HOW DO NEGATIVE EVALUATION SENSITIVITY, ANXIETY SENSITIVITY, AND EXPECTANCY COMBINE TO DETERMINE FEAR IN PEOPLE WHO STUTTER AND PEOPLE WHO DO NOT STUTTER?

A Thesis by

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Bachelor of Arts, Wichita State University, 2008

Submitted to the Department of Communication Sciences and Disorders

and the faculty of the Graduate School of

Wichita State University

in partial fulfillment of

the requirements for the degree of

Master of Arts

August 2010

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The following faculty have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Arts, with a major in Communication and Sciences Disorders.

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Anthony DiLollo, Committee Chair

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DEDICATION

To my parents, my two brothers and my dear stuttering and non-stuttering friends

ACKNOWLEDGMENTS

ABSTRACT

There has been a long history of research into the possible relationship between anxiety and stuttering. Despite this history, however, relatively little research has focused on components of anxiety and how these components combine to create fear responses in both fluent speakers and persons who stutter. This study was designed to determine if differences existed between fluent speakers (FS) and persons who stutter (PWS) with respect to components of fear described by Reiss' (1991) expectancy model. Twenty PWS and twenty FS were provided with a hypothetical social communication scenario and asked to complete measures related to predicted anxiety, anxiety sensitivity, fear of negative evaluation, and expectancy. Results indicated that the FS group behaved as predicted by Reiss' model but the PWS group did not. Results suggested that clinicians working with people who stutter may tend to view their client's anxiety based upon their own experiences. Clinicians should explore the client's components of fear and how it is playing a role in their experience of stuttering.

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CHAPTER 1

INTRODUCTION

Do persons who stutter (PWS) experience greater anxiety than fluent speakers? Is stuttering a *result* of greater levels of anxiety in PWS? Are persons who stutter more "sensitive" to feelings of anxiety than fluent speakers? These, and many other, questions linking stuttering and anxiety have been asked many times and in many different ways (see Bloodstein & Ratner, 2008, for a comprehensive review). One of the primary reasons for this link has been the observation that stuttering will often be seen to increase when a PWS reports feeling greater anxiety and to decrease when lower levels of anxiety are reported (Bloodstein & Ratner, 2008). Unfortunately, research related to anxiety and stuttering has failed to produce definitive answers to the many questions being asked, at least in part because of the many different ways that anxiety may be defined (Bloodstein & Ratner, 2008).

A recent model used to explain fear is Reiss' (1991) expectancy model of fear. Reiss' expectancy model is comprised of two functional parts: (a) sensitivity and (b) expectancy. Expectancy refers to what a person thinks will happen when presented with a certain stimulus (i.e., their *predictions*). Sensitivity refers to the tendency of a feared stimulus to elicit expectations of becoming anxious. Reiss' also identified six factors that contribute to fear behavior: (a) danger expectancy, (b) injury sensitivity, (c) anxiety expectancy, (d) anxiety, sensitivity, (e) social evaluative expectancy, and (f) social evaluative sensitivity.

According to Reiss' (1991) expectancy model, therefore, for most people who stutter, fear in speaking situations will be a function of anxiety sensitivity (i.e., "I can't stand the thought of stuttering"), negative evaluation sensitivity (i.e., "It would be embarrassing to stutter"), and expectancy related to those two components of fear. Although injury sensitivity may also

contribute to fear experienced by some PWS (e.g., "what if I get so afraid that I have a heart attack"), for most PWS, in most "normal" situations, this component is likely to contribute to fear significantly less than anxiety sensitivity and negative evaluation.

Reiss (1991) suggested that fear is made up of components that combine together to determine fear in a given situation. Moore, Chung, Peterson, Katzman, and Vermani (2009) demonstrated that these components combine in an additive way. The purpose of this study was to examine each of the components of fear in relation to possible differences between FS and PWS, with the goal of determining whether these components combine to produce fear (social anxiety) in the same (predicted by Reiss's model) way for FS and PWS.

CHAPTER 2

LITERATURE REVIEW

Fear is an emotional response to threat or danger (House & Stark, 2002). It is a basic survival mechanism occurring in response to a specific stimulus that can, at times, be maladaptive. It is undeniable that fear and anxiety play some role in the manifestation of stuttering, although that role, despite substantial research, remains unclear (Bloodstein & Ratner, 2008; Menzies, Onslow, & Packman, 1999; Messenger, Onslow, Packman, & Menzies, 2004). In this study, a particular model of fear, the expectancy model (Reiss, 1991), was explored to investigate further the cognitive structure of fear for persons who stutter and how that may differ between persons who do and do not stutter.

2.1 Fear, Anxiety and Stuttering

The question of whether people who stutter are more anxious than fluent speakers has been asked many times. Various attempts have been made to measure trait anxiety in people who stutter to determine if heightened levels of trait anxiety is characteristic of people who stutter (Miller & Watson, 1992; Molt & Guilford, 1979). Researchers on the topic have found mixed results. Some researchers have tried to assess anxiety levels in people who stutter through the use of questionnaires. Boland (1953), for example, found higher levels of trait anxiety in people who stutter than people who do not stutter. Higher levels of trait anxiety in people who do no stutter, however, were obtained by Berlinsky (1955), Agnello (1962), and Cox, Seider, and Kidd (1984). State anxiety levels during communication were found to be higher in people who stutter (Ezrati-Vinacour & Levin, 2004).

Anxiety is a complex psychological construct that involves three components: (a) verbal-cognitive, (b) behavioral, and (c) physiological (Marks, 1987). The verbal-cognitive component refers to worry scales or other self-report measures in which an individual self-reports how anxious they are. The behavioral component refers to any escape or avoidance actions taken by an individual to leave potentially threatening or anxiety provoking situations. The physiological component refers to the physical measures of anxiety, which include heart rate, galvanic skin response, respiration, and cortisol changes.

There is a long history of the belief that those who stutter are anxious (Honig, 1947; Schultz, 1947). Fowlie and Cooper (1978) found that mothers of children who stutter report that they think their children are more anxious compared to reports from parents of children who do not stutter. It is clear that perception of anxiety in relationship to stuttering affects the way stuttering is viewed. Early writings on the disorder of stuttering refer to a relationship between anxiety and stuttering (Despert, 1946; Goodstein, 1958). The belief that anxiety is common among people who stutter continues to be reflected in the writings of modern stuttering authorities (Bloodstein, 1995; Brutten & Shoemaker, 1971; Ingham, 1984). Lincoln, Onslow and Menzies (1996) reported that people who stutter commonly experience anxiety associated with speaking situations.

The perception that there is a relationship between stuttering and anxiety is supported by research. Adults who stutter have shown high levels of anxiety on a variety of measures including trait and state anxiety (Craig, 1990). For example, Kraaimaat, Janssen, & Van Dam-Baggen (1991) found high levels of anxiety for people who stutter based on social evaluative measures of anxiety. Similarly, Hanson, Rice, and Gronhovd (1981) found that they could discriminate between people who stutter and people who do not stutter using the modified

Speech Communication Checklist (SSC). They identified twenty-one questions that discriminated between people who stutter and people who do not stutter so successfully that they did not need speech data.

Stuttering has also been observed to vary under certain speaking situations thought to be due to anxiety (e.g., audience size, communication partner, etc.) (Porter, 1939). Speaking situations may induce greater autonomic arousal in people who stutter than in persons who do not stutter. Weber and Smith (1990) found that autonomic arousal correlated positively with frequency and severity of stuttering during speaking situations. Despite the numerous studies to investigate the relationship between fear and stuttering no clear understanding of that relationship has been found (Bloodstien, 1987, 1995; Bloodstein & Ratner, 2008).

Individuals who stutter may experience higher levels of anxiety even independent of speech tasks. This has been noted on general anxiety scales (Craig, 1990) and physiological measures of anxiety. Blood, Blood, Bennett, Simpson, and Susman (1994) found that during periods of high stress, people who stutter show greater increases in salivary cortisol than people who do not stutter. Treatment studies also provide further evidence of the link between anxiety and stuttering. Kraaimaat, Janssen, and Brutten (1988) found that high anxiety, measured by skin conductance, predicted poorer treatment outcomes. Furthermore, desensitization, an anxiety treatment, has consistently been found to reduce anxiety in as little as ten hours in a controlled setting (Boudreau & Jeffrey, 1973).

In short, there is good reason to believe that there is a relationship between anxiety and stuttering that is clinically important, and that clinicians will encounter people who stutter where anxiety is a component affecting the disorder (Messenger, Onslow Packman, & Menzies, 2004). Kraaimaat, Vanryckeghem, and Van Dam-Baggen (2002) noted, for many clients, management

of anxiety is likely to be an important element in the management of chronic stuttering. Furthermore, it is not enough to know that anxiety can be a key component affecting stuttering, but to know details of the nature of how anxiety is involved with the disorder of stuttering. Authorities generally are willing to admit that anxiety can be associated with stuttering, but they are uncertain about the exact nature of that relationship (Andrews et al., 1983; Ingham, 1984). In addition Bloodstein (1995) stated, "all we can say is that by the definitions of anxiety that are usual in clinical and experimental work, anxiety about stuttering has a distinct but inconsistent, limited, and qualified relationship to stuttering" (p. 321).

2.2 Expectancy Model of Fear

Reiss (1991) proposed a model of fear that has been widely investigated (e.g., McNally & Stekete, 1985; Peterson & Heilbronner, 1987; Reiss, Peterson, Gursky, 1988) but has not been investigated in relation to different population groups such as PWS. In this model, Reiss suggested that human motivation to avoid a feared stimulus is comprised of two functional parts: (a) expectation and (b) sensitivity. Expectation refers to what an individual thinks will happen when presented with a certain stimulus. Sensitivity refers to the theoretical tendency of a feared stimulus to elicit expectations of becoming anxious.

In Reiss' (1991) expectancy model of fear, sensitivities and expectancies provide the keys to understanding human fears. Reiss identified six factors that contribute to fear behavior: (a) danger expectancy, (b) injury sensitivity, (c) anxiety expectancy, (d) anxiety sensitivity, (e) social evaluation expectancy and (f) social evaluation sensitivity. Danger expectancy refers to the person's expectations of harm from the external or physical environment. Injury sensitivity refers to a person's sensitivity to personal injury. Anxiety expectancy refers to the person's expectation of the possibility of becoming anxious or stressed. Anxiety sensitivity refers to the

person's sensitivity to experiencing anxiety. It is the tendency to fear anxiety-related sensations

due to beliefs that those sensations have negative consequences. Social evaluation expectancy

refers to the person's expectation of reacting to a feared stimulus that leads to negative

evaluation. Social evaluation sensitivity refers to person's sensitivity to negative evaluation. Fear

of negative evaluation is composed of three parts: (a) experience of distress, discomfort, fear,

and anxiety in social situations, (b) deliberate avoidance of social situations; and (c) finally as a

fear of receiving negative evaluations.

In support of expectancy theory, research has indicated that anxiety sensitivity can be

differentiated from anxiety, fear, and panic (Reiss, Peterson, & Gursley, 1988; Reiss, Peterson,

Gursky & McNally, 1986), that danger expectancies are empirically distinct from anxiety

expectancies (Gursky & Reiss, 1987), and that fear arises from the interaction between

expectancies and sensitivities (Schoenberg, Kirsch, & Rosengard, 1991).

2.3 Additive Nature of Sensitivity and Expectancy

According to Reiss' (1991) expectancy model, total fear behavior is the addition of the

three fundamental fears (pain/death, anxiety sensitivity, and social evaluation), each of which is a

product (in the mathematical sense) of an individual's expectation and sensitivity. Reiss,

therefore, suggested that fear could be described by the formula presented in Figure 1.

$$\text{Fear} = \alpha\,(E_d \times S_d) + \beta\,(E_a \times S_a) + \lambda\,(E_{se} \times S_{se})$$

Where:
E_d = Danger expectancy E_{se} = Social evaluation expectancy
S_d = Injury sensitivity S_{se} = Social evaluation sensitivity
E_a = Anxiety expectancy α, β, λ = Unknown weights
S_a = Anxiety sensitivity

Figure 1. Formula for Reiss' (1991) Expectancy model of fear

Moore, Chung, Peterson, Martin, Katzman, and Vermani (2009), however, suggested that there were actually three possibilities regarding the way that anxiety sensitivity and expectancy could be integrated to produce a fear response: (a) multiplicative, (b) additive, or (c) averaging processes. They stated that a multiplicative integration would result in geometrical increases in fear related to greater sensitivity, whereas an additive integration would result in a simple, uniform increase or decrease in fear. Finally, an averaging integration would be where the same expectancy information may increase or decrease anxiety, depending on the individual's anxiety sensitivity.

Moore, Chung, Peterson, Martin, Katzman, and Vermani (2009) ran three studies to test which integrative process accounted for fear reactions to potentially stressful situations. The studies used information integration theory to examine how anxiety sensitivity and event expectancy combine to express anxiety in a potentially stressful situation. The three studies addressed the following major questions:

1. How are anxiety sensitivity and event expectancy cognitively integrated to determine social anxiety?

2. Are anxiety sensitivity and event expectancy integrated differently among university students than among anxiety-clinic patients?

The first study was conducted with 70 participants who were university undergraduates fulfilling psychology course requirements. Participants were presented with a collection of written scenarios depicting a potentially socially stressful situation (described in methods section). Participants were asked to respond to scenarios as if they were in the situation themselves. Upon responding to scenarios participants then filled out a measure, Anxiety Sensitivity Index (Peterson & Reiss, 1992), to assess their individual anxiety sensitivity. The

results for study 1 showed no evidence to support a multiplicative or averaging integration rule. Rather, results showed medium expectancy lowered social anxiety levels across all levels of anxiety sensitivity, supporting an adding integration rule.

Study 2 tested the reliability of the initial results from Study 1. A replicated study was conducted using the same methodology as in Study 1. Participants included 70 undergraduate students who did not participate in Study 1. The results again found no evidence to support a multiplicative or averaging integration rule, indicating that participant's social anxiety ratings followed a simple additive integration rule.

Study 3 was conducted with 54 participants receiving treatment for one or more anxiety disorders at the Center for Addiction Mental Health. This study was conducted using the same methodology as the first and second studies. The results again found no evidence to support multiplicative or averaging integration rule, indicating that participant's social anxiety ratings followed a simple additive integration rule.

2.4 Statement of the Problem

Given the work of Moore, Chung, Peterson, Martin, Katzman, and Vermani (2009), therefore, applying Reiss' (1991) expectancy model of fear to persons who stutter would suggest that fear in speaking situations should be a function of anxiety sensitivity (e.g., "I can't stand the thought of stuttering"), negative evaluation sensitivity (e.g., "It would be embarrassing to stutter") and expectancy. Although "injury sensitivity" (e.g., "I may get so anxious that I might have a heart attack") and "danger expectancy" may play a role for some PWS in some situations, for the purposes of this study, the assumption will be made that, for most PWS, in most relatively "normal" social situations, these components would contribute minimally to overall fear. This

assumption is based on the lack of descriptions in the literature of PWS typically demonstrating or describing fears that relate to injury or physical danger (e.g., Bloodstein & Ratner, 2008).

Consequently, the purpose of this study was to examine if differences exist between fluent speakers and PWS in measures of Reiss' (1991) components of fear (anxiety sensitivity, negative evaluation sensitivity, and expectancy) and in the way these components combined to produce fear in a hypothetical social communication task. Specifically, the following research questions will be investigated:

1. Is there a relationship between predicted anxiety and anxiety sensitivity for FS and PWS?

2. Is there a relationship between predicted anxiety and fear of negative evaluation for FS and PWS?

3. Is there a relationship between predicted anxiety and expectancy for FS and PWS?

4. 4.Is there a relationship between predicted anxiety and a combination (added) of anxiety sensitivity, fear of negative evaluation, and expectancy for FS and PWS?

5. Do FS and PWS differ on predicted anxiety, based on a hypothetical social situation?

6. Is there a relationship between predicted anxiety and a combination (multiplied) of anxiety sensitivity, fear of negative evaluation, and expectancy for FS and PWS?

7. Is there a relationship between predicted anxiety and a combination (averaged) of anxiety sensitivity, fear of negative evaluation, and expectancy for FS and PWS?

8. Do FS and PWS differ on a measure of anxiety sensitivity?

9. Do FS and PWS differ on a measure of fear of negative evaluation?

10. Do FS and PWS differ on expectancy, based on a hypothetical social situation?

CHAPTER 3

METHODS

A link between anxiety and stuttering has been suggested in the literature from early writings through to the current day, though no definitive understanding regarding the structure of fear and stuttering has been identified. One model that might be useful for this purpose is Reiss' (1991) expectancy model of fear. According to this model, for most people who stutter during speaking situations, fear will be comprised of expectancies, anxiety sensitivity, and negative evaluation sensitivity. The purpose of this study was to examine the components of fear in relation to possible differences between FS and PWS, with the goal of determining whether these components combine to produce fear (social anxiety) in the same way for FS and PWS.

3.1 Participants

Participants for this study included 20 people who stutter (PWS) and 20 fluent speakers (FS). Participants in the fluent speakers group included 12 males and 8 females who do not stutter with an age range of 20-67. Participants in the persons who stutter group included 6 females and 14 males with an age range of 16-42. There were no gender requirements but participants had to be 16 years of age or older. A self-report of stuttering and involvement in stuttering treatment were deemed sufficient for a participant to qualify for the PWS group. Participants qualifying for the FS group self-reported no history of stuttering. Sampling methods included volunteer sampling and convenience sampling. Participants in the PWS group were recruited by talking to professionals in the area and getting contacts from self-help or other professional organizations. Personal contacts from the researcher were also used. For the FS group convenience sampling was used. All participants signed and were provided with consent forms for participation in the study prior to any data collection.

3.2 Instruments

This study incorporated three measures of the components of fear in accordance with Reiss' (1991) expectancy model of fear. The three components measured were expectancy, anxiety sensitivity, and evaluation sensitivity. The Anxiety Sensitivity Index (Reiss, 1991) was used to measure anxiety sensitivity. The Brief Fear of Negative Evaluation scale (Leary, 1983) was used to measure evaluation sensitivity. Event scenarios (described in the "procedures" section) were used to measure individual's subjective expectancy.

Negative-evaluation sensitivity was measured by using the Brief Version of the Fear of Negative Evaluation scale (BFNE) (Leary, 1983). The BFNE is a short version of the Fear of Negative Evaluation (FNE) Scale (Watson & Friend, 1969), a widely used social anxiety instrument that has been suggested to be a valid measure of negative-evaluation sensitivity (Zvolensky, Goodie, Ruggiero, Black, Larkin, & Taylor, 2002). The BFNE was developed because, despite its applicability to topics in psychology and personality, one of the complaints against the FNE was that it was too long (Leary, 1983). The BFNE was developed by Leary to shorten the FNE without sacrificing psychometric properties. It contained 12 items from the FNE that correlate very highly with the original scale ($r = .96$) and demonstrates properties that are nearly identical to those of the full-length scale. In addition, the internal consistency correlation was quite high with the original measure (Leary, 1983). In a recent study, Collins, Westra, Dozois, and Stewart (2003) found results that strongly supported the psychometric properties of the BFNE. The patterns of correlations provided evidence for the discriminate validity of BFNE suggesting that the measure taps social anxiety, as originally intended (Watson & Friend, 1969).

The Anxiety Sensitivity Index (ASI) (Reiss, 1991) was developed to measure concern about the real or imagined consequences of anxiety. The ASI has been, and continues to be, the most used instrument to measure the construct of anxiety sensitivity. The ASI is a 16-item questionnaire that measures the fear of anxiety, with each item expressing a concern about a possible negative consequence of symptoms associated with anxiety. Items are rated on a 0-4 point Likert scale with response alternatives *very little, a little, some, much,* and *very much.* Total scores can range from 0-64. The ASI has good test-retest reliability (Peterson & Reiss, 1992) and high internal consistency in clinical and non-clinical populations (Vujanovic, Arrindell, Bernstien, Norton, & Zvolensky, 2007).

3.3 Design

This study was a pre-experimental, static group study design. In this study two groups were compared relative to three measures of fear, based on Reiss' (1991) expectancy model. The independent variable that determined the groups was being a person who stutters or being a fluent speaker. The dependent variables were the three components of fear in accordance with Reiss' expectancy model of fear, a self-report of stuttering severity, and self-reported, predicted level of anxiety.

3.4 Procedures

For testing done in person, participants were provided with two copies of consent forms that explain the purpose and procedure of study. Participants were given time to read over the consent forms and ask any questions pertaining to study. Participants signed both consent forms, one for the experimenter and one for the participant. Participants completed the Anxiety Sensitivity Index to assess anxiety sensitivity and the Brief Fear of Negative Evaluation scale to assess negative evaluation sensitivity. For testing done online through e-mail interactions,

participants were provided with a step-by-step direction page to fill out surveys. Participants

completed the Anxiety Sensitivity Index to assess anxiety sensitivity and Brief Fear of Negative

Evaluation scale to assess negative evaluation sensitivity. Informed consent was implied if

participants e-mailed completed surveys back to the examiner.

Participants also responded to event probability scenarios to assess subjective

expectancy. This procedure and the scenarios used were adapted from those used by Moore,

Chung, Peterson, Martin, Katzman, & Vermani (2009) in their study of anxiety sensitivity and

expectancy. Participants were presented with event scenarios that depict a potentially stressful

communicative situation. The core scenario is provided below:

Having just arrived and sat down in class, you suddenly remember that today is the day on which student in-class report

presentations are to be given. To promote fairness, attendance, and to motivate students to prepare their reports, the professor has

decided to pick on student's name at random each week on this day, and that student is to give their presentation to the class at

that time. Students who have given presentation are no longer included in the drawing. Presentations may not be rescheduled or

postponed, although they count for only 10% of the grade in this extremely large, year-long class.

After reading this scenario, participants were asked to respond to the following question:

On a scale from 0 (not at all) to 100 (extremely), how anxious would you be at this moment about being chosen to give your

presentation to the class?

Participants were asked to respond to the event scenario as if it were happening to them. After

reading and responding to the core scenario, participants were presented with three descriptions.

Each description indicated a different probability for the event described in the core scenario. In

the lowest probability condition, the description read as follows:

Because this is only the second-class meeting, relatively few students have given their presentations. As a result, you are one of a

hundred students who has not given a presentation, and thus the statistical probability of your being chosen is 1%.

In the intermediate probability condition scenario, the description read as follows:

Because now it is the middle of the academic year, a number of students have already given their presentations. As a result, you

are one of a fifty students who has not given a presentation, and thus the statistical probability of your being chosen is 2%.

In the highest probability condition scenario, the description read as follows:

Because it is now relatively late in the academic year, most students have already given their presentations. As a result, you are one of a ten students who has not given a presentation, and thus the statistical probability of your being chosen is 10%.

The descriptions were randomly ordered for each participant. Participants were directed to take as much time as needed to respond to the core scenario (no expectancy information) and three descriptions. The participants were instructed not to review any scenarios or responses after completing them. After each description scenario, participants were asked the following questions to assess expectancy:

On a scale from 0 (not at all) to 100 (extremely) how likely do you think that you would be chosen to give their presentation under the circumstances? Testing was conducted in person or online via e-mail interactions.

3.5 Statistical Analyses

These data were analyzed statistically using two procedures. Correlation analysis was used to test for significant associations between several variables (predicted anxiety and anxiety sensitivity, predicted anxiety and fear of negative evaluation, predicted anxiety and expectancy, and predicted anxiety and a combination score). Independent-measures t tests were used to test for differences on (anxiety sensitivity, fear of negative evaluation, predicted anxiety, and expectancy) between the PWS group and the FS group

Following guidelines from Cohen (1988), power analyses were completed after the data were gathered and after statistical testing was completed to determine the adequacy of the sample size to detect significant correlations and t test results. Because the correlation analyses involved two different sample sizes, a different procedure was used to determine the power of the correlation tests, namely, a desired power level was postulated to determine an adequate sample size. The following conditions were set: (a) the non-directional alpha level (α) = .05, (b) desired power = 80%, and (c) a large effect size was postulated so that r = .50. These conditions resulted

in an expected sample size of $n = 28$ (see Table 3.4.1 of Cohen, 1988, p. 102). This suggests that the group-specific correlations ($n = 20$) were somewhat underpowered, whereas the correlations involving both groups ($n = 40$) were sufficiently powered.

The following conditions were set in order to determine the power of the t tests to compare two groups of $n = 20$: (a) the non-directional alpha level (α) = .05, and (b) a large effect size was postulated so that $d = .80$. These conditions yielded a power value of .69. (see Table 2.3.5 of Cohen, 1988, p. 36), which is somewhat underpowered but was deemed an adequate starting point for this exploratory study's analyses.

CHAPTER 4

RESULTS

Reiss (1991) suggested that fear is made up of components that combine together to determine fear in a given situation. Moore, Chung, Peterson, Martin, Katzman, and Vermani (2009) demonstrated that these components combine in an additive way. The purpose of this study was to examine each of the components of fear in relation to possible differences between FS and PWS, with the goal of determining whether these components combine to produce fear (social anxiety) in the same (predicted by Reiss's model) way for FS and PWS. Consequently the results of this study are presented as responses to the eight research questions described at the end of chapter 2.

4.1 Is there a relationship between predicted anxiety and anxiety sensitivity for FS and PWS?

No significant correlation was found between scores on the Anxiety Sensitivity Index and predicted Anxiety (ES1) for people who stutter ($r = -.004$, $p = .987$). A significant correlation was found, however, for fluent speakers ($r = .476$, $p = .034$). When both groups were combined, no significant correlation between Anxiety Sensitivity Index and predicted Anxiety (ES1) ($r = .236$, $p = .142$) was found.

4.2 Is there a relationship between predicted anxiety and fear of negative evaluation for FS and PWS?

No significant correlation was found between BFNE and predicted Anxiety (ES1) for people who stutter ($r = .053$, $p = .824$). Once again, however, a significant correlation was found for fluent speakers ($r = .455$, $p = .044$). When both groups were combined, no significant correlation between BFNE and predicted Anxiety (ES1) ($r = .207$, $p = .200$) was found.

4.3 Is there a relationship between predicted anxiety and expectancy for FS and PWS?

No significant correlation was found between Expectancy (Average Expectancy Score) and predicted Anxiety (ES1) for people who stutter ($r = .303$, $p = .194$).   Again, a significant correlation was found for fluent speakers ($r = .586$, $p = .007$). When both groups were combined, a significant correlation between Expectancy and predicted Anxiety ($r = .432$, $p = .005$) was found.

4.4 Is there a relationship between predicted anxiety and a combination (added) of anxiety sensitivity, fear of negative evaluation, and expectancy for FS and PWS?

No significant relationship was found between predicted anxiety and a combination of anxiety sensitivity, fear of negative evaluation, and expectancy for people who stutter ($r = .297$, $p = .204$). A significant correlation was found, however, for fluent speakers ($r = .613$, $p = .004$). When both groups were combined, a significant relationship between predicted anxiety and a combination of anxiety sensitivity, fear of negative evaluation, and expectancy ($r = .443$, $p = .004$) was found.

4.5 Is there a relationship between predicted anxiety and a combination (multiplied) of anxiety sensitivity, fear of negative evaluation, and expectancy for FS and PWS?

No significant relationship was found between predicted anxiety and a combination of anxiety sensitivity, fear of negative evaluation, and expectancy for people who stutter ($r = .128$, $p = .589$). A significant correlation was found, however, for fluent speakers ($r = .570$, $p = .009$). When both groups were combined, a significant relationship between predicted anxiety and a combination of anxiety sensitivity fear of negative evaluation, and expectancy ($r = .359$, $p = .023$).

4.6 Is there a relationship between predicted anxiety and a combination (averaged) of anxiety sensitivity, fear of negative evaluation, and expectancy for FS and PWS?

No significant relationship was found between predicted anxiety and a combination of anxiety sensitivity, fear of negative evaluation, and expectancy for people who stutter ($r = .278$, $p = .235$). A significant correlation was found, however, for fluent speakers ($r = .642$, $p = .002$). When both groups were combined, a significant relationship between predicted anxiety and a combination of anxiety sensitivity fear of negative evaluation, and expectancy ($r = .450$, $p = .004$).

4.7 Do FS and PWS differ on predicted anxiety, based on a hypothetical social situation?

There was no significant difference in average anxiety (Event scenario one) scores between people who stutter ($M = 53.75$) and fluent speakers ($M = 52.50$).

4.8 Do FS and PWS differ on a measure of anxiety sensitivity?

There was no significant difference between people who stutter ($M = 14.30$, $SD = 6.538$) and fluent speakers ($M = 15.55$, $SD = 8.470$) on the ASI, $t(38) = -.522$, $p = .604$.

4.9 Do FS and PWS differ on a measure of fear of negative evaluation?

There was no significant difference between people who stutter ($M = 29.50$, $SD = 5.72$) and fluent speakers ($M = 28.30$, $SD = 4.29$) on the BFNE, $t(38) = .746$, $p = .460$.

4.10 Do FS and PWS differ on expectancy, based on a hypothetical social situation?

There was no significant difference between people who stutter ($M = 27.96$, $SD = 26.39$) and fluent speakers ($M = 26.86$, $SD = 27.41$) on the Average Expectancy Score, $t(38) = .129$, $p = .898$.

CHAPTER 5

DISCUSSION

The purpose of this study was to examine if differences exist between fluent speakers and PWS in measures of Reiss' (1991) components of fear (anxiety sensitivity, negative evaluation sensitivity, and expectancy) and in the way these components combine to produce fear in a hypothetical social communication task. Results indicated no significant difference between the fluent speaker and persons who stutter groups on any of the components of fear from Reiss' model. Interestingly, however, the two groups did differ in the way that these components related to the self-reported, predicted level of anxiety for the hypothetical scenario. For the fluent speaker group, significant, positive relationships between level of predicted anxiety and anxiety sensitivity, fear of negative evaluation, and expectancy all were consistent with Reiss' model. Furthermore, the significant, positive relationship between predicted anxiety and a composite (additive, multiplicative, and averaging) of the three components also indicated consistency with Reiss' model and variations proposed by Moore et al. (2009). In other words, the fluent speaker group in this study behaved in a way predicted by, and consistent with, Reiss' model of fear and the different ways of integrating the components of fear (additive, multiplicative, and averaging) proposed by Moore et al.

Conversely, the persons who stutter group demonstrated no significant relationships between predicted anxiety and any of the three components of Reiss' (1991) model, nor did they produce a significant relationship between predicted anxiety and a composite, (added, multiplicative, or averaging) of the three components. Clearly, then, the participants in this group did not behave in a way consistent with Reiss' model of fear. This finding suggests that, for

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persons who stutter, the experience of anxiety or fear may be qualitatively different from that of fluent speakers and may involve Reiss' components being combined in a non-additive manner or, perhaps, the influence of additional components not yet identified. For example, Reiss' model predicts that increases in expectancy will lead to increases in anxiety. This result was not observed with the PWS group in this study. Discussion with participants from the PWS group following testing, however, revealed that, for some people who stutter, as expectancy increases anxiety will decrease due to the decrease in "uncertainty" related to when they would be called on to present. This concept of "uncertainty" may represent an additional component to the fear equation for persons who stutter.

Of further interest are the results of study 3 conducted by Moore et al. (2009) in which the components of fear were investigated with persons with anxiety disorders. Results of this study indicated that persons with anxiety disorders conformed to the additive integration process in the same way that "normal" participants did. Given this finding, the results of the current study that indicate that PWS experience fear in a different way to fluent speakers provides further evidence that stuttering is not a disorder of anxiety.

Considering the findings of the current study in relation to recent studies that have focused on stuttering and anxiety, there appears to be some inconsistent results. Messenger, Onslow, Packman, and Menzies (2004) conducted a study exploring the relationship between stuttering and non-stuttering groups for negative social expectancies. In contrast to the current findings, these authors found that persons who stutter differed from fluent speakers in their expectation of negative social evaluation and in anxiety related to the social domain. Messenger et al., however, did not present participants with event scenarios as in the current study, but simply asked their participants to complete questionnaires, which may have resulted in different

response patterns from both fluent speakers and persons who stutter. Furthermore, the results reported by Messenger et al. of differences between PWS and FS may be consistent with the findings from the current study that indicate that the overall experience of anxiety in social situations for PWS may be different than for FS.

5.1 Limitations

Interpretation of these findings must be made keeping in mind some potential limitations related to certain aspects of the study. Firstly, power analysis is the probability that the phenomenon observed would yield statistically significant results. The significant correlations reported for the study revealed robust and reliable associations between several variables. On the other hand, the non-significant correlations (e.g., anxiety sensitivity and predicted anxiety scores for PWS) and the lack of significant differences between the PWS group and the FS group could be due to the small sample size.

Secondly, the design of the study included the use of a hypothetical scenario rather than a real, anxiety provoking situation. This may have limited the accuracy of the measure of anxiety, as self-reported, predicted anxiety may be significantly different from anxiety experienced in the actual situation. Furthermore, physiological measures of anxiety may also represent more accurate measures of anxiety than self-reported, predicted measures. The use of the hypothetical scenario, however, was based on a previous investigation with Reiss' (1991) model of fear (Moore, Chung, Peterson, Martin, Katzman & Vermani, 2009) that demonstrated that the scenario response measure provided a useful index of anxiety. Indeed, Moore et al. reported that many participants indicated that they had experienced significant anxiety about public speaking and that the scenarios reminded them of those events.

5.2 Clinical Implications

The findings from the current study indicate that for people who stutter, anxiety or fear appears to be qualitatively different between people who stutter and fluent speakers. This finding may have significant implications for clinical intervention with PWS, particularly for clinicians who themselves do not stutter. When working with persons who stutter clinicians may tend to view their client's anxiety based on their own experiences of social anxiety (MacKinnon, Hall, & MacIntyre, 2007; White & Collins, 1984). This may lead clinicians to incorrect assumptions about their clients' level of anxiety, experience of anxiety, and the components that contribute to that experience. Based on the results of the current study, clinicians should engage clients in a discussion to explore the components of anxiety and how they play a role in the clients' experience.

5.3 Future Directions

Future directions for research could include investigating if the relationships between anxiety and Reiss' (1991) components of fear for both PWS and FS would be the same if real social communication situations and physiological measures of anxiety were used instead of hypothetical scenarios and predicted anxiety.

Additionally, further exploration of why PWS overall fear combined in a way that was not consistent with Reiss expectancy model of fear would be useful. Such a study would involve qualitative interviews of PWS and FS to try to identify additional components of fear or varying interpretations of components. Such a study could then lead to development of ways to measure any additional components that were identified, enabling a similar study to the current one to be conducted to identify differences in these additional components (and the way they combine) between PWS and FS.

Future research should also address the sample size issue from the current study by increasing sample size of future studies.

5.4 Conclusions

Although anxiety and fear are universal to human experience, how these emotions are triggered, what components are involved, and how these components combine may all be factors that vary between groups of individuals. In this study, no significant differences were found between PWS and FS for measures of components of fear (anxiety sensitivity, expectancy, and fear of negative evaluation) related to a hypothetical, social communication situation, suggesting that these components may be common to the two groups. Differences between the groups were observed, however, in how these components related to predicted anxiety, indicating that factors contributing to anxiety for each group may be different. Further investigation of this finding may be important. Although there has been a significant amount of research into the components of fear for fluent speakers, little has been done with groups of disordered speakers, such as PWS. A greater understanding of what components contribute to anxiety for PWS and how these components combine to produce anxiety may provide insight into specific treatment and management options that, at present, remain unexplored.

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APPENDICES

APPENDIX A

CONSENT FORM

WICHITA STATE UNIVERSITY
College of Health Professions
Department of Communication Sciences and Disorders

INFORMED CONSENT FORM PERSONAL CONTACT

Purpose: You are invited to participate in a study designed to investigate how persons who stutter and fluent speakers experience fear and anxiety to speaking in public. From this study we hope to learn about the different components that contribute to social anxiety to allow us to design more comprehensive and effective treatment programs for people who stutter.

Participation Selection: You were selected as a possible participant in this study because you are either an adult with no history of stuttering or because you are an adult who *does* have a history of stuttering. We are recruiting 30 participants from each of these groups.

Explanation of procedures: As a participant in this study, you will be asked to complete questionnaires that relate to how you experience fear and anxiety. You will also be asked to read and respond to a scenario that describes an event in which there is a chance that you would be asked to speak I public (although you *will not* be asked to speak in public as part of this study), and how you would feel at that time. Participation in this study should take approximately 30-45 minutes.

Discomforts/Risks: There is no discomfort or risk associated with the procedures planned for this study. If you become uncomfortable at any time during the study, you may stop your participation and withdraw from the study.

Benefits: There are no specific benefits to the participants in the study. Greater knowledge regarding how persons who stutter and fluent speakers might differ in their experience of fear and anxiety related to speaking situations may provide important information that can help improve planning for effective treatment of stuttering.

Confidentiality: Participant's responses will be coded and names will be removed to protect personal privacy. In addition, all responses and participant information will be maintained in a locked file cabinet in a locked office and in password protected files on a computer.

Compensation: There is no compensation for your participation in this study. In addition, Wichita State University does not provide medical treatment or other forms of reimbursement to persons injured as a result of or in connection with participation in research activities conducted by Wichita State University or its faculty, staff, or students. If you believe that you have been injured as a result of participating in the research covered by this consent form, you can contact the Office of Research Administration, Wichita State University, Wichita, KS 67260-0007, telephone (316) 978-3285

Refusal/Withdrawal: Participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your future relations with Wichita State University. If you agree to participate in this study, you are free to withdraw from the study at any time without penalty.

Contact: If you have any questions about this research, you can contact me at: Anthony DiLollo, PhD, Department of Communication Sciences & Disorders, Wichita State University, 1845 Fairmont, Wichita, KS 67260-0075, telephone (316) 978-3319, email: anthony.dilollo@wichita.edu. If you have any questions pertaining to your rights as a research subject, or about research-related injury, you can contact the Office of Research Administration at Wichita State University, Wichita, KS 67260-0007, (316) 978-3285.

You are under no obligation to participate in this study. By e-mailing filled out materials below you are providing consent to participate in this study.

APPENDIX B

INFORMED CONSENT E-MAIL VERSION

Instructions

1. Please read over the attached *Consent Form*. If you have any questions about the study you can e-mail Dr. Anthony Dilollo at anthony.dilollo@wichita.edu. By returning the completed questionnaires and scales you are providing your consent to participate in this study. Please print a copy the informed consent form for your records.
2. Please complete the *Demographic Form* by filling out age, gender, stuttering severity, and stuttering therapy history. Do not fill in the code (this will be used by the researcher to ensure the confidentiality of your responses).

The remaining sections of the packet include the materials related to the study. Please complete all of these materials in one sitting if possible. You may take as much time as you need to complete these materials.

1. Complete the *Brief Fear of Negative Evaluation Scale*. Read directions, rating scale, and questions carefully. Put answers in the space provided to the left of the questions.
2. Complete the *Anxiety Sensitivity Index*. Read directions, rating scale, and questions carefully. Put answers by the numbers provided to the right of the questions.
3. Read and complete questions for each of the four *Event Scenarios*. Read directions, event scenario, and question carefully. Put answers in the space provided immediately after the question.
4. When Demographic Form, Brief Fear of Negative Evaluation Scale, Anxiety Sensitivity Index, and Event Scenarios are completed please *save* the completed material and e-mail as an attachment to jdrobinson@wichita.edu.

    Thankyou for your participation in this study!

WICHITA STATE UNIVERSITY

College of Health Professions
Department of Communication Sciences and Disorders

CONSENT FORM

Purpose: You are invited to participate in a study designed to investigate how persons who stutter and fluent speakers experience fear and anxiety to speaking in public. From this study we hope to learn about the different components that contribute to social anxiety to allow us to design more comprehensive and effective treatment programs for people who stutter.

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Explanation of procedures: As a participant in this study, you will be asked to complete questionnaires that relate to how you experience fear and anxiety. You will also be asked to read and respond to a scenario that describes an event in which there is a chance that you would be asked to speak I public (although you *will not* be asked to speak in public as part of this study), and how you would feel at that time. Participation in this study should take approximately 30-45 minutes.

Discomforts/Risks: There is no discomfort or risk associated with the procedures planned for this study. If you become uncomfortable at any time during the study, you may stop your participation and withdraw from the study.

Benefits: There are no specific benefits to the participants in the study. Greater knowledge regarding how persons who stutter and fluent speakers might differ in their experience of fear and anxiety related to speaking situations may provide important information that can help improve planning for effective treatment of stuttering.

Confidentiality: Participant's responses will be coded and names will be removed to protect personal privacy. In addition, all responses and participant information will be maintained in a locked file cabinet in a locked office and in password protected files on a computer.

Compensation: There is no compensation for your participation in this study. In addition, Wichita State University does not provide medical treatment or other forms of reimbursement to persons injured as a result of or in connection with participation in research activities conducted by Wichita State University or its faculty, staff, or students. If you believe that you have been

injured as a result of participating in the research covered by this consent form, you can contact the Office of Research Administration, Wichita State University, Wichita, KS 67260-0007, telephone (316) 978-3285

Refusal/Withdrawal: Participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your future relations with Wichita State University. If you agree to participate in this study, you are free to withdraw from the study at any time without penalty.

Contact: If you have any questions about this research, you can contact me at: Anthony DiLollo, PhD, Department of Communication Sciences & Disorders, Wichita State University, 1845 Fairmont, Wichita, KS 67260-0075, telephone (316) 978-3319, email: anthony.dilollo@wichita.edu. If you have any questions pertaining to your rights as a research subject, or about research-related injury, you can contact the Office of Research Administration at Wichita State University, Wichita, KS 67260-0007, (316) 978-3285.

You are under no obligation to participate in this study. By e-mailing filled out materials below you are providing consent to participate in this study.

BRIEF FEAR OF NEGATIVE EVALUATION SCALE

Brief Fear of Negative Evaluation Scale
Leary (1983)

Read each of the following statements carefully and indicate
how characteristics it is of you according to the following
scale:

1= Not at all characteristic of me
2= Slightly characteristic of me
3= Moderately characteristic of me
4= Very characteristic of me
5= Extremely characteristic of me

_____ 1. I worry about what other people will think of me even when I know it doesn't
make any difference.

_____ 2. I am unconcerned even if people are forming an unfavorable impression of me.

_____ 3. I am frequently afraid of other people noticing my shortcomings.

_____ 4. I rarely worry about what kind of impression I am making on someone.

_____ 5. I am afraid others will not approve of me.

_____ 6. I am afraid that people will find fault with me.

_____ 7. Other people's opinions of me do not bother me.

_____ 8. When I am talking to someone, I worry about what they may be thinking about me.

_____ 9. I am usually worried about what kind of impression I make.

_____ 10. If I know someone is judging me, it has little effect on me.

_____ 11. Sometimes I think I am too concerned with what other people think of me.

_____ 12. I often worry that I will say or do the wrong things.

APPENDIX D

ANXIETY SENSITIVITY INDEX

Anxiety Sensitivity Index

Please rate each item by selecting one of the five answers for each question. Please answer each statement by putting an x by the number that best applies to you.

	Very little	a little	some	much	very much
1. It is important to not appear nervous.	0	1	2	3	4
2. When I cannot keep my mind on a task, I worry that I might be going crazy.	0	1	2	3	4
3. It scares me when I feel shaky.	0	1	2	3	4
4. It scares me when I feel faint.	0	1	2	3	4
5. It is important to me to stay in control of my emotions.	0	1	2	3	4
6. It scares me when my heart beats rapidly.	0	1	2	3	4
7. It embarrasses me when my stomach growls.	0	1	2	3	4
8. It scares me when I am nauseous (sick stomach).	0	1	2	3	4
9. When I notice my heart beating rapidly, I worry that I might be having a heart attack..	0	1	2	3	4
10. It scares me when I become short of breath.	0	1	2	3	4

11. When my stomach is upset, I worry that I might be seriously ill.	0	1	2	3	4
12. It scares me when I am unable to keep my mind on a task.	0	1	2	3	4
13. Other people notice when I feel shaky.	0	1	2	3	4
14. Unusual body sensations scare me.	0	1	2	3	4
15. When I am nervous, I worry that I might be mentally ill.	0	1	2	3	4
16. It scares me when I am nervous.	0	1	2	3	4