmatically directly to a spreadsheet, which reduced the factor of human error in data entry.

Results

Correlation between each of the three dependent variables

For each subject, a Pearson's Product-Moment Correlation Coefficient was calculated for pairs of the three dependent variables: expected speaking-related anxiety and expected amount of stuttering (anx_stut); expected speaking-related anxiety and expected pressure to not stutter (anx_pres); expected pressure to not stutter and expected amount of stuttering (pres_stut). The three correlations for each subject were calculated using the ratings the subject provided for the 30 speaking situations. From the 99 correlations for each variable, mean correlations across subjects were calculated. The data are shown in Table 1. All three mean values are significant at the 0.005 level (one-tailed).

Table 1

Correlations between dependent variables

Correlation	N	Mean R	Median R	Minimum R	Maximum R	Std. Deviation
Anx_stut	99	.7326819	.7712820	.06425	.97313	.1749026
Anx_pres	99	.7189677	.7608310	.23417	1.00000	.1609036
Pres_stut	99	.6603395	.7242420	-.08896	.97657	.2235062

Variability between subjects

The variation between subjects' correlation values for each pair of dependent variables is relatively low, as can be seen from the standard deviations displayed in Table 1. Figures 1, 2, and 3 provide a visual display of the variability between subjects using histograms to show the range of correlation coefficients for each of the three sets of paired dependent variables. For each of the three pairs of variables, the majority of subjects had correlation coefficients of 0.65 or higher: for both the paired variables

'anx_stut', and 'anx_pres', 74 out of 99 subjects had 0.65 or higher and on the third scale,

'pres_stut', the correlation coefficients of 63 out of 99 subjects were 0.65 or higher.

Figure 1: Spread of correlation coefficients between expected speaking anxiety and

stuttering frequency

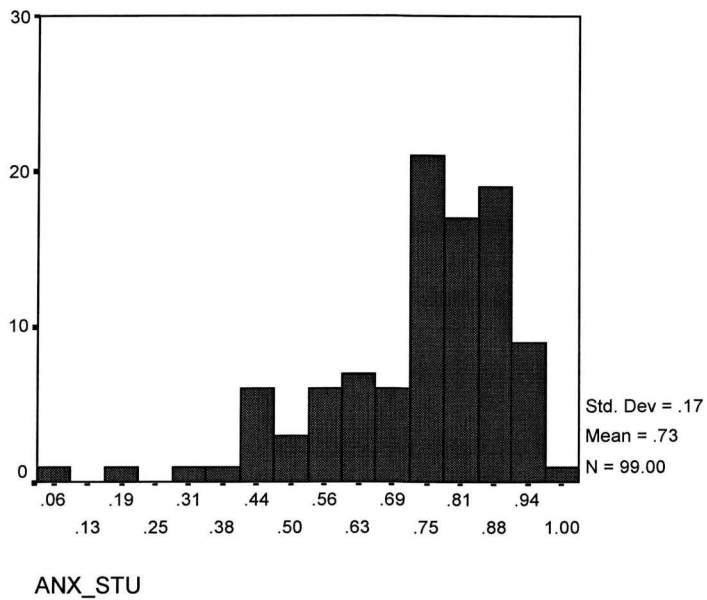ANX_STU

Figure 2: Spread of correlation coefficients between expected speaking anxiety and pressure to not stutter

ANX_PRS
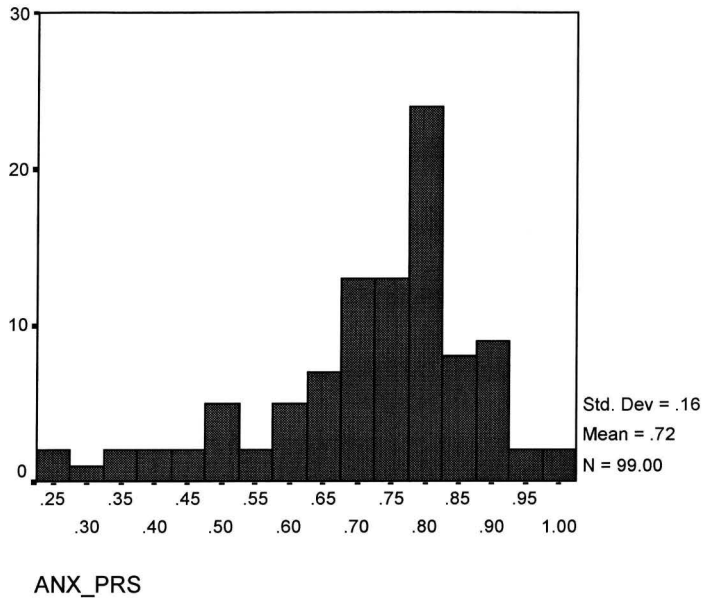
Figure 3: Spread of correlation coefficients between expected pressure to not stutter and stuttering frequency

PRS_STU
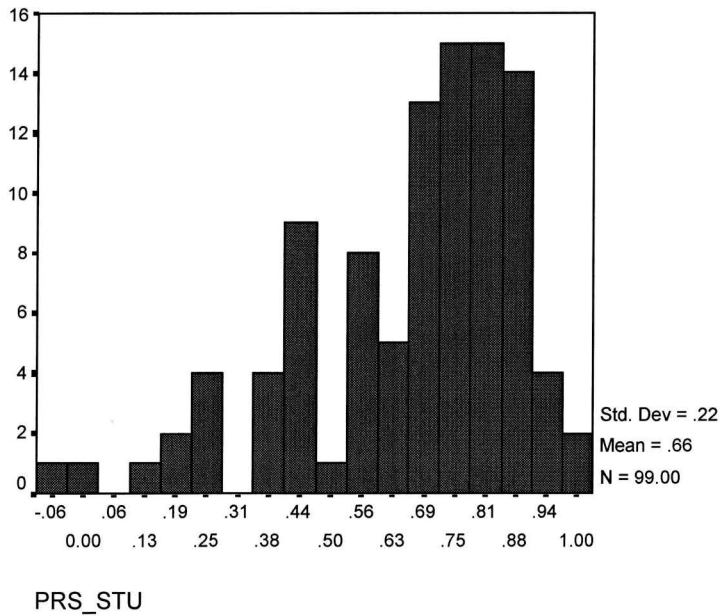
Effects of therapy and gender

Table 2 displays the mean correlation coefficients between pairs of variables as a function of therapy participation. It is noted that sample size for the two groups are unequal. To determine whether the differences in these scores were significant, an independent samples t-test was performed on the data (see Table 3). For each pair of variables the correlations were significantly stronger for those subjects who had participated in therapy.

Table 2

Correlations between dependant variables as a function of therapy

Paired dependent variables	Mean correlation coefficient score	
	Participated in therapy n= 84	Did not participate in therapy n=14
Anx_stut	0.75	0.66
Anx_pres	0.73	0.66
Pres_stut	0.69	0.52

Table 3

Independent Samples T-Test: Therapy

	t_{obt}	df	Significance (one tailed)
Anx_stut	1.674	96	Significant at the 0.05 level
Anx_pres	1.394	96	Significant at the 0.10 level
Pres_stut	2.708	96	Significant at the 0.005 level

***one subject's data were removed as this person did not answer the therapy question

Results were also analyzed in terms of gender. The mean correlations for each of the paired variables are displayed in Table 4, with the results of the independent sample t-test shown in Table 5. Of the three correlations, only the one between anxiety and pressure was found to be significantly different, with the mean correlation coefficient being higher for males than females

Table 4

Correlations between dependant variables as a function of gender

Paired dependent variables	Mean correlation coefficient score	
	Male (n=69)	Female (n=30)
Anx_stut	0.74	0.71
Anx_pres	0.74	0.68
Pres_stut	0.68	0.62

Table 5

Independent Samples T Test: Gender

	t_{obt}	df	Significance (one tailed)
Anx_stut	1.010	97	Not significant
Anx_pres	1.655	97	Significant at the 0.10 level
Pres_stut	1.058	97	Not significant

Effect of situational factors on rating of dependent variables

The data was also analyzed to determine in which hypothetical scenarios the subjects expected to experience the most and least amounts of the three dependent variables: speaking-related anxiety; pressure to not stutter; and stuttering. From the data set of the 99 subjects, the mean score and standard deviation for each of the three variables was determined for the 30 speaking situations. Table 6 shows the situations in order from lowest to highest mean anxiety score, with the 10 lowest rated items making up the low anxiety category, the next 10 making up the medium anxiety category and the highest rated situations making up the high anxiety category. Anxiety was chosen as the variable on which to base these rankings, as it was the original variable on which the

speaking situations were based in the design of the questionnaire. As there is high correlation between all three variables, choosing one variable to base these categories on does not impact significantly upon the ranking of the other two variables.

Table 6

Mean scores and standard deviations for each hypothetical speaking situation (arranged by lowest to highest anxiety score)

Hypothetical speaking situations	Anxiety		Pressure		Stuttering	
	mean score	sd	mean score	sd	mean score	sd
Speaking to yourself out loud with no one else present	1.18	0.68	1.41	1.23	1.46	0.85
Talking with your spouse/ significant other over dinner	1.77	1.17	2.3	1.49	2.57	1.30
Speaking to an infant or young child	2.03	1.16	2.63	1.59	2.19	1.19
Speaking to a person who stutters whom you know well	2.12	1.41	2.35	1.73	2.88	1.33
Having a conversation with a good friend	2.13	1.22	2.88	1.67	3.01	1.20
Speaking to your speech clinician	2.41	1.33	3.16	2.01	2.84	1.24
Speaking to a close friend on the telephone	2.47	1.49	2.96	1.63	3.33	1.46
Conversing with a group of 3-4 familiar people during a card, golf, or any other game	2.47	1.36	3.06	1.79	3.2	1.35
Speaking to your mother/ father on a neutral subject	2.65	1.63	3.08	1.97	3.29	1.43
Engaging in small talk with someone younger than you	2.65	1.19	3.33	1.76	2.98	1.31
Talking with a group of friends at a party	3.02	1.51	3.65	1.77	3.61	1.39
Speaking to a doctor about a medical condition you have	3.1	1.43	3.65	1.79	3.55	1.38
Leaving a telephone message on a friend's answering machine	3.14	1.68	4.06	1.88	3.62	1.60
Talking with an instructor after class in his/her office	3.45	1.45	4.24	1.62	3.86	1.33
Returning an appliance which does		1.73	4.13	1.72	3.78	1.58

not work to a busy department store	3.47					
Giving directions to a stranger	3.49	1.62	4.07	1.66	3.79	1.43
Delivering a very important message to a co-worker	3.5	1.47	4.45	1.66	3.86	1.31
Apologizing to a co-worker or classmate	3.53	1.53	3.88	1.49	3.69	1.37
Telling a taxicab driver where to take you	3.63	1.67	4.18	1.69	3.9	1.43
Asking for flight or bus information when you are late for that plane or bus	3.72	1.55	4.13	1.73	3.98	1.46
Giving instructions to a small number of new coworkers from a position of authority	3.86	1.56	4.88	1.69	3.94	1.50
Telling a funny story to a group of 2-8 friends.	3.93	1.80	4.7	1.78	4.44	1.55
Reacting to a criticism made by your supervisor	4.14	1.73	4.78	1.81	4.21	1.67
Speaking with your professor or boss on an important subject	4.35	1.59	5.09	1.72	4.29	1.45
Being asked to answer a question in a class when you know the answer	4.49	1.76	5.07	1.68	4.57	1.53
Talking after being teased about your speech	4.71	1.93	5	1.87	4.11	1.66
Speaking during an interview with a prospective employer	5.09	1.54	5.9	1.37	4.65	1.61
Introducing yourself to a group of 10 people after everyone else has given their names	5.51	1.69	5.79	1.57	5.33	1.57
Speaking to a group of 10 unfamiliar people	5.56	1.51	5.7	1.54	5.19	1.62
Participating in a debate in front of an audience	6.08	1.31	6.09	1.40	5.52	1.52

The mean ratings for anxiety ranged from 1.18 to 6.08 (out of 7). This demonstrates that for the population of people who stutter there is a perception that different speaking situations are associated with different levels of anxiety. Likewise, the ratings for pressure to not stutter range from 1.41 to 6.09 (out of 7). People who stutter

evidently feel that pressure to not stutter does vary widely depending on the speaking task at hand. Finally, the range of ratings for expected amount of stuttering in these 30 speaking situations ranged from 1.46 to 5.52. This range is slightly tighter than for the other two dependant variables, but it does show that people who stutter do feel that different speaking situations are associated with differing frequencies of stuttering.

As a measure of the internal consistency of the survey, Cronbach's alpha was calculated on the results of each of the three variables. Cronbach's alpha is a coefficient of reliability that can be used to describe the reliability of multi-point formatted questionnaires or scales. The higher the score, the more reliable the scale is (Santos, 1999). When the inter-item correlations are high, this is evidence that the items are measuring the same underlying construct ("UCLA Academic Technology Services", 2003). For the expected anxiety scale, the alpha was .94; for the expected amount of stuttering scale, the alpha was .95, and for the expected pressure to not stutter scale, the alpha value was .96. All of these values exceed .9 and thus demonstrate the high reliability of the instrument.

Discussion

The principal finding of Study I was a strong positive relationship between each of the paired dependent variables. The mean correlation coefficients for each pair of variables was between .66 and .73 and median values all above .70. According to Cohen (1988), any correlation coefficient equal to or larger than .50 is considered to be a large effect size for research conducted in the fields of behavioural science. Cohen stated that in the fields of behavioural science, researchers rarely encounter correlation coefficients above the .50-.60 range. Given this benchmark, the correlations between the three

variables studied here are very strong. The current study provides compelling evidence that amongst people who stutter there is a strong relationship between perceived degree of speaking-related anxiety, pressure to not stutter, and stuttering frequency as a function of situation. These results are consistent with those of Green (1999) who looked at the relationship between perceived stuttering severity and social interaction for adults who stutter. He found a negative correlation between perceived stuttering severity and social interaction. In other words, a higher perceived severity of stuttering appeared to be related to lower participation in social interaction.

Differences in the way that subjects rated their response to the hypothetical speaking situations based on exposure to stuttering treatment, and as a function of gender were also examined. It was found that for each pairing of dependent variables, there was a significant difference in the mean correlation coefficient of those who had participated in therapy and those who had not. The relationships between pairs of the three dependent variables were significantly stronger for subjects who had participated in therapy. There are several possible explanations for these findings. It is possible that there is a selection bias for those who underwent treatment. Perhaps these people were naturally more bothered by or anxious about their stuttering, which is why they sought out therapy. Perhaps those who decided not to have treatment were more comfortable with their stuttering and so do not tend to get as anxious about it. Another possibility is that through participating in therapy, these people may have learned to pay attention to these three variables in a different way and they may have become more attuned to what it is that makes them stutter.

In examining any differences in correlation scores in terms of gender, it was found that while the mean correlation value for males is consistently higher than for females, the t-test results indicate that there is no significant difference between the sexes in correlations for two of the three pairs of variables(anx_stut, pres_stut). There was, however, a significant difference in the correlation coefficients for males and females between the variables of anxiety and pressure to not stutter (anx_pres). It is important to point out that the absolute values are not markedly different therefore this difference, though significant, may not be important or meaningful. These results are consistent with the findings of Leith, Mahr, and Miller (1993) who measured communication attitudes of males and females who stutter and found gender differences to be minimal.

Variations in ratings of speech anxiety, pressure to not stutter, and stuttering frequency as a function of situational factors were also explored. A significant difference was found in participant ratings of each variable, based upon the situation depicted. The pattern of high and low ratings for all three dependent variables was consistent across subjects. This pattern of predictions of anxiety, stuttering, and pressure to not stutter in the hypothetical speaking situations corresponds with the findings of Dietrich and Roaman (2001) who had a group of 24 people who stutter rate the amount of anxiety they would experience in each of 20 speaking situations. Similar to the findings of the current study, they found a pattern in the ratings of situations believed to elicit higher or lower anxiety across subjects. In the present study, the four highest rated items were 'speaking during an interview with a prospective employer', 'introducing yourself to a group of 10 people after everyone else has given their names', 'speaking to a group of 10 unfamiliar people', and 'participating in a debate in front of an audience'. These results correspond

to those of Dietrich and Roaman where participants predicted 'introducing oneself at a party' and 'introducing oneself at a meeting' would produce the highest amounts of anxiety. The results are also consistent with studies that link audience size (Porter, 1939; Martin and Haroldson,1988; Young,1985), audience status (George and Lydiard, 1994; Sheehan, Hadley and Gould, 1967), and evaluation of one's speech (Gabel, Colcord, Petrosino, 2002) to an increase in both stuttering frequency and anxiety in people who stutter. On the other end of the anxiety scale, the results of the present study also correspond to those of Bloodstein (1950) who examined conditions under which stuttering would be reduced or absent. The three situations rated lowest for speaking-related anxiety in the present study, were 'speaking to yourself out loud with no one else present', 'talking with your spouse/significant other over dinner', and 'speaking to an infant or young child'. These items correspond to 'speaking with no one else present', 'speaking to an infant', and 'speaking to your wife or husband', all items from Bloodstein's study which were rated as being associated with "very markedly less or hardly any stuttering" or "No stuttering at all" by the majority of participants.

The speaking situations were chosen by the researcher to cover a wide range of anxiety, stuttering frequency, and pressure to not stutter. Each situation was initially categorized by the researcher as either potentially high, medium, or low speech-anxiety tasks. The researcher's prediction of how subjects would actually rate the speaking situations was correct for only slightly more than half the items (18/30). Within the experimenter's original category of low anxiety situations, seven of the nine speaking situations were actually ranked by subjects as low scoring. For the expected high anxiety situations, 10 of the 14 were actually ranked highest overall. For the expected mid-range

anxiety situations, only one of the seven were actually ranked by participants as mid-range anxiety-arousing situations.

Study II

Method

Participants

Nine subjects participated in Study II. The data from one subject was discarded, as she did not demonstrate any episodes of stuttering during the testing sessions. This made her results uninterpretable, given that stuttering frequency was the dependent variable and it did not vary.

Participants completed a questionnaire on demographic information at the end of the testing session (see Appendix D). This information was collected in order to describe the population sample, as well as to aid in looking for explanations for any patterns or anomalies in data, should they arise upon analysis. The eight subjects whose data were retained were seven males and one female ranging in age from 20 to 63 years of age with a mean age of 43.1. None of the eight subjects whose data were retained were currently attending therapy sessions, but all had taken part in therapy previously. Six subjects had discontinued therapy more than three years ago, and two had been in therapy between one to three years ago. All subjects indicated that this therapy had been successful in helping them reduce their stuttering, either in the short term or in the long term, or both. Five of the nine subjects had been involved with a self-help group in the past, but none were presently involved with one. Four of the participants indicated having some post-secondary education, one indicated having a college diploma, and three indicated having a bachelor's degree. Two subjects indicated rarely speaking in public, five indicated that they sometimes speak in public, and one participant indicated that he often engaged in public speaking. All subjects were recruited from a list of people who stutter who had

identified themselves to the primary supervisor as willing to participate as subjects in research endeavours.

Materials

An initial questionnaire, the Speech Anxiety Mini Questionnaire, was administered via telephone several weeks prior to the testing date. This questionnaire was designed by the researcher and consisted of 10 speaking situations to be rated on the amount of anxiety that the subject would expect to experience in each (see Appendix E) for Speech Anxiety Mini Questionnaire). A 7-point Likert-type scale was used, with 1 indicating 'no anxiety expected' and 7 indicating 'extreme anxiety expected'.

For each testing situation, two questionnaires were completed by each subject. The State-Trait Anxiety Inventory, form X-1 (STAI-X1) (Spielberger et al., 1970) was used to determine the state anxiety of the subjects immediately prior to each speaking situation (see Appendix F). The STAI is a standardized test that has been commonly used in research focusing on the measurement of specific moments of anxiety. The test consists of 20 items designed to measure state anxiety by asking the subjects to indicate how they feel "right now…at this moment" (Spielberger et al., 1970, p. 20). The scale for each response is a 4-point scale, with 1 indicating 'not at all' and 4 indicating 'very much so'. The maximum score possible on the scale is 80, which indicates the highest degree of anxiety.

A Post-Situation Anxiety Questionnaire was completed immediately following each testing situation (see Appendix G). The items on this form included three Likert-type scales. One scale measured the actual speaking-related anxiety experienced in the speaking situation, the next addressed the amount of effort expended by the subject to

control stuttering, and the third scale was used to compare the subjects' speech in the testing situation to their everyday, normal speech. Each scale consisted of 7 points, with 1 indicating no, or very low, levels, and 7 indicating very high levels of the construct in question. The scale for comparison of speech was included on the questionnaire after three of the participants had already been tested, so this data is only available for five of the eight subjects. A fourth and fifth question on the use and types of techniques for controlling stuttering was included for each subject. All participants were asked to provide information on any triggers that typically cause stuttering for them personally.

Each subject rated 'reading to yourself out loud with no one else present' lowest out of the 10 speaking situations, thus all eight had this as their low-anxiety situation. This tasks required two reading passages that were each 300 syllables in length and were of a grade-eight level of difficulty. The materials required for the higher anxiety situations varied. The two subjects and the volunteers who were asked to introduce themselves to an audience were provided with a list of topics to discuss during the introduction (see Appendix H for the complete list). The subjects who were asked to speak to a group of people were provided with a list of topics from which they could choose one or two to speak on (see Appendix I for the complete list). The subject who was asked to participate in a debate was provided with the topic in advance of the testing session. The subject who was asked to tell jokes to an audience was provided with a number of jokes and several URLs of humourous websites to look for other jokes.

Equipment

Each speaking situation was audio recorded using a Sony TCM 5000 EV recorder and an Audiotechnica omni-directional microphone that was provided by the School of

Human Communication Disorders. For the last six of the eight participants, the testing

situations were also video recorded using a Sony DCR-TRV315 video recorder.

Procedure

Potential participants were initially contacted by phone by the primary researcher

who explained the purpose of the study to them. If the person agreed to take part in the

study, the examiner administered the Speech Anxiety Mini Questionnaire to determine

the degree of speech anxiety they would expect to experience in each of the ten speaking

situations. From these ratings, two of the speaking conditions, one rated with a high

score and one rated with a low score, were chosen and prearranged for the subject for the

day of their participation (see Appendix J for the questionnaire items and scores from

which the testing situations were chosen for each subject). The purpose of this

methodology was so that each subject would experience two situations that he/she had

personally identified as being associated with low and high anxiety. Subjects were told

that they would be speaking in two different speaking situations, but were not necessarily

told which two until just prior to the allotted speaking time. If one of their speaking

situations required preparation prior to the day of testing, they were informed and given

sufficient time for preparation. Three of the eight subjects were informed prior to the

testing day to prepare for one of the speaking tasks they would be taking part in.

For each subject, both testing situations took place on the same day. Each subject

was tested separately. When the subject arrived at the Dalhousie School of Human

Communication Disorders for the testing, they were brought into a room (10' 7" by 10'

9") with a double-sided mirror on one wall. In the room there was only a table and three

chairs. On the table there was an omnidirectional microphone that was attached to an

audio recorder that was placed on a chair. The subject was given an Informed Consent Form (see Appendix K), which described the purpose of the study and what they would be asked to do. After reading and signing this document, the subject was informed about what the first situation would consist of and immediately prior to this speaking task, was asked to complete the STAI-X1. All eight subjects had 'reading out loud to yourself with no one else present' as their low stress situation. The subject was provided with two reading selections and told to read them out loud to themselves after completing the STAI-X1. The researcher then switched on the tape recorder and left the room. For the subjects who were also video recorded, a video camera was set up in the adjacent room and recording took place from behind the two-way mirror. An intercom system between the two rooms allowed for the sound to be recorded. Following the first testing situation, the subject was asked to complete the Post Situation Anxiety Questionnaire.

The subject was then informed of what the second testing situation would consist of, if he/she did not already know, and was given sufficient time for preparation. For those who were aware of what the second situation would be, they were asked to wait for 15 –30 minutes while the testing room was set up. Immediately prior to the second situation, participants again filled out the STAI-X1 and following it, they filled out the Post Situation Anxiety Questionnaire. For seven of the eight participants, Situation 2 took place in a classroom at the Dalhousie School of Human Communication Disorders where the audio and video recording equipment had been set up. These situations all consisted of some type of public speaking involving an audience; either a debate, introducing oneself to strangers, telling jokes, or giving a brief speech. For these situations requiring audience members, students and staff from the Dalhousie School of

Human Communication Disorders were recruited. For the situations where the subject was to speak to a group for 10 minutes, audience members were told that they were needed to sit and listen to the speaker for approximately 10 minutes. These audiences were made up of 6 to 15 people for each scenario. For the situations requiring people to introduce themselves, five volunteers were provided with a list of things they could tell about themselves to make the introduction longer. For the eighth subject who did not take part in an audience-situation, the second testing situation took place in an office with a phone. The subject was provided with the name and telephone number of an unknown informed confederate and was asked to call this person and talk with him. The audio and video recording equipment was set up in the office prior to the subject entering the room.

Following each speaking situation the researcher conducted a quick debriefing session with the participant to discuss what they thought of the situation, and find out techniques used to help control stuttering, as well as the participant's perception of his/her success in speaking fluently, and any concerns they might have. After completing testing with the first three participants, the researcher amended the Post Situation Anxiety Questionnaire to include a question to rate how the amount of stuttering displayed in the testing situation compared to the subjects' normal everyday speech, as this had been something that she had been inquiring of each participant and believed was important to capture systematically. As a result, there is a formal rating of this feature for only five of the eight subjects.

Each participant experienced the low anxiety situation as the first, and the higher anxiety situation as the last. This strategy was used to avoid an order effect that the researcher could foresee as a possibility; a low anxiety situation should not have any

impact on a high anxiety situation following it, but a high anxiety situation may impact on any situation, high or low, which follows it. It was reasoned that if the subject underwent a higher anxiety-arousing speaking situation first, there would be a possibility of carry-over of the heightened anxiety to the following speaking situation. By having the supposedly lesser anxiety-producing situation as the first, this confounding factor is eliminated. The researcher took this step to decrease the effect of order of conditions in an attempt to preserve the internal validity of the study.

Each situation was audio recorded, and the last five of the eight were both audio and video recorded, because it was found that audio recording alone was not picking up the data on all the core stuttering behaviours, such as inaudible postural fixations, or secondary behaviours like facial grimaces, blinking, or ticks, which some subjects were displaying. The combined time for both testing situations and set up time in between was approximately 1.5 hours for each participant.

Data Analysis

Stuttering was defined as part-word repetitions, part-word prolongations, and/or inaudible postural fixations. Stuttering episodes were calculated from the first 300 syllables of participants' audio-recorded passages by the primary researcher, who was a graduate student in speech-language pathology. The video-recorded passages were used to verify the original counts, or to make adjustments to the counts. Adjustments were only made if additional data on subjects' stuttering episodes was observed on the video that was not accessible with the audio recording (for example, inaudible postural fixations). To obtain inter-rater reliability, stuttering episodes were recalculated by a second graduate student in speech-language pathology for 25% of the speech samples

chosen at random (one speech sample for each of four subjects). The same method of using the audio recordings first and then the video recordings second was used for the recounting. Interjudge syllable-by-syllable agreement was high, ranging from 89% to 96% on these four speech samples.

Results

The raw data for each subject for each of the rating scales, questionnaires, and the total stuttering counts are displayed in Table 7.

Table 7

Study II raw data

S1 Results		
	Situation 1	Situation 2
Speech Anxiety Mini Questionnaire (phone interview) score (1-7)	2	7
STAI Score (out of 80) for pre-situation anxiety	25	40
Amount of stuttering (out of 300 syllables)	24	10
Speech anxiety experienced (1-7)	2	2
Effort to control stuttering (1-7)	3	3
Control techniques used (own words)	"slow bouncing, once or twice"	None indicated
**Speech in situation compared to everyday speech (1-7, own words)	Was not asked	Was not asked

S2 Results		
	Situation 1	Situation 2
Speech Anxiety Mini Questionnaire (phone interview) score (1-7)	1	6
STAI Score (out of 80) for pre-situation anxiety	38	48
Amount of stuttering (out of 300 syllables)	3	29
Speech anxiety experienced (1-7)	1	3
Effort to control stuttering (1-7)	1	1
Control techniques used (own words)	None indicated	None indicated
**Speech in situation compared to everyday speech (1-7; own words)	Was not asked	Was not asked

S3 Results	Situation 1	Situation 2
Speech Anxiety Mini Questionnaire (phone interview) score (1-7)	1	5
STAI Score (out of 80) for pre-situation anxiety	35	37
Amount of stuttering (out of 300 syllables)	10	16
Speech anxiety experienced (1-7)	2	4
Effort to control stuttering (1-7)	2	3
Control techniques used (own words)	None indicated	"Controlled speaking"
**Speech in situation compared to everyday speech (1-7; own words)	Was not asked	Was not asked

S4 Results	Situation 1	Situation 2
Speech Anxiety Mini Questionnaire (phone interview) score (1-7)	1	3
STAI Score (out of 80) for pre-situation anxiety	37	31
Amount of stuttering (out of 300 syllables)	49	20
Speech anxiety experienced (1-7)	1	2
Effort to control stuttering (1-7)	4	2
Control techniques used (own words)	"yes, but not sure what"	Yes (nothing indicated)
**Speech in situation compared to everyday speech (1-7; own words)	4	1

S5 Results	Situation 1	Situation 2
Speech Anxiety Mini Questionnaire (phone interview) score (1-7)	1	7
STAI Score (out of 80) for pre-situation anxiety	28	29
Amount of stuttering (out of 300 syllables)	13	4
Speech anxiety experienced (1-7)	1	1
Effort to control stuttering (1-7)	2	2
Control techniques used (own words)	None indicated	"slow speech"
**Speech in situation compared to everyday speech (1-7; own words)	3	2

S6 Results		
	Situation 1	Situation 2
Speech Anxiety Mini Questionnaire (phone interview) score (1-7)	1	6
STAI Score (out of 80) for pre-situation anxiety	29	33
Amount of stuttering (out of 300 syllables)	52	30
Speech anxiety experienced (1-7)	4	4
Effort to control stuttering (1-7)	6	6
Control techniques used (own words)	"repetition, smooth onset, breathing"	"smooth onset"
**Speech in situation compared to everyday speech (1-7; own words)	6	4

S7 Results		
	Situation 1	Situation 2
Speech Anxiety Mini Questionnaire (phone interview) score (1-7)	1	6
STAI Score (out of 80) for pre-situation anxiety	49	57
Amount of stuttering (out of 300 syllables)	19	28
Speech anxiety experienced (1-7)	3	4
Effort to control stuttering (1-7)	4	5
Control techniques used (own words)	"deep breaths & slowing down"	"slowing down- tried but did not work out all that well"
**Speech in situation compared to everyday speech (1-7; own words)	5	5

S8 Results		
	Situation 1	Situation 2
Speech Anxiety Mini Questionnaire (phone interview) score (1-7)	1	6
STAI Score (out of 80) for pre-situation anxiety	38	43
Amount of stuttering (out of 300 syllables)	1	69
Speech anxiety experienced (1-7)	1	6
Effort to control stuttering (1-7)	1	4
Control techniques used (own words)	None indicated	None indicated
**Speech in situation compared to everyday speech (1-7, own words)	1	7

** for this scale, 1= much less stuttering than normal speech; 4= just like normal everyday speech; 7= much more stuttering than normal speech

Four of the eight subjects (S2, S3, S7, S8) showed an increase in amount of stuttering demonstrated in the second speaking situation. The remaining four subjects (S1, S4, S5, S6) showed a decrease in stuttering during the second speaking task. To determine whether the differences in stuttering counts between Situations 1 and 2 were significant across subjects, the Wilcoxon Signed Ranks Test was performed. The T_{obt} score for the stuttering data was 17.5. This is considerably larger than the T_{crit} score of 3, thus the test demonstrates that there was no significant difference between stuttering frequencies for either speaking situation across subjects. To examine differences in anxiety experienced across subjects, the Wilcoxon Signed Ranks Test was also performed on the actual anxiety experienced data. Again, no significant difference was found between speaking tasks (T_{obt}: $6 > T_{crit}$ 3).

Data for individual subjects were also examined. To this end, a Chi-Square test was used for a within subjects analysis. For each subject, the amounts of stuttering demonstrated in each speaking situation were added together and divided in half to obtain the expected frequency (F_e). The results of these tests are displayed in Table 8:

Table 8

Chi Square Data for individual subjects

Subject	Situation 1 stuttering count	Situation 2 stuttering count	F_e	chi^2	X_{crit} (.05 level)	Difference
S1	24	10	17	5.76	3.841	Significant
S2	3	29	16	21.13	3.841	Significant
S3	10	16	13	1.38	3.841	Not significant
S4	49	20	34.5	12.19	3.841	Significant
S5	13	4	8.5	4.76	3.841	Significant
S6	52	30	41	2.95	3.841	Not significant
S7	19	28	23.5	1.72	3.841	Not significant
S8	1	69	35	66.06	3.841	Significant

Although as a group the differences in stuttering from Situation 1 to Situation 2 were not significant, individually, the stuttering demonstrated by five of the eight subjects was significantly different between Situations 1 and 2. However, the Chi-Square test is non-directional and so could not take into account the direction of the increase or decrease in stuttering. Out of the five subjects whose stuttering frequencies proved to be significantly different, only two (S2, S8) displayed differences in the predicted direction (stuttering increase in Situation 2).

To see whether there was a relationship between any of the other factors examined and the stuttering demonstrated in each speaking situation across subjects, Spearman Rank Order Correlations were calculated. The results are displayed in Table 9.

Table 9

Correlations between all measurement factors in Study II

Correlation	Spearman's Rho	Significance
Stuttering & Actual anxiety	0.665	Significant at the .01 level (2-tailed)
Stuttering & Effort to control stuttering	0.704	Significant at the .01 level (2-tailed)
Actual anxiety & Effort to control stuttering	0.650	Significant at the .01 level (2-tailed)
Stuttering & Speaking Anxiety Mini Questionnaire	0.134	Not significant
Stuttering & STAI scores	0.058	Not significant
STAI scores & Actual anxiety	0.328	Not significant
STAI scores & Effort to control stuttering	0.039	Not significant
STAI Scores & Speaking Anxiety Mini Questionnaire	0.195	Not significant
Actual anxiety & Speaking Anxiety Mini Questionnaire	0.358	Not significant
Effort to control stuttering & Speaking Anxiety Mini Questionnaire	0.132	Not significant

The correlations between the three variables of stuttering, actual anxiety, and effort to control stuttering were found to be significant. This finding is important because these were the three variables that were measured during the actual speaking tasks. The other two variables (Speaking Anxiety Mini Questionnaire score and STAI score) were obtained prior to the speaking situations and thus were not directly related to the actual testing situations.

Discussion

In Study II the researcher attempted to directly examine the question of whether stuttering frequency differs significantly for speech produced in situations judged by the speakers as moderately-to-highly anxiety arousing compared to speech produced in situations judged as eliciting low levels of anxiety. Study II differs from Study I in that all the speaking situations were real, as opposed to hypothetical, and thus the measurements were based on actual experiences versus expectations or predictions.

Adults who stutter were asked to speak in two different situations: one that they had personally identified as likely to elicit low anxiety and one that they had identified as likely to elicit moderate-high anxiety. It was hypothesized that stuttering frequency would be significantly higher in the moderate-high anxiety condition than in the low anxiety condition. However, across subjects there was no significant difference in actual anxiety for the two speaking situations. Further, when individual subjects' data were examined, seven of the eight subjects showed at most a 2-point difference. Therefore the researcher was not successful in establishing low versus moderate-high anxiety situations for the subjects as a group and because these independent variables were not

appropriately established, the hypothesis could not be properly tested for the subjects as a group.

Examining stuttering frequency on an individual basis, the seven subjects for whom there was only a minor difference in anxiety scores, showed variable patterns: three subjects displayed more stuttering in the second, supposedly more anxiety-arousing situation and four showed the opposite effect- there was more stuttering evident in the first speaking situation.

The results for the one subject for whom the two situations did differ dramatically in anxiety, however, are very notable. For S8, when speaking-related anxiety substantially increased, so did the amount of stuttering, and so did the effort to control the stuttering. This is an important finding because this was the one subject for whom the independent variable was effectively created as intended. The results of S8 provide support for the original hypothesis that stuttering frequency would be significantly higher in a moderate-high anxiety condition than in a low anxiety condition. For the first speaking task, S8 was completely at ease. He was in a setting which for him was associated with positive speaking experiences, as this was where he attended therapy sessions and self-help group meetings for several years. In conjunction with this relaxed state, S8 was extremely fluent during this speaking task. He indicated that his stuttering during the first speaking situation was greatly reduced compared to his normal speech. He also indicated that both the speaking-related anxiety he felt and the effort to control stuttering he expended in this task were minimal. However, for the second speaking situation, it was learned that he had prepared for the wrong side of the debate in which he was about to take part. As such, he was given an extra 20-30 minutes and access to the

Internet to research the topic and prepare for the debate. This circumstance was quite anxiety-arousing for him, and regardless of the fact that he was still in the same physical setting, by the time the second speaking situation began, S8's anxiety level was much higher than normal. He displayed substantially more stuttering in this second speaking situation. He indicated that the stuttering in the second speaking task was much higher than in his normal everyday speech. The anxiety he reported feeling was also much higher than that in the first speaking task, as was the effort he used to try to control the stuttering. This finding provides tangible support for Study I as well, where it was found that people who stutter perceive stuttering frequency to vary as a function of anxiety and pressure to not stutter in a given situation.

Although there were no significant group differences across subjects for either stuttering or anxiety from Situation 1 to 2, the results of Study II do provide some support for the hypothesis that there is a relationship between speaking-related anxiety and stuttering. There was a significant correlation between the amount of stuttering evidenced and the actual anxiety experienced. There were also significant correlations between amount of stuttering and the effort to control stuttering, and also between actual anxiety experienced and effort to control stuttering. For this correlation analysis, there were 16 data points for each variable: eight subjects with two speaking situations each. Examined in this way it was found that in general when there was a lower anxiety score, there was a lower stuttering score and a lower effort to control stuttering score; when there was a higher anxiety score there was a higher stuttering score or effort to control stuttering score.

These findings also support those of Study I, in which the researcher also found a high positive correlation between the three dependent variables of expected speaking-related anxiety, expected stuttering, and expected pressure to not stutter. While in study II, the subjects were not asked to rate the pressure they felt to not stutter in each situation, they were asked to rate the effort they expended to control their stuttering. These two variables can be considered as related, as they both refer to an internal desire or need to keep stuttering at a minimum.

Study II differed from Study I, however, in that more than one rating of anxiety was obtained for each speaking situation. Subjects rated the speaking tasks on the 7-point Likert-type scale several weeks prior to the testing date (SAMQ); they completed an anxiety checklist (STAI-X1) immediately prior to each speaking task, and they rated the actual anxiety experienced in the speaking situation with the 7-point Likert-type scale immediately after each speaking task. This method allowed for the researcher to examine how the predicted anxiety related to the actual anxiety experienced, and how the anxiety the person experienced immediately prior to the speaking situation related to actual anxiety. The results from Study II indicate, however, that the relationship between predicted anxiety and actual anxiety was weak. As well, for the subjects in Study II the anxiety experienced immediately prior to a speaking situation seemed to have had little bearing on the anxiety the person experienced in the actual speaking situation, as the correlation between the two variables was low. The researcher also looked at the relationship between predicted anxiety and actual stuttering and anxiety immediately prior to a speaking task and actual stuttering. In both cases it was found that the relationship between the variables was weak.

There are several factors that may have contributed to the difficulty in creating the predicted degree of anxiety the majority of subjects. Most of these variables were difficult to anticipate or control. One factor which seemed to have affected each subject to varying degrees was the setting where the testing took place. Seven of the eight subjects had either attended fluency treatment sessions, self-help group meetings or both at the school. As such, the physical setting was associated with positive speaking experiences for these subjects before they were even placed in the testing situations. As well, at least two subjects encountered their former therapist prior to the testing scenarios. This encounter may have had the effect of further reducing any speaking-related anxiety that the subjects may have normally experienced. Another confounding factor that may have affected the outcome was that two subjects were made aware that the audience for the second speaking task consisted solely of student speech-language pathologists. One of these subjects admitted that he did relax when he discovered this, as he felt more comfortable knowing that he wouldn't be judged on his speech. These can all be seen as reasons why the anxiety ratings were not as high as were expected for situation 2.

Also, the choice of low-anxiety speaking situations for each person may have played a role in the lack of significant differences between speaking situations. For Situation 1, each subject was asked to read two passages out loud while alone. The problem with this is that a reading task is difficult to compare to other spontaneous speaking tasks. During an oral reading task, avoidance behaviours cannot be used and when a person who stutters is faced with a word on which they would normally block, they cannot substitute another word in its place. This is perhaps why the stuttering counts for Situation 1 were higher for half of the subjects, even though the anxiety ratings were

low. While all subjects indicated that this would be a low-anxiety speaking situation for them, it was probably due to the original description of the situation that indicated that they would be alone with no one listening to or watching them. The fact that the script would be unchangeable was perhaps not considered. It is impossible to determine whether the reading aspect of this situation really affected the results, however, it is a possibility.

Conclusions

While clinicians and theorists have long proposed that stuttering is causally related to anxiety, there has been little empirical evidence to support this view. Researchers have attempted to show that people who stutter have higher levels of anxiety, but, overall, have not been successful in doing so. This may be because researchers in the past have typically studied trait anxiety rather than state anxiety when looking for the connection between stuttering and anxiety. However, of these two types of anxiety, it is state anxiety which is more likely to show up in speaking situations. Further, when researchers did attempt to examine state anxiety levels, physiological measurements were most often used to determine anxiety levels during speaking situations. These forms of measurement may not have been conducive to capturing the actual anxiety that the person may have been experiencing. The subjective feelings of state anxiety may be better captured by cognitive or perceptual measures than by physiological measures. It has been speculated that self-reporting techniques may be a better method of capturing any subjective feelings related to a speaking situation, such as the anxiety experienced. Using this self-report method, both Studies I and II support the notion that state anxiety does play a role in stuttering. Both studies show that there is a strong relationship between the variables as a function of speaking situation. Study I shows that there is a strong correlation between the three independent variables of anxiety, pressure to not stutter, and stuttering in hypothetical speaking situations. Thus, even when not actively engaged in a speaking situation, but merely reflecting on how they feel while speaking, people who stutter appear to relate the degree of stuttering to varying degrees of anxiety. The results of Study II show a correlation between actual anxiety and degree of stuttering in real life

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situations. However, as the results from both studies were derived using correlational analysis, they do not provide any information on the direction of the relationship between anxiety and stuttering.

One of the theories on the connection between anxiety and stuttering is Johnson's anticipatory avoidance theory (as cited in Bloodstein, 1995). According to Johnson, stuttering is what one does when he or she is trying not to stutter. It is "…an anxiety-motivated avoidant response that becomes conditioned to the cues or stimuli associated with its occurrences" (Johnson, 1955 p.23). In Study II, the researcher had hoped to test this theory by establishing two discretely different anxiety-level situations and demonstrating that stuttering would vary accordingly. The level of anxiety would be established first, and then subjects would have to speak. The researcher, however, was not successful in creating the predicted levels of anxiety for the group of subjects. One subject did experience the predicted levels of anxiety and did show the expected effect: heightened anxiety, heightened stuttering. As this was only one subject, however, one must be cautious with any interpretation.

The results can be seen as a useful contribution to the field of fluency research. Study I demonstrated that amongst people who stutter there is a strong relationship between perceived degree of speaking-related anxiety, pressure to not stutter, and stuttering frequency as a function of situation, and that if the degree of one increases, it is expected that the other will as well. From Study II the significant correlations between the three variables of amount of stuttering, effort to control stuttering, and actual anxiety experienced also provide evidence for the hypothesis that there is a relationship between speaking anxiety, pressure to not stutter, and amount of stuttering exhibited in different

speaking situations. The results from the one subject for whom the set up of independent variables was successful provides tangible evidence that for people who stutter, the frequency of stuttering does vary as a function of speaking related anxiety.

Study I also provides evidence that people who participate in therapy for stuttering are more likely to expect an increase in stuttering if there is an increase in anxiety or pressure to not stutter than people who do not take part in therapy. As well, Study I shows that there is no real difference in the attitudes of men versus women in terms of a relationship between these variables. Finally, a hierarchy of 30 speaking situations has been developed from the data provided by the 99 participants in Study I.

Clinical Implications

There are several clinical implications for the current findings. First of all, the hierarchy of speaking situations rated for expected anxiety, stuttering and pressure to not stutter from Study I would make a useful tool for clinicians to use in deciding on situations in which to expose clients in terms of varying levels of anxiety. As well, from both studies, it has been learned that degree of stuttering as well as amount of anxiety and/or pressure to not stutter, are influenced by cues that occur in different speaking situations and people who stutter are, themselves, very aware of this. Thus, this study provides some much-needed empirical support for the underlying belief amongst people who stutter, clinicians, and the general public alike that stuttering is associated with state anxiety. The results of this study, which point to a relationship between anxiety, pressure to not stutter, and stuttering, however, are correlational for the most part. Thus, further exploration of a causal relationship (i.e. anxiety actually precipitating stuttering) is indicated.

Summary

The purpose of this research was to examine whether there is a relationship between the levels of speaking anxiety, pressure to not stutter, and amount of stuttering exhibited in different speaking situations. Using both hypothetical and live speaking situations, the experimenter enlisted people who stutter to report on their expectations and/or experiences of speaking related anxiety, pressure to not stutter, and amount of stuttering in various speaking situations. As was hypothesized, it was found that there is a strong relationship between these variables, both for expectations and actual experiences of these variables.

It is a very difficult task to design and execute a study that is based on such a precarious independent variable a person's level of anxiety, which can be tied to or affected by so many different variables. Study II demonstrates the hazards that exist in carrying out such an endeavour. However, this remains a very important area of study and future researchers should take into account both the results of and the lessons learned from this study in any attempts to repeat it.

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Appendix A

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Situational Speaking Anxiety and Stuttering Questionnaire

This questionnaire focuses on the relationship that speech anxiety and the pressure to not stutter may have to stuttering. Speech anxiety is the fear of negative evaluation by others in a speaking situation. For example, a person might experience a high amount of speech anxiety if they have to deliver a speech to a large group of people. They may fear that people will think differently or badly of them if they make a mistake during the speech. A person may have a low level of speech anxiety when speaking to a close friend, as they are not worried about what that person thinks of them. Speech anxiety is not a trait that you would use to describe your personality; it is an emotion experienced before or during a specific speaking situation.

The questionnaire consists of three different scales that you will use to rate 30 separate speaking situations: they measure the degree of speech anxiety, severity of stuttering behaviour, and the pressure you would feel to <u>not</u> stutter in that situation. Please be as truthful and accurate as possible when answering each item. At the bottom of each scale there is extra space for you to include and rate some specific situations that you have personal experience with. If you decide to provide us with this information, please use the same situation(s) for each of the three scales.

For demographic purposes, please provide the following information:

1. Age: _____

2. Sex: _____

3. Are you presently or have you ever attended therapy sessions at any time in the past regarding your stuttering? Yes _____ (go to Question 4) No _____ (go to Question 7)

4. How long ago did you finish therapy?
   a. 1-6 months
   b. 6-12 months ago
   c. 1-3 years ago
   d. More than 3 years ago
   e. I am currently attending therapy sessions

5. Indicate which of the following techniques you've used (choose all that apply):
    a. Stuttering modification skills- e.g. techniques to help you stutter more easily
    b. Fluency shaping skills- e.g. slow speech and easy voice onset to help you speak more fluently over all
    c. Voluntary stuttering- that is, stuttering on purpose
    d. Fear reduction strategies- e.g. role playing, practice speaking in difficult situations
    e. Do not know

6. Was this therapy successful in helping you reduce your stuttering?
    Yes _____   No _____

7. Are you presently or have you ever been involved with a stuttering self-help group?
    Yes _____ (go to Question 8)   No _____ (go to Question 9)

8. How long have you been involved with a stuttering self-help group?
    a. 1-6 months
    b. 6-12 months
    c. 1-3 years
    d. More than 3 years

9. What is the highest level of education you have attained?
    a. Less than grade 12
    b. High school diploma
    c. Some post-secondary education
    d. Bachelors degree or college diploma
    e. Masters or doctoral level studies (Graduate degree)

10. How often do you have to speak to groups of people in your daily life?
    a. Never
    b. Rarely
    c. Sometimes
    d. Often

1. On a scale from 1-7, how much **speech anxiety** (fear of negative evaluation in a speaking situation) would you experience in the following situations?

Example scale: **1** 2 3 **4** 5 6 **7**
  no   moderate   Extreme
anxiety   anxiety   anxiety

1. Conversing with a group of 3-4 familiar people during a card, golf, or any other game   1 2 3 4 5 6 7

2. Asking for flight or bus information when you are late for that plane or bus   1 2 3 4 5 6 7

3. Speaking to yourself out loud with no one else present   1 2 3 4 5 6 7

4. Speaking to a doctor about a medical condition you have   1 2 3 4 5 6 7

5. Speaking to an infant or young child   1 2 3 4 5 6 7

6. Giving directions to a stranger   1 2 3 4 5 6 7

7. Speaking to your mother/ father on a neutral subject   1 2 3 4 5 6 7

8. Speaking during an interview with a prospective employer   1 2 3 4 5 6 7

9. Speaking to a close friend on the telephone   1 2 3 4 5 6 7

10. Talking with your spouse/ significant other over dinner   1 2 3 4 5 6 7

11. Leaving a telephone message on a friend's answering machine   1 2 3 4 5 6 7

12. Speaking with your professor or boss on an important subject   1 2 3 4 5 6 7

13. Speaking to a group of 10 unfamiliar people   1 2 3 4 5 6 7

14. Participating in a debate in front of an audience   1 2 3 4 5 6 7

15. Speaking to a person who stutters whom you know well   1 2 3 4 5 6 7

16. Delivering a very important message to a
     co-worker   1 2 3 4 5 6 7

17. Returning an appliance which does not work
     to a busy department store   1 2 3 4 5 6 7

18. Giving instructions to a small number of new
     coworkers from a position of authority   1 2 3 4 5 6 7

19. Reacting to a criticism made by your supervisor   1 2 3 4 5 6 7

20. Engaging in small talk with someone younger
     than you   1 2 3 4 5 6 7

21. Talking after being teased about your speech   1 2 3 4 5 6 7

22. Speaking to your speech clinician   1 2 3 4 5 6 7

23. Being asked to answer a question in a class
     when you know the answer   1 2 3 4 5 6 7

24. Introducing yourself to a group of 10 people
     after everyone else has given their names   1 2 3 4 5 6 7

25. Apologizing to a co-worker or classmate   1 2 3 4 5 6 7

26. Telling a taxicab driver where to take you   1 2 3 4 5 6 7

27. Talking with a group of friends at a party   1 2 3 4 5 6 7

28. Having a conversation with a good friend   1 2 3 4 5 6 7

29. Telling a funny story to a group of 2-8 friends   1 2 3 4 5 6 7

30. Talking with an instructor after class in
     his/her office   1 2 3 4 5 6 7

31. _____   1 2 3 4 5 6 7

32. _____   1 2 3 4 5 6 7

33. _____   1 2 3 4 5 6 7

34. _____   1 2 3 4 5 6 7

2. On a scale from 1-7, how **severely would you stutter** in the following situations?

Example scale:	**1**	2	3	**4**	5	6	**7**
	no stuttering			usual amount of stuttering for me			much more stuttering than usual

1. Conversing with a group of 3-4 familiar people during a card, golf, or any other game   1   2   3   4   5   6   7

2. Asking for flight or bus information when you are late for that plane or bus   1   2   3   4   5   6   7

3. Speaking to yourself out loud with no one else present   1   2   3   4   5   6   7

4. Speaking to a doctor about a medical condition you have   1   2   3   4   5   6   7

5. Speaking to an infant or young child   1   2   3   4   5   6   7

6. Giving directions to a stranger   1   2   3   4   5   6   7

7. Speaking to your mother/ father on a neutral subject   1   2   3   4   5   6   7

8. Speaking during an interview with a prospective employer   1   2   3   4   5   6   7

9. Speaking to a close friend on the telephone   1   2   3   4   5   6   7

10. Talking with your spouse/ significant other over dinner   1   2   3   4   5   6   7

11. Leaving a telephone message on a friend's answering machine   1   2   3   4   5   6   7

12. Speaking with your professor or boss on an important subject   1   2   3   4   5   6   7

13. Speaking to a group of 10 unfamiliar people   1   2   3   4   5   6   7

14. Participating in a debate in front of an audience   1   2   3   4   5   6   7

15. Speaking to a person who stutters whom you know well   1   2   3   4   5   6   7

16. Delivering a very important message to a

co-worker   1 2 3 4 5 6 7

17. Returning an appliance which does not work
to a busy department store   1 2 3 4 5 6 7

18. Giving instructions to a small number of new
coworkers from a position of authority   1 2 3 4 5 6 7

19. Reacting to a criticism made by your supervisor   1 2 3 4 5 6 7

20. Engaging in small talk with someone younger
than you   1 2 3 4 5 6 7

21. Talking after being teased about your speech   1 2 3 4 5 6 7

22. Speaking to your speech clinician   1 2 3 4 5 6 7

23. Being asked to answer a question in a class
when you know the answer   1 2 3 4 5 6 7

24. Introducing yourself to a group of 10 people
after everyone else has given their names   1 2 3 4 5 6 7

25. Apologizing to a co-worker or classmate   1 2 3 4 5 6 7

26. Telling a taxicab driver where to take you   1 2 3 4 5 6 7

27. Talking with a group of friends at a party   1 2 3 4 5 6 7

28. Having a conversation with a good friend   1 2 3 4 5 6 7

29. Telling a funny story to a group of 2-8 friends   1 2 3 4 5 6 7

30. Talking with an instructor after class in
his/her office   1 2 3 4 5 6 7

31. _____   1 2 3 4 5 6 7

32. _____   1 2 3 4 5 6 7

33. _____   1 2 3 4 5 6 7

34. _____   1 2 3 4 5 6 7

3. On a scale from 1-7, how much **pressure would you feel to <u>not</u> stutter** in the following situations?

	Example scale :	**1**	2	3	**4**	5	6	**7**
		not important			moderately important			Extremely important

1. Conversing with a group of 3-4 familiar people during a card, golf, or any other game   1   2   3   4   5   6   7

2. Asking for flight or bus information when you are late for that plane or bus   1   2   3   4   5   6   7

3. Speaking to yourself out loud with no one else present   1   2   3   4   5   6   7

4. Speaking to a doctor about a medical condition you have   1   2   3   4   5   6   7

5. Speaking to an infant or young child   1   2   3   4   5   6   7

6. Giving directions to a stranger   1   2   3   4   5   6   7

7. Speaking to your mother/ father on a neutral subject   1   2   3   4   5   6   7

8. Speaking during an interview with a prospective employer   1   2   3   4   5   6   7

9. Speaking to a close friend on the telephone   1   2   3   4   5   6   7

10. Talking with your spouse/ significant other over dinner   1   2   3   4   5   6   7

11. Leaving a telephone message on a friend's answering machine   1   2   3   4   5   6   7

12. Speaking with your professor or boss on an important subject   1   2   3   4   5   6   7

13. Speaking to a group of 10 unfamiliar people   1   2   3   4   5   6   7

14. Participating in a debate in front of an audience   1   2   3   4   5   6   7

15. Speaking to a person who stutters whom you know well   1   2   3   4   5   6   7

16. Delivering a very important message to a
    co-worker   1   2   3   4   5   6   7

17. Returning an appliance which does not work
    to a busy department store   1   2   3   4   5   6   7

18. Giving instructions to a small number of new
    coworkers from a position of authority   1   2   3   4   5   6   7

19. Reacting to a criticism made by your supervisor 1   2   3   4   5   6   7

20. Engaging in small talk with someone younger
    than you   1   2   3   4   5   6   7

21. Talking after being teased about your speech   1   2   3   4   5   6   7

22. Speaking to your speech clinician   1   2   3   4   5   6   7

23. Being asked to answer a question in a class
    when you know the answer   1   2   3   4   5   6   7

24. Introducing yourself to a group of 10 people
    after everyone else has given their names   1   2   3   4   5   6   7

25. Apologizing to a co-worker or classmate   1   2   3   4   5   6   7

26. Telling a taxicab driver where to take you   1   2   3   4   5   6   7

27. Talking with a group of friends at a party   1   2   3   4   5   6   7

28. Having a conversation with a good friend   1   2   3   4   5   6   7

29. Telling a funny story to a group of 2-8 friends 1   2   3   4   5   6   7

30. Talking with an instructor after class in
    his/her office   1   2   3   4   5   6   7

31. _____   1   2   3   4   5   6   7

32. _____   1   2   3   4   5   6   7

33. _____   1   2   3   4   5   6   7

34. _____   1   2   3   4   5   6   7

Classification of speaking situations on questionnaire according to expected anxiety level

Low speech pressure

1. Speaking to yourself out loud with no one else present
2. Speaking to an infant or young child
3. Speaking to your mother/ father on a neutral subject
4. Talking with your spouse/ significant other over dinner
5. Speaking to a person who stutters whom you know well
6. Engaging in small talk with someone younger than you
7. Speaking to your speech clinician.
8. Talking with a group of friends at a party
9. Having a conversation with a good friend

Medium speech pressure

1. Conversing with a group of 3-4 familiar people during a card, golf, or any other game
2. Giving directions to a stranger
3. Speaking to a close friend on the telephone
4. Giving instructions to a small number of new coworkers from a position of authority
5. Being asked to answer a question in a class when you know the answer.
6. Apologizing to a coworker or classmate
7. Telling a funny story to a group of 2-8 friends.

High speech pressure

1. Asking for flight or bus information when you are late for that plane or bus
2. Speaking to a doctor about a medical condition
3. Speaking during an interview with a prospective employer
4. Leaving a telephone message on a friend's answering machine
5. Speaking with your professor or boss on an important subject
6. Speaking to a group of 10 unfamiliar people
7. Participating in a debate in front of an audience
8. Delivering a very important message to a coworker
9. Returning an appliance which does not work to a busy department store
10. Reacting to a criticism made by your supervisor
11. Talking after being teased about your speech
12. Introducing yourself to a group of 10 people after everyone else has given their names
13. Telling a taxicab driver where to take you.
14. Talking with an instructor after class in his/her office

The Effect of Situational Speaking Anxiety on Stuttering Frequency in Adults who Stutter

You are invited to take part in a research study aimed at examining the relationship between speech anxiety, pressure not to stutter, and stuttering frequency in adults who stutter. You may participate in this study if you are an adult who stutters who is over the age of 18. Taking part in this study is voluntary and you may end your responses to the survey at any point. The study is being conducted as part of a Master's Thesis program through the School of Human Communication Disorders at Dalhousie University. Your participation will not affect your ability to access related services, such as fluency therapy, in any way.

The purpose of the study is to examine the relationship between stuttering and anxiety. Many people, including researchers, clinicians, and those who stutter, believe that anxiety plays a role in stuttering, but no one has been able to clearly demonstrate a relationship. Using the results of the present study, we intend to explore the relationship between stuttering and a specific type of anxiety: situational speaking anxiety.

Your completion of the survey will be interpreted as your consent for participation in the study. It is estimated that it will take 20 minutes to complete the survey. At no point is your name or any identifying information required, and no attempt will be made to identify any of the subjects through the information you provide. The website survey does not track email addresses or any other identifying information. You will not be identified in any reports or publications. Complete anonymity will be maintained.

Participating in the study may not benefit you directly, but we might learn things that will benefit others. We do ask that you be as candid as possible, as your anonymity will be assured. It is hoped that your participation will contribute to research addressing a better understanding about the nature of stuttering and how it may be effectively treated.

If you have any questions about the survey, feel free to contact Lori Thorne, the principal investigator, or Joy Armson, the faculty supervisor at the telephone number or email address shown above. In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact the Human Research Ethics/Integrity Coordinator at Dalhousie University's Office of Human Research Ethics and Integrity for assistance: (902) 494-1462 or Patricia.Lindley@Dal.ca.

Thank you for your participation.

Sincerely,

Lori Thorne, BA.   Joy Armson, Ph.D
Graduate Student,   Associate Professor,
Director of the School Dalhousie University
of Human Communication Disorders, Dalhousie

Click here to proceed with the
questionnaire

Appendix D

Demographic Questionnaire (Study II)

For demographic purposes, please provide the following information:

1. Age: _____

2. Sex: _____

3. Are you presently or have you ever attended therapy sessions at any time in the past regarding your stuttering? Yes _____ (go to Question 4) No _____ (go to Question 7)

4. How long ago did you finish therapy?
   a. 1-6 months
   b. 7-12 months ago
   c. 1-3 years ago
   d. More than 3 years ago
   e. I am currently attending therapy sessions

5. Indicate which of the following techniques you've used (choose all that apply):
   a. Stuttering modification skills- e.g. techniques to help you stutter more easily
   b. Fluency shaping skills- e.g. slow speech and easy voice onset to help you speak more fluently over all
   c. Voluntary stuttering- that is, stuttering on purpose
   d. Fear reduction strategies- e.g. role playing, practice speaking in difficult situations
   e. Do not know

6. Was this therapy successful in helping you reduce your stuttering?
   Short term   Yes _____   No _____
   Long term   Yes _____   No _____

7. Are you presently or have you ever been involved with a stuttering self-help group?
   Yes _____ (go to Question 8) No _____ (go to Question 9)

8. How long have you been involved with a stuttering self-help group?
   a. 1-6 months
   b. 7-12 months
   c. 1-3 years
   d. More than 3 years

9. What is the highest level of education you have attained?
    a. Less than grade 12
    b. High school diploma
    c. Some post-secondary education
    d. Bachelors degree or college diploma
    e. Masters or doctoral level studies (Graduate degree)

10. How often do you have to speak to groups of people in your daily life?
    a. Never
    b. Rarely
    c. Sometimes
    d. Often

Appendix E

Speech Anxiety Mini Questionnaire

1. On a scale from 1-7, how much **speech anxiety** (fear of negative evaluation in a speaking situation) would you experience in the following situations?

Example scale:

1	2	3	**4**	5	6	**7**
no anxiety			moderate anxiety			Extreme anxiety

1. Reading to yourself out loud with no one else present
2. Speaking to a close friend or family member
3. Speaking to a stranger on the telephone
4. Speaking to a group of 10 unfamiliar people
5. Participating in a debate in front of an audience
6. Speaking to a speech clinician
7. Talking to a child.
8. Giving info to a 1st year speech student interested in stuttering
9. Telling a fairly detailed joke to a small audience
10. Waiting to introduce yourself after 5 people have given long introductions.

Appendix F

Stait-Trait Anxiety Inventory, Form X1 (Stait Anxiety)

SELF-EVALUATION QUESTIONNAIRE

Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

STAI FORM X-1

NAME _____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *feel* right now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I am regretful	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel rested	①	②	③	④
9. I feel anxious	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel "high strung"	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel over-excited and "rattled"	①	②	③	④
19. I feel joyful	①	②	③	④
20. I feel pleasant	①	②	③	④

Appendix G

Post-Situation Anxiety Questionnaire

Based on your performance and how you felt during the speaking situation you just took part in, please fill in the following scale as truthfully and accurately as possible. If you have any questions, feel free to ask the examiner.

1. On a scale from 1-7, **how much speech anxiety** (fear of negative evaluation) did you experience during this situation

1	2	3	4	5	6	7
no anxiety			moderate anxiety			extreme anxiety

2. Did you use any techniques to help you control your stuttering during this situation?

    Yes: _____   No: _____

3. If yes, what technique did you use? _____

4. On a scale from 1-7, how much effort did you expend to control your stuttering?

1	2	3	4	5	6	7
no effort			moderate effort			extreme effort

5. Thinking about your speech during that situation, on a scale from 1-7, how would you compare it to your everyday, normal speech:

1	2	3	4	5	6	7
much less stuttering than normal speech			just like normal everyday speech			much more stuttering than normal speech

6. For you, what are the triggers which typically cause stuttering?

Appendix H

List of Introduction Topics

- What is your name
- Where are you from
- Where are you living right now
- Describe your family
- What are your hobbies
- What do you do for a living?
- What kind of training did you need for this job?
- Why did you choose this job and what do you like about it?
- What are some interesting things you did over the summer?

List of group discussion topics

Topics to talk about: (2-3 topics for 10 minutes total)

- Your opinions on how our society has changed or has stayed the same since 9/11

- Talk about your most interesting vacation

- Talk about what your favourite hobbies are, or what you would like to take up as a hobby and why

- Your opinions on reality TV: is it good, or bad and why

- Talk about your favourite foods, restaurants

- Talk about your ideal job and why you would choose it

- What do you like about living in Halifax?

- If you won 10 million dollars, how would you spend it and why

- What are some of your superstitions? Why do you have these?

- You have inherited 10 million dollars from your great aunt Matilda, but in the will she states that you must spend the money to help other people. What are some things you would spend the money on?

SAMQ questionnaire items and scores for each subject

Subject	Highest rated situation(s)	Score	Lowest rated situation(s)	Score
S1	Speaking to a group of 10 unfamiliar people	7	Reading to yourself out loud with no one else present	2
			Speaking to a close friend or family member	2
S2	Speaking to a group of 10 unfamiliar people	6	Reading to yourself out loud with no one else present	1
			Speaking to a close friend or family member	1
S3	Waiting to introduce yourself after 5 people have given long introductions	5	Reading to yourself out loud with no one else present	1
			Talking to a child	1
S4	Speaking to a group of 10 unfamiliar people	3	Reading to yourself out loud with no one else present	1
	Speaking to a stranger on the telephone	3	Speaking to a close friend or family member	1
	Participating in a debate in front of an audience	3	Talking to a child	1
	Telling a fairly detailed joke to a small audience	3	Speaking to a speech clinician	1
			Waiting to introduce yourself after 5 people have given long introductions	1
			Giving information to a 1st year speech student interested in stuttering	1
S5	Waiting to introduce yourself after 5 people have given long introductions	7	Reading to yourself out loud with no one else present	1
			Talking to a child	1

S6	Speaking to a stranger on the telephone	6	Reading to yourself out loud with no one else present	1
	Speaking to a group of 10 unfamiliar people	6	Speaking to a close friend or family member	1
	Participating in a debate in front of an audience	6		
S7	Telling a fairly detailed joke to a small audience	6	Reading to yourself out loud with with no one else present	1
S8	Participating in a debate in front of an audience	7	Reading to yourself out loud with no one else present	1
	Waiting to introduce yourself after 5 people have given long introductions	7	Speaking to a close friend or family member	1
			Talking to a child	1

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INFORMED CONSENT STATEMENT

Title: The Effect of Situational Speaking Anxiety on Stuttering Frequency in Adults who Stutter

Principal Investigator:
& Contact Person

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Introduction

We invite you to take part in a research study at Dalhousie University. Taking part in this study is voluntary and you may withdraw from the study at any time. The study is being conducted as part of a Master's Thesis through the School of Human Communication Disorders at Dalhousie University. Your participation will not affect your ability to access other related services, such as fluency therapy in any way. The study is described below. This description tells you about any inconveniences, discomfort or risks that you might experience. Participating in the study might not benefit you directly, but we might learn things that will benefit others. You may discuss any questions you have about this study with the primary investigator, Lori Thorne.

Purpose of the Study
The purpose of this study is to examine the relationship between situational speaking anxiety (speech anxiety), pressure not to stutter, and stuttering frequency in adults who stutter. For purposes of this study, speech anxiety is defined as the fear of negative evaluation by others in a speaking situation. Many people, including researchers, and those who stutter, believe that anxiety plays a role in stuttering, but no one has been able

to clearly demonstrate a relationship. Using the results of the present study, we hope to achieve a better understanding of the relationship between stuttering and a specific type of anxiety: situational speaking anxiety. Our results may help speech-language pathologists plan more effective treatment strategies for clients who stutter.

Study Design
Nine adults who stutter will be included in the study. Each participant will be will be asked to participate in two speaking situation, one that you have identified as easy, or associated with low anxiety and one that you have identified as difficult, or associated with moderate or high anxiety. The amount of stuttering produced in the two conditions will be compared.

Who can participate in the study
Adults over the age of 18 who stutter are eligible to participate in this study.

Who will be conducting the research
The principal investigator of this study, Lori Thorne, is a second-year Masters of Science Student at Dalhousie University's School of Human Communication Disorders. Dr. Joy Armson, PhD., Associate Professor and Director of the School of Human Communication Disorders is the principal supervisor of this study.

What you will be asked to do
As a participant in this study, you will be asked to participate in two different speaking situations. These two speaking situations will be chosen by the experimenter based on the answers you provided to the questionnaire administered during the initial phone conversation with the experimenter. The situations will be approximately 10 – 30 minutes in length. You will be audiorecorded speaking in each situation. Following each situation you will be asked to complete two questionnaires relating to the actual anxiety you felt in the situation. These questionnaires will take approximately 10 minutes to complete. Your participation will be approximately 1 hour for each speaking situation and the questionnaires, and 2 hours total for both situations. The administration of the two situations will take place during one day.

Possible inconveniences or discomforts or risks
Your participation in this study will require a commitment of approximately two hours. You will be asked to discuss and participate in situations that you have indicated may be stressful for you. However, these situations will be nothing out of the ordinary and may be a part of your normal life. There will be no physical risks involved with participating in this study.

Possible benefits
There are no direct benefits to you as a result of taking part in this study. However, the results may help contribute to our understanding about the nature of stuttering and how it may be effectively treated.

Confidentiality
The results will be kept confidential. Only the people directly involved in the experiment, that is, the primary researcher, the supervisor and a research assistant, will hear the audio recordings unless you give us permission to use them publicly for teaching or scientific purposes. A form is attached to complete if you wish to give permission. Your name will not be identified in any data analyses or oral or written reports. The data you provide will be labeled with only a number. The audio recordings will be collected and stored for seven years in locked cabinets at Dalhousie University and only the researchers will have access to them. Following this period, the audiotapes will be destroyed.

Questions
Should you have any questions regarding this study, please feel free to ask the investigator, Lori Thorne, at any time, either during the sessions, or afterwards by phone at (902) 423-4528 or by email at: lorithorne@hotmail.com. You will be given information regarding the study at the start of the study as well as at any other time that you might have a question.

Termination
You may decide to terminate your participation in this study at any time. Should you decide not to continue, this will not have any effect on any present or future fluency treatment programs.

Problems or concerns
In the event that you have any difficulties with or wish to voice concern about, any aspect of your participation in this study, you may contact the Human Research Ethics/Integrity Coordinator at Dalhousie University's Office of Human Research Ethics and Integrity for assistance: (902) 494-1462 or Patricia.Lindley@Dal.ca.

_____   _____
Lori B. Thorne, BA.   Joy Armson, PhD.
Graduate Student   Associate Professor

"I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realize that my participation is voluntary and that I am free to withdraw from the study at any time"

Signature (subject): _____ Date: _____

Signature (researcher): _____ Date: _____

Consent to Use Audio and Video Records

"I hereby give my consent to use audio and video recordings of my speech publicly with the express understanding that such records may be used only for scientific purposes, teaching, or research. I understand that any identifying information will not be used and shall remain confidential."

_____
Date

_____
Signature

_____
Witness