

## **Public speaking anxiety: comparing face-to-face and web-based speeches**

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### **ABSTRACT**

This study is to determine whether or not students have a different level of anxiety between giving a speech to a group of people in a traditional face-to-face classroom setting to a speech given to an audience (visible on a projected screen) into a camera using distance or web-based technology. The study included approximately 70 students. Participants were placed in groups (Group A and Group B). All students gave the same speech two times. Group A began by giving their speech to an audience face-to-face. Their second speech was delivered to a remote audience through web-based technology. The members of Group B delivered the speech twice, but in reverse order of Group A. Two instruments were used to measure the anxiety levels for the speeches. During the speeches each student was equipped with a monitor that provides data on the student's heart rate for the duration of the speech. The results of both speeches for each student were compared to determine if there was a different anxiety level between the two speeches. The other instrument used to determine their anxiety level was a survey. The survey asked the students to compare their anxiety levels between the two speeches. The survey results for each student were compared to the heart rate data to see if there were differences between the heart rate data and perceived anxiety level for each speech as indicated on the survey.

The research includes a benefits analysis for student and instructor based on the results.

Keywords: speech anxiety, web-based technology, communication skills, speech delivery methods

## **INTRODUCTION**

Communication in the public and private sector is rapidly changing with new technology. Nowhere is this more obvious than in recent years with the significant increase of web-based technologies that provide opportunities to communicate using audio and video. This is evident in the number of people using synchronous communication tools like Skype, iChat, Camfrog Video Chat, Oovoo, Yugma, & Dimdim, to communicate with friends and family all over the world. In the business community it is also true that people are relying more on tools like GoToMeeting, WebEx, & Adobe Connect to hold meetings and conduct interviews. The technology is very inexpensive when compared to travel costs associated of assembling a group of people from various regions into one room. It is also much cheaper than traditional distance-learning/meeting technologies. In addition to the cost of a computer with an internet connection, the software can be purchased very inexpensively (\$50 - \$250). Business-centered web-conferencing tools provide more features than traditional video and audio-based capabilities. Some of the more popular web-conferencing features include screen sharing, document sharing, desktop sharing, whiteboards, web browsing, PowerPoint presentations, and polling.

One segment of society that has benefitted greatly from the proliferation of web-conferencing tools is education, particularly higher education. At non-traditional institutions the number of online classes is increasing dramatically. According to Travis Kaya, online enrollment is increasing at a rapid rate with a 21% increase in 2009. This trend is not likely to slow down, evidenced by the offering of online classes by prestigious universities and state colleges (Kaya 2010). Nonprofit private and for-profit private institutions are in constant competition to offer exceptional online courses to students. Failure to compete in this rapidly increasing method of curriculum delivery may result in the loss of students to universities that offer quality online courses.

One key component of an online class is the synchronous chat session. These sessions are used for many reasons, but primarily for lecture (PowerPoint, or audio lecture only), and question-and-answer sessions with the instructor. In some cases students are expected to possess equipment in order to communicate via the audio and video capabilities with their instructor, and with other members of the class. Students that would conduct their final presentation to a room full of students are increasingly completing the same assignment online via web-conferencing. Some institutions are requiring students to give oral speeches online.

As technology changes, students need to be able to adapt to a new paradigm of mediated communication. However, one thing that has not changed is the general perception that speaking in front of an audience can be a very unsettling experience. As technology changes the way people communicate, it was of interest to the researchers to look at the anxiety levels that individuals experience when speaking in front of an audience, and to compare the traditional face-to-face delivery to a speech delivered to an audience at a separate site (or locations) through the aid of a web-conferencing application.

## **OBJECTIVE**

The goal of this study was to determine if people experience different levels of anxiety between delivering a speech in the traditional classroom (face-to-face) and a speech delivered to the same audience using web-conferencing technology. A secondary goal of this study was to determine if there is a need for communication courses to teach both the traditional method of

speaking before a live audience and the emerging method of speaking before a web-based audience. This goal is quite important as institutions of higher learning have an obligation to prepare their students to meet expectations of the work force they will be entering. If more and more public and private businesses are utilizing web-based technology for meetings and presentations, students need to be prepared to meet those expectations.

The use of web-based technology and internet technology has increased dramatically during the past few years. Educational institutions are increasing the number of online courses offered to keep up with the trends and to meet student needs (Chen, Lambert, & Guidry, 2009). The competition for Colleges and Universities to offer online courses is so great that even the most traditional institutions are now offering online courses. Online courses by their very nature require the use of web-based technology. Educational institutions need to recognize that merely offering students courses in an online format is not the same as preparing students to offer presentations to a web-based audience.

## **METHODOLOGY**

The research in this paper was through the pragmatic approach. Empirical research was completed by direct observation of students in a classroom setting. Intellectual secondary data was collected through various journal articles. Various studies included in this paper support the researchers premise that there is a need for public speaking courses offered in higher education to include the live audience speech and video audience speech.

The subjects for the empirical research were 70 students enrolled in three different sections of a Public Speaking course. All students had two attempts on the same topic. One attempt was in front of a face-to-face audience and the other attempt was given to the same audience, but delivered in a different room using Adobe Connect web-conferencing tool. Each class section was broken into two groups (Group A and Group B). Group A's first speech was given in front of the face-to-face audience, and the second speech was delivered to the distance audience using the web-conferencing tool. Group B's first speech was delivered to the audience using the web-conferencing application, and the second speech was delivered to a face-to-face audience.

### **Instruments:**

Two instruments were used to collect the data. One tool for gathering the data was a 16-question survey comparing the experiences that was completed after giving both speeches. A variety of different questions were asked to determine any perceived differences, with particular interest related to comparing their anxiety level between the two speeches. For many of the questions, participants were given three options; web-based delivery, face-to-face delivery, or uncertain. For example, one question asked; "Did you feel more anxiety during your face-to-face speech or the web-based speech"?

The other instrument used for collecting the data was a heart rate monitor that each student wore during both speeches. The data collected provided the researchers with the opportunity to compare the average and maximum heart rates for each student for the face-to-face and web-based speeches. The method of collecting the data would also show the point during the students' presentations they experienced the most anxiety; leading up to and during the opening; the middle of the presentation; or the conclusion and shortly after completing the

speech. According to Harris, Sawyer, & Behnke, these psychological moments are called milestones. Their study clearly indicated that anxiety played a large role in presenting a speech, and they went on to say “communication apprehension” is 80% genetically determined. Intervention to help students cope fails when their apprehension is genetically based. They also stated that prolonged exposure to audiences tends to reduce state anxiety, which is a level of anxiety indicative of a person’s general level of anxiety (Harris, Sawyer, & Behnke, 2007).

### **Sample Demographics:**

A total of 70 students participated in the study. Of the 70, there were 43 average heart rates recorded for the live presentations and 37 for the web presentation. There were 5 participants who had heart rate data, but no survey data. The sample consisted of 36 females and 34 males.

### **RESULTS**

All 70 students that participated in the study returned the survey (partially or fully completed). In the survey students were asked; “Before the speeches, which speech were you more anxious about giving”. Of the group of 70 students, 65 responded to the question. Almost half of the students (45.7%) were more anxious about giving their speech face-to-face, and a little more than one third (34.3%) were more anxious about the web-based delivery. The remaining responses were either missing data or uncertain. Another question queried; “Was it more difficult to maintain eye contact with the camera or the members of the face-to-face audience?” More than two thirds of the respondents (67.7%) felt it was more difficult to maintain eye contact with the camera. Exactly 20% felt it was more difficult to maintain eye contact with the face-to-face audience, and 12.3% thought it was equally difficult. One question was; “Did you feel more anxiety during your face-to-face speech or the web-based speech?” The percent of students feeling greater anxiety during the face-to-face speech was 40%. A slightly greater number of respondents felt more anxiety in the web-based delivery (44.6%). A little over fifteen percent were unsure. Another question asked students to answer; “Through which delivery mode (face-to-face or web-based) do you think you felt more anxiety in your ability to demonstrate knowledge of basic communication skills (content and delivery)?” Almost half of the students (49.2 %) responded that they felt more anxiety in the web-based delivery. A little more than 20% (21.5%) felt more anxiety with the face-to-face delivery. The rest were either unsure, felt equal amounts of anxiety or data was not able to be collected.

### **Heart Rate Comparisons:**

A t-test was done to see if there was a significant difference in the average heart rates when comparing face-to-face with web-based speeches. The results were that there were no significant differences,  $t(35) = .70, p > .05$ . The average heart rate for live presentations was 123.39 and 120.64 for web presentations. The differences between the averages may have been due to chance alone. There was, however, a fairly strong correlation between students' anxiety scores across both presentation types (i.e., those who had high anxiety in face-to-face, were more likely to have high anxiety during web-based presentation and vice versa,  $r = .49$ ). (Appendix 1)

### **Self-Perception of Anxiety Verse Recorded Average Heart Rates:**

Students were asked, “Did you feel more anxiety during your face-to-face speech or the web-based speech?” Response options included Face-to-face delivery, Web-based delivery, and Unsure. Out of the students who had heart rate data, 14 selected face-to-face, 18 selected Web-based delivery, and 7 chose Unsure. It was hypothesized that those who selected Face-to-face delivery would have higher average heart rates when conducting the face-to-face presentation, whereas, those who selected Web-based delivery were hypothesized to have higher average heart rates when conducting the web-based presentation. The following table and figure show results consistent with the hypotheses.\* Also of interest, those who selected more anxiety for face-to-face delivery, had higher average heart rates regardless of presentation type.

\*Note, although means are consistent, when statistical inference tests were conducted (i.e., mixed-model ANOVA), the results were not significant. This is likely due to small sample size and therefore inadequate statistical power. Results are presented in two ways; one includes the “unsure” group and one does not. (Appendix 2)

### **Heart Rate by Gender:**

Question: Are there differences between male and female heart rate normally? Looking at the means, although we see differences, these differences were not significant (i.e., may have been found due to chance alone). (Appendix 3)

### **ISSUES**

In some cases not all the heart rate data was successfully collected. The issues involved user error in saving the data and also an inability to establish a connection between the heart rate monitor with the base unit for one or both speeches for a given student. Individuals with very thin frames were an issue. In situations when data for one or both speeches for a student was not captured, there was no opportunity to compare the face-to-face with the web-based speech. This resulted in the researchers not gathering as many samples as initially anticipated.

### **LITERATURE REVIEW**

The Business and Education fields can both benefit from this study. Skills in public address are necessary for presenting to the audience a clear understanding of the topic. Presenters and speakers in the business world will often be faced with no choice in the method the presentation is made; either a web-based audience or a face-to-face audience. Clearly there is a need for students to be taught to make high-quality presentations in both forums. Students should also be aware of which method of delivery works best for them, should they have a choice in the method of delivery. Knowing which method works best for them will give students the opportunity to improve on the method that most needs improving. In order to properly prepare students for the world they will enter after graduation, educators have an obligation to teach both delivery methods to their students.

According to Dunbar, Brooks, & Miller, oral communication skills are a necessary skill in today’s job market. One competency indentified by the U.S. Department of Labor is that

students must possess the ability to speak well in order to carry out certain work-related tasks. The authors went on to say that the goal of teaching essential skills in higher education is to prepare students to be more effective employees and responsible citizens. This being the case, it is clear that higher education has a duty to deliver state-of-the-art education in speech classes and provide all available methods of speech delivery to their students. Dunbar, et al, also pointed out that educational institutions have worked hard at restructuring their curriculum to meet with current societal needs to attract and maintain students in their programs. Educational institutions are constantly seeking better ways to make sure their students meet the competencies required of them when they become part of the work force. Communication skills are necessary for students to be successful in their collegiate studies as well as the work place (Dunbar, Brooks, & Miller, 2006).

Personal experience will attest to the fact that a speaker needs to be properly prepared to deliver an effective oral presentation. One does not have to be an expert in oral delivery to recognize an effective public speaker. This leads to the presumption that educators must offer the best techniques available to their students for all methods of public address. The question is whether web-based technology is as efficient as face-to-face instruction. To be competitive in the market place, as well as to accommodate a growing demand, educational institutions must offer more classes online. They are no longer trapped into specific time slots to acquire their degrees, and can adjust their courses around work hours or personal time. As to the effectiveness of online or web-based instruction, a study by Garza and Kock resulted in findings that generally online delivery outcomes are positive (Garza & Kock, 2011). According to Badia, Barbera, Guasch, and Espasa, online is particularly suitable to the study of social and individual aspects of learning (Badia, Barbera, Guasch, and Espasa). Public speaking courses would most certainly fall into this category.

Institutions with the infrastructure to offer online courses do not relieve students of any investment on their part. Students today are expected to have their own computers or have access to one. This might not be possible for all students. One solution is to have a computer lab available for students to use for online courses. This is a good option for any student living on or near campus. However, some students in online classes may be out of the area and access to a computer lab on campus is not a realistic possibility. The only option left is for the student to have access to a computer locally or to purchase a computer. However, this problem is not as prevalent as one might think as most entry level college students today already have their own personal computer (Chen, Lambert, Guidry, 2009). This being the case, the few students who do not have personal computers would not be sufficient for universities to reconsider not offering courses in the online format. A potentially greater concern may be access to the course content. Connectivity for people in remote regions or areas that don't offer high-speed internet connections can pose problems, particularly online content that uses up a large amount of bandwidth (audio, video, etc.). One possible solution, albeit a costly one, is to purchase a remote hot spot. The monthly fees can be in excess of \$50, and may be limited to only those with a portable device (smartphone, tablet, etc.) with an optional data plan. This option may be expensive, but assures that one can stay connected to their instructor, the course materials and other students in class anywhere in the world that has access to the cellular towers for their data plan.

## CONCLUSION

### Literature Review

With the availability of web-based technology and the demand for efficiency in both the public and private business sector, more and more meetings and presentations will be conducted before a web-based audience. Educational institutions have an ethical obligation to prepare their students for this trend. Faculty should train students to become more familiar and comfortable communicating through the use of web-based technology. In an article by Dupagne it was stated that expectations often hold true that students self-directed technology in students observing their communication competency should enhance their communication experience and reduce their apprehension toward that experience and improve their public speaking skills (Dupagne, Stacks, Giroux, 2007).

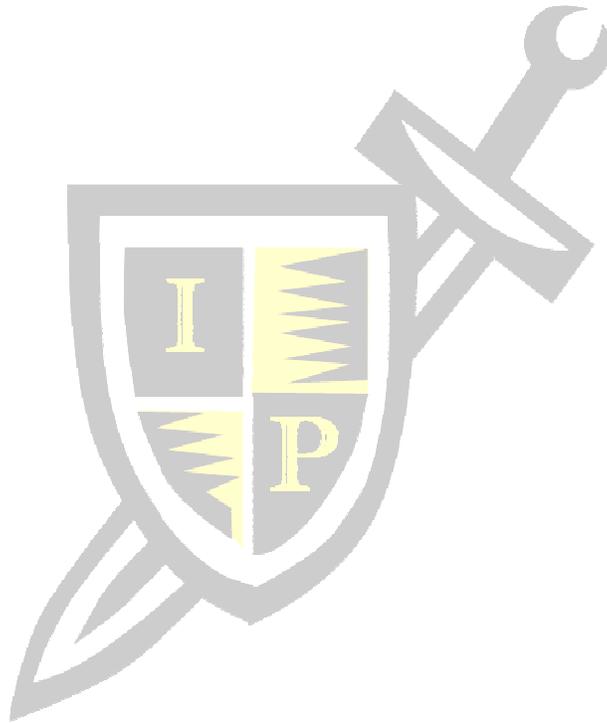
### Student Survey and Heart Rate Data Collected

Based on results using both instruments, there were no significant differences in the amount of anxiety between delivering a traditional face-to-face speech and a speech given using web-conferencing technology. The researchers did, however, conclude that there was an interesting, albeit somewhat slight, difference between the anxiety recorded through the heart rate data and the students' response to the question "Did you feel more anxiety during your face-to-face speech or the web-based speech?" A greater number of respondents (18) felt more anxiety regarding the web-based delivery and than the face-to-face delivery (14). Conversely, the research for the heart rate data found that the average heart rate for the face-to-face speech was slightly higher (123.39) than the web-based speech (120.64). Taking into consideration the results between the participants' perceived anxiety (survey) and the physiological data (heart rate) it suggests that perception is not completely aligned with reality when analyzing anxiety. Further studies are needed to look analyze this conclusion to better understand a student's anxiety about speaking to a face-to-face audience and a web-based audience. The goal is to identify the causes of the speaker anxiety with the goal of developing appropriate strategies to limit or remove any anxiety pertaining to face-to-face or web-based speeches.

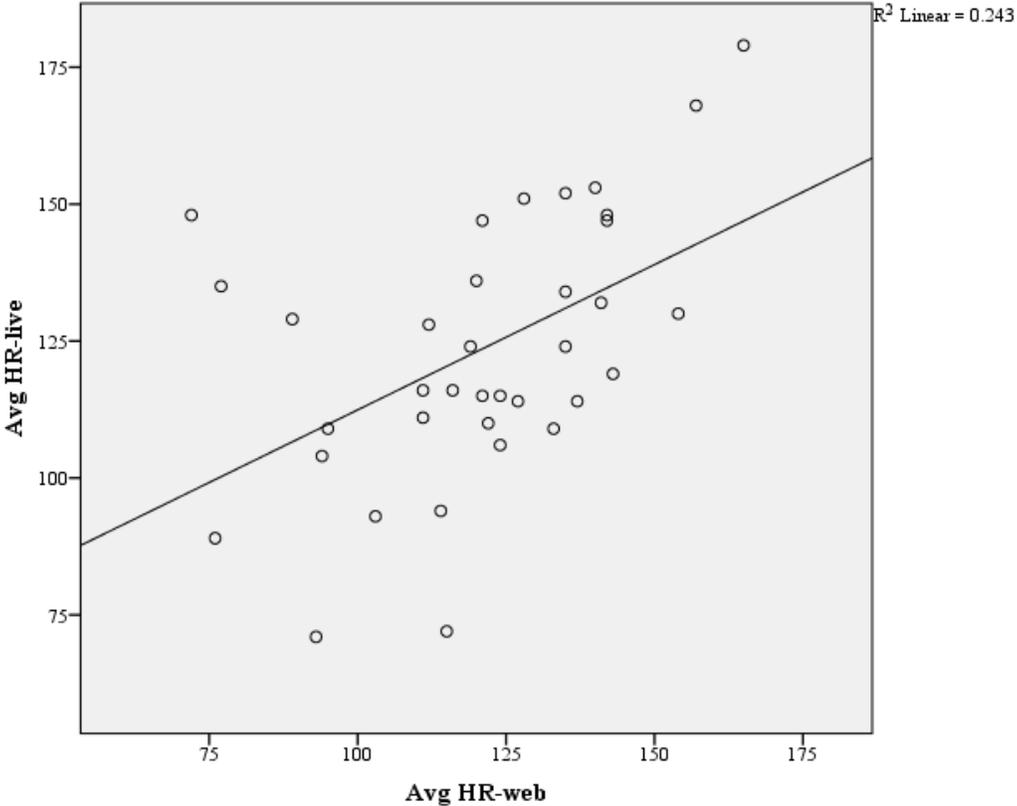
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Appendix 1



**Appendix 2**

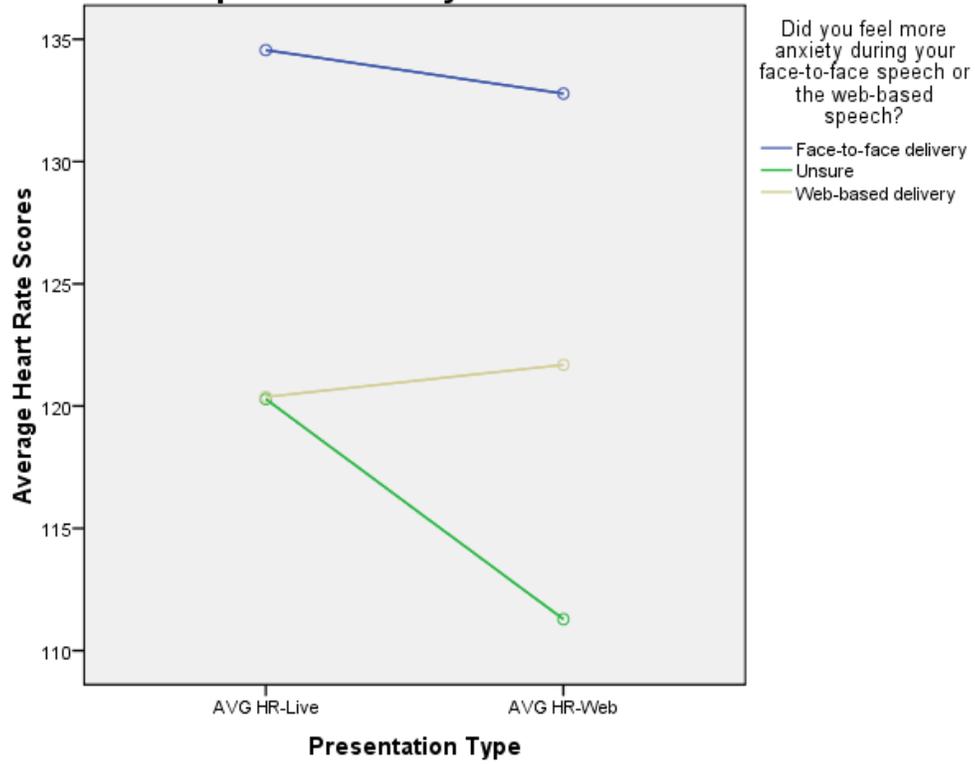
## Descriptive Statistics

Did you feel more anxiety during your face-to-face speech or the web-based speech?		Mean	Std. Deviation	N
Avg HR-live	Face-to-face delivery	134.56	25.437	9
	Web-based delivery	120.38	24.448	16
	Total	125.48	25.249	25
Avg HR-web	Face-to-face delivery	132.78	16.828	9
	Web-based delivery	121.69	23.269	16
	Total	125.68	21.501	25

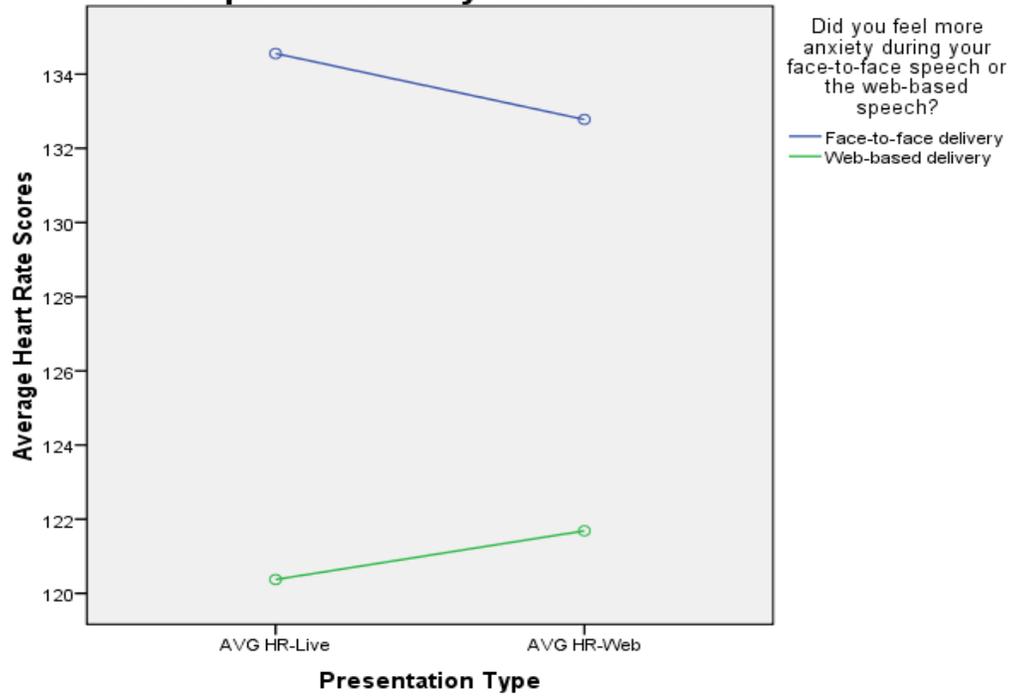
## Descriptive Statistics

Did you feel more anxiety during your face-to-face speech or the web-based speech?		Mean	Std. Deviation	N
Avg HR-live	Face-to-face delivery	134.56	25.437	9
	Unsure	120.29	16.080	7
	Web-based delivery	120.38	24.448	16
	Total	124.34	23.417	32
Avg HR-web	Face-to-face delivery	132.78	16.828	9
	Unsure	111.29	18.927	7
	Web-based delivery	121.69	23.269	16
	Total	122.53	21.536	32

### Self-Perception of Anxiety Verse Recorded Heart Rates



### Self-Perception of Anxiety Verse Recorded Heart Rates



**Appendix 3**

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Avg HR-live	Female	23	128.48	25.552	5.328
	Male	20	119.90	20.323	4.544
Avg HR-web	Female	17	120.24	22.925	5.560
	Male	20	121.00	22.262	4.978

Independent Samples Test								
t-test for Equality of Means								
							95% Confidence Interval of the Difference	
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Avg HR-live	Equal variances assumed	1.21	41	.23	8.58	7.12	-5.79	22.95
Avg HR-web	Equal variances assumed	-.10	35	.92	-.76	7.44	-15.88	14.35