WIDENING THE LENS: AN INTERDISCIPLINARY APPROACH TO

EXAMINING THE EFFECT OF EXPOSURE THERAPY

ON PUBLIC SPEAKING STATE ANXIETY

Amber N. Finn, B.B.A., M.S.

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APPROVED:

Brian C. O'Connor, Co-Major Professor
Chris R. Sawyer, Co-Major Professor
Richard L. Anderson, Committee Member
Herman Totten, Dean, School of
        Library and Information Science
Sandra L. Terrell, Dean of the Robert B.
        Toulouse School of Graduate Studies

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This study used an interdisciplinary approach to examine an intervention for reducing public speaking state anxiety. A quasi-experiment was conducted to determine if a multiple-exposure treatment technique (TRIPLESPEAK) would help to attenuate public speaking anxiety. The treatment group reported experiencing significantly less state anxiety during their post-test presentation than did the control group. This lead to the conclusion that exposure therapy can be used to help students enrolled in basic communication classes begin to overcome their fear of speaking in front of an audience.

Follow-up analysis of the treatment group's reported anxiety levels during all five presentations (pre-test, Treatment Presentation 1, Treatment Presentation 2, Treatment Presentation 3, and post-test) revealed an increase in anxiety from the last treatment presentation to the post-test presentation. In order to explore this issue, Shannon's entropy was utilized to calculate the amount of information in each speaking environment. Anderson's functional ontology construction approach served as a model to explain the role of the environment in shaping speakers' current and future behaviors and reports of anxiety. The exploratory analysis revealed a functional relationship between information and anxiety.

In addition, a qualitative study was conducted to determine which environmental stimuli speakers perceived contributed to their anxiety levels. Students reported experiencing anxiety based on four categories, which included speaker concerns,

audience characteristics, contextual factors and assignment criteria. Students' reports of anxiety were dependent upon their previous speaking experiences, and students suggested differences existed between the traditional presentations and the treatment presentations. Pedagogical and theoretical implications are discussed.

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION TO THE STUDY

We are not students of some subject matter, but students of problems.
And problems may cut right across the borders of any subject matter or
discipline.

Karl Popper

The reduction of public speaking anxiety is a major area of concern and inquiry in

the field of communication. For the past several decades, communication instructors

and scholars have explored means for helping individuals, especially novice speakers,

combat their fear of speaking in front of an audience. Since the most common outcome

resulting from speech anxiety is avoidance of speaking situations (McCroskey, 1997),

which can limit one's involvement and effectiveness in community activities, educational

endeavors, and career pursuits, to name but a few, considerable time and attention has

been devoted to the study of this complex phenomenon. While past research exploring

a variety of anxiety reduction strategies has yielded promising theoretical and

pedagogical implications, this line of research has not been without debate. Many

communication scholars continue to ask which treatment strategy is most effective and

some question if it is even possible to reduce one's public speaking anxiety.

Often complex research questions cannot easily be addressed from within the

confines of a particular discipline. Answers frequently lie within other disciplinary

divisions, and the production of knowledge requires efficient communication across

subject matters. Such inquiry is often referred to as interdisciplinarity (Salter & Hearn,

1996). In recent years, interdisciplinary approaches have been used to guide both

scholarly research and teaching practices (Lattuca, 2001). Given the beneficial nature of

such endeavors, most universities now incorporate interdisciplinary courses and/or

degrees into their curriculum. According to O'Connor (2007),

> The Doctor of Philosophy degree may be said to be fundamentally
> interdisciplinary. All those who pursue the degree, in one sense or another seek
> to clarify some portion of our best possible image of the world. That is to say,
> each of those who pursue the Ph.D. seek to provide the most robust
> understanding and the most appropriate tools for enabling each member of
> society to live well, to make the best life decisions, to become most fully human.
> Doctoral pursuits follow many paths, use different tool sets, invoke different mind
> sets, and continue testing assumptions by different means. Over the past
> centuries many of these have clustered into discrete departments or schools. An
> interdisciplinary program attempts to return to an era of broader assumptions,
> linking paths, and cross-fertilizing research. Such an approach provides
> resources across boundaries. (¶ 2)

Similarly, commenting on the field of information science Buckland (2001) noted:

> Professional education discourages interest in the nature of the field. The ideal
> professional program would be within a broader concern with the production,
> distribution, and utilization of knowledge. It would be scholarly and scientific and
> critical, drawing on formal techniques (algorithms) and social sciences (cultural
> anthropology, policy analysis sociology), and also humanities (rhetoric,
> semantics, epistemology). Our importance comes from the importance of our
> problems and the relevance of our instruction, research and public service to
> those problems….If we do not share our heritage and interests with others, we
> cannot expect to be understood and will continue to have unknowing others think
> that our concerns are a "new" field. Evolving in interesting ways, yes; new, no.
> (¶2)

Interdisciplinarity can take a number of different forms depending upon the

purpose of the research. This paper will use what Salter and Hearn (1996) call

instrumental interdisciplinarity. Instrumental interdisciplinarity refers to "borrowing

methods and tools from across the disciplines in an effort to address needs dictated by

a specific problem at hand" (p. 30). The authors suggest this type of interdisciplinary

approach emerges because "complexity generates its own need for coordination, and

coordination itself breeds interdisciplinarity" (p. 30).

An interdisciplinary approach returns us to the rich and robust scholarship of an earlier time, when philosophy drew few boundaries around knowledge domains and informed one area of investigation with the insight of others. This study will use an interdisciplinary approach to explain a complex communication phenomenon – public speaking anxiety. It appears there is an aspect of public speaking anxiety that would benefit from the weaving together of psychology, information science, and communication studies. Specifically, the field of psychology offers a treatment strategy, supported by a strong theoretical foundation and empirical evidence, which may help communication scholars devise a treatment method for the attenuation of public speaking state anxiety. In addition, the field of information science brings a method for measuring the situational determinants of public speaking anxiety, as well as a theory for explaining the relationship between environmental variables and public speaking anxiety. In return, the fields of psychology and information science may profit from the additional empirical evidence and theoretical support this study may provide. Thus, the weaving together of these three disciplines should be advantageous to all.

Public Speaking Anxiety

Communication apprehension (CA) is an "an individual's level of fear or anxiety associated with real or anticipated communication with another person or persons" (McCroskey, 1977, p. 78). Public speaking anxiety (PSA) is a subset of CA. It involves a speaker's level of fear or anxiety about presenting in front of an audience (McCroskey, 1970). Speakers often allude to the physical discomfort of presenting in front of an audience (Horvath, Hunter, Weisel, Sawyer & Behnke, 2004; Horvath, Moss, Xie,

Sawyer & Behnke, 2004; McCullough, Russell, Behnke, Sawyer & Witt, 2006), and this discomfort is often what leads to the labeling of the experience as frightening (Behnke & Beatty,1981). Subsequently, speaker's physiological responses are associated with degradations in performance quality (Mulac & Sherman, 1974; 1975a; 1975b). For instance, highly apprehensive individuals have more speech errors than nonanxious individuals (Harper, Wiens, & Matarazzo, 1978), use incomplete sentences and repeat words (Kasl & Mahl, 1965) pace and manipulate objects while speaking (Mulac & Wiemann, 1997).

PSA manifests itself as both a trait and a state (Behnke, Carlile & Lamb, 1974; Spielberger, 1966). Public speaking trait anxiety describes how a speaker "generally feels" when giving public speeches, and this feeling is believed to remain relatively stable over time (Spielberger, 1966). State anxiety represents how a speaker feels during a particular public speech (Behnke & Sawyer, 1998), and this feeling is known to vary during and between presentations. The two primary explanations for the etiology of trait-like CA are heredity and the environment (McCroskey, 1984). In other words, individuals can be born with trait anxiety or they can learn it. On the other hand, there are a variety of factors believed to contribute to state public speaking anxiety. For instance, the number of individuals in the speaking environment augments anxiety levels (Jackson & Lantane, 1981; Lantane & Harkins, 1976), as does the composition of the audience (McCroskey, 1984; Seta, Seta, Crisson, & Wang, 1989).

Treatment

A number of teaching techniques and intervention strategies have been devised

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to help students cope with and alleviate symptoms associated with PSA. Various assumptions exist as to the source of PSA, and the interventions reflect these differences (Wadleigh, 1997). For instance, some scholars believe irrational cognitions are the source of PSA, and their treatment approach involves changing cognitive interpretations of the speaking event (Ellis, 1962; Fremuow & Zitter, 1978; Motley, 1990; 1995). Other scholars contend that lack of appropriate speaking skills causes PSA; thus, their intervention involves helping students learn the appropriate skills to be successful in the public speaking situation (Kelly, 1989; 1997; Kelly & Keaton, 1992). Still others suggest that individuals experience public speaking anxiety because performance has become associated with negative consequences, and they assert that people must learn that presenting in front of an audience will not result in such consequences (Friedrich, Goss, Cunconan, & Lane, 1997). Past research documents the effectiveness of the various treatment methods (Allen, Hunter, & Donohue, 1989; Friedrich, et al., 1997; Kelly, 1997; Motley, 1995); however, a combination of interventions has proven more effective than any one method alone (Allen, Hunter, & Donohue, 1989; Hopf & Ayres, 1992).

Previous studies have concluded that instruction in a basic communication course helps alleviate PSA (Ellis, 1995; Ford & Wolvin, 1993; Rose & Rancer, 1993; Rubin, Rubin & Jordan, 1997), and recently Duff, Levine, Beatty, Woolbright and Park (2007) posited that completion of a basic communication course might reduce PSA just as much as any other treatment method. Communication scholars have posed several possible reasons for PSA reduction as the result of instruction in a communication course. For instance, the decrease in anxiety might be the result of delivering

presentations in front of an audience (Duff et al., 2007; Menzel & Carrell, 1994), it might

be the result of students growing more comfortable with their audience members (Duff

et al., 2007), or it might be the result of learning the appropriate skills to deliver an

effective presentation (Kelly, 1997). At this point in time though, there is no empirical

evidence or theoretical reasoning as to why public speaking anxiety might decrease as

the result of delivering presentations in a basic communication course.

Exposure Therapy

The most common and successful intervention used to treat anxiety disorders in

the field of psychology is *exposure therapy* (Barlow & Wolfe, 1981; Foa, Hubbert, &

Cahill, 2006). Exposure therapy is a cognitive-behavioral treatment strategy in which

individuals safely confront a feared object (i.e. spider, audience, doctor, contaminated

object, etc.) for an extended period of time (Spiegler & Guevremont, 1993). Exposure

therapy has been used to treat both phobic and obsessive-compulsive disorders.

Scholars have indicated that exposure to the feared stimulus promotes habituation

within a treatment session (Foa & Kozak, 1985; 1986) as well as reduces the intensity

of anxiety between treatment sessions (Chaplin & Levine, 1981; Foa & Chamberless,

1978; Gray & McNaughton, 2000).

There are both cognitive and behavioral explanations for the effectiveness of the

various types of exposure therapy. A cognitive account suggests that "as clients

observe their ability to handle a little exposure to upsetting stimuli and note how their

anxiety level subsides, they gain confidence in themselves and develop the courage to

persist in efforts to overcome their problems" (Sarason, 1985, p. 100). The behavioral

explanation is based on the principles of extinction and adaptation (Mineka & Thomas, 1999). Accordingly, behaviorists contend that certain associations between stimuli and responses constitute the underlying pathology of anxiety disorders in which neutral stimulus evoke anxiety responses, and they assume that exposure therapy helps to change the stimulus–response associations (Mowrer, 1960; Stampfl & Levis, 1967).

Emotional processing theory (EPT) explains both the cognitive and behavioral effects of exposure therapy (Foa & Kozak, 1985; 1986; Foa, Huppert & Cahill, 2006). Foa and Kozak (1985), the originators of the theory, asserted that, "deficits lie in both stimulus-response associations and their evaluations. Successful treatment changes stimulus-response associations through habituation. It also changes estimates of threat and valence" (p. 443). According to EPT, one's fearful interpretations can be altered by exposure to the threatening object or event (Foa & Kozak, 1986). If individuals have positive experiences, they can create a new cognitive structure to replace the previously construed fear structure (Foa, Huppert, & Cahill, 2006). In order for emotional processing to occur, the fear structure must be activated at just the right level; the stimulus intensity cannot be too strong or too weak (Rauch & Foa, 2006). In addition, repeated exposure is necessary for long term anxiety reduction (Foa, Huppert, & Cahill, 2006).

Sawyer and Behnke (2002) suggested that delivering presentations in front of an audience is a type of exposure therapy because "practicing speech skills is synonymous with stimulus exposure," (p. 117). Supporting this, several communication scholars have alluded to the fact that PSA does decline as a result of performing in front of an audience. For instance, Ayres, Schliesman and Sonandre (1998) found practicing a

presentation in front of a small audience before delivering the presentation in front of the entire class helped reduce public speaking state anxiety. Similarly, while testing the effects of visualization, Ayres and Hopf (1985) found students with considerable public speaking experience had less anxiety than those students with minimal public speaking experience. They concluded that, "visualization helps reduce speech anxiety but that other factors, like experience, are more powerful influences" (p. 322). Dubner and Mills (1984) presented a multiple speaking exposure assignment, which they called the TRIPLESPEAK presentation, as an alternative to the traditional one-shot presentations typically used in communication courses. This assignment required students to deliver the same speech three times in a row. The authors suggested the multiple speaking exposures helped reduce students' public speaking anxiety, but to date, the effect of multiple speaking exposures on anxiety scores has not been scientifically investigated.

Habituation during Presentations

Previous communication research indicates that speakers generally habituate during a presentation (Behnke & Carlile, 1971; Behnke & Sawyer, 1998; 1999; 2004; Finn, Sawyer & Behnke, 2003; Sawyer & Behnke, 1999). This decline in anxiety is a result of being exposed to the threatening situation (Behnke & Sawyer, 2004). Students begin to feel more comfortable and less uncertain during the delivery of a presentation the longer they are exposed to their audience (Behnke & Carlile, 1971; Behnke & Sawyer, 1998; 1999; 2004; Finn, Sawyer & Behnke, 2003; Sawyer & Behnke, 1999).

Gray's neurological theory of anxiety (1982; 1990; Gray & McNaughton, 2000) has been used to explain the process of habituation that occurs during the course of

giving a speech (Behnke & Sawyer, 2001a; 2001b; Finn, Sawyer, & Behnke, 2003; Freeman, Sawyer, & Behnke, 1997; Sawyer & Behnke, 1999). According to the neurological theory, a comparator, located in the brain, is responsible for mediating anxiety, leading to habituation. When actual stimuli are different than expected stimuli and/or prior learning, the comparator detects a "mismatch," and triggers one of two separate sub-systems. One is the behavioural approach system (BAS) that manages behavior prompted by non-threatening stimuli. The other is the behavioural inhibition system (BIS), which controls behavior triggered by threatening stimuli. While the BAS uses learned adaptive strategies to engage the threat, the BIS restricts behavior and increases anxiety.

In situations perceived as threatening (i.e. public speaking), the comparator triggers the BIS (Gray, 1982; 1990; Gray & McNaughton, 2000). The BIS suppresses on going motor activity (Gray, 1982), while increasing both physiological and psychological activity (Sawyer & Behnke, 1999). Once the stimulus is no longer perceived as threatening, the BAS takes over and anxiety decreases (Gray, 1982). Previous anxiety pattern research indicates that the BIS dominates reactions early in the speech, and the BAS takes charge for the later moments of the presentation, as the speaker begins to habituate to the stimuli (Behnke & Sawyer, 2001a; Finn, Sawyer, & Behnke, 2003; Freeman, Sawyer, & Behnke, 1997; Sawyer & Behnke, 1999).

Statement of Problem

While previous research has revealed that students experience habituation during a presentation due to exposure, research has not yet examined reduction in PSA

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between-sessions as a result of exposure. In addition, it is unclear which situational factors may contribute to the augmentation or diminution of PSA. If exposure does help reduce public speaking anxiety, a clear understanding of the situational determinants of anxiety is necessary in order to design speaking assignments and environments conducive for emotional processing.

Purpose of Study

This study will use an interdisciplinary approach to examine the effect of exposure therapy on public speaking state anxiety and determine the mechanisms that may be responsible for the change. The study will be three-fold. First, in order to determine whether exposure to an audience helps to lessen the intensity of anxiety experienced during subsequent presentations, this study will examine the effects of a multiple-exposure treatment strategy using a controlled experiment. The effects of exposure will be reviewed using Foa & Kozak's (1986) emotional processing theory (EPT) from the field of psychology. Second, the experiment will be re-examined from an information science perspective using Shannon's (Shannon & Weaver, 1949) information theory and Anderson's (2006) functional ontology construction (FOC) approach. Past communication research has indicated that situational factors play a role in public speaking state anxiety, and Shannon's theory will allow for the calculation of the information contained in the speaking environments. As a result, this project will determine if there is a functional relationship between information and public speaking anxiety levels. As stated above, this will allow for a better understanding of the type of speaking environment appropriate for exposure therapy. Finally, as a means for

determining the speakers' perceptions of the environmental stimuli affecting anxiety levels, this project will conduct a qualitative study. Specifically, speakers' opinions will be obtained through focus groups.

In addition, Duff et al. (2007) noted two major weaknesses in public speaking anxiety reduction studies. First, past research has primarily only investigated treatment methods using students with high self-reported public speaking anxiety, and these scholars suggested the use of extreme scores may lead to regression toward the mean, reducing internal validity. Thus, this study will use all students enrolled in the course, instead of only those with high anxiety scores. Duff et al. (2007) also noted that treatment demands caused by students' recognition that they were receiving treatment may skew their reports of their anxiety after treatment. Therefore, instead of having students attend an outside-of-class treatment session, this study incorporated the treatment sessions into the class. Students in the treatment group participated in treatment sessions during regular class time as a normal class assignment, and therefore, were unaware they were receiving "treatment."

Background: The Basic Communication Course

Basic communication courses on college and university campuses are designed to improve students' communication skills, especially their effectiveness at presenting in front of an audience (Morreale & Backlund, 2002). The basic communication course is defined as, "that communication course either required or recommended for a significant number of undergraduates; that course which the department has, or would recommend as a requirement for all or most undergraduates" (Morreale, Hanna, Berko,

& Gibson, 1999, p. 3). It traditionally follows one of two models: 1) hybrid model or 2) public speaking model (Morreale et al., 1999; Morreale, Hugenberg, & Worley, 2006). If the course follows the hybrid model, the course consists of three basic parts: 1) interpersonal communication, 2) public speaking, and 3) group communication (Morreale et al., 1999). Students learn both communication theory and skills related to these three components. The public speaking portion of the course typically requires the delivery of two presentations: 1) an informative presentation and 2) a persuasive presentation. If the course follows the public speaking model, students deliver a series of presentations throughout the course of the semester. The course instructor typically changes the requirements for each presentation in terms of research requirements, delivery style (extemporaneous vs. impromptu), type (informative vs. persuasive), etc., so that the presentation assignments progressively become more difficult. When following the public speaking model, the entire focus of the class is public speaking (i.e. theory and skills); whereas, in the hybrid model, only a third of the class time is typically devoted to public speaking.

Even though the two models vary in terms of the number of presentations delivered over the course of the semester, both of the models require students to delivery presentations in front of their entire class. This type of class presentation is often referred to as a traditional one-shot presentation. It involves the delivery of a short presentation (typically around 5-7 minutes), in a typical classroom setting, to a class of about 20-25 students and a course instructor. The presentation is graded by the course instructor and is part of the student's overall grade in the class.

Definitions of Terms

- Between session habituation – a decline in anxiety from one presentation to another

- Habituation – the progressive reduction of state anxiety during a performance

- Information – a measure of one's freedom of choice when selecting a message (Shannon & Weaver, 1949)

- Narrowbanding – segmenting the public speaking event into specific phases in order to measure state anxiety at different points in time

- State public speaking anxiety – the anxiety experienced during a single public speech

- Stimulus – a detectable element of the surrounding environment, capable of serving a variety of functions (Dinsmoor, 2004)

- Traditional one-shot presentation – a presentation delivered in a normal class setting to 20-25 peers and a course instructor

- Trait public speaking anxiety – the general level of anxiety one feels about delivering a public speech; a rather stable personality characteristic

- TRIPLESPEAK assignment – an assignment that requires the delivery of a single presentation three consecutive times, each time to a different small group (4-6 students) of peers

- Within session habituation – a decline in anxiety during a single presentation

Significance of the Study

Communication research regarding public speaking anxiety has not yet explored exposure therapy as a means of reducing public speaking state anxiety. Understanding how exposure works in the reduction of public speaking anxiety can enhance both theoretical and pedagogical practices. As a result, instructors may be better able to inform and advise students who seek to reduce their level of public speaking anxiety, and they may be able to design assignments specifically for the purpose of reducing anxiety in the basic communication course. Recently Witt and Behnke (2006) advocated

the use of *instructional therapy* in courses to reduce uncertainty and anxiety. A more advanced understanding of the effects of exposure on public speaking anxiety should lead to more sophisticated instructional therapies.

This study uses an interdisciplinary approach to get a more holistic view of the factors which help to reduce public speaking anxiety in a basic speech communication course. Specifically, this study will combine theory and method from the fields of communication studies, psychology and information science. This will allow the extension of two theories, emotional processing theory (EPT, Foa & Kozak, 1986) and information theory (Shannon & Weaver, 1949), and a model, functional ontology (Anderson, 2007), to the public speaking anxiety literature and will introduce a new way of measuring situational variables that may influence speaking behaviors and emotions. In addition, this study will integrate both quantitative and qualitative research methodologies to add depth and clarity to the effects of exposure therapy on public speaking state anxiety.

Limitations of the Study

The following aspects of the research posed limitations to the study:

1. The study was conducted at a single private institution; thus, the results may not be generalizable to all college students.

2. The participants in the study were primarily freshman and sophomore college students; thus the results may not be generalizable to nontraditional college students.

3. The measurement of state public speaking anxiety was based only on self-reported information.

Delimitations of the Study

The study is delimited in the following ways:

1. Data were only collected from students enrolled in the basic communication course at a private, four-year, liberal arts university.

2. The study only includes students enrolled in the 8-week sessions of the course, and does not include those enrolled in the semester long (16 week) version of the course.

3. The study only includes undergraduate students.

CHAPTER 2

PSYCHOLOGY PERSPECTIVE

This chapter will review a prominent theory from the field of psychology used to explain the effectiveness of exposure therapy for treating anxiety disorders. Specifically, emotional processing theory (EPT, Foa & Kozak, 1986) will be reviewed in light of what is already known about habituation during public speaking presentations in the field of communication studies. The hypotheses and research questions in this chapter are based on EPT, and EPT is used to guide the design of the quasi-experiment performed in the following chapter.

Emotional Processing Theory

In the field of psychology, scholars use emotional processing theory as a theoretical basis for explaining the origination and treatment of a variety of anxiety disorders, such as agoraphobia, obsessive-compulsive disorder and post-traumatic-stress disorders (Foa & Kozak, 1985; 1986). EPT is based on Lang's (1977; 1984) "fear structure" as well as Rachman's (1980) "emotional processing." It is specifically used to explain the effectiveness of exposure therapies in the reduction of anxiety (Foa & Kozak, 1986). Developed by Foa, an internationally renowned authority on the treatment of anxiety, EPT is a prominent theory in the field of psychology.

EPT began with Lang's bioinformational theory of fear (Lang, 1977). Lang (1977) proposed fear existed in a cognitive structure in memory, referred to as a fear structure. A fear structure contains a stimulus (i.e. audience), a response (i.e. sweating, rapid heart rate, stomach pain, feelings of being afraid, avoidance), and a meaning element

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(i.e. public speaking is unpleasant and/or scary). The components of the fear structure are associated with one another and are used as a blueprint for avoiding or escaping danger. Lang (1977) suggested that in order for the fear structure to be modified it first had to be activated to some extent. He proposed it could be activated when current information matched some piece of the stored information in the fear structure.

Based on Lang's conceptual framework, Rachman (1980) attempted to provide a unified explanation of the effects of exposure therapies used for fear reduction, which she called *emotional processing*. She defined emotional processing as "a process whereby emotional disturbances are absorbed and decline to the extent that other experiences and behaviors can proceed without disruption" (p. 51). Rachman (1980) suggested successful emotional processing took place when an individual confronted a previously distressing event or stimulus without experiencing or displaying signs of distress. The return of fear after exposure therapy was evidence of failed or incomplete emotional processing.

Elaborating on Lang's (1977) and Rachman's (1980) assumptions, Foa and Kozak (1985; 1986) devised EPT to provide a theoretical framework to explain the psychopathology and treatment of anxiety and its disorders. Foa and Kozak (1985; 1986) differentiated between normal and pathological fear structures and posited that specific pathological fear structures underlie anxiety disorders, while normal fear structures are adaptive and reflect reality. Pathological fear structures are maladaptive and contain erroneous associations between the pieces of information in the fear structure. The erroneous associations distort reality and often include excessive response elements (i.e. avoidance of safe situations).

Pathological fear structures contain pathological associations and/or pathological evaluations (Foa, Huppert, & Cahill, 2006). The cognitive biases associated with the pathological evaluations include 1) exaggerated probability estimates of harm, 2) exaggerated costs associated with the anticipated harm, and 3) the notion that anxiety will remain forever unless escape or avoidance is possible (Foa, Huppert, & Cahill, 2006). Foa, Huppert and Cahill (2006) suggested that "the persistence of a pathological fear structure is due to behavioral and cognitive avoidance, as well as to cognitive biases in processing information at various stages" (encoding, interpretation, and retrieval) (p. 5). According to EPT, successful treatment requires the modification of the pathological elements in the fear structures (Foa, Huppert, & Cahill, 2006; Foa & Kozak, 1986).

Emotional Processing

According to EPT (Foa & Kozak, 1986) two conditions are necessary for emotional processing to occur: 1) the fear structure must be activated and 2) new information that is incompatible with the pathological elements of the fear structure must be incorporated into the fear structure. In terms of activation, the greater the match between the fear evoking stimulus and the pathological fear structure, the greater the activation of the fear structure. Extreme levels of activation can disrupt emotional processing (Foa & Kozak, 1986; Rauch & Foa, 2006). According to Foa, Huppert, and Cahill (2006), "overactivation leads to a failure to incorporate new information due to inhibited attention, which diminishes encoding of the new corrective information and biases the processing of available information"(p. 7). In addition, under-engagement can

also impede the efficacy of treatment (Rauch & Foa, 2006). Thus, if the fear structure is over-engaged the individual will not be able to focus on the new information needed to incorporate into the fear structure, and if the fear structure is not engaged enough, the new information will not be incorporated into the fear structure.

In addition, activation must be accompanied by information that disconfirms the erroneous associations present in the fear structure in order for emotional processing to occur (Foa & Kozak, 1986). Foa and Kozak (1986) originally proposed that the pathological associations needed to be replaced with non-pathological associations; however, recent advances in learning have changed their thinking and advanced the theory. Foa, Huppert, and Cahill (2006) recently suggested that both the new associations and the old associations remain stored in memory. Depending on the context, one of the fear structures will be activated and used to determine behaviors, cognitions, and emotions in the current situation. If the current situation includes information that confirms the current pathological fear structure, instead of disconfirming the stored associations, the fear structure remains unchanged or is strengthened (Foa et al., 2006).

Foa et al. (2006) suggested the corrective information usually resides in the absence of harm during exposure to the feared situation, object or memory. The lack of harm provides the corrective information that disconfirms the individual's negative perceptions and evaluations and helps to change the fear structure. Foa and Cahill (2001) indicated that there are two types of information individuals receive during exposure: 1) habituation and 2) corrective information. Accordingly, when repeated exposure to a stimulus results in a decrease in a particular response, typically elicited

by that stimulus, new information results about the absence of the response, which is incompatible with the current fear structure. For instance, if a speaker's heart stopped racing while he or she was speaking, that decrease in rapid heart rate would be incompatible with the stored information in the fear structure and could be used to modify the fear structure. Thus, as the speaker began to habituate during a presentation and the BAS began to operate instead of the BIS, the individual would experience less physiological symptoms which, based on EPT, could be seen as corrective information. In addition, the scholars suggested that exposure may provide "corrective information as to the realistic likelihood of feared consequences" (Foa & Cahill, 2001, p. 12366). For example, a speaker may include meaning representations with unrealistically high estimations of failure. If a speaker had a positive speaking experience, the incompatible information would provide the corrective information needed to modify the fear structure.

Assessing Emotional Processing

Foa and Kozak (1986) stressed the importance of differentiating between emotional processing and treatment outcome when assessing emotional processing. Emotional processing is a "hypothetical construct referring to the ongoing course of change in fear structure," and treatment outcome is an "endpoint at which structural changes are assumed to have occurred" (Foa & Kozak, 1986, p. 22). "Processing is ongoing, requiring repeated measurement of fear; outcome is discrete, requiring measurement at some endpoint of behavior both directly and indirectly to the fear structure" (Foa & Kozak, 1986, p. 22).

According to EPT (Foa & Kozak, 1986), there are three indicators of emotional processing 1) evidence of activation of the fear structure during exposure, 2) decrease

in anxiety during exposure (within-session habituation), and 3) decreases in initial reactions to the feared object at each exposure session (between-sessions habituation). Within-session habituation refers to the decrease in anxiety that occurs during exposure exercises; whereas, between-sessions habituation refers to the decline in anxiety from one session to another (Foa & Kozak, 1986).

Foa, Huppert, and Cahill (2006) proposed that within-session habituation is not a reliable indicator of emotional processing and that decreases in anxiety during a session may be the result of factors believed to impair emotional processing (i.e. distraction and cognitive avoidance) rather than encourage it. However, they contended that "for individuals that are fully engaged with an exposure exercise and experience within-session habituation, such habituation is still an indicator of emotional processing and may facilitate between session habituation" (Foa, Huppert, & Cahill, 2006, p.9). In addition, "in most cases, the encoding of new information that contradicts the pathological elements in the fear structure occurs both within and between sessions (Foa, Huppert, & Cahill, 2006, p. 10).

Effectiveness of Exposure Therapies

Foa and Kozak (1985) suggested that the success of certain therapies can be attributed to differences in either the effectiveness of activating the fear structure or in providing information that will modify the fear. In terms of activating the fear structure, they offered the following guidelines: 1) the medium used to evoke the relevant fear structure must accurately and completely present the feared stimulus, 2) patients should experience the physiological fear responses during treatment, and 3) patients should

pay attention to the fear-evoking information during the treatment, instead of avoiding (blunting) it. In relation to modifying the fear, they suggested the following: 1) patients should focus attention on the feared situation, 2) exposure time should increase with the intensity of the fear to promote habituation, 3) in vivo exposure should be used when skills are needed in the feared situation, 4) the noxious stimuli should match the patients' fear memory, and 5) treatment should trigger moderate responding (both high arousal and low arousal may hinder emotional processing). Thus, success depends on the activation of the fear, as well as the inclusion of information needed to modify it.

Public Speaking Anxiety

Beginning in the 1930's and persisting still today, there have been three approaches to the measurement of PSA. They include 1) self-report (Gilkinson, 1942; Lomas, 1934; McCroskey, 1982), 2) physiological (Behnke & Beatty, 1981; Behnke & Carlile, 1971; Behnke, Carlile, & Lamb, 1974; Redding, 1936) and 3) observational measures (Henning, 1935; Mulac & Sherman, 1974, 1975a, 1975b). Self-report scales remain the most widely employed approach for the measurement of PSA in general, and they are the most common form of measurement in the public speaking anxiety treatment literature (McCroskey, 1997).

Measurement Improvements

Over the years, scholars have made significant improvements to each measurement approach in order to enhance measurement reliability and validity. One of the most noted advancements came in 1966 when Spielberger introduced the concepts

of *state* and *trait* anxiety (Spielberger, 1966). According to Spielberger (1966), states describe the "transitory state or condition of the organism which fluctuates over time," while traits depict a "unitary, relatively permanent personality characteristic" (p. 13). Specifically, public speaking trait anxiety describes how a speaker "generally feels" when giving public speeches, and state anxiety refers to how a speaker feels at a given moment in time during a speech (Behnke & Sawyer, 1998). Spielberger's (1966) trait-state distinction allowed scholars to focus on a specific referent when measuring state anxiety, which ultimately improved the conceptualization of public speaking anxiety and increased measurement reliability and validity.

A more recent improvement entails focusing on very specific moments in time, a principle called narrowbanding (Behnke & Sawyer, 1998). By narrowing the bandwidth of anxiety scales to allow speakers to focus on precise moments of a presentation when reporting their anxiety, communication scholars have been able to improve measurement accuracy and determine public speaking anxiety patterns (Behnke & Beatty, 1981; Behnke & Carlile, 1971; Behnke, Carlile, & Lamb, 1974; Behnke & Sawyer, 1998; 1999; 2000; Sawyer & Behnke, 1999). Anxiety patterns illustrate when speakers experience the most anxiety during presentations. A key finding has been that a pattern of habituation exists for physiological, psychological, and behavioral anxiety responses (Behnke & Sawyer, 2001; Finn, Sawyer, & Behnke, 2003; Freeman, Sawyer, & Behnke, 1997; Sawyer & Behnke, 1999); however, previous anxiety treatment studies have not used narrowbanded measures of state anxiety and, therefore, have not tracked changes in anxiety patterns as a result of treatment.

Public Speaking Anxiety Patterns

In order to establish a pattern of public speaking anxiety, narrowband measures have traced state public speaking anxiety over four traditional phases of public speaking: *anticipation* (one minute before the speech), *confrontation* (when the speech begins), *adaptation* (at the end of the speech), and *release* (when the speech is over). The results indicated that physiological and psychological responses under the same conditions are not synchronized (Behnke & Sawyer, 1998). When speaker's reported how they felt during a presentation, the highest degree of anxiety occurred during the anticipation stage, before the speech began and then declined for the remainder of the speech (Behnke & Beatty, 1981; Behnke & Sawyer, 1998; 1999; 2000; Sawyer & Behnke, 1999). Conversely, when physiological measures were used, anxiety rose one minute before an individual began speaking, reached its peak during the first minute of the presentation, and then declined throughout the duration of the speech (Behnke & Carlile, 1971; Behnke, Carlile, & Lamb, 1974).

Although anxiety peaks varied depending on the measurement being utilized, a similar generalizable pattern did exist for psychological, physiological, and behavioral anxiety responses. All three exhibited a pattern of habituation after they reached their peak (Finn, Sawyer, & Behnke, 2003). As previously mentioned, physiological measures revealed that anxiety peaked during the confrontation stage and continually declined until the speech concluded (Behnke & Carlile, 1971; Behnke, Carlile, & Lamb, 1974), self report measures revealed that anxiety reached its climax during the anticipation stage and then declined for the remainder of the speech (Behnke & Beatty, 1981; Behnke & Sawyer, 1998; 1999; 2000; Sawyer & Behnke, 1999), and

observational measures indicated that anxiety was the highest at the beginning of the speech and decreased as the speech continued (Finn, Sawyer, & Behnke, 2003). Thus, all three measurement approaches indicated the longer the speaker was exposed to the threat, the less anxiety the speaker experienced, which is typically referred to as a pattern of habituation. While previous research suggested PSA declined during a single traditional one-shot presentation, scholars have not determined if this pattern of habituation occurs in subsequent presentations, nor have they examined whether there is a decrease in peak anxiety during future presentations as a result of previous positive speaking experiences.

Within Session vs. Between Session Habituation

Following EPT, a "session" refers to one treatment condition, or for the case of this study, one public speaking presentation. Thus, within-session habituation is the reduction in anxiety experienced during a public speaking performance. In order to experience within-session habituation, one must be exposed to the threatening stimulus (i.e. audience) long enough (Foa & Kozak, 1985). Past research has documented that students experience within-session habituation during five-minute traditional one-shot presentations (Behnke & Sawyer, 2001; Finn, Sawyer, & Behnke, 2003; Sawyer & Behnke, 1999). However, according to EPT, within-session habitation doesn't always lead to long-term effects (Foa & Kozak, 1986). Treatment sessions must be repeated for long-term anxiety reduction outcomes (Foa & Kozak, 1985; 1986). Thus, it is repetition of the treatment that leads to between-sessions habituation.

Between-sessions habituation refers to the reduction in the "peak" anxiety experienced during subsequent encounters with the threatening stimulus (Foa & Kozak, 1985; 1986; Foa, Hubbert, & Cahill, 2006). Repetition of the treatment eventually allows individuals to experience minimal levels of anxiety from the start of the session (Foa & Kozak, 1985; 1986). Thus, according to EPT, one's overall intensity of anxiety should decrease from one treatment session to another if emotional processing has occurred.

Summary

EPT suggests that, in order to reduce anxiety, an individual's fear structure must be activated and the erroneous information present in the current fear structure must be replaced with incompatible information. Activation of the fear structure is the result of being exposed to the perceived threatening stimulus. During exposure, individuals evaluate the situation in order to determine their state of danger. If they have a positive experience during the treatment, this new positive information will be stored in their memory. Further, this new memory will be triggered in subsequent interactions with the threatening stimulus. Activation of this new fear structure will result in a less anxiety in future situations.

Hypotheses and Research Questions

Based on EPT and previous communication studies research regarding habituation during a public speaking presentation, the following hypotheses and research questions are posited:

H1: Students will experience within-session habituation across the four public speaking milestones during the traditional one-shot presentations.

R1: To what extent, if at all, will students in the treatment group experience more between-sessions habituation than those in the control group?

H2: Students will experience within-session habituation across the four public speaking milestones during treatment presentations.

R2: To what extent, if at all, will students in the treatment group experience between-sessions habituation for the treatment presentations?

CHAPTER 3

EXAMINING EXPOSURE THERAPY

This chapter will utilize a quantitative method to examine the effect of exposure therapy on public speaking state anxiety. This chapter will explain the research design, the method, and the analysis for the exposure therapy experiment. Then the results of the experiment will be presented along with a discussion of the findings based on EPT and current communication research.

Research Design

This chapter used a quasi-experimental, quantitative design (Campbell & Stanley, 1966; Gall, Borg, & Gall, 2006) to examine the impact of exposure therapy on public speaking state anxiety. A quasi-experimental design allowed for the approximation of the conditions of a true experiment in a setting which did not allow for the manipulation of all the variables (Gall, Borg, & Gall, 2006). The independent variables included 1) group (treatment or control), 2) public speaking anxiety milestones (anticipation, confrontation, adaptation and release), and 3) speech (pre-test or post-test). The dependent variable was self-reported public speaking state anxiety.

Method

Human Subjects Approval & Participants

Before conducting the experiment, permission was obtained from both the cooperating institution's Institutional Review Board as well as the University of North Texas' Institutional Review Board respectively to use human subjects. Following

approval (see Appendix A), participants were recruited from a basic communication course at Texas Christian University (i.e. the cooperating institution). The course was part of the core university requirements and followed the hybrid communication model discussed in chapter one.

Participants included 200 undergraduate students enrolled in the basic communication course during the first eight-week term in spring 2007. The course was taught in eight sections consisting of approximately 25 students each. The course lasted approximately eight weeks. The total number of students that completed the study was 158 (n = 158). The decrease in numbers of participants in the study as the study progressed reflected students who withdrew from the class, stopped attending, or did not complete course or research requirements (i.e. delivery of a speech, completion of all the measures).

As part of the normal class requirements, participants delivered the public speaking presentations discussed below; however, students were not required to participate in the study. All students signed informed consent forms expressing their willingness to have their responses used in this study. No students declined to allow the use of their responses.

Experimental Conditions

Intact groups were randomly assigned to the treatment or control group based on class section time. The control group and the treatment groups each consisted of four sections (for a total of eight sections). Students in both the control and treatment groups delivered a pre-test and post-test presentation. The pre-test presentation involved the delivery of a five-minute evaluated informative presentation in a normal classroom

setting to approximately 20-25 of their peers and the course instructor. The pre-test took place at the beginning of the eight week term (3rd or 4th week of class). The post-test presentation involved the delivery of a five-minute persuasive presentation at the end of the eight week term (7th or 8th week of class). The course instructor graded and timed the presentations. Both the prê-test and post-test presentations took place in the same classroom (see Figure 1).
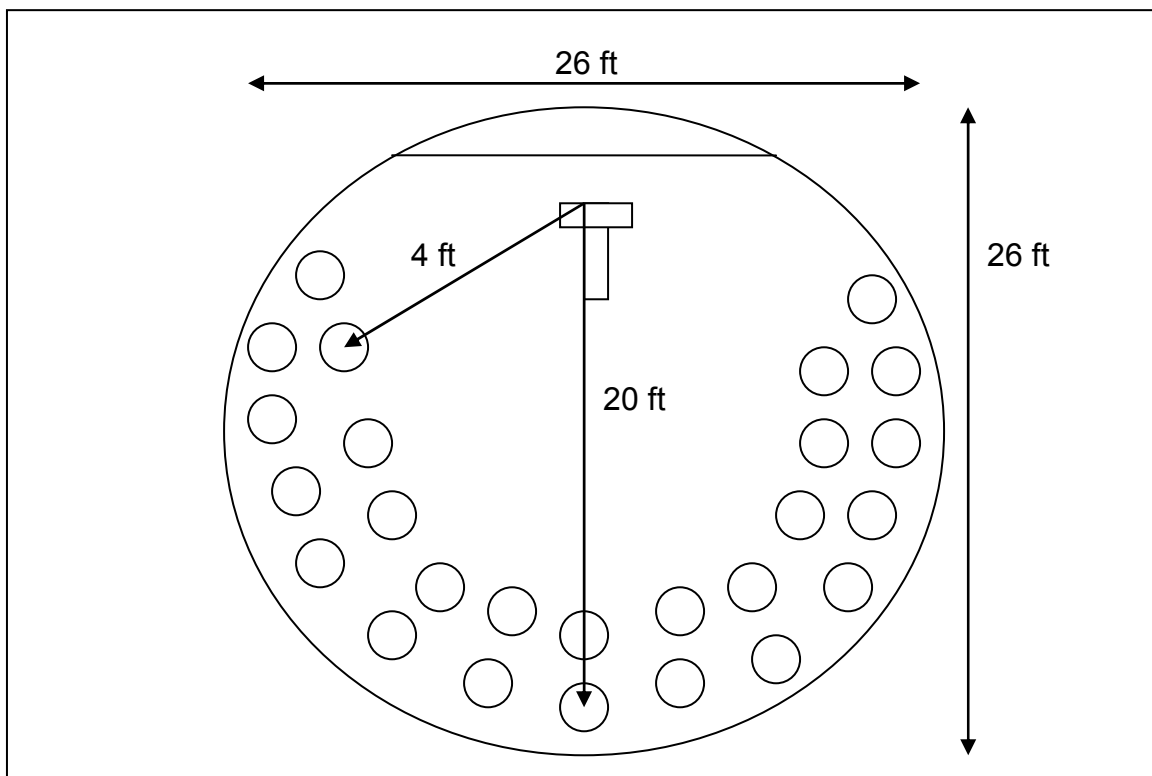
Figure 1. Schematic diagram of classroom used for traditional one-shot presentations.

The treatment group participated in an exposure based treatment assignment (TRIPLESPEAK) between the pre and post-test presentations, and the control group completed an alternative non-speaking assignment between the pre and post-test

presentations. The treatment presentations took place in three identical breakout rooms (see Figure 2), which were attached to the classroom used for the pre and post-test presentations. Treatment involved a multiple exposure assignment. Students in the treatment group delivered an additional four-minute presentation three consecutive times, mid-semester (5th or 6th week of class) to small groups each consisting of a fourth of their class. This assignment was based on Dubner and Mills' (1984) TRIPLESPEAK assignment.
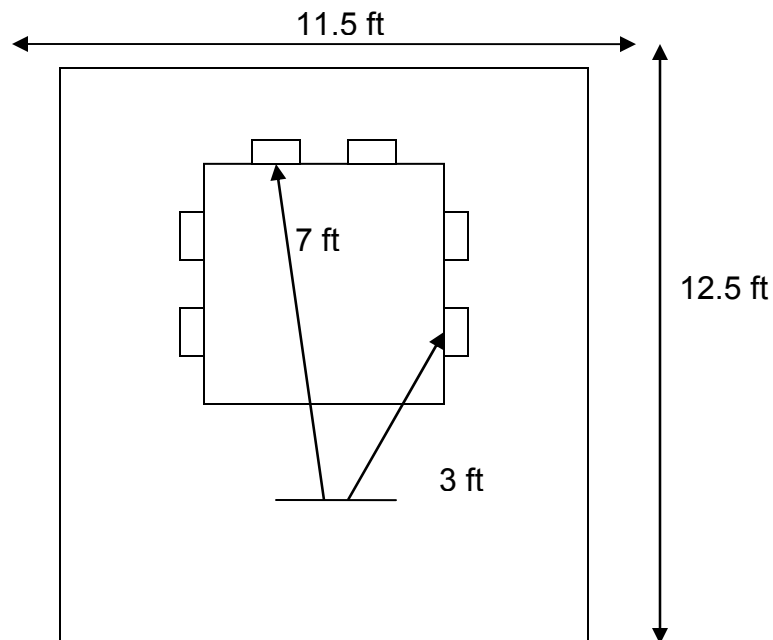
Figure 2. Schematic diagram of rooms used for the TRIPLESPEAK presentations.

Each section of the class receiving treatment was divided into four equal groups (Group A, B, C, D) so that each group consisted of approximately five to six students. The students in Group A presented their presentations on the first day. The students in Groups B, C and D served as the audience members for the speakers. Each small group was positioned in a separate breakout room, and the speakers traveled from one

room to another delivering their presentations (see Figure 3). Each student had

approximately four to five minutes between each presentation. The time was used to

complete a survey instrument (discussed in the following section). The students were

instructed to make any changes to their presentations they deemed necessary between

presentations. The next class day, the students in Group B were the speakers, and the

members of Groups A, C, and D were the audience members. This procedure was

repeated until all groups had delivered their presentations. According to Gray and

McNaughton (2000), habituation of anxiety decays gradually over time, often taking

human subjects months before their anxiety reactions begin to approximate pre-

treatment levels. Although times between treatment and post-test conditions were not

equivalent in all cases, these differences were no greater than 18 days for any

participant in this study. Consequently, differences in temporal proximity among

subjects did not pose a threat to validity.
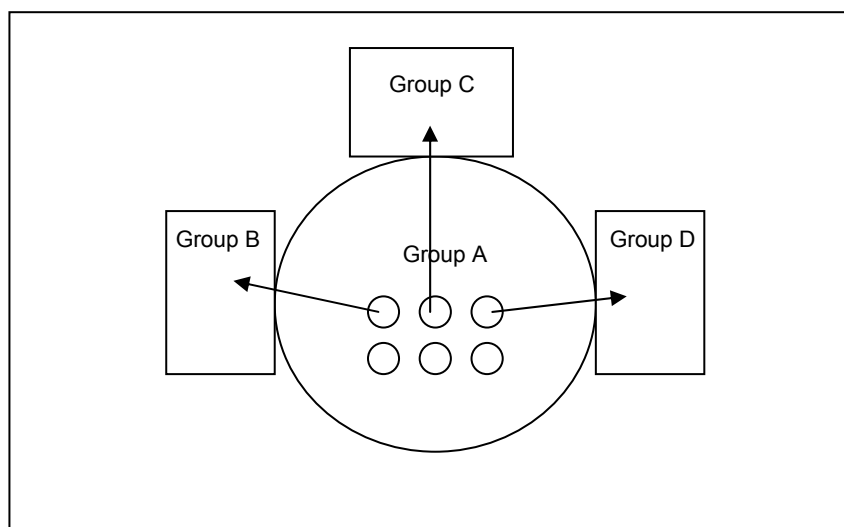
Figure 3. Schematic diagram of the TRIPLESPEAK process.

Students in the control group completed alternative assignments that did not involve public speaking. They completed these assignments during the same weeks the treatment group participated in the multiple exposure presentations.

Instruments

At the beginning of the semester, all students participating in the study were asked to complete the Personal Report of Communication Apprehension-24, (PRCA-24, Levine & McCroskey, 1990) and a student information form (see Appendix B). The PRCA-24 is widely used by communication scholars to operationalize trait communication anxiety (Beatty, 2004). This instrument has proven to be both a valid and reliable measure of trait anxiety (see Beatty 2004 for review). Respondents are asked to report their anxiety using a Likert-type scale pertaining to anxiety across four contexts: small group, meeting, interpersonal, and public speaking. There are 24 total items on the scale, with six items pertaining to each subgroup. Reliability estimates for all 24 items range from .93 to .95 (McCroskey, Beatty, Kearney, & Plax, 1985).

A total communication anxiety score was calculated by summing all four context subscores. Scores can range from a minimum of 24 to a high of 120. Scores below 51 represent people who have very low anxiety; whereas, scores above 80 represent people who have high levels of trait anxiety. Scores between 51 and 80 represent people with average CA. Since intact groups were used for this study, the results of this survey were used to assure there were no significant differences between the treatment and control groups on trait anxiety prior to the experiment.

As stated above, all students presented two traditional one-shot presentations, one at the beginning of the eight week term (pre-test) and one at the end of the eight

week term (post-test). Immediately after delivering their presentations, students completed the A-Sate version of Spielberger's (Spielberger, Gorsuch, & Lushene, 1970) State-Trait Anxiety Inventory (A-STAI) referring to how they felt during the four milestones of public speaking: anticipation (the minute before the speech), confrontation (the first minute of the speech), adaptation (the last minute of the speech), and release (the minute immediately following the speech). The STAI is a 20-item Likert-type scale. The instructions asked students to report how they felt during the different public speaking milestones, using statements such as "I was tense," "I was jittery," "I was nervous, "I was worried," etc. Validity and reliability of this measure have been consistently high in previously published public speaking studies (Behnke & Beatty, 1981; Behnke, Sawyer, & King, 1987; Sawyer & Behnke, 1999).

The students in the treatment group participated in the TRIPLESPEAK assignment between the two traditional one-shot presentations. Following each speech, students completed the STAI A-Sate (Spielberger, Gorsuch, & Lushene, 1970) referring to the anticipation, confrontation, adaptation, and release stages of the presentation as described above.

Data Analysis

Data were analyzed at the end of the term using SPSS 14.0. Significant levels were set at alpha = .05.

Primary Analysis

The data from the quasi-experiment were analyzed using a three-way analysis of variance. Specifically, a 2 X 2 X 4 mixed design factorial ANOVA was obtained to

examine the combined and unique influences of speech (speech #1 X speech #2), condition (Treatment X Control), and the public speaking state anxiety milestones (Anticipation X Confrontation X Adaptation X Release). Analysis of variance indicates whether sample means differ (Fisher, 1925). Analysis involved 140 students ($n = 140$; 68 in the control group and 72 in the treatment group). Only 140 students of the 158 were used in the analysis because 18 students were removed due to missing data.

Secondary Analysis

The data from the treatment group were analyzed using a two-way analysis of variance (ANOVA). Specifically, a 3 X 4 mixed design factorial ANOVA was obtained to examine the combined and unique influences of exposure (Exposure 1 X Exposure 2 X Exposure 3) and the public speaking state anxiety milestones (Anticipation X Confrontation X Adaptation X Release). Analysis involved the 72 students who received treatment ($n = 72$).

Results

Demographics

Participants in the study consisted of 140 undergraduate students (60 male, 80 female) enrolled in a basic speech communication course at Texas Christian University. There were 58 freshmen, 47 sophomores, 23 juniors and 12 seniors. Ages ranged from 17 - 29 years of age ($M = 19.08$, $SD = 1.40$).

Trait Anxiety

The PRCA-24 items were scored according to the scale instructions (McCroskey, 1982) to derive anxiety subscores for group, meeting, dyadic, and public speaking. In addition, summing the four subscores allowed for an overall communication anxiety score. Alpha reliability was .86 for this study. The means and standard deviations for the items according to group are presented in Table 1. A one-way independent ANOVA on each of the anxiety subscores and the overall communication anxiety score indicated there were no significant differences between the treatment and control groups.

Table 1

PRCA-24 Means (and Standard Deviations) According to Condition

PRCA	Control Group	Treatment Group
Meeting	14.67 (5.07)	15.17 (4.19)
Dyadic	13.26 (4.52)	13.74 (4.19)
Group	12.80 (4.55)	14.13 (4.52)
Public Speaking	18.40 (5.21)	18.87 (4.40)
Overall	59.18 (14.89)	61.91 (12.84)

State Public Speaking Anxiety

The STAI-A scale items were scored for each of the public speaking milestones for the pre-test and post-test presentations according to the scale instructions. Alpha reliability ranged from .93 to .95. The means for the items are presented in Table 2.

Table 2

State Mean Anxiety Scores by Time and Speech Stage According to Condition

Speech Stage	Control Group		Treatment Group	
	Pre-test	Post-test	Pre-test	Post-test
Anticipation Stage	50.44	46.49	51.33	46.28
Confrontation Stage	48.71	48.04	51.53	46.85
Adaptation Stage	41.74	40.31	45.14	38.79
Release Stage	33.56	34.13	37.24	32.68

Primary Results

The results of the three-way ANOVA revealed a significant main effect for speeches, $F(1, 138) = 13.29$, $p < .001$. Specifically, state anxiety scores for the post-test ($M = 41.70$, $SD = 5.70$) were significantly lower than state anxiety scores for the pre-test ($M = 44.96$, $SD = 6.40$). This finding indicates that overall students experienced between-sessions habituation between the traditional one-shot presentation delivered at the beginning of the semester and the traditional one-shot presentation delivered at the end of the semester.

There was also a significant main effect for the four milestones of public speaking (anticipation, confrontation, adaptation, release), $F(2.22, 305.83) = 197.63$, $p < .001$. Since the analysis did not achieve the sphericity criterion, the Greenhouse-Geisser analysis was used for the analysis. Sphericity refers to the equality of variances of the differences between treatment levels (Field & Hole, 2003). Greenhouse-Geisser attempts to adjust the degrees of freedom in the ANOVA test in order to produce a more accurate significance value (Field & Hole, 2003). Girden (1992) recommends that when

estimates of sphericity are less than .75, the Greenhouse-Geisser should be used. Therefore, Greenhouse-Geisser was used in this analysis. State anxiety scores were significantly different for the milestones of the presentations (see Table 3); thus, Hypothesis 1, which predicted students would experience within-session habituation during the traditional one-shot presentations was supported.

There was not a significant main effect between the treatment ($M = 42.93$, $SD = 6.15$) and the control groups ($M = 43.73$, $SD = 6.38$), $F (138, 1) = .257$, ns. This indicates that when the time at which state anxiety was measured is ignored, the treatment group is not significantly different than the control group. Thus, even though intact groups were used, there was no significant difference between conditions.

Table 3

Mean State Anxiety Scores and (Standard Deviations) by Time and Milestone for both the Treatment and Control Groups Combined

Public Speaking Milestone	Pre-test	Post-test
Anticipation Stage	50.90_a (11.94)	46.38_b (12.14)
Confrontation Stage	50.16_a (12.00)	47.43_b (12.59)
Adaptation Stage	43.49 (14.16)	39.53 (12.51)
Release Stage	35.45_c (13.45)	33.39_c (11.41)

Note. Means with the same subscript are not significantly different at $p < .05$.

The results of the three-way ANOVA revealed no significant three-way interaction effect between the speeches, the public speaking milestones, and the treatment and control groups, $F (3, 414) = 1.32$, ns. This finding suggests that the overall pattern of anxiety across the public speaking milestones is the same between groups and

speeches. This finding is consistent with previous anxiety pattern research that suggests students experience a monotonic decelerating pattern of anxiety during traditional one-shot presentations (Behnke & Carlile, 1971; Behnke & Sawyer, 1998; 1999; Finn, Sawyer & Behnke, 2003; Sawyer & Behnke, 1999).

There was not a significant two-way interaction effect between speeches (Speech 1 X Speech 2) and the public speaking milestones (Anticipation X Confrontation X Adaptation X Release), $F(2.52, 348.30) = 2.07$, $ns.$, nor was there a significant two-way interaction effect between the public speaking milestones (Anticipation X Confrontation X Adaptation X Release), and the treatment and control groups, $F(2.27, 313.30) = .12$, $ns.$ Since the analysis did not achieve the sphericity criterion, the Huynh-Feldt analysis was used for both of the above analyses. Girden (1992) recommends when estimates of sphericity are greater than .75, Huynh-Feldt be used. These findings suggest the overall pattern of anxiety across the public speaking milestones is consistent between speeches and groups. Thus, irrespective of which speech is being delivered, and regardless of whether they receive treatment or not, speakers habituate from the beginning of the presentation to the end. This is consistent with previous anxiety pattern research (Behnke & Carlile, 1971; Behnke & Sawyer, 1998; 1999; Finn, Sawyer & Behnke, 2003; Sawyer & Behnke, 1999). Students habituate to the speaking situation the longer they are exposed to the audience.

There was a significant two-way interaction between the pre and post-test speeches and the treatment and the control groups, $F(1, 138) = 4.49$, $p < .05$. This finding indicates that the students who received the multiple-exposure treatment experienced more between-sessions habituation between the traditional one-shot

presentations than the students who didn't receive the treatment. Thus, the answer to Research Question 1 is "yes"; students participating in the TRIPLESPEAK assignment experienced more between-sessions habituation than those not participating in the assignment (i.e. receiving the treatment).

Secondary Results

The results of the two-way ANOVA revealed a significant main effect for the TRIPLESPEAK speeches, $F(1.58, 110.74) = 92.78$, $p < .001$. Specifically, state anxiety scores were significantly different between presentations. Since the analysis did not achieve the sphericity criterion, the Huynh-Feldt analysis was used for both of the above analyses. Girden (1992) recommends when estimates of sphericity are greater than .75 Huynh-Feldt be used. This finding addresses Research Question 2, concerning whether students would experience between-sessions habituation during the TRIPLESPEAK presentation, and this finding indicates that students did experience between-sessions habituation for the TRIPLESPEAK presentations (see Table 3.3).

There was also a significant main effect for the four milestones of public speaking (anticipation, confrontation, adaptation, release) in the TRIPLESPEAK presentations, $F(2.78, 194.78) = 85.71$, $p < .001$. Since the analysis did not achieve the sphericity criterion, the Huynh-Feldt analysis was used for both of the above analyses. This finding indicates that students experienced within-session habituation during the TRIPLESPEAK presentations (see Table 4). Thus, Hypothesis 2, which predicted students would experience within-session habituation during the TRIPLESPEAK presentations was supported.

There was a significant two-way interaction between the TRIPLESPEAK speeches and the public speaking milestones, $F(4.27, 298.85) = 3.53$, $p < .05$. This suggests the habituation patterns changed somewhat between the presentations (see Figure 4). Trend analysis for TRIPLESPEAK #1 revealed a significant linear $F(1, 71) = 106.42$, $p < .001$, quadratic $F(1, 71) = 12.16$, $p < .001$, and cubic relationship $F(1, 71) = 22.74$, $p < .001$. Trend analysis for TRIPLESPEAK #2 revealed a significant linear relationship, $F(1, 71) = 124.90$, $p < .001$. Trend analysis for TRIPLESPEAK #3 revealed a significant linear $F(1, 71) = 78.60$, $p < .001$ and quadratic relationships $F(1, 71) = 5.74$, $p < .01$.

Table 4

Mean Anxiety Scores (and Standard Deviations) for Triplespeak Presentations over PS Milestones

PS Milestones	T1	T2	T3
Anticipation	44.94_a(10.03)	40.32 (10.60)	33.69_b (9.58)
Confrontation	45.41_a (11.08)	37.28 (9.66)	33.58_b (12.04)
Adaptation	38.21 (11.18)	33.31 (9.68)	29.13 (9.57)
Release	34.08 (11.06)	30.07 (8.71)	25.26 (7.62)

Note. Numbers in parentheses are standard deviations. Means with the same subscript are not significantly different at $p < .05$.
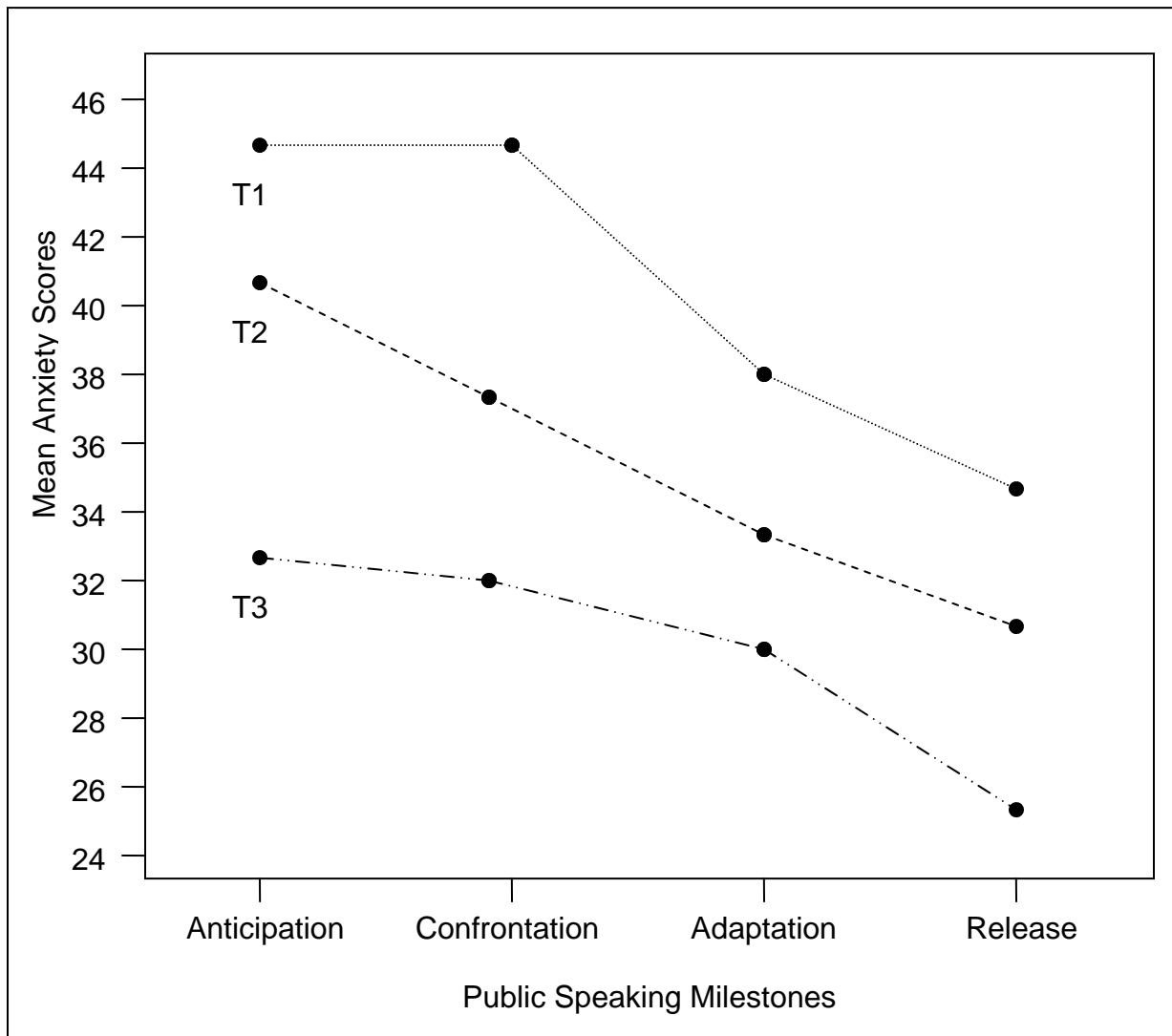
Figure 4. Mean anxiety scores for TRIPLESPEAK over PS milestones.

Follow-up Analysis

In order to determine the between-sessions habituation for all the presentations delivered by the treatment group, a repeated measure ANOVA on confrontation scores (peak anxiety scores) was run. Analysis involved the 72 students who received treatment ($n = 72$). Since the analysis did not achieve the sphericity criterion, the Huynh-Feldt analysis was used for both of the above analyses. Girden (1992)

recommends that when estimates of sphericity are greater than .75, Huynh-Feldt be used. The results of the repeated measures ANOVA revealed a significant difference between confrontation anxiety scores, $F(3.51, 248.87) = 54.65$, $p < .001$. Pairwise comparisons using Bonferroni, revealed a significant difference between all the presentations except between the first treatment presentation and the post-test presentation (see Table 5).

Table 5

Mean Anxiety Scores for Treatment Group over PS Milestones

Anxiety Score	Pre-test	T1	T2	T3	Post-test
Confrontation	51.53	45.41a	37.28	33.58	46.85a

Note. Means with the same subscript are not significantly different at $p < .05$.

In order to determine the relationship between the TRIPLESPEAK presentations and the treatment group's pre and post-test anxiety scores, a 5 X 4 mixed design factorial ANOVA was obtained to examine the combined and unique influences of exposure (Pre-test X Exposure 1 X Exposure 2 X Exposure 3 X Post-test) and the public speaking state anxiety milestones (Anticipation X Confrontation X Adaptation X Release).

Since the analysis did not achieve the sphericity criterion, the Greenhouse-Geisser analysis was used for the analysis. Greenhouse-Geisser was used because sphericity was less than .75. The results revealed significant main effects for speeches, $F(2.80, 196.18) = 64.61$, $p < .001$ and milestones $F(2.27, 158.84) = 142.31$, $p < .001$. In addition, there was a significant interaction effect between speeches and milestones

F(7.27, 508.64) = 4.71, *p* < .001. Means are presented in Table 6 and plotted for comparison purposes in Figure 5.

Table 6

Mean Anxiety Scores for Treatment Group over PS Milestones by Speech

PS Milestones	Pre-test	T1	T2	T3	Post-test
Anticipation	51.33_a	44.94_{be}	40.32	33.69_c	46.28_{de}
Confrontation	51.53_a	45.41_{bf}	37.28	33.58_c	46.85_{df}
Adaptation	45.14	38.21_g	33.31	29.13	38.79_g
Release	37.24_{hi}	34.08_{hj}	30.07_k	25.26	32.68_{ijk}

Note. Means with the same subscript are not significantly different at *p* < .05.
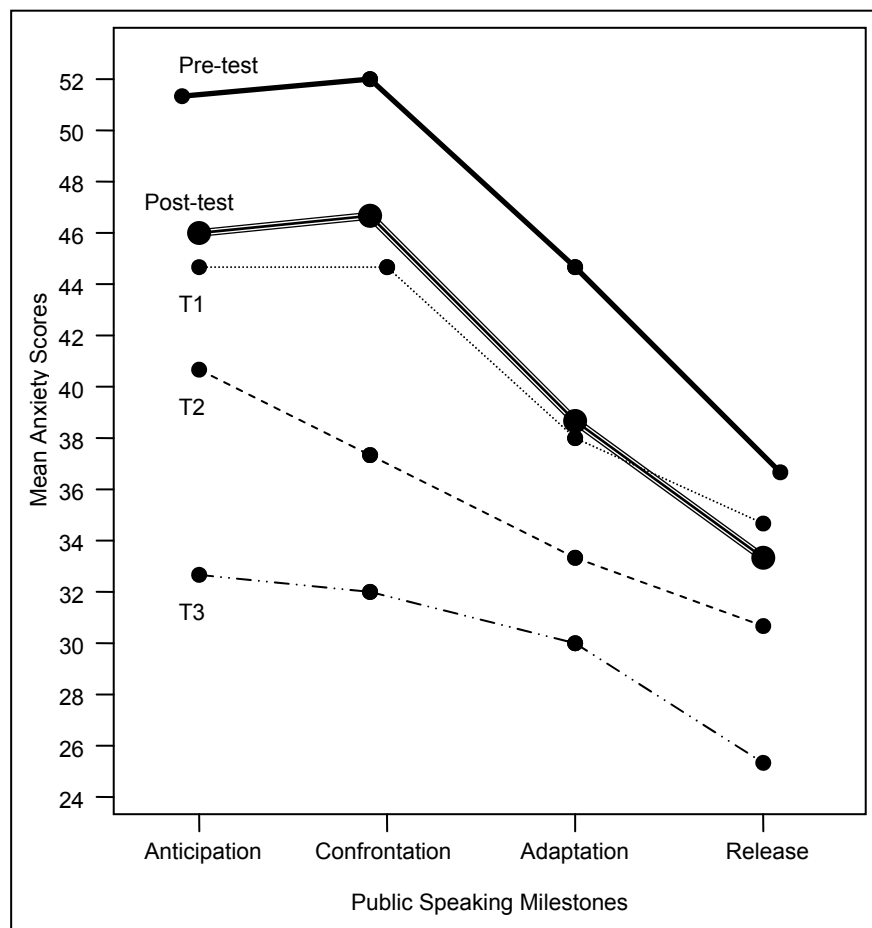
Figure 5. Mean anxiety scores for treatment groups presentations over PS milestones.

Discussion

Although a variety of different treatment strategies for the reduction of public speaking anxiety have been introduced, examined, and determined to be effective in the communication literature, this issue has not been without debate. Some communication scholars continue to question previous findings regarding the therapeutic effectiveness of various public speaking anxiety reduction approaches. Recently, Duff et al. (2007) speculated that completion of a basic communication course might be just as effective at reducing public speaking anxiety as any other treatment method; however, extant communication literature has not provided empirical evidence or a theoretical explanation as to why this might occur. To address this area of inquiry, the previous chapter suggested public speaking anxiety might decline as a result of exposure to the threatening stimulus (audience) and advanced a theory from the field of psychology, emotional processing theory, as a theoretical explanation. This chapter conducted a quasi-experiment, using a type of in-class exposure therapy (TRIPLESPEAK), to determine the effect of exposure on students' self-reported public speaking state anxiety scores. The results yielded promising theoretical and pedagogical implications.

Review of Findings

Hypothesis 1, which predicted students would experience within-session habituation during the traditional one-shot presentations (i.e. pre and post-test presentation), was supported. Consistent with previous anxiety pattern research, (Behnke & Sawyer, 1998; 1999; Sawyer & Behnke, 1999), students reported experiencing a decrease in public speaking anxiety from the beginning of the

presentation to the end of the presentation for both their pre and post-test speeches. Irrespective of what type of speech the students were delivering (informative or persuasive) or whether they received treatment or not, a monotonically decreasing pattern emerged. This finding adds further empirical evidence to the notion that the longer a speaker is exposed to an audience during a single presentation, the less anxiety he/she will report experiencing.

Similarly, Hypothesis 2, which predicted students would experience within-session habituation during the TRIPLESPEAK presentations was also supported. Students reported experiencing a decrease in anxiety from the beginning of the speech to the end of the speech in all three treatment presentations. Thus, it seems speakers habituate in a similar manner when presenting in front of a classroom full of their peers and a course instructor as they do when delivering a speech to a small group of their peers. In addition, even when the same presentation is repeated multiple times, students experienced a peak in anxiety at the beginning of each speech with a gradual decline as they continued speaking. This finding adds further empirical support for the use of narrowbanding measures of public speaking state anxiety and Gray's (1982; Gray & McNaughton, 2000) neurological theory of anxiety, which suggests the comparator switches from the BIS to the BAS when punishment does not ensue from exposure to a threat.

Research Question 1 asked whether students participating in a multiple-exposure speaking assignment (TRIPLESPEAK) would report experiencing more between-sessions habituation than those students not participating in the assignment. While both the treatment group and the control group reported experiencing less anxiety during

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their final presentation, the students who received the multiple-exposure treatment experienced significantly more between-sessions habituation than the students who did not receive the treatment. In other words, students participating in the TRIPLESPEAK assignment reported experiencing significantly less anxiety during their final presentation than those not participating in the assignment. This suggests that exposure therapy may be an effective means for helping students to combat their fear of speaking in front of an audience.

Research Question 2 asked whether students in the treatment group would experience between-sessions habituation for the treatment presentations, and they did. Students reported experiencing a decrease in peak anxiety during each additional presentation they delivered. Thus, even though students experienced an increase in anxiety each time they approached a new audience, the peak was significantly less. It took students less time to habituate to the speaking situation with each additional presentation delivered.

Emotional Processing Theory

This study adds some support for EPT in the public speaking context. EPT indicates that emotional processing occurs when an individual experiences a decrease in peak anxiety from one encounter with the threatening stimulus to another. When comparing the pre and post-test presentation scores, this study suggests TRIPLESPEAK presentations delivered in a basic communication course, in which the audience is instructed to be congenial and supportive of the speaker, allow for emotional processing to occur. In this type of speaking environment, most students' fear

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structures are activated by having to present in front of a group of their peers and the majority of the students have a positive speaking experience. The positive speaking experience allows for new contradictory information to be stored in memory, and according to EPT, this new information is used as a blueprint for future speaking episodes. Since students reported experiencing significantly less anxiety during the post-test presentation than they did during the pre-test presentation, one could assume that emotional processing did occur; however, further investigation of all the treatment group's presentations uncovered an interesting, yet perplexing finding that warrants further discussion.

The analysis revealed that the treatment group reported experiencing a continual decline in peak anxiety from the pre-test presentation all the way through the final treatment presentation; however, the students reported experiencing a peak in anxiety during the post-test presentation. While the level of anxiety reported during the final presentation was significantly less than that reported during the pre-test presentation, it was approximately the same as the amount of anxiety experienced during the first treatment presentation. EPT suggests individuals should experience less anxiety with each additional treatment session; however, if each presentation the treatment group delivered over the course of the semester is thought of as a treatment session (i.e. pre-test, Treatment 1, Treatment 2, Treatment 3, and post-test), peak anxiety increased from Speech 4 (Treatment 3) to Speech 5 (post-test).

There are a few different explanations as to why this peak in state anxiety might have occurred when considering Foa and Kozak's (1985) guidelines for therapeutic success. Foa and Kozak (1985) suggested the success of exposure therapy can be

attributed to differences in either the effectiveness of activating the fear structure or in providing information that will modify the fear. One of the primary guidelines for activating the fear structure specifies that the medium used to evoke the relevant fear structure must accurately and completely present the feared stimulus. There were a number of differences between the pre- and post-test presentations and the TRIPLESPEAK presentations, and these differences might have played a role in the peak in anxiety during the final presentation. For instance, there were only 4 to 6 audience members in the TRIPLESPEAK presentations; whereas, there were approximately 24 audience members in the post-test presentation. In addition, there was a course instructor evaluating the speaker's performance in the post-test presentation, but there was not an instructor in the TRIPLESPEAK presentations.

Communication scholars have differentiated between high-intensity and low-intensity presentations based on audience size and ramifications for ineffective performance (Beatty & Behnke, 1991; Booth-Butterfield, 1981). A high intensity presentation involves delivery of a speech to an entire class and course instructor who is evaluating the speaker's performance. The pre and post-test presentations used in this study are considered high-intensity presentations (Beatty & Behnke, 1991). A low intensity presentation involves delivery of a speech to a small audience, and it does not involve evaluation. The multiple-exposure TRIPLESPEAK presentations could be considered low-intensity. Previous research notes that high-intensity presentations trigger more anxiety than do low-intensity presentations (Beatty & Behnke, 1991). Thus, the TRIPLESPEAK assignment, because it is low-intensity, may not have accurately

and completely exposed the speakers to the feared stimulus that was examined in the post-test presentation.

Another guideline for appropriately activating the fear structure indicates that individuals should experience physiological fear responses during treatment. Given that physiological responses were not measured in this study, it is unclear if students did experience the same physiological responses during the TRIPLESPEAK presentations as during the pre and post-test presentations. It may be that the TRIPLESPEAK presentations did not trigger the same intensity of physiological reactions because of the nature of the assignment, and when the speakers experienced an increase in physiological symptoms during the final presentation, this led to the labeling/reporting of increased anxiety.

In regards to modifying the fear, Foa and Kozak (1985) suggest treatment should trigger moderate responding, not too high nor too low, if emotional processing is going to occur. As previously stated, it is unclear if the TRIPLESPEAK presentations generated enough anxiety to allow for emotional processing. The low-intensity nature of assignment might have restricted the treatment process.

Future research needs to continue to explore EPT in the public speaking context. This study suggests that exposure therapy does help to reduce public speaking anxiety; however, in order to most effectively design exposure therapy treatment sessions, EPT needs to be thoroughly examined and understood. At this time, it is unclear if the stimulus potency of the TRIPLESPEAK presentations is strong enough to trigger emotional processing.

Future research should examine the effect of increasing the stimulus potency. One way of doing this may be to place video cameras in each of the rooms used for TRIPLESPEAK delivery. This might increase the stimulus potency without changing the nature of the TRIPLESPEAK assignment. In addition, future scholars should measure anxiety using both physiological and self-report means, for, as stated above, it is unclear if students experienced the same physiological reactions in the TRIPLESPEAK presentations as they did in the traditional one-shot speeches. Future scholars should also investigate whether the number of treatment presentations impacts post-test public speaking state anxiety scores and if delivering an additional one-shot presentation between the pre and post-test presentations is just as effective at reducing public speaking anxiety as the TRIPLESPEAK assignment. This appears to be a fruitful line of research for discovering a way to help students overcome their fears associated with speaking in front of an audience.

Conclusion

Based on the findings of this study, the TRIPLESPEAK assignment is a promising type of instructional therapy (Witt & Behnke, 2006) appropriate for reducing public speaking state anxiety in basic communication courses. However, before such an assignment is implemented, research should attempt to determine the cause(s) of the peak in anxiety during the post-test presentation described above. Doing so will allow for a more thorough understanding of EPT in the public speaking context and enable instructors to incorporate the TRIPLEPSPEAK assignment in their classes in the most effective way possible. Thus, the remainder of this study will examine the threatening

stimuli in each of the different speaking environments in an attempt to help explain the

peak in anxiety during the final presentation. The next chapter will borrow theory and

method from the field of information science.

CHAPTER 4

INFORMATION SCIENCE PERSPECTIVE

This chapter considers the above study from an information science perspective. Based on the theory and findings presented in the preceding chapter, it is unclear why students experienced a significant increase in anxiety during their last presentation. According to Foa and Kozak (1986), students should have experienced a decline in peak anxiety from their last treatment presentation to their post-test presentation; however, as discussed in the previous chapter, they experienced a significant increase. While their anxiety did decline from pre-test to post-test due to the exposure therapy (TRIPLESPEAK presentations), further investigation needs to be done to understand why their anxiety increased during the final presentation. Given the pre and post-test presentations and the TRIPLESPEAK presentations took place in different speaking environments, with different requirements, examining the environmental stimuli in each may help answer why students experienced this peak in anxiety. Thus, this chapter explores a theory and method from the field of information science to determine the role of the environmental stimuli in the treatment of public speaking state anxiety.

Environmental Stimuli

When speakers deliver presentations in front of an audience, they might ask themselves, "Can my audience hear what I am saying? Can my audience tell my hands are shaking because I am nervous? Do they understand my visual aid? Does my audience understand what I am saying? Are they laughing because my joke was funny? Was that point clear? Are the members of my audience even listening to me?" In order

to answer these questions, to fulfill his/her information need, the speaker must scan the speaking environment to find the answer(s). All the stimuli within the speaking environment provide the information needed for the speaker to determine if he/she is effectively communicating his/her message. A head nod from an audience member might imply agreement with the speaker, a podium at the front of the room might signify the formality and importance of the speaking occasion, and a yawn might indicate the speaker is completely boring the audience. In other words, the head nod, the podium, and the yawn may act as a reinforcer, a discriminative stimulus, or a punisher for the speaker. It is the speaker's responsibility to decode the environmental stimuli in order to most effectively communicate his/her message. The decoding process is based on the speaker's own frame of reference; thus, the interpretation of the environmental stimuli is based on the speaker and varies among speakers.

In explaining the meaning of stimuli, Dinsmoor (2004) states:

To trace the concepts used in the experimental analysis of behavior back to their historical origins, it is necessary to begin with the physiologists, who elicited a variety of glandular and muscular reactions by applying electrical or chemical agents at different points in the body. Because these instigating agents seemed to provoke the subsequent reaction without much regard to surrounding circumstances, early physiologists thought of them as akin to spurs or goads and gave them the name *stimuli*. In contemporary psychology, however, stimuli need not be stimulating: the word stimulus does not necessarily or even usually imply any instigation to action but merely a detectable element of the surrounding environment, capable of serving a variety of functions (p. 311).

Thus, anything in the speaking environment that has function for the speaker can be considered a stimulus. This chapter assumes the stimuli in the speaking environment have an effect on students' reports of public speaking state anxiety.

Information Theory

In 1948, Shannon, while working for Bell Labs doing basic research related to communication, published a paper titled *A Mathematical Theory of Communication.* The paper addressed channel capacity related to telephone lines. At the time, engineers wanted to know how much information a single copper cable could hold, for the answer would allow them to determine how many different telephone conversations could occur on the same copper line simultaneously without interfering with one another. Thus, Shannon, in order to answer this complex question, figured out a means for measuring information and then mathematically calculated information capacity of a channel using entropy, a measure of the uncertainty in transmitted data. Shannon thus devised a measure of how much information is transmitted in a given message. Shannon's paper was republished in book form a year later, along with an expository introduction by Weaver, written to describe and promote the relationship between science, mathematics, and communication to a broad audience (Shannon & Weaver, 1949). Since its conception, Shannon's theory of communication (now often referred to as information theory) has served as a foundation for a number of communication theories; however, it has not previously been used in studies regarding communication anxiety.

In his paper, Shannon partitioned communication into its component parts: information source, message, transmitter, signal, receiver, destination and noise. His schematic diagram of a general communication system (see Figure 6), including these communication components, has been used to introduce and explain broad communication issues such as human interaction, written communication, advertising, and telecommunication. Unfortunately, many scholars have relied solely on this diagram

to explain communication phenomena and have failed to get at the heart and value of

Shannon's theory. When one considers the pictorial description and not the

mathematical explanations, Shannon's theory is often reduced to a simplified

(sometimes inaccurate), view of the communication process. It is Shannon's notion of

entropy that may help explain the increase in anxiety during the last presentation in the

preceding experiment.
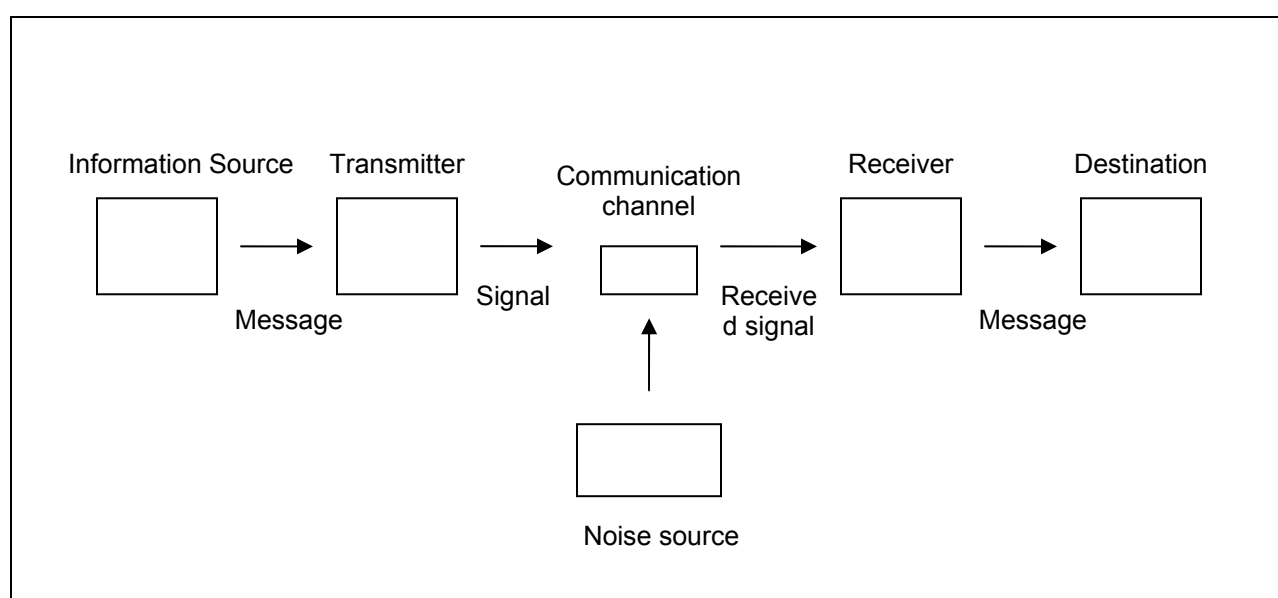
Figure 6. Shannon's schematic diagram of a general communication process.

Information

Information theory mathematically addresses the relationship between

information, entropy, redundancy, and uncertainty related to communication. Each term

is based on exact measurement and logarithmic expressions. Given these terms are

defined in various ways across disciplines, it is important to spend some time

delineating each according to Shannon's theory before proceeding any further.

Shannon did not use the term *information* in the ordinary sense of the word, in which information and meaning are essentially synonymous. According to Shannon and Weaver (1949), information is independent from meaning. One message of pure nonsense (e.g., ice can may you would) and one message loaded with meaning (e.g., would you like some ice cream?) can be exactly equivalent in this theory. Information is "a measure of one's freedom of choice when selecting a message" (p. 9). It is "not so much what you *do* say, as to what you *could* say" (p. 8). The key to this idea is that information can be precisely measured in bits. Specifically, one can determine how much information is transmitted in a given message using bits.

Entropy, a measure of information (in Shannon's sense), is based on the laws of thermodynamics (Shannon & Weaver, 1949). Weaver explains that, in the physical sciences, entropy refers to the degree of randomness in a given situation and that the idea of entropy proposed by Shannon is similar. Entropy is how unpredictable a string of bits is. Entropy increases when one has a large number of possible message choices and/or when one message choice is no more probable than another. Entropy decreases when one message choice becomes more predictable than the other(s). Thus, entropy is a measure of randomness, which is uncertainty, which is also information in this theory. Shannon expresses entropy (information) as an equation:

$$H = -\sum p_i \log p_i$$

H = entropy / information

p = probability of choice $_i$

$_i$ = set of independent symbols

Figure 7. Shannon's entropy (H) equation.

Redundancy, on the other hand, is the "fraction of the structure of the message which is determined not by the free choice of the sender, but rather by the accepted statistical rules governing the use of the symbols in question" (p. 13). It is the predictable part of the message. It is calculated by subtracting the relative entropy, the ratio of actual entropy to the maximum entropy, from one. Thus, if the relative entropy were .20, the redundancy would be .80. In other words, 80% of the message would be redundant. The more information in a message, the less redundant the message is, and the more redundant, the less information there is.

Communication Questions

In his introduction to Shannon's theory, Weaver suggested three levels of general communication problems. These included (Shannon & Weaver, 1949, p. 4):

Level A. How accurately can the symbols of communication be transmitted? (The technical problem.)

Level B. How precisely do the transmitted symbols convey the desired meaning? (The semantic problem.)

Level C. How effectively does the received meaning affect conduct in the desired way? (The effectiveness problem.)

Weaver explained that while Shannon's theory was primarily concerned with the Level A question dealing with the accuracy of transference from the sender to the receiver, Level A problems must be considered if one is going to effectively address the Level B and C problems. Specifically he posited, "it seems highly suggestive for the problem at all levels that error and confusion arise and fidelity decreases, when, no matter how good the coding, one tries to crowd too much over a channel" (p. 26).

Concerned with the Level B and C questions, Hayes (1993) extended Shannon's definition of information to include an additional variable, *r*, which measures the

importance of the signal to the recipient of it. Hayes defined information as, "any stimulus that alters cognitive structure in the receiver" (p. 3). He posited that the result of the information transfer from the sender to the receiver is meaningful only when it is understood by the recipient. He suggested understanding involves a process of "table-look-up in which the data are matched against some form of list and interpreted for their significance" (p. 5). Further, he suggested that "knowledge results from the understanding of information that has been communicated and from integration of it with prior information. To an extent, it is a result of internalizing the information, but it is more than that, since it requires an active process, a restructuring of the cognitive structure" (Hayes, 1993, p. 5). Hayes created a new equation, called weighted entropy, which extends Shannon's equation and takes into consideration the importance to the recipient.

A number of scholars have used Hayes' (1993) weighted entropy to examine viewer's perceptions of information. For instance, Kearns and O'Connor (2004) calculated children's perceived rates of information in moving image documents (videos). They found children's perceived entropy measure (PEM) was correlated with mechanically calculated entropy measures (CEM), and proposed that CEM "can be used as useful and predictive elements of representations for children's videos" (p. 163). Later, Kearns (2005) examined Microsoft PowerPoint® presentations using calculated (CEM) and perceived (PEM) entropy measures. She found the closer the CEM of a PowerPoint® form attribute was to an extreme end of the normal curve, the more it distracted from the desired communication. She concluded that the most

effective PowerPoint® has a balance between information and content. Thus, it appears perceptions of entropy (information) closely resemble calculations of entropy.

Boolean Logic

Shannon's measure of information, entropy, is based on Boolean logic (Shannon & Weaver, 1949). Boolean logic, conceived by Boole (1854), is a way to deal with questions that have one of two answers, such as yes/no or on/off. Such questions can be answered with one symbol that can take one of two values, usually a zero and a one. The symbol is a binary digit, which Shannon refers to as a bit (**bi**nary dig**it**) of information. For example, if one were to ask, "Do you want some ice cream?" one could respond with a zero for "no" or a one for "yes." Thus, this question requires one bit of information. The value of Boolean logic is that no matter how complex a question is, it can be answered by using a string of yes/no, true/false, or on/off questions (Seife, 2006).

Using Boolean logic, it is possible to determine how much information a message contains. For instance, one can determine the maximum amount of information a song contains, a book includes, or a movie clip holds (Seife, 2006). Building on the previous studies by O'Connor and Kearns, as well as Anderson (2006), which calculated the amount of information in a document (e.g. moving image document, PowerPoint® presentation), this study suggests an entropy measure can be used to calculate the amount of information in the environments in which the students delivered their presentations. The speaking environment is, in a sense, a document like a film or a PowerPoint® presentation with multiple stimuli.

Information Revisited

Before continuing any further, it is important to clarify the meaning of the term information in this chapter. In the preceding chapters, the term *information* was used in the explanation of Foa and Kozak's (1986) emotional processing theory; however, the meaning associated with the word *information* in this chapter is considerably different. The appropriate definition for the term information is one of the most debated issues in the field of information science. A number of different meanings have been attributed to it, and consequently, discussions about which is most accurate abound. For instance, Buckland (1991) defines information as "thing," "knowledge," and "process." Allen (1996) defines it as "the process in which informant's cognitive structures are encoded and transmitted to an information seeker, who perceived the coded messages, interprets them, and learns from them" (p. 3), and Ingwersen (1992) delineates information as "thing." The definition used in this chapter is based on Shannon's (Shannon & Weaver, 1949) definition, where information is a measure of one's freedom of choice when selecting a message.

Functional Ontology Construction

Recently, Anderson (2006) proposed a functional ontology construction (FOC) approach, based on a radical behaviorist perspective, for studying the relationships between information and human behavior in the field of information science. FOC is an interdisciplinary approach integrating information science and behavior analysis. It examines "the relationships between the individual, the aspects of the physical environment that have function to the individual … and the consequences of those

relationships" (p. 9). Anderson suggested the functional ontology is "the set of environmental stimuli and historical factors that have function for an individual at a particular point in time – those things that select behavior" (p. 27).

Anderson recently introduced FOC as a way to address problems in the field of information science that involve the relationship between human behavior and information. Specifically, he stated, "Interacting with documents has a selective function on the behavior of the users in the engagement and the behavior of the user has a selective function on the document" (p. 18). In explaining his approach, Anderson provides an excerpt from Skinner's (1953) *Science and Human Behavior* that is worth noting here as well.

> The external variables of which behavior is a function provide for what may be called a causal or functional analysis. We undertake to predict and control the behavior of an individual organism. This is our 'dependent variable' – the effect from which we are to find the cause. Our 'independent variables' – the causes of behavior – are the external conditions of which behavior is a function. Relations between the two – the 'cause-and-effect relationships' in behavior are the laws of science. A synthesis of these laws expressed in quantitative terms yields a comprehensive picture of the organism as a behaving system. (p. 35)

FOC is akin to Wilson's (1973) concept of situational relevance, O'Connor, Copeland, and Kearns' (2003) information seeking model, O'Connor's (1996) knowledge state model, and Skinner's (1969) three-term contingency. It also grounds these concepts in a model offering quantifiable attributes and known processes of examination.

Following FOC, the environmental conditions in which the speakers delivered their presentations will likely have an effect on their behaviors and self reports of emotional states (i.e. self reported anxiety) during a presentation, which will in turn play a role in the behaviors and reports of emotions during future presentations (see Figure 8) . Anderson (2006) explains:

Operant behavior is behavior that is selected by the events or consequences that follow an instance of behavior. If the behavior in question increases in rate or probability, the consequence is considered a reinforcer. If the consequence that follows the instance of behavior decreases the rate of the behavior of interest or the probability of future occurrence of the behavior of interest, then the consequence is considered to be a punisher. Once a particular stimulus or consequence has acquired behavior function (e.g. as a reinforcer or punisher), then a contingency emerges between the behavior of interest and the consequence. It is not necessary for the consequence to occur every time the behavior of interest occurs to maintain the contingency between the behavior of interest and the consequent stimulus. The frequency at which the consequent stimulus is delivered following the behavior of interest is the schedule of reinforcement. Extinction is the process of breaking a contingency by removing the contingent relationship between the consequent stimulus and the behavior of interest. (pp. 37-38)

Thus, a stimulus in a speaking environment can act as a reinforcer, a punisher, or a discriminative stimulus; as a result, a contingent relationship emerges between the consequent stimulus and the behavior. This chapter assumes the stimuli in the speaking environment have function for speaker behavior, but they also impact students' reports of emotions (i.e. public speaking anxiety). Stimuli can work to either increase or decrease public speaking state anxiety. Therefore, the stimuli in the speaking environment have a functional role on the speakers' behaviors and self reports of emotions.
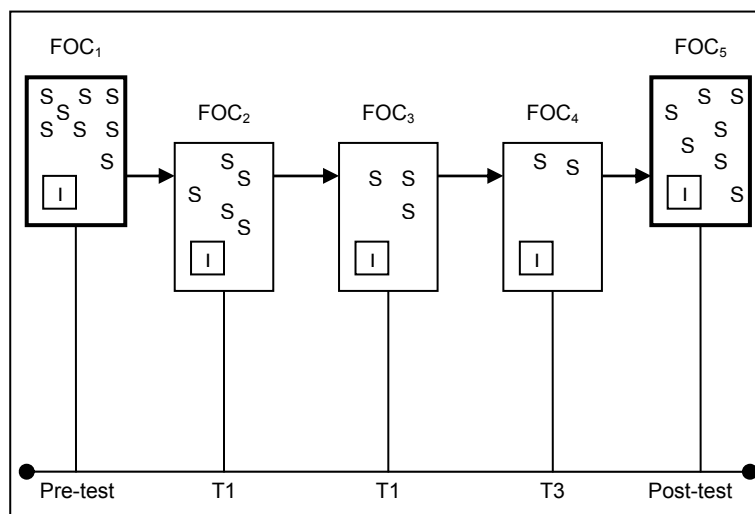
Figure 8. Public speaking FOC model adapted from Anderson's (2006) FO model.

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Sources of State Anxiety

Communication scholars have often focused on the relationship between the contextual characteristics of the speaking situation and anxiety levels. McCroskey and Richmond (1987) identified two types of communication apprehension that involve environmental factors: 1) receiver-based and 2) situational. Receiver-based CA encompasses fear and/or anxiety triggered by the person or type of person or group involved in the communication. For instance, an individual may not experience anxiety when presenting a speech to his/her peers, but may experience high anxiety while delivering the same presentation to an instructor or supervisor. Situational CA is viewed as a transitory orientation toward communication based on the communication context. The authors suggested that "this type of CA should be expected to fluctuate substantially as a function of changed constraints introduced by the environment in which communication takes place and the behavior of the other person or people in the communication encounter" (p. 144).

Previous scholars have identified a number of different situational variables that play a role in increasing public speaking state anxiety. For instance, Behnke, Sawyer and King (1994) determined that when a speaker experienced high public speaking anxiety during a presentation, the next speaker experienced an increase in public speaking anxiety. They referred to this as the contagion effect. MacIntyre, Thivierge, and MacDonald (1997) indicated that an uninterested or unresponsive audience can cause an increase in public speaking anxiety, and Thompson and Rapee (2002) found that an unstructured speaking event can increase state anxiety.

Buss (1980) identified three causes for situational public speaking anxiety. The

first was *conspicuousness*. He suggested that when speakers are on stage and realize they are the center of attention they may experience acute public self-awareness which will distract from the delivery of their presentations. The second cause was *novelty* - novelty associated with being in unfamiliar surroundings, as well as novelty of assuming the role of a performer. The final source of anxiety involved factors related to *properties of the audience*. These included the size of the audience, the status of the audience members in relation to the speaker, whether the audience is familiar and similar, and the behavior of the audience members.

McCroskey (1984), borrowing from Buss (1980), presented nine situational causes of anxiety. They included: novelty, formality, subordinate status, conspicuousness, unfamiliarity, degree of attention from others, degree of evaluation, and prior history. Brief definitions are described in Table 7.

Table 7

McCroskey's Situational Causes of Anxiety

Categories	Explanation
Novelty	Ambiguity about what to expect and how to respond
Formality	The situation involves highly prescribed appropriate behaviors
Subordinate status	When someone in the audience of higher status than the speaker defines appropriate behavior
Conspicuousness	The degree the speaker stands out or is visible to the audience
Unfamiliarity	When the audience isn't well known by the speaker
Dissimilarity	When a difference exists between the speaker and the audience members
Degree of attention from others	One extreme or the other - when either all eyes are on the speaker or the speaker is ignored
Degree of evaluation	How much the audience member(s) are judging the speaker, and the outcome associated with the judgment
Prior history	The speaker's previous negative or positive speaking experiences

Note. McCroskey (1984, p. 25-26).

Similarly, Daly and Buss (1984) speculated that many of the same situational characteristics played a role in increasing anxiety, but they used a different classification system. They divided the situational determinants into: 1) factors augmenting anxiety before the speech (e.g. lack of preparation time, lack of knowledge about the upcoming event, etc.); 2) factors increasing anxiety during the speech (e.g. disruptions, audience reactions, etc.); 3) conspicuousness (e.g. being alone on stage, degree the speaker is open to inspection, etc.); 4) characteristics of the audience (e.g. size, status relative to speaker, dissimilarity, etc.); and 5) novelty (of the speaking environment, of the audience, role).

Proctor, Douglas, Garera-Izquierdo, and Wartman (1994) asked high-communication apprehensives in a series of focus groups to report the reasons they experienced public speaking anxiety. Based on the students' reports, the scholars identified four factors: evaluation and criticism, mistakes and failure, attention and isolation, and an unfamiliar audience.

Bippus and Daly (1999) asked college students naïve to communication research to give reasons as to why they thought people experienced stage fright. Based on the students' reports, the scholars devised a nine-factor model accounting for 65% of the variance. The factors, in rank order, included humiliation, preparation, physical appearance, rigid roles, personality traits, audience interest, unfamiliar role, mistakes, and negative roles. The definitions for each are presented in Table 8. In addition, Bippus and Daly (1999) examined whether high and low apprehensive students made different attributions about reasons for stage fright, and they found that they did not differ significantly in their scoring of the nine factors.

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Table 8

Naïve Assumptions about Stage Fright

Category	Description
Humiliation	Concern about being personally ridiculed or rejected
Preparation	Poor organization and research on the content of the presentation
Physical appearance	Sensitivity about one's physical features being scrutinized
Rigid roles	Perception that there are certain specific expectations as to what constitutes a good performance, and the speaker will not be successful if those expectations are not met
Personality traits	Dispositional tendencies to be negatively self-focused
Audience interest	Concern that the audience will be unreceptive to the performance
Unfamiliar roles	The person is new to doing oral presentations and is not comfortable with them
Mistakes	A fear that one will make a mistake of some kind during the presentation
Negative results	Concern that the performance will have adverse consequences for the speaker

Note. Bippus & Daly (1999, p. 66).

Summary

According to Shannon (Shannon & Weaver 1949), information is entropy, which is a measure of one's freedom of choice when selecting a message. Information is measured in bits, and anything that has a finite answer can be measured in bits. Thus, the environmental conditions can be investigated by determining the amount of information using Shannon's entropy measure. Anderson's (2006) FOC approach suggests that the stimuli in the speaking environment impact behavior at a certain point in time, which then influence behavior in future situations. According to Anderson, the stimuli present in the speaking context will influence students' behaviors and self reports of anxiety. Previous communication scholars have found a number of situational determinants of public speaking anxiety. Thus, based on Shannon's information theory and Anderson's FOC, the following research question is posed:

R3: Is there a functional relationship between information and public speaking state anxiety?

Method

Although there are a number of contextual characteristics of the speaking situation that are likely to influence speaker anxiety levels (see discussion above), only a select few that are open to direct measurement will be considered in this study. This is the first attempt to assess environmental stimuli in the speaking situation using a measure of information; thus, this will serve as a starting point for further exploration. The factors being considered are audience size, room size, distance zones, and evaluation factors.

Audience Size

A number of scholars have indicated that the size of the audience contributes to public speaking state anxiety (Ayres, 1990; Beatty & Behnke, 1991). Specifically, speaker state anxiety tends to increase as a multiplicative function of audience size (Beatty & Payne, 1983; Jackson & Latane, 1981). Social impact theory (Jackson & Latane, 1981) suggests that as the number of people increases, each additional person has less of an impact than the previous person. Thus, if a speaker is presenting to five people and one more individual joins the audience, this is more significant than if the speaker is delivering a presentation in front of fifty people and one more becomes a member of the audience. However, the speaker should experience more anxiety speaking to fifty people than to five. Given Shannon's definition of information, a measure of one's freedom of choice when selecting a message, one could assume

more people in the speaking environment would increase the randomness of the communicated message (i.e. the environment is the message).

Room Size

Working hand in hand with audience size, room size will also likely impact entropy and public speaking anxiety. While previous communication research has not examined the relationship between the size of the speaking environment and public speaking state anxiety, one could presume there would be more environmental stimuli in a larger room than in a smaller room. In the large classroom in which the pre and post-test presentations were delivered, there were more chairs, more lights, more student belongings, more audience reactions to monitor, more space, more sounds, etc. compared to the small rooms used for the treatment presentations. All the additional environmental stimuli that exist due to the size are likely to increase the unpredictability of the communicated message (recall here that the environment is the message), which in turn is likely to increase public speaking state anxiety.

Distance Zones

Hall (1969) indicated that in the dominant United States culture there are four communication distance zones perceived as appropriate and comfortable depending on the purpose of the communication (see Table 9 for descriptions). An individual often becomes anxious when another individual communicates a particular type of message at an inappropriate distance. For instance, when an acquaintance attempts to tell someone a story in their intimate distance, this can be uncomfortable and often anxiety

producing. Previous communication anxiety research has not determined the role of

distances in public speaking contexts; however, one might expect the more distance

zones audience members occupy the more challenging, and possibly anxiety producing,

the speaking situation would become for the speaker. In addition, the number of

distances occupied by the audience is likely to increase the randomness of the

communicated message. An audience member sitting in the speaker's personal

distance is likely to send a different type of message than the audience member sitting

in the speaker's public distance. For example, the audience member at the back of the

room, in the speaker's public distance, might send a message to the speaker that he or

she cannot hear what the speaker is saying (e.g. points at ear), while the audience

member at the front of the room, in the speaker's personal distance, might communicate

that the speaker is too loud (e.g. hand over one ear, clinched teeth and wrinkled face).

Table 9

Communication Distances

Distance Zones	Distance	Purpose
Intimate distance	Less than 18 inches	Private conversations
Personal distance	18 inches – 4 feet	Casual social conversations
Social distance	4 feet – 12 feet	Impersonal business
Public distance	More than 12 feet	Public speaking

Note. Hall (1969).

Evaluation Factor

     Previous scholars have suggested evaluation plays a role in increasing public

speaking state anxiety (McCroskey, 1984; Proctor et al., 1994). In addition, it seems

plausible that an evaluator in the speaking room would increase the unpredictability of the communicated message. In the pre and post-test presentations, an evaluator was present and was grading the speaker on a wide variety of different items (eye contact, gestures, facial expressions, content, source citation, visual aid use, etc.); whereas, in the treatment presentations, there was no course evaluator in the room grading the speeches, and the speaker was only being graded on time and appearance.

Information

Using Shannon's entropy equation, and modeling after Kearns' (2005; Kearns & O'Connor 2004) recent studies measuring information in moving image documents and PowerPoint presentations, this study will take the first step at measuring the amount of information in a speaking environment. The formulae used to calculate entropy are presented in Table 10.

Table 10

Entropy Formulae

Entropy Type	Formulae	Description
Audience Size Entropy (HAS, where H is entropy)	$HAS = - \frac{n_{aud}}{N_{totaud}} * \log_2 \frac{n_{aud}}{n_{totaud}}$	where n_{aud} = number of people in the audience N_{totaud} = total number of possible audience members
Room Size Entropy (HRS)	$HRS = - \frac{n_{size}}{n_{totsqft}} * \log_2 \frac{n_{size}}{n_{totsqft}}$	where n_{size} = sq footage of the room in which the speech is being delivered $n_{totsqft}$ = total sq footage
Distance Zones Entropy (HDZ)	$HDZ = - \frac{n_{dz}}{n_{totdz}} * \log_2 \frac{n_{dz}}{n_{totdz}}$	where n_{dz} = number of distance zones the audience members occupied n_{class} = total number of possible distance zones
Evaluation Factors Entropy (HEF)	$HEF = - \frac{n_{ef}}{n_{totef}} * \log_2 \frac{n_{ef}}{n_{totef}}$	where n_{ef} = number of evaluative factors for the speech n_{totef} = total number of evaluative factors

Analysis

Based on Shannon and Weaver's (1949) information theory and Anderson's (2006) FOC, the following research question was posited: Is there a functional relationship between public speaking state anxiety and information? To answer this question, the amount of information in the speaking environments was calculated using formulae derived from Shannon's entropy measure. The results are presented in Table 11. They indicate that the pre and post-test presentation environments contained more information than did the speaking environments used for the treatment presentations. It appears that a direct positive relationship exists between anxiety and the amount of information in the speaking environment (see Figure 9).

Table 11

Entropy

	Speech 1	Speech 2	Speech 3	Speech 4	Speech 5
HAS	.46	.22	.22	.22	.46
HRS	.52	.33	.33	.33	.52
HDZ	.41	.33	.33	.33	.41
HEF	.46	0	0	0	.46
Average H	.46	.22	.22	.22	.46
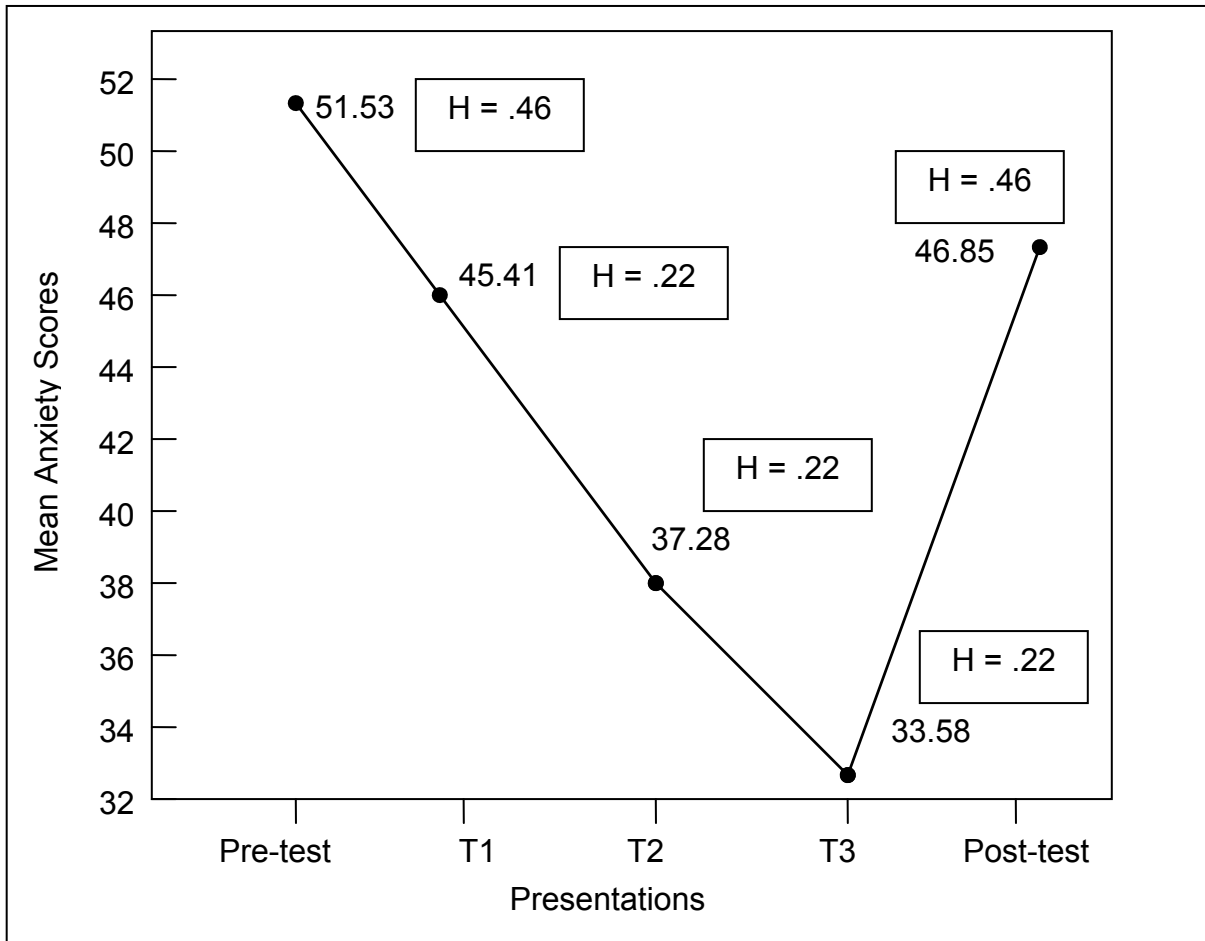
Figure 9. Mean anxiety scores and entropy tracked over the presentations.

Discussion

The purpose of this chapter was to investigate why speakers experienced a peak in anxiety during their post-test presentations in the experiment conducted in the previous chapter. This chapter was interdisciplinary and exploratory in nature. While previous communication scholars have examined various contextual factors believed to increase public speaking state anxiety, they have not attempted to measure the amount of information in the speaking environment in order to determine if there is a relationship between information and public speaking state anxiety. Thus, this chapter borrowed

theory and method from the field of information science to examine whether information (in Shannon's sense) could perhaps help explain the increase in anxiety which seems to be contrary to what EPT (Foa & Kozak, 1986) would suggest.

Using Shannon's entropy measure, this chapter indicates that there was more information (defined as a measure of one's freedom of choice when selecting a message) in the classrooms in which the pre and post-test presentations were delivered than in the rooms in which the treatment presentations took place. In order to determine the effect of information in the public speaking context, information was compared to mean anxiety scores from the previous experiment. Results revealed a direct positive relationship between anxiety and information.

One way to interpret the peak in anxiety during the final presentation would be based on the relationship between information and anxiety. Based on these exploratory findings, students experience the most anxiety in environments with the most information. Thus, anxiety might have increased during the final presentation because of the increase in information. While further research is needed to confirm the relationship between anxiety and information, the results are promising. If there is indeed a relationship between information and anxiety, individuals interested in using exposure therapy to combat public speaking state anxiety would need to take into consideration information when designing treatment sessions.

If there is a direct relationship between anxiety and information, one might ask additional questions. First, why did students report less anxiety in the post-test presentation than in the pre-test presentation if they were in the same environment with the same amount of information? In addition, why did students report experiencing less

anxiety in each treatment presentation if there was the same amount of information in each room?

To answer these questions, one has to once again consider Anderson's (2006) FOC approach and Foa and Kozak's (1986) EPT. According to FOC, the stimuli in a speaking environment have function on the speaker's behaviors and reports of public speaking anxiety. In addition, those stimuli have function on behavior (and reports of anxiety) in future speaking events. Anderson refers to stimuli that have function in subsequent events as historical factors. Historical factors play a role in future situations; thus, historical factors likely played a role in the post-test presentation. Some of the stimuli from the first speaking environment (pre-test) were likely present again during the post-test presentation. If a speaker had a positive experience with those stimuli during the pre-test presentation, the student might not perceive them as threatening in the post-test presentation. Thus, one would expect students' reports of anxiety to decrease. Similarly, EPT (Foa & Kozak, 1986) suggests that the consequences of one speaking event affect future speaking events, and if an individual has a positive experience when exposed to a threatening stimulus in one situation, the results will carry over to future events and help to decrease anxiety. Hence, when the environment is held constant, exposure therapy appears to help decrease public speaking state anxiety.

The results of this study should be interpreted with some caution. The environmental stimuli selected and measured in this chapter (i.e. distance zones, room size, evaluation factors and audience size) were either averaged or did not vary. In order to get a more precise measure of entropy, future research will need to select

environmental stimuli that do vary between speeches and exact numbers should be used instead of averages. However, since this was a first attempt at measuring entropy in a speaking environment, this approach was deemed acceptable. The purpose was simply to begin exploring the feasibility of calculating the amount of information in a speaking environment and to determine if there was a relationship between information and anxiety.

This chapter suggests it is possible to calculate the amount of information in the speaking environment using entropy. Thus, the next step is to determine exactly which stimuli should be measured in order to increase the predictive validity of public speaking state anxiety. As the preceding literature review indicates, there are a number of other situational determinants that likely play a role in increasing public speaking state anxiety; however, it unclear exactly which stimuli speakers perceive contribute to their anxiety. As Hayes (1991) points out, it is important to recognize the significance of the signal to the receiver (without discrediting the statistical issues involved in message transmission). In order to determine the significance of the environmental stimuli to the speakers, the next chapter will ask the speakers to explain which factors they felt caused their public speaking anxiety during a traditional one-shot presentation and the TRIPLESPEAK presentations.

CHAPTER 5

PERCEIVED ENVIRONMENTAL STIMULI

In the preceding chapter, four categories of situational stimuli (i.e. audience size, room size, distance zones and evaluation factors) were investigated to determine if there was a functional relationship between information and self-reported public speaking state anxiety. While a strong positive relationship did exist between the two, there are likely several other situational stimuli contributing to self-reported public speaking state anxiety that were not considered. In addition, at this time it is unclear if speakers perceive the four categories used in the previous chapter to have function on their public speaking anxiety levels. Thus, this chapter seeks to determine the stimuli in the speaking environment that have function on speakers' self reports of public speaking anxiety, from the speakers' point of view.

The overall goal of this chapter is to gain insight into the public speaking experiences of students in a basic communication course. In this chapter, the research design, method, and analysis are explained. The results are presented along with a discussion of the findings based on FOC and current communication studies research

The following research questions will guide the study:

RQ4: What stimuli play a role in augmenting students' self-reported public speaking state anxiety during traditional one-shot presentations?

RQ5: What stimuli play a role in augmenting students' self-reported public speaking state anxiety during TRIPLESPEAK presentations?

Method

Research Design

This chapter used a qualitative design (Gall, Borg, & Gall, 2006). Focus groups

were conducted to examine students' perceptions of the environmental stimuli that had function on their public speaking state anxiety levels. A focus group is "a facilitator-led group discussion used for collecting data from a group of participants about a particular topic" (Keyton, 2006, p. 276). According to Morgan (1997, p.6), "it is the researcher's interest that provides the focus, whereas the data themselves come from the group interaction." A facilitator uses a discussion guideline to lead a series of questions designed to prompt participant interaction (Keyton, 2006). Focus groups can be used as a self-contained method for collecting data, used as a supplementary source of data, or can be used in multi-method studies that combine two or more means of gathering data (Morgan, 1997). Focus groups have been used effectively by communication scholars to learn more about high communication apprehensives (Lederman, 1983; Proctor, Douglas, Garera-Izquierdo, & Wartmann, 1994).

Focus groups provide insight into participants' experiences and opinions, and a detailed description is obtained through the comparisons the participants make among each other's experiences and opinions (Morgan, 1997). Participant interaction increases response potential through synergism, snowballing, stimulation and security (Stewart & Shamdasani, 1990). There is no attempt for the group to reach consensus in a focus group; instead, participants are encouraged to openly agree and disagree with other participants' perceptions and opinions (Keyton, 2006).

Human Subjects Approval & Participants

Before the focus groups were held, permission was requested from both the cooperating institution's Institutional Review Board as well as the University of North

Texas' Institutional Review Board respectively to use human subjects. Once the project was approved (see Appendix C), participants were recruited from a basic communication course at Texas Christian University (i.e. the cooperating institution). Participation was voluntary.

The participants in this study included students enrolled in the basic speech communication course during the second eight-week term in spring 2007. Part of the course requirement included presenting a traditional one-shot presentation at the beginning of the semester and TRIPLESPEAK presentations mid-semester (descriptions of each are provided in the previous chapter). Students who had completed these assignments were invited to participate in a focus group. Only those who had completed the assignments were asked to participate in a focus group because the purpose was to gain insight into the students' perceptions and experiences regarding these two public speaking assignments. Students who had not completed these two required presentations were given an alternative extra credit assignment. Students were awarded five points extra credit for participation.

According to Morgan (1997), researchers should hold 3 to 5 focus groups per research study to allow for saturation. Saturation is when additional data collection no longer generates new understanding (Glaser & Strauss, 1967). Morgan (1997) recommends determining a target number of focus groups during the planning stage but to have a flexible schedule so that additional groups can be added if saturation is not obtained. This study planned for 4 focus groups, and since responses in the 4 focus groups were similar, suggesting saturation, no further focus groups were held.

A focus group is typically 5 to 10 people (Krueger & Casey, 2000); however, Morgan (1997) recommends over-recruiting by 20%. Thus, this study recruited 8 to 12 students for each focus group. In order to maximize participation, 4 different time periods over 2 days were offered. Students chose to participate in the focus group that worked with their schedule. A total of 29 students (14 males and 15 females) participated in the focus groups. Each focus group consisted of 6 to 10 students.

Limitation

One limitation is worth noting at this point. The students who participated in the focus groups in this chapter were not a part of the sample who participated in the quasi-experiment discussed in the preceding chapter. The participants in this chapter included students enrolled in the basic communication course during a different eight-week term. They completed a traditional one-shot presentation and the TRIPLESPEAK assignment. The one-shot presentation took place prior to the TRIPLESPEAK assignment. They did not complete the post-test traditional one-shot presentation due to time constraints. Thus, in order to determine whether the students used in this study were drawn from a similar population as the students used in the previous study, TRIPLESPEAK assignment anxiety scores were compared.

A 3 X 4 mixed design factorial ANOVA was obtained to examine the combined and unique influences of exposure (Exposure 1 X Exposure 2 X Exposure 3) and the public speaking state anxiety milestones (Anticipation X Confrontation X Adaptation X Release) for each of the TRIPLESPEAK presentations. Analysis involved 74 students (n = 74). Means and standard deviations are presented in Table 12. The results of the two-

way ANOVA revealed a significant main effect for the TRIPLESPEAK speeches, $F(1.42,$ 103.68) = 59.20, $p < .001$ and a significant main effect for the four milestones $F(1.86,$ 135.87) = 66.32, $p < .001$. There was not a significant two-way interaction between the TRIPLESPEAK speeches and the public speaking milestones, $F(4.09, 298.52) = 1.38,$ *ns*. Greenhouse-Geisser was used for the analysis (Girden, 1992).

The analysis yielded similar results to the previous study. Specifically, students reported experiencing the most anxiety during their first TRIPLESPEAK presentation with a continual decline for the remainder of the presentations. Anxiety peaked at the beginning of each TRIPLESPEAK presentation and decreased as the speech progressed. Thus, the students are assumed to be drawn from similar populations.

Table 12

Mean Anxiety Scores (and Standard Deviations) for Triplespeak Presentations over PS Milestones

PS Milestones	T1	T2	T3
Anticipation	48.51 (11.62)$_a$	44.45 (12.82)$_b$	38.59 (13.41)$_c$
Confrontation	48.22 (13.50)$_a$	43.50 (12.77)$_b$	37.53 (13.38)$_c$
Adaptation	42.80 (13.50)	39.13 (12.84)	35.17 (13.28)
Release	39.78 (13.89)	34.68 (12.58)	30.43 (12.22)

Note. Numbers in parentheses are standard deviations. Means with the same subscript are not significantly different at $p < .05$.

Location and Time

The 4 focus groups were held at the end of the term, after the students had completed the presentations. According to Morgan (1997) a focus group should last 1 to 2 hours, with a good rule of thumb being to plan for a 90-minute session. Each focus

group in this study lasted approximately 90 minutes. The first 15 minutes involved the facilitator: 1) introducing the study, 2) explaining the consent form and giving participants time to sign, and 3) reviewing the guidelines for participating in the focus group. The last 10 minutes of the focus group involved a debriefing session and a time for participates to ask questions related to the study.

All the focus groups were held in the same location, which was a conference room located in the Center for Instructional Services on the campus of Texas Christian University. This room was selected because it was equipped with high quality audio and video recording equipment, and student workers were able to operate the recording equipment behind a two-way mirror. The consent form the students signed prior to participating in the study explained the focus group would be recorded. The recordings were later transcribed verbatim for analysis purposes.

Focus Group Procedure

I served as the facilitator in all the focus groups. I begin each focus group by explaining the purpose of the study, distributing the consent forms, and carefully covering the guidelines the students were expected to follow while participating in the focus group. The guidelines included:

1. You are responsible for generating and sustaining your own discussion
2. Use effective conversation skills
3. Only one person should speak at a time
4. There should be no side conversations among neighbors
5. Everyone should participate

6. If you notice someone hasn't contributed, take a leadership role, and ask their opinion

7. You are not trying to reach consensus

8. Don't be too terse; provide examples

9. Discuss one idea before brining up a new idea

Once the consent forms were signed and collected and all students' questions had been answered, I began the focus group. The research questions listed above served as the primary questions posed during each focus group. I asked the questions and then encouraged the students to talk freely and interact with one another. I took notes as they conversed. I only participated in the conversation when the group hit a lull (e.g., the group looked at me, unsure of what to do). When this happened, I asked questions to probe further about something that had already been alluded to but not discussed in any detail.

Analysis

After the focus groups, each focus group recording was transcribed verbatim. The transcripts were then coded and analyzed for categories. According to Lindlof and Taylor (2002), categories can be derived in one of three ways: 1) examining existing theory and research for categories and applying them to the data in a deductive manner, 2) applying standard demographics, institutional labels, or widely used pre-coded topics 3) using the inductive process of analytic coding. Given that a number of factors already exist in the current communication literature (Bippus & Daly, 1994; Buss, 1980; McCroskey, 1984; Proctor et al., 1994), this project used the first of the methods;

however, items were not forced into pre-existing categories. New categories were created when appropriate and necessary.

The analysis required several steps, and two research assistants helped with this process. First, the three of us met to discuss a list of anxiety inducing factors specified in the current literature and determined a suitable working definition. Second, we read through the transcripts several times individually, coding statements based on the pre-existing factors and noting when a statement was perceived to be different from the previously established factors. Third, we met to discuss the results. Disagreements were resolved by discussing the item until all were in agreement regarding the appropriate descriptor. When a statement did not fit into one of the established factors, a new factor was devised and agreed upon by all. Factors were then placed into appropriate descriptive categories. Finally, we determined exemplars for each factor, which are presented below by research question.

<center>Results</center>

The transcripts from the four focus groups were coded and placed into identifying categories. Four broad categories emerged for both types of presentations. They included 1) speaker concerns, 2) audience characteristics, 3) contextual factors and 4) assignment criteria. See Table 13 for a list and explanation of all the factors.

RQ4: What stimuli play a role in augmenting students' self-reported public speaking state anxiety during traditional one-shot presentations?

Table 13

Students' Perceptions of the Sources of Anxiety during the Traditional One-Shot Presentation

Categories		Description
Speaker Concerns	Conspicuousness	speaker mentions the high visibility associated with delivering a speech in front of an audience; being exposed
	Preparation*	speaker doesn't feel adequately prepared
	Physical Appearance*	speaker is concerned with physical appearance; speaker experiences physiological sensations and worries the audience will notice
	Mistake	speaker slip-ups; forgets part of speech
	Worry*	speaker expresses self doubt; concerned about messing up or being rejected by others
Audience Characteristics	Size	number of people in the audience
	Unfamiliarity*	audience isn't well known by speaker
	Dissimilarity*	a noticeable difference exists between the speaker and audience members
	Audience behavior*	audience fails to give feedback, gives inappropriate feedback, does something to distract the speaker, or ignores the speaker
	Degree of evaluation*	extent to which the audience is judging the speaker; outcome of the judgment
Contextual Factors	Characteristics of room*	distance between the speaker and the audience members; dimensions of the room; formality of room
	Novelty*	ambiguity about what to expect and how to respond
	Previous speaker	anxiety created by watching the previous speaker perform really well, make a mistake, or appear nervous
Assignment Criteria	Formality	presentation involves highly prescribed behaviors
	Visual Aid*	speaker lacks confidence using his/her visual aid, is not satisfied with his/her visual aid, or experiences a problem associated with visual aid
	Topic*	speaker dislikes topic, finds topic difficult to explain, or lacks first hand experience with topic
	Time*	speaker is concerned about meeting the time requirements

Note. Items with an * were mentioned in at least 3 out of the 4 focus groups.

Speaker Concerns

Several factors related to the speaker emerged during the focus groups. Feeling unprepared to deliver the presentation, concerns about physical appearance, and worries related to messing up or being rejected by the audience were alluded to in all four focus groups. The other two factors, conspicuousness and making a mistake, were mentioned in two of the four groups.

Preparation

The first factor, preparation, is related to how prepared the speaker was to deliver the presentation. If the speaker did not have time, or chose not to adequately prepare for the delivery of the traditional one-shot presentation, he/she reported feeling an increase in anxiety. For instance, two students made the following comments:

> For me, it was like I was just under prepared because the two nights before were like a Monday night and a Tuesday night and I was real sick throwing up and stuff so I couldn't look over my notes. I stayed up. I ended up getting better like at 6:00 a.m. I was writing notes and trying to figure things out. That really wasn't fun at all. I was nervous.

> I knew the first half of my speech I practiced a lot and I was more comfortable with that, but the last half of my speech I didn't practice as much so I was more nervous as I progressed in my speech.

Physical Appearance

The second speaker concern contributing to anxiety involved the speaker's physical appearance. If the speakers didn't feel comfortable with their attire or they experienced a physiological symptom associated with presenting in front of an audience and were concerned the audience would notice it, the speakers reported experiencing

an increase in public speaking state anxiety. The following comments were made during

the focus groups:

> I couldn't find my suit socks that night so I had white socks and was wearing them. I was like, "Dude, everybody knows." I kept looking down to see if you could see my socks. I tried to fix my pants and stuff, so I was really anxious.

> I was nervous because of my outfit. I didn't have the stuff I wanted to wear. I didn't have my pants or skirts. I had to make them match and I hated it. I hated my clothes. I thought, "Don't look at me." People would say, "You have cute shoes." I was just like, "No, it's not cute. I hate my outfit. It's not business. It's just there."

> In the first speech I felt like everything was wrong with me. My whole neck, my face — I got so red. Just like random blushes so it was like some disease. I knew that was going to happen because that happens to me all the time. If I get nervous, I can feel it. My face gets red and I notice random spots. It just looks weird. Then my voice got shaky. I know that, but after I asked people, they had no idea. "I couldn't tell your voice was shaky." Also, my hands were shaking. I could see my note cards shaking, but when I asked people after my speech, no one else noticed that either – it made me feel better.

Worry

The third factor related to speaker concerns was worry. Several students

expressed experiencing anxiety associated with self-doubt, specifically worrying about

making a mistake while delivering the presentation. Comments included:

> I was anxious about "just what everybody is nervous about when giving a speech, afraid of messing up, afraid of saying something wrong like the way you aren't supposed to say it or leaving out stuff. Just basic worries of speech.

> I entered the presentation with an initial feeling that I'm just going to do bad. I'm a horrible speaker. I don't like to speak in front of people. People make me nervous.

Conspicuousness

The fourth factor that emerged related to speaker concerns was

conspicuousness, anxiety associated with being visible to the audience. A number of

students were concerned about being the center of attention, about all eyes being on them. Students remarked:

> We started off in the semi-circle type room. You feel like all the attention is on you.

> It was the most formal of all the presentations because you're up there by yourself. We had a semi-circle and everybody was looking directly at you.

Mistakes

The final factor related to speaker concerns involved the speaker making a mistake. This factor is different than worrying about possibly making a mistake, for it concerns the student actually messing up during the speech, which in turn increased his/her anxiety. Students expressed:

> When I messed up and just played it off, I felt like they knew that stuff even though they didn't. That made me even more nervous and I kept messing up.

> It's like ice-skating. Once I mess up, that ruins it.

Audience Characteristics

Consistent with past research (Buss, 1980; McCroskey, 1984; Proctor et al., 1994), this study indicates the audience played a large role in increasing state anxiety. Unfamiliarity, audience behaviors, and degree of evaluation emerged in all four focus groups. Dissimilarity surfaced in three out of the four, and anxiety associated with the size of the audience was discussed in two of the four groups.

Unfamiliarity

The first factor, unfamiliarity, pertains to the speaker not knowing the audience

members. Several students mentioned they experienced anxiety because they didn't

know anyone in their class. Students stated:

> On the first presentation, I didn't know anyone in the class yet, so I was really
> uncomfortable since I didn't know anyone. I just really talk to people I know better.
> I'm more comfortable.

> I've been giving speeches — I was in a leadership class my senior year and I was
> really comfortable giving a speech because I knew everyone there. I guess
> because I didn't know the people in this class, it made me really nervous…If I'm
> giving a speech to somebody I haven't really met at all and am worried about
> them as human nature is, you're worried about them judging you if you've never
> met them for the first time. That's why the first one is definitely the hardest one
> for me.

Interestingly, some students indicated they experienced anxiety when there was

someone in the audience they knew really well because they were concerned with what

the audience member would do during the presentation (e.g. make them laugh) or say

after the presentation related to their performance. This is consistent with McCroskey

(1984), who suggested "in general, as the degree of familiarity increases, the degree of

CA decreases… however, some people are most uncomfortable when communicating

to similar peers, because they are more concerned with the evaluations such people

make than they are with people who are very different from themselves" (p. 25-26). It

appears knowing someone in the audience really well or being unfamiliar with one's

audience increases state anxiety.

Audience Behaviors

The second factor related to audience characteristics involves the way the

audience members behave during the presentation. Speakers experience an increase

in anxiety if they are ignored by the audience, if the audience members fail to give

feedback or give inappropriate feedback, or if someone in the audience does something

to distract the speaker. Students explained:

> I had a lot of trouble because of my roommate in my class. He tried to sit in the front row and stare at me the whole time and just pull roommate stuff. Basically, he would just make me nervous and crack up a few times.

> Everybody else in my class except for our friends and stuff were looking down and drawing or playing on their cell phone. That bugged me. I was kind of like, "Hey, I'm doing something for you guys. I worked hard on this. Pay attention at least.

Degree of Evaluation

The third factor related to the audience, degree of evaluation, involves the extent

to which members of the audience are judging the speaker's performance, and the

outcome associated with the judgment. Students indicated that both the instructor

grading the speech and their peers' judgments contributed to their anxiety. They said:

> I was kind of nervous partly because my cousin was in the audience. He knows what I'm capable of and what I'm not capable of, so I thought he was sitting there judging me and he's going to go home and tell his parents.

> I don't normally have a problem giving public speeches because I've gone to banquets and given speeches, but what made me more nervous was having the course instructor in room actually grading it.

Dissimilarity

Dissimilarity refers to any noticeable difference that exists between the speaker

and the audience members. A few students indicated their anxiety increased because

they were concerned about the difference. They suggested:

> English is my second language, so I don't want to mess up and I don't want people to make fun of me if I confuse my words.

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I always get more nervous when I am speaking in front of somebody older even though it is my course instructor.

I was one of two sophomores in the class.

Audience Size

The final audience factor involved the size of the audience. There appear to be some individual differences when it comes to this factor. Some students indicated they felt more comfortable speaking to a small audience (TRIPLESPEAK presentations) whereas other students indicated they felt more comfortable speaking in front of a large audience. The students that experienced more anxiety because of the large size of the audience were concerned about the number of eyes on them, the number of people evaluating their performance, and not really making a connection with anyone. Examples related to increased anxiety because of the large size of the audience during the traditional one-shot presentations included:

> I think the connection to the audience - that made me have a lot of anxiety. I didn't have that connection with the audience. I wanted to connect to everyone, but I couldn't because it's a class of 30 students. You can look at every single person in a class of 30, but you can't connect with that person, that person and that person.

> I'm more comfortable talking to a smaller group than a bigger group.

Context

The speaking environment in which the one-shot presentation was delivered also played a role in increasing students' state anxiety levels. Novelty regarding the context was mentioned in all four focus groups, characteristics of the room was discussed by

three of the groups, and anxiety related to the *previous speaker* was alluded to in two of the focus groups.

Novelty

Novelty, ambiguity about what to expect or how to respond, was one of the primary factors related to the context which triggered an increase in anxiety. Students reported being anxious either because they were the first to present, it was their first presentation, or because they hadn't delivered a presentation in a long time. Students remarked:

> I think for me, one thing was that it was on the first day, so I had no idea. I hadn't seen anyone else really go except a few people before me so that was kind of nerve-wracking.

> I think probably everyone would agree the first one was the hardest because you don't know what to expect.

Characteristics of the Room

The second factor pertaining to the context involved the characteristics of the room in which the presentation was delivered. Students attributed some of their anxiety to the circular room and the formality of the room. They stated:

> I didn't like the room because it was circular. The people were sitting right there by you. You want to make eye contact with them. I was thinking the whole time that I had to make eye contact with these people, and then I would be thinking about it so much that I would forget what I was supposed to say while I was doing it. I don't know why but I didn't like the circular room at all and how close everybody seemed.

> I think being behind the podium makes me more nervous. It makes me less nervous in the sense that they can't see what you're doing like fiddling with your hands and stuff like that but it makes you feel a lot more professional and when you're in the front and everyone else is out at you, that makes me a lot more

nervous rather than TRIPLESPEAK or something like this wouldn't make me nervous at all.

Previous Speaker

Consistent with previous research regarding the contagion effect (Behnke,

Sawyer, & King, 1994), the performance of previous speakers elicited some anxiety.

Students reported experiencing more anxiety if a previous speaker performed

exceptionally well, if a previous speaker made a mistake that was obvious to the

audience, or if a previous speaker appeared nervous. Specific comments included:

> I think it was the waiting for it [my presentation]. I was one of the last ones to go. A couple of guys in front of you give a real good presentation, and you've maybe lost confidence about yours. You experience anxiety as you're watching their presentation. You're just kind of sitting there wanting to get it over with.

> Especially if you're not as confident about your visual or maybe the content of your actual speech that it made you lot more nervous when you would see people with good graphics or had a lot of confidence. It kind of made you a lot more nervous.

> Even though I got to watch half the class go before I went, watching them mess up before me made me more nervous just because I thought that was what I was going to look like.

Assignment Criteria

The final major category associated with an increase in anxiety during the

traditional one-shot presentations involved the speech assignment. Anxiety associated

with the visual aid as well as the topic was mentioned in all four focus groups, anxiety

pertaining to the time requirements was alluded to in three of the groups, and *formality*

of the speech was discussed in two of the four groups.

Visual Aid

The first factor that emerged related to the assignment criteria involved the use of a visual aid during the traditional one-shot presentation. Students were required to use a visual aid of their choosing. Students reported experiencing an increase in anxiety if they disliked their visual aid, they weren't confident using their visual aid, or they experienced a problem with their visual aid during the speech. Examples included:

> I had a poster board with statistics on there - that was pretty much it. I had bar graphs on there and I thought it was really boring.   Nobody likes mine.

> Also, my visual aid did not work, so all the attention was on me instead of on the visual aid. That kind of sucked.

> I hadn't ever used PowerPoint since middle school in my speech class. I never used it in high school, and so I didn't really know what to do. It was kind of difficult for me to incorporate my PowerPoint into my speech because I'd done it five years ago in middle school. I wasn't really prepared for that. I was concentrating looking back and forth. Am I on point? How should I be taking this?

Topic

Second, students reported that the topic of their presentation contributed to the amount of anxiety they experienced during their traditional one-shot presentation. They suggested that not liking the topic, finding the topic difficult to explain, and/or not having first hand experience with the topic caused anxiety. Examples included:

> I think another thing that contributed was I just really didn't care about what I was talking about. If I was to get up there and talk about something that interested me, I could talk forever and I would never forget what I was going to say because I talk about it all the time. But this was just a random topic thrown at you and it was like, "Okay, talk about it. Research it, read books about it." There was no motivation to do that because you don't care except for you want an A in the class. I think that contributed to it.

> That wasn't my problem. I really didn't know anything. I did cosmetic surgery, and I thought I would go — I'm not interested in it or anything, but I feel more

comfortable talking about my experience. I guess that's how it was with our TRIPLESPEAK. We got to pick our favorite city. That was much easier to talk about because I had experience with that, but the other topic I didn't know anything about it and didn't have any experience, so I knew that was a problem for me.

It's a lot easier to construct a speech out of something you already know about instead of researching something that you don't know about and then making a speech for that. You're not sure of yourself at all.

Time Requirements

The third factor students suggested contributed to their anxiety was the time requirement. The traditional one-shot presentation was a five minute speech; thus students were expected to stay between 4:30 and 5:30 as part of the requirements for the presentation. One point was deducted for each additional 30 seconds the student went over or under the time limit. If students went more than two minutes over the time limit, the instructor would intervene and ask the student to wrap up the speech immediately. This rule was in place to ensure all students would get to present on their assigned day. Students remarked:

The time limit. I was nervous that I was going to be over or under. I practiced so many times, but I was so nervous.

I think a wider range of when you can finish would be better on the first one because that was one of my first timed speeches. I gave a couple in high school, but it didn't really matter. If you were close, in high school it didn't really matter. It was a little more stressful because when I was practicing, I came up really long the first time. I eventually narrowed it down, but a bit of a wider time range on the first one definitely would have eased a little bit of the anxiety.

I was actually really nervous about meeting my time as well as all the information at the same time.

Formality

The final factor related to the assignment that emerged during the focus group

discussion was the formality of the speech. McCroskey (1984), suggested formality

referred to a situation involving "highly prescribed appropriate behaviors" (p. 25). In

relation to this, students stated:

> I had all these facts that I'd researched and felt like I had to get everything out. I
> felt like I was on this schedule and get everything I could list, all these separate
> points, and if I didn't do it, then somehow I hadn't done very well in the speech.

> I came to a halt in my presentation when I had to cite resources. It's just a
> hindrance and it distracted me a lot from my presentation.

> One thing I've noticed that caught me off guard was how formal all these
> presentations had to be. I have a problem with public speaking, but I didn't know
> there were so many specific guidelines I had to follow. It was a little difficult having
> to critique my speech so I could fit the certain guidelines into the presentation.

RQ5: What stimuli play a role in augmenting students' self-reported public speaking
state anxiety during TRIPLESPEAK presentations?

The same four categories (i.e. speaker concerns, audience characteristics,

contextual factors, and assignment criteria) and many of the same factors students

alluded to in relation to the traditional one-shot presentation surfaced during the

discussions of the causes of anxiety during the TRIPLESPEAK presentations. There

were some differences as well. The contributing factors are presented by category in

Table 14.

Table 14

Students' Perceptions of the Sources of Anxiety during the TRIPLESPEAK Assignment

Categories	Factors
Speaker Concerns	Conspicuousness*
	Preparation
	Worry
	Prior history*
Audience Characteristics	Size
	Unfamiliarity
	Dissimilarity
	Audience behavior*
	Degree of evaluation*
Contextual Factors	Characteristics of room
	Novelty*
Assignment Criteria	Visual Aid
	Topic
	Time*

Note. Items with an * were mentioned in at least three out of the four focus groups.

Speaker Concerns

Fewer factors related to speaker concerns for the TRIPLESPEAK presentations transpired compared to the traditional one-shot presentation. Conspicuousness, preparation, and worry were alluded to again, but *c*onspicuousness was the only factor mentioned in at least three of the four groups. Preparation was discussed in two of the groups and worry in one. Two factors mentioned during the traditional one-shot presentation discussion, appearance and mistake, did not show up during the

TRIPLESPEAK discussions. A new factor, prior history, transpired, and it surfaced in all

four focus groups.

Conspicuousness

Students indicated that conspicuousness was one of the major causes of their

state anxiety during the TRIPLESPEAK presentations, and it seemed to play a larger

role than it did in the traditional one-shot presentations. This was likely because there

was no podium in the TRIPLESPEAK rooms for the students to stand behind; thus, they

might have felt more exposed. Students commented:

> With the TRIPLESPEAK, of course they're going to be looking at you. Five people
> and you're the only one standing up. Everybody's looking at you or at least you feel
> that way.

> It's kind of awkward when you're standing up there with nothing if front of you
> and just everybody looking right at you.

> These eyes would just be staring at you the entire time. There was no way to get
> around their looking at you. You know they're paying attention to every move. I
> have asthma, and so if I get really nervous or even if I don't, I just start breathing
> really, really hard. If I'm speaking to a small group, and I feel like I have to take a
> breath, it's not just going to be a breath. It's going to be like they're taking a break
> and watching and noticing everything that I'm doing.

Preparation

Preparation didn't seem to be as big of a factor for the TRIPLESPEAK as it was

for the traditional one-shot presentations. This was probably because of the nature of

the speech. For the TRIPLESPEAK presentations, students were asked to talk about

their favorite city. They didn't have to include any research, and most likely had first

hand experience they could discuss in their speech. However, a few students did mention they felt like they didn't practice enough before the speech.

Worry

Similarly, worry wasn't mentioned as much during the TRIPLESPEAK presentation discussions as it was for the traditional one-shot presentation. At this time, it is unclear why this might be. It could be that the TRIPLESPEAK presentation didn't weigh as heavily in terms of the grade for the class, the previous speech may have gone well so students worried less about the TRIPLESPEAK, or worry could have been incorporated into some of the other statements and coded as different factors. While the categories in the study are believed to be mutually exclusive, some of the statements made by the students were lacking in detail. Without a detailed explanation from the students, the factors had to be coded based on our best understanding of what the students were describing.

Prior History

Prior history emerged as a cause of anxiety for the TRIPLESPEAK presentations, but it was not alluded to during the discussions for the traditional one-shot presentations. McCroskey (1984) discusses prior history in terms of the speaker's previous negative and positive speaking experiences. Statements referring to anxiety caused by a previous negative event were coded as prior history. Students who messed up during a TRIPLESPEAK presentation suggested they were more nervous for their next TRIPLESPEAK presentation because of their previous experience. It is

interesting this factor didn't transpire during discussions of the traditional one-shot

presentation. There could be several reasons for this. Possibly the students in this study

never had a negative speaking experience, maybe their negative experiences

happened so long ago they didn't make the connection, or maybe they didn't feel

comfortable sharing their negative experience during the focus group. In relation to the

TRIPLESPEAK presentations though, students stated:

> Personally, my anxiety increased during 2 and decreased during 3. It increased mainly because I wanted to hit the time limit like I did in the first one and I wanted to fix all my errors that I did in the first one. That kind of made me think about it a bit more before I did my second. Maybe got a little nervous that I wasn't going to hit it as perfect.

> On the first, I was over, and so for the second one I was worried about how long to go. The whole time I was thinking about that. I wasn't thinking about other people in front of me and making eye contact. I was just thinking of time and keeping a good pace. That was kind of nerve-wracking.

Audience Characteristics

Like for the traditional one-shot presentations, students indicated that the

majority of their anxiety during the TRIPLESPEAK presentations was caused by the

audience. Audience behavior and degree of evaluation were mentioned in all four focus

groups, audience size was mentioned in two, and unfamiliarity was only mentioned in

one. Dissimilarity was not mentioned in any. No new factors emerged.

Audience Behavior

In regards to audience behavior, students commented:

I liked the fact that friends were there, but it was weird not having them talk back to you. You're always used to your friends commenting on something you say or

something like that and when they can't do that, it makes it a more tense, nervous situation. You think - "I guess they don't like what I'm saying.

Then the third one — I went in there not as nervous because the second one had gone so well, but then once I didn't really get any feedback from them, it increased again.

I had one group where the people were talking while I was talking. It was like, "Why are you talking? I'm supposed to do a presentation?" Later on, I think they laughed at something and I didn't know if it was on me or not? My words started coming out really weird. I started to forget where I was going with it. "Okay, what city am I talking about?" It really depended on the audience, the people that were in the room.

In one my speeches one girl actually interrupted me and said, "You're reaching your time limit right now," because she had actually been keeping time. At first I was, "Okay. I'll just finish up here." It was kind of awkward because I didn't know she was timing me. She said, "Yes, you're about four minutes right now, so you might want to stop." I said, "Okay, but I'm not done yet." I just kept going. That just made it kind of awkward. I wasn't expecting that and it took me by surprise.

Degree of Evaluation

Although there was not an evaluator in the room grading the TRIPLESPEAK

presentations, students were still concerned about how their peers were evaluating

them. This seemed to contribute to a lot of their anxiety. They remarked:

I gave my speech the last day. We had three days for it, so mine was on Friday, and our group was really critical on those who were doing speeches. We tried to analyze like, "How was this? How was that?" When I went in there, I was, "Oh, my Gosh. They're going to be so critical of me now." It's kind of like talking behind my back. I wondered what they were saying. I wanted to know what they were thinking.

Sometimes it made you feel like a stare, like the way they looked at you, like if they're holding their pen and going back and forth in their chair and looking at you. It's like they're contemplating and it makes you think, "I wonder what they're thinking right now?" I just think that specific look …If they're making fun of the way I'm speaking, if I'm being girly and talking about shopping too much. When it comes to girls, you're always wondering what girls are thinking when you're talking.

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Audience *Size*

As previously mentioned, some students indicated they felt more nervous speaking to a small audience than they did a large audience. Students who experienced more anxiety in the small audience were concerned about constant eye contact from just a few people in the audience and making eye contact with their audience members. They felt like the audience members had to pay attention to them because it would be noticeable and rude if they didn't give them their undivided attention. The constant, undivided attention made them nervous. Specifically, they said:

> For me, it was kind of awkward because I'd rather give a formal speech in front of a big group.

> Everybody here sounds like they were really comfortable with having to speak in front of four or five people, but that really freaked me out for some reason. I just thought that was really weird.

> I'd rather just have a bunch of people, a bunch of random people looking at me than just four or five people.

> I think something that can make a speaker more nervous is that there are only a few people sitting in the room and you'd feel rude if you were to look away. Like if you were in a normal size classroom you don't have to maintain consistent eye contact.

Unfamiliarity

Only one student, in one focus group, mentioned she felt nervous during the TRIPLESPEAK because she didn't know any of the audience members in one of the TRIPLESPEAK rooms. It may be that the students felt like they knew their classmates better by the time the TRIPLESPEAK presentations were delivered. Seeing each other deliver the traditional one-shot presentation might have helped increase familiarly.

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Context

Students reported feeling nervous about speaking because of the characteristics of the room as well as the novelty of the speaking environment. All four groups discussed the novelty factor and two discussed the characteristics of the room. Since the students did not get to view other speeches on the day they delivered their TRIPLESPEAK presentations, the previous speaker factor mentioned for the traditional one-shot presentation did not play a role in increasing the students' anxiety during the TRIPLESPEAK presentations.

Novelty

Novelty seemed to play a major role in increasing anxiety for at least the first TRIPLESPEAK presentation. None of the students had ever delivered a presentation in a small room such as the one used for the TRIPLESPEAK presentations. They didn't know what to expect, and the uncertainty contributed to their anxiety. The said:

> The thing that got me the most anxious was this was a completely new format for me. When I was going into it, I was nervous because I wasn't sure what to expect.

> I say that was the worst thing, that it's a completely new format. I wasn't sure what I was going to expect going in there like what kind of room it was going to be and stuff like that.

> For me, once again, it was the first presentation so I didn't realize it was right there. You're trying to give a speech to five people. The first one was kind of awkward.

Characteristics of the Room

The room in which the TRIPLESPEAK presentations were delivered seemed to

make some students nervous. Example comments included:

> I think the size of the room, the space, definitely made me a lot more nervous than the big classroom settings. It did feel like they were just right there on top.

> Having the proximity as far as eye contact. It was really hard to make good eye contact when the people are like right there. It seems a little weird because you're standing right there and the people are two feet away from you staring at you.

Assignment Criteria

Students reported that part of their anxiety was caused by the assignment criteria. Time was mentioned in three groups and topic and visual aid were mentioned in two of the four groups. Formality was not mentioned at all.

Time

The majority of the students' grade for the TRIPLESPEAK assignment was based on meeting the time requirement, not going over or under. After each presentation, the students learned their time. The students were encouraged to adapt their speech in order to meet the time requirement for their next speech if they hadn't met the time requirement for the previous one. At this time, it is not completely clear why time contributed to their anxiety. Their anxiety might have been related to a concern about their grade or could have been the result of negative feedback between the presentations. Students knew they would lose one point per TRIPLESPEAK presentation if they didn't meet the time requirement, and if they were concerned about their grade, this could have made them nervous. It could have also been that the negative feedback (e.g. you didn't make the time requirement) affected them. Future

research needs to explore the role of negative feedback and speech anxiety. In regards to time, students said:

> Making time was one of the most nerve-wracking things ever speech. I don't know how much you get counted off for not making time, but I know it was a chunk. That was my main goal in everything, to make time.

> Time was what I was worried about the most.

Topic

Although students were encouraged to deliver their TRIPLESPEAK presentation over their favorite city, only one student in each class could deliver a speech over each city. If a student's favorite city was already taken by another student, he/she had to choose a different city. Some students were not happy with the city they ended up selecting, and they reported that it contributed to their anxiety. They commented:

> It was harder for me to speak, to do my TRIPLESPEAK presentation because I wasn't as familiar with the town that I would like to be.

> I felt nervous about my topic because I'm from El Paso and I just did El Paso since I thought I'd feel more comfortable talking about it since I knew a lot about it. I went in and thought, "There's no way they're going to believe that El Paso is my favorite city." Not that it's bad or anything. Most people are like Orlando or some cool place and half of them haven't been there [El Paso].

Visual Aid

Students were not required to use a visual aid during their TRIPLESPEAK presentation although may of them chose to use one. A few that chose to use a visual aid ended up saying it added to their nervousness because they had not thought about how they were going to use it before delivering their speech. They said:

We had the option to bring a poster board - I did, and there wasn't really any place for us to put it except on another chair. It kind of made it awkward when you were speaking. You're trying to hold up your poster board at the same time you're trying to speak. You're directing your speech toward a chair. It was kind of awkward. Just the awkwardness contributed to a little bit of anxiety.

It felt funnier because my visual aid was on the table and I'm bending over while I'm talking and holding my note cards and then pointing at the pictures. It made me nervous.

Consistent with the findings in chapter two, students reported experiencing a decrease in public speaking anxiety with each additional TRIPLESPEAK presentation in most cases. However, students mentioned two reasons why they might have experienced an increase in either the second or third treatment presentation instead of experiencing the continual decline from one, to two, to three that the majority of students reported experiencing. First, if a speaker realized he or she did not stay within the time requirements for a previous TRIPLEPSEAK presentation, the speaker reported experiencing an increase during the next treatment presentation. This finding warrants further investigation as to why the student experienced an increase in anxiety. Was it because the student received negative feedback about his/her performance? The only feedback the speakers received between the presentations was in regards to their time. Was it because the student was concerned about his/her grade? If a student didn't meet the time requirement, he/she only lost one point. Would losing one point increase anxiety?

Second, the speaker reported experiencing an increase in public speaking anxiety if the audience members in one of the rooms gave the speaker inappropriate feedback or failed to give the speaker feedback. The students seemed to be more aware of and concerned about feedback during the TRIPLESPEAK presentations than

they were in the traditional one-shot presentation. The students indicated they felt more comfortable in the rooms in which the audience members gave them positive feedback (head nods, smiles, eye contact, laughter at the right time, etc.).

Along these same lines, students reported an increase in anxiety if someone they knew well was in one of the TRIPLESPEAK rooms. They felt anxious because they wanted that person to respond to what they were saying during their presentation like the individual would in a normal conversation. The students wanted both verbal and nonverbal feedback from their friends, and when they didn't receive verbal feedback, this increased anxiety.

Traditional One-Shot vs. TRIPLESPEAK

The purpose of this chapter was to determine which stimuli students perceived contributed to their anxiety during the traditional one-shot presentation as well as the TRIPLESPEAK assignment. Using focus groups, this chapter determined that the situational factors triggering state anxiety can be grouped into four categories 1) speaker concerns, 2) audience characteristics, 3) contextual factors, and 4) assignment criteria. Some of the factors under each category were consistent between presentations, but a few differed. See Table 15 for a comparison.

Not as many factors were perceived to contribute to anxiety during the TRIPLESPEAK presentations compared to the traditional one-shot presentation. The audience seems to be a major source of anxiety in both types of presentations, as does the novelty of the situation.

Table 15

Comparison of Students' Perceptions of the Sources of Anxiety during the Traditional One-Shot Presentation and the TRIPLESPEAK Assignment

Sources of Anxiety		Traditional One-Shot	TRIPLESPEAK
Speaker Concerns	Preparation	* * * *	* *
	Physical appearance	* * * *	
	Worry	* * * *	*
	Conspicuousness	* *	* * *
	Mistake	* *	
	Prior history		* * * *
Audience Characteristics	Unfamiliarity	* * * *	*
	Audience behavior	* * * *	* * * *
	Degree of evaluation	* * * *	* * * *
	Dissimilarity	* * *	
	Size of audience	* *	* *
Contextual Factors	Novelty	* * * *	* * * *
	Characteristics of room	* * * *	* *
	Previous speaker	* *	
Assignment Criteria	Visual Aid	* * * *	* *
	Topic	* * * *	* *
	Time	* * *	* * *
	Formality	* *	

Note. The * indicate how many focus groups discussed the source.

Discussion

In the previous chapter, audience size, room size, distance zones and evaluation factors were posited as environmental stimuli that might increase public speaking state anxiety. This chapter indicates that speakers do perceive all four of these factors to play a role in increasing public speaking state anxiety. However, there are some individual differences. While a majority of the students reported experiencing more anxiety because of the large room, some students reported more anxiety because of the small

room. Similarly, most suggested the large audience made them more nervous, but a few reported the small audience made them more anxious. Thus, it seems high entropy makes most people more anxious; however, low entropy makes some more nervous. Perhaps the variation in response is the result of some component stimulus and would require a finer grain model of the stimulus package. In order for communication scholars to really understand the effects of information on anxiety, future research will need to explore individual differences and use more precise entropy measures. Communication scholars have long recognized that some individuals experience more anxiety when presenting to a group, yet others experience more anxiety when speaking to just one other person (McCroskey, 1982). Could this be related to information?

Future research might begin exploring ways to measure some of the other situational factors that emerged in this study. For instance, based on the discussions in this chapter, the audience members play a large role in increasing public speaking state anxiety. One approach might be to videotape the audience members during presentations and analyze the videos using entropy formulae. Similarly, novelty is a major source of anxiety. Novelty, ambiguity caused by the newness and uniqueness of a situation, and entropy, a measure of one's freedom of choice when selecting a communicated message, are likely closely related. Future research should continue to explore this relationship in regards to public speaking anxiety.

Anderson's (2006) FO model was used to explain the relationship between environmental stimuli and reports of public speaking state anxiety. The FOC approach suggests environmental stimuli have function on behavior at a particular moment in time and continue to have function in future situations. This is clearly revealed in the

TRIPLESPEAK presentations. A student enters the first treatment presentation with a certain level of anxiety associated with speaking in front of an audience. During the first speech, the speaker encounters a number of environmental stimuli which influence his or her reports of anxiety. The speaker might report a decrease in anxiety if the audience members gave him or her positive feedback; however, the speaker might report an increase if the audience members gave no feedback. The speaker then enters the next presentation with an increased level of anxiety or a decreased level of anxiety based on his or her previous speaking experience. In addition, each new speaking environment has some of the same environmental stimuli as well as some new, different environmental stimuli. Thus, the speakers' reports of anxiety are based on the environmental stimuli in the current situation and the consequences of the environmental stimuli in the previous speaking situation(s).

CHAPTER 6

CONCLUSION

This project used an interdisciplinary approach to study the impact of exposure therapy on public speaking state anxiety. Theory and method from the fields of communication studies, information science, and psychology allowed a wider lens through which to examine a complex communication phenomenon – public speaking state anxiety.

Summary of Results

Stage one of this project involved a quasi-experiment. The purpose was to examine whether a multiple-exposure speaking assignment (TRIPLESPEAK) incorporated into a basic communication course could help reduce self-reported public speaking state anxiety. The results of the experiment were promising. The students who participated in the multiple-exposure assignment reported significantly less anxiety during their final speech of the term than did those who did not complete the assignment. Based on these findings, a multiple-exposure speaking assignment can be thought of as a type o*f instructional therapy* (Witt & Behnke, 2006) used in basic communication courses to aid in the reduction of public speaking state anxiety.

Upon first analysis, it appeared there was a negative relationship between speaking exposures and self-reported public speaking state anxiety. In other words, it seemed the more times a student delivered a presentation in front of an audience, the less anxiety he or she reported experiencing. However, after further analysis of the treatment presentations along with the pre and post-test presentations, an interesting

yet perplexing result emerged. Although the treatment group reported experiencing less anxiety during the post-test presentation than did the control group, there was not a significant difference between the treatment groups' reports of anxiety during the first treatment presentation and the post-test presentation. The students in the treatment group experienced a peak in anxiety (equivalent to their first treatment presentation) during their last presentation.

The second stage of this project explored this finding. The primary purpose was to establish whether the information in the speaking environments could be measured, for doing so would aid in determining the relationship between information and anxiety. Shannon's (Shannon & Weaver, 1949) information theory was employed to calculate the amount of information in the two different speaking environments. In addition, Anderson's (2006) FOC was used to explain the relationship between the speaking environment and students' reports of public speaking state anxiety. Entropy formulae for audience size, room size, distance zones and evaluation factors were devised, and an overall entropy score was calculated for each presentation. The overall entropy score and students' anxiety scores were compared, and the exploratory results yielded a functional relationship between information and public speaking state anxiety. It was concluded that it is possible to measure information in a speaking environment using Shannon's entropy.

The third and final stage of this project involved a qualitative investigation into the situational factors the speakers believed contributed to their public speaking state anxiety and offered a means for examining FOC (Anderson, 2006). Based on the results of four focus groups, four categories emerged for both the traditional one-shot

presentation as well as the TRIPLESPEAK assignment. They included speaker concerns, audience characteristics, contextual factors, and assignment criteria. The audience characteristics (i.e. size, audience behavior, unfamiliarity, etc.) and contextual factors (i.e. characteristics of the room) provided environmental stimuli that are subject to direct measurement; thus, entropy formulae could be devised for each. Factors in these categories were deemed important to consider in future research because the speakers perceived them as sources of their public speaking state anxiety. Future research may also want to explore additional environmental stimuli not mentioned in the focus groups such as room color, level of ambient light, elevation of audience, time of day, level of ambient noise, etc.

Pedagogical Implications

The findings in this study have important implications for speech instructors. One method which should help students combat their fear of speaking in front of an audience is to have them present in front of an audience. While this might sound counterintuitive, this is a tried and true technique called exposure therapy used in the field of psychology to help individuals overcome a variety of phobias. If an individual faces a threatening stimulus (e.g. audience, dog, spider, etc.) and has a positive experience (no negative consequences result), the individual should experience less anxiety in future encounters with the threatening stimuli (Foa & Kozak, 1986). The key is that the individual must have a positive experience. Thus, if students have positive experiences while speaking in front of an audience in class, they will likely experience less anxiety in future speaking situations.

Students in basic communication classes typically have positive experiences delivering presentations because the audience is instructed to be supportive and congenial toward the speaker. Thus, students often report experiencing less anxiety during each additional presentation delivered in the course. However, when a student has a negative experience, he or she reports an increase in anxiety. For instance, in the TRIPLESPEAK presentations, when audience members failed to give the speaker positive feedback, the speaker reported experiencing an increase in anxiety. This negative experience also had an impact on speakers' behaviors and reports of anxiety in subsequent speaking situations. Future research will need to continue examining the environmental stimuli responsible for augmenting public speaking anxiety in order to help instructors minimize these negative influences.

The assignment criteria (i.e. visual aid, topic, time, etc.) alluded to during the focus groups provide a few factors speech instructors may want to consider when designing public speaking assignments. For instance, the focus groups indicated the time requirements added to their anxiety levels. Thus, instructors may want to refrain from enforcing strict time requirements, at least for the first presentation students deliver in the course. Another option would be to reward students for making the time limit (i.e. give the students a bonus point) instead of punishing the students for not making the time limit (i.e. deducting a point).

Speech instructors ought to recognize there are individual differences when it comes to state anxiety. For instance, in this study, while the majority of the students reported experiencing more anxiety delivering a presentation in front of a large audience, some students reported experiencing more anxiety while presenting in front

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of a small audience. Similarly, some students reported less anxiety when they were able to stand behind a podium to present, but others reported more anxiety due to the podium. Speech instructors may want to take these and other differences into consideration when designing speaking assignments for novice speakers so that all students can have the opportunity to have a positive first speaking experience.

In addition, more needs to be known about trait anxiety and exposure therapy. Empirical research conducted by Beatty and colleagues (Beatty 1988; Beatty, Balfantz, & Kuwabara, 1989; Beatty & Friedland, 1990) suggests that situational variability may simply be the result of individuals with high trait anxiety perceiving the situation differently. For instance, Beatty (1988) found that subordinate status, conspicuousness, and dissimilarity correlated significantly with both state and trait anxiety; thus, he suggested these factors represent individual differences, not pure situational differences. According to Beatty (1988), "the causal chain, put simply, is that dissimilarity and evaluation lead to conspicuousness which leads to subordinate status which in conjunction with dissimilarity and evaluation leads to perceived formality which combined with being ignored by dissimilar listeners produces a novel experience leading to arousal which, if interpreted as anxiety, leads to communication anxiety which leads to trait-like CA which, in turns, heightens the communicators feeling of dissimilarity, conspicuousness and inferiority" (p. 36-37).

Theoretical Implications

The results of this study have important theoretical implications. A number of theories were examined in this study, all of which helped in explaining the reduction of

public speaking anxiety in a basic communication course, and they provide a foundation for further investigation into public speaking anxiety. First, emotional processing theory (Foa & Kozak, 1986) was used to examine the role of exposure in reducing public speaking state anxiety. While this theory did not explain the peak in anxiety that resulted during students' final presentations, it does offer insight into the effectiveness of exposure therapy. Future research should continue examining EPT in the public speaking context to determine the similarities and differences between the effects of exposure therapy on public speaking anxiety and other phobias. As more is learned about the reduction of public speaking anxiety in relation to this theory, effective exposure therapy treatment plans can be devised for use in basic communication courses.

Second, Shannon's (Shannon & Weaver, 1949) information theory was used to calculate the amount of information in the speaking environments in which the students in this study delivered their presentations. While Shannon's theory is not new to the field of communication, this study incorporated the mathematical side of the theory and hopefully shed some light on the true meaning and value of Shannon's work. Entropy has been used by scholars in a variety of areas such as computer science, biology, neurology, art, etc., and the field of communication should also benefit from the use of entropy. CA researchers should continue exploring the use of entropy to calculate the amount of information in different communication contexts in order to better understand the effect of the environment on communication exchange. In addition, Powers and colleagues' (Powers & Lowry, 1984; Powers & Witt, 2007) work on communication

fidelity, which uses part of Shannon's theory as a theoretical foundation, may profit from the use of an entropy measure.

Finally, Anderson's FOC was used to explain the relationship between environmental stimuli and reports of public speaking anxiety. FOC explains how environmental stimuli have function on behavior at a particular moment in time and continue to have function in future situations. FOC provides a strong foundation for examining communication episodes.

The introduction of this study began with an explanation from O'Connor (2007) about the nature of doctoral work. A portion of it is worth repeating again, for it denotes the essence of this project. "Doctoral pursuits follow many paths, use different tool sets, invoke different mind sets, and continue testing assumptions by different means" (¶ 2). The interdisciplinary nature of this study provided new insight into a multifaceted communication phenomenon and it offers a number of avenues for future exploration both for the field of communication and information science. In this study, entropy linked both areas of inquiry. Weaver (Shannon & Weaver, 1949), alluding to the generality of Shannon's use of entropy, states:

> This is a theory so general that one does not need to say what kinds of symbols are being considered – whether written letters or words, or musical notes, or spoken words, or symphonic music or pictures. The theory is deep enough so that the relationship it reveals indiscriminately apply to all these and to other forms of communication. This means, of course, that the theory is sufficiently imaginatively motivated so that it is dealing with the real inner core of the communication problem – with those basic relationships which hold in general, no matter what special form the actual case may take. (p. 25)

Thus, entropy can be used to analyze public speaking environments and other communication contexts, if one considers the setting to be a communicated message.

APPENDIX A

LETTER OF APPROVAL FROM THE UNIVERSITY OF NORTH TEXAS

INSTITUTIONAL REVIEW BOARD

UNT
UNIVERSITY OF
NORTH*TEXAS
DISCOVER THE POWER OF IDEAS

RESEARCH AND TECHNOLOGY TRANSFER
Office of Research Services

March 29, 2007

Amber Finn
School of Library and Information Science
University of North Texas

RE: Human Subjects Application No. 07-090

Dear Ms. Finn:

In accordance with 45 CFR Part 46 Section 46.101, your study titled "Reducing Uncertainty: An Examination of the Impact of Exposure Therapy on Public Speaking State Anxiety" has been determined to qualify for an exemption from further review by the UNT Institutional Review Board (IRB).

No changes may be made to your study's procedures or forms without prior written approval from the UNT IRB. Please contact Shelia Bourns, Research Compliance Administrator, ext. 3940, if you wish to make any such changes.

Sincerely,

Scott Simpkins, Ph.D.
Chair
Institutional Review Board

SS:sb

P.O. Box 305250 | Denton, Texas 76203-5250 | TEL 940.565.3940 | FAX 940.565.4277 | TTY 940.369.8652 | www.unt.edu

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APPENDIX B

STUDENT INFORMATION FORM

Write in the last four digits of your student ID number: _____

Lab Time: _____

Circle your lab group:　　　　　　Addison　　　　　　Randolph

Circle your TCU classification:　Freshman　　　Sophomore　　Junior　　Senior

Indicate your sex (circle one):　　Male　　　　　Female

Write in your age:　　_____

APPENDIX C

SECOND LETTER OF APPROVAL FROM THE UNIVERSITY OF NORTH TEXAS

INSTITUTIONAL REVIEW BOARD

UNT
UNIVERSITY OF
NORTH★TEXAS
DISCOVER THE POWER OF IDEAS

April 30, 2007

Amber Finn
School of Library and Information Science
University of North Texas

Institutional Review Board for the Protection of Human Subjects in Research (IRB)
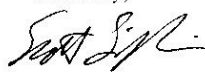RE: Human Subject Application #07-090

Dear Ms. Finn:

The UNT IRB has received your request to modify your study titled "Reducing Uncertainty: An Examination of the Impact of Exposure Therapy on Public Speaking State Anxiety." As required by federal law and regulations governing the use of human subjects in research projects, the UNT IRB has examined the request to add focus group sessions to this study. The modification to this study is hereby approved for the use of human subjects. **Approval for this project is March 29, 2007 through March 28, 2008.**

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. Please mark your calendar accordingly. The IRB must also review this project prior to any other modifications made. **Federal policy 21 CFR 56.109(e) stipulates that IRB approval is for one year only.**

Please contact Shelia Bourns, Research Compliance Administrator, at (940) 565-3940, or Boyd Herndon, Director of Research Compliance, at (940) 565-3941, if you wish to make changes or need additional information.

Sincerely,

Scott Simpkins, Ph.D.
Chair
Institutional Review Board

SS/sb

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