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Gender differences in discussion strategies of asynchronous online undergraduate psychology major students

Shawna Marie Burtis
Walden University

Walden University

College of Social and Behavioral Sciences

This is to certify that the doctoral dissertation by

Shawna Burtis

has been found to be complete and satisfactory in all respects,
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the review committee have been made.

Review Committee
Dr. James Carroll, Committee Chairperson, Psychology Faculty
Dr. Lana Nassen, Committee Member, Psychology Faculty
Dr. Kimberley Cox, University Reviewer, Psychology Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
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Abstract

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MS, Walden University, 2014

BA, American Military University, 2012

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Numerous studies have focused on gender differences in communication in various learning settings and have found that men and women typically communicate in different ways; however, no studies have directly investigated undergraduate psychology major students. Based on symbolic convergence theory, a survey design was in this quantitative study to examine gender differences in online discussion strategies among undergraduate psychology student majors at online universities. Focusing on 4 asynchronous online discussion strategies, the research questions addressed gender differences in discussion strategies while controlling for students' previous experience with online learning and level of study in their current program. A convenience sample of 117 online undergraduate psychology majors completed the Discussions Strategies Scale-Asynchronous. Using independent *t*-tests and an analysis of covariance, the results revealed no significant gender difference in 2 of the 4 discussion strategies of undergraduate psychology majors when controlling for level in program and previous experience with online learning programs. The discussion strategies of Elaboration and Interaction had a significant gender difference. After further analysis, it was determined the covariate of level in program was the significant factor contributing to these results. Understanding how this specific group of students communicates within discussions can lead to positive social change by allowing instructional designers to create more effective online discussions, and such understanding can assist instructors in approaching students in more engaging ways. Students who have better experiences in classroom can become more knowledgeable practitioners.

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Dedication

I would like to dedicate this dissertation to my children, Sebastian Burtis and David Burtis. You are the reason for everything I do. I love you both to the moon and back. I hope you will follow your dreams, down whatever path they lead you. Wheresoever you go, go with all your heart.

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Lastly, Eddie, my love, my partner, my husband. Thank you for supporting me on my journey back to school 7 years ago. Thank you for helping me find the time, and drive to do what I wanted to do. I love you.

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Chapter 1: Introduction to the Study

Introduction

As more and more schools are offering online courses, and even full programs entirely online, the market for high-quality online programs will become more competitive. Being able to create, develop, implement, and maintain effective and engaging online courses will be important for institutions to stand above the competition. To accomplish this, it is important to understand the dynamics of the students that are taking those courses.

To better understand the undergraduate psychology major student population, I used a nonexperimental survey design to gather data on online psychology major students' discussion strategies to understand how students approach asynchronous discussions. My findings could be used to develop more engaging courses, that use students' preferred discussion strategies.

In this chapter I will provide a background on the topic, as well as a problem statement and purpose statement. I will also provide the research questions and theoretical framework that I used in this study. I also briefly describe the nature of the study, including definitions, assumptions, limitations, and delimitations. I then detail the significance of this study and its potential implications for social change.

Background

The study of effective strategies for students to learn has been a constant area of research. Educational approaches are consistently changing throughout the years, adapting to cultural shifts, population differences, economic changes, and new technologies. However, despite many of the changes in educational approaches

throughout the centuries, one aspect of education has remained consistent: communication (Edgar, 2012; Laliberte, 2005; McNiel, 2006). Although communication approaches and strategies have shifted, it is well understood that in order to learn communication, either verbal or written, is crucial. In the 1960s and 1970s, a newer approach to learning began to take shape. This approach was student-centered learning, where students would be active participants in their own learning rather than passive listeners (Laliberte, 2005). This allowed students to be engaged in the classroom and discuss the course content, rather than simply just taking notes from a lecture.

This approach to learning, where students communicate their learning, communicate with each other, and discuss their ideas has been shown to improve overall student achievement (Black & Williams, 1998; Davies, 2001; Sternberg, 1996). Students who are required to discuss classroom topics are also more likely to develop high self-efficacy, and are they more likely to continue to pursue their educational goals (Davies, 2001). Creating environments that promote student communication can be a highly effective educational approach (Laliberte, 2005). However, students may prefer to communicate in different ways. Many factors may influence discussion strategies, such as if a student prefers to engage in a debate or offer additional supporting evidence when replying to peers; one factor might be gender.

Gender differences in discussion strategies are not a new area of research. Previous research suggests that, especially in learning environments, males and females communicate differently (Brizendine, 2006; Leaper & Ayres, 2007). In a review of the literature on classroom discussions both in person and online, published from 2005 to 2016, males were more likely to dominate classroom discussions; be more combative in

their discussions; find areas of disagreement; and seek to prove their point of view correct both in live classes, synchronous online classes that have active chatroom discussions, and in online classes that have asynchronous online discussions (Aries, 1998; Holmes, 2004; Leaper & Ayres, 2007; Tannen, 1990). In contrast, females tended to seek out discussions where they can offer support, both emotional and anecdotal (Brajer & Gill, 2000). However, researching these gender differences in online settings has not been as thorough as the research in traditional classrooms as online classrooms are a relatively new medium for earning college education.

Active or synchronous discussions, such as those in traditional classrooms are different from asynchronous discussions such as those used in a majority of online learning classrooms. In synchronous discussions students are often speaking in real time, meaning that they cannot take advantage of time and distance to formulate a reply. In asynchronous discussions, several students may communicate on the same topic in the course of several days. This gives students more time to respond. This time and distance might influence how students respond to one another. Understanding discussion strategies in this dynamic is crucial for developing stronger courses that appeal to students.

To better understand the necessity for creating better online courses, it is important to understand the field of online learning in general. Online education is a relatively new field of education, first introduced in latter part of the 20th century. Since its first introduction, online education has grown at an exponential rate faster than other area in education (Allen & Seaman, 2006). The demand for online classes is high and universities are continually developing courses and programs to meet the demands of

students seeking an online education (Nagel, 2010). Institutions that can offer these courses will be in higher demand in the future. Understanding online education and discussion strategies of the students will provide significant insight for instructional designers.

With the influx of online students, researchers have begun to look into and research various aspects of online education. One of these areas has been communication. Recent research into communication patterns and discussion strategies has produced varying results. Some studies suggest that females are more communicative than males, using three times as many words (Brizendine, 2006). Another study suggested that males are more communicative than females in online classrooms (Leaper & Ayres, 2007). In yet another study, based on word counts in online classroom discussions, no statistical significance was found relating to gender and how many words were used in discussions (Mehl et al., 2007). These varying conclusions indicate that different groups of students might communicate differently in online settings.

However, when looking at psychology major students specifically, the literature on discussion strategies is not as comprehensive. A majority of the current literature focuses on business, economics, nursing, or education majors. It is important to look at psychology majors specifically because of the gender composition of this population. Psychology major students have one of the highest gender disproportions than students in other majors. Females make up approximately 75% of all undergraduate psychology students (National Center for Education Statistics Integrated Postsecondary Education Data System, 2016). With this significant disproportion of males and females, current findings regarding the gender differences in discussion strategies might not be applicable

to psychology major students. Therefore, researching communication patterns specifically in psychology students could provide new insights specifically about how online psychology major students engage in asynchronous discussions.

When considering discussion strategies of psychology major students, other variables should be considered. As the population of psychology major students is dominated by females, it is possible that female communication patterns might influence male communication patterns. According to symbolic convergence theory, the minority adopts the majority's behaviors (Smith & Mackie, 2005). Considering this aspect, it is possible that as males progress through a psychology program their communication patterns and strategies might change. Adding year in program as a variable will also provide data on the differences in discussion strategies at each stage of an undergraduate psychology program.

Another variable to consider when looking at online discussion strategies is previous experience with online education. As technologies evolve, colleges are not the only educational institutions utilizing online education platforms. In recent surveys, it has been suggested that more than 25% of high school students will take at least one online class (Nagel, 2010). With more than a quarter of high school students taking online classes, considering these previous experiences in this research study will add new level of depth not currently researched.

Although the gender differences in discussion strategies have been researched in both traditional classrooms and online classrooms, psychology students specifically have been not been studied before. It is important to study this population because of the gender composition of the discipline in undergraduate education. Psychology major

students are predominately female, with estimates between 70%-75% of psychology undergraduate students being female (NCES IPEDS, 2016; U.S. Department of Education, National Center for Education Statistics, 2014). As this population is one-sided, discussion strategies used by undergraduate psychology major students in asynchronous online courses may differ than the discussion strategies used by online students in general.

This study was needed to better understand asynchronous online undergraduate psychology major students. With online education rapidly growing, understanding current trends and the needs of the students will become increasingly important. Filling this gap in the literature will provide unique insights into this population; and better aid institutions, instructional designers, and instructors in recruitment, enrollment, and engagement.

Problem Statement

Existing literature strongly suggests significant differences between genders in discussion board discussion strategies among asynchronous online students enrolled in an undergraduate psychology coursework. However, because psychology major students have not specifically been investigated it is important to determine if these findings can be generalized to this population. In symbolic convergence theory it is suggested that discussion strategies are driven by how the majority of the group communicates (Gullier & Durndell, 2006; Kupczynski, Brown, Holland, & Uriegas, 2014; McCabe, 2014). This might suggest that a group of students might be influenced by how the majority of students communicate.

Purpose of the Study

The purpose of this quantitative study was to examine the gender differences in discussion strategies of asynchronous online undergraduate psychology major students at an online university. Participants were considered psychology major students if they have declared their undergraduate major as psychology. Although the format may vary by intuition, asynchronous online courses for this study were considered to be courses that have a standard format characterized by weekly discussion boards where students are required to post a main post and respond to at least one peer, as per the asynchronous courses developed at most online universities. Asynchronous discussions do not have to occur at the same time, but must be completed within a 1-week time span. This is the standard format in most online psychology programs.

I had two covariates in this study. The first covariate was the year or level in program (freshman, or 0–45 credits earned; sophomore, or 46–90 credits earned; junior or 91–136 credits earned; senior, or 137–181 credits earned). The second covariate for this study was prior experience in online education prior to enrolling in current program. This included previous education programs, as well as online courses taken for training purposes, such as work seminars. These two covariates may have affected the results of this study thus they were investigated as well.

Research Questions and Hypotheses

Research Question 1: What is the difference in the discussion strategy of Elaboration between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education?

$H_1$1: There is a significant difference in the discussion strategy of Elaboration in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

$H_0$1: There is not a significant difference in the discussion strategy of Elaboration in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

Research Question 2: What is the difference in the discussion strategy of interaction between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education?

$H_1$2: There is a significant difference in the discussion strategy of interaction in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

$H_0$2: There is not a significant difference in the discussion strategy of interaction in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

Research Question 3: What is the difference in the discussion strategy of comprehension between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education?

$H_1$3: There is a significant difference in the discussion strategy of comprehension in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

$H_0$3: There is not a significant difference in the discussion strategy of comprehension in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

Research Question 4: What is the difference in the discussion strategy of Anxiety between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education?

$H_1$4: There is a significant difference in the discussion strategy of Anxiety in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

$H_0$4: There is not a significant difference in the discussion strategy of Anxiety in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

Theoretical Framework

The theoretical framework that I used for this study was the symbolic convergence theory as described by Smith and Mackie (2005), who suggests that the minority in a population will adapt to the majority's behaviors. I will provide more details regarding symbolic convergence theory will be addressed in Chapter 2. Applied to this study, symbolic convergence theory suggests that because the undergraduate psychology population is predominately female, males may be more likely to have similar discussion strategies to their female counterparts. As current research suggests men and women communicate differently online, symbolic convergence theory might

help explain fewer communication differences between male and female undergraduate psychology major students.

Nature of the Study

In this quantitative research, I used a non-experimental design. I distributed a survey electronically to online undergraduate psychology major students at an online university. The survey included demographic information such as gender, age, and level in program (freshmen, sophomore, and junior, senior). I used a discussion strategies survey, the Discussion Strategies Scale-Asynchronous (DSS-A; Tsai, Liang, Hou, & Tsai 2015), to gather data on how students engage in online discussions (i.e., discussion strategies). This scale includes four features of online discussion strategies including: Elaboration, Interaction, Comprehension, and Anxiety.

I chose this design as it allowed participants to respond to the survey based on how they think and feel they engage in discussions. I chose this design instead of observations and coding of discussions as it will provide the students' perspective, rather than the researcher's assumptions.

The independent variable in this study was gender, as this it was used to compare the sample. *Gender*, as I defined it, was the self-identified gender of the participant, either male or female. The dependent variables in this study were the four types of discussion strategies including: Elaboration, Interaction, Comprehension, and Anxiety. I had two covariates, including level in program (freshman, sophomore, junior, senior) and prior online education experience before enrolling in college.

I first analyzed the data using descriptive statistics. To answer the four research questions I used an independent *t*-test on each of the discussion strategies (Elaboration,

Interaction, Comprehension, Anxiety) to compare the means to determine if there was a significant difference between the males and females. An analysis of covariance (ANCOVA) was run to determine if the population means of the four types of discussion strategies (Elaboration, Interaction, Comprehension, Anxiety) are equal across genders while controlling for level in program and prior experience with online education.

Definitions

Anxiety: The level of hesitation or fear in posting in online academic discussion forums.

Asynchronous: A series of communication that does not occur in real time including discussion board posts where responses are not immediate.

Comprehension: The level in which a person evaluates another person's post before responding.

Discussion strategies: Discussion strategies refer to how a student approaches discussion replies to their peers as measured by four identified categories in the DSS-A (Tsai et al., 2015) survey: elaboration, interaction, comprehension and anxiety.

Elaboration: The level in which a person integrates their own thoughts, such as supporting another post with new insights.

Gender: For the purposes of this study I considered gender to be the gender identity of the participant as self-identified, rather than the biological gender. Participants will select either male or female.

Interaction: The extent to which a person exchanges ideas, such as debating, or offering differing opinions.

Undergraduate psychology major: A participant was considered an undergraduate psychology student if they have not received any college degree and are enrolled at least part-time in an undergraduate psychology program, not just taking a psychology class.

Assumptions

I assumed that participants were honest in their identification as an asynchronous online undergraduate psychology major and answered the survey truthfully. This assumption is justified because the survey was only be sent to undergraduate psychology major students at an online university and participants self-identified as undergraduate psychology majors prior to entering the survey. Anonymity and confidentially provided participants protection and thus honest answers were more likely to be provided.

Scope and Delimitations

The scope of population that was studied was undergraduate psychology major students enrolled at least part time in an undergraduate program. I recruited participants using SurveyMonkey's targeted audience feature, which sent out a notification to all of SurveyMonkey's participant pool that met the criteria of "undergraduate student." Through the informed consent process, participants acknowledged they were online psychology majors before continuing the survey.

Delimitations include the choice of recruitment. Students recruited were predominately contacted via SurveyMonkey, so students in the undergraduate psychology population who were not enrolled with SurveyMonkey did not have the opportunity to be recruited for this study. As the responses through SurveyMonkey required participants to self-identify as online psychology majors, it is likely that some responses were given by participants outside this population. Because SurveyMonkey offered a monetary

incentive, participants in the survey may have only completed the survey for financial gain.

Limitations

The limitations of the research study were that the participants I recruited were from a convenience sample, and thus may not be reflective of the entire population of asynchronous undergraduate psychology major students. Another limitation was that the survey was given only once and thus, results are applicable to only that point in time as opposed to changes in discussion strategies through time. I considered this limitation and I included the covariate of level in program; however, this does not account for changes of an individual participant's strategies through time.

Significance

My goal in this study was to aid online psychology programs and instructional designers in developing and implementing more successful online courses. Understanding if any differences exist in how males and females communicate in psychology classes may aid in creating more comprehensive discussion prompts that are more engaging for students. Any differences can also be integrated to create a more balanced course and curriculum. This will be of use in several capacities. First, online psychology programs are becoming more abundant, thus more competitive. Schools that can offer more comprehensive programs that meet the students where they are by using psychology major students unique discussion strategies may increase enrollment and become more desired.

As the field of psychology is also predominately female, courses that appeal to more males by incorporating their discussion strategies and structuring discussions to

how males communicate, might increase the number of male psychology students. This may help decrease the feminization of the field of psychology. Appealing to male students may help bridge the gender gap seen in the field of psychology.

Summary

This chapter severed as an introduction of this study, in which I sought to understand gender differences in discussion strategies of online asynchronous undergraduate psychology major students. Current research suggests that males and females have different discussion strategies in online classrooms; however, research might apply to psychology students because the gender composition is one sided with significantly more female students. In this chapter I also defined the terms that were used for the remainder of this study including defining discussion strategies as Elaboration, Interaction, Comprehension, and Anxiety, based on the research conducted by Tsai et al. (2015). I also defined the structure for an asynchronous course, which is based on weekly discussions that occur over the course of the week, and not in real time. The nature of this study was a non-experimental survey design to test three research questions.

In chapter 2, I will review literature on the topic including the benefits of communication on learning and how it is used in classrooms, online education, the make-up of the psychology major population, and current research on the gender differences in discussion strategies of online students.

Chapter 2: Literature Review

Introduction

Existing literature suggests significant differences between genders in discussion board communication among asynchronous online students enrolled in an undergraduate program. However, because psychology major students have not specifically been investigated it is important to know if these findings can be generalized to this population. In symbolic convergence theory discussion strategies are driven by how the majority of the group communicates (Gullier & Durndell, 2006; Kupczynski et al., 2014; McCabe, 2014). As psychology major students are composed mostly of female students which may affect how this particular group communicates online. The purpose of this quantitative study was to examine the gender differences in discussion strategies of asynchronous online psychology students at an online university.

In this chapter I will review literature on online education, communication in the classroom, the benefits of communication in learning, and gender differences in communication. Understanding online discussion strategies in the classroom is important for instructional designers to know when developing courses. This can help create courses that are more engaging for students and how they prefer to communicate and learn. Effective online psychology programs will draw more students to the program. Thus, developing comprehensive, effective, and engaging courses for online psychology major students is of importance to university administration.

Although understanding discussion strategies can be interesting it is important to understand if these factors might impact student success. This variable was studied by Kupcyznski et al. (2014) among education major students. During their research they

used a comparative design to determine whether a relationship existed between the gender of the students and the course grades in an online distance course. Significant communication differences were found between genders, with females more likely to relate the material to their personal lives and experiences whereas male students were more likely to use textbook support or other academic resources. Final grades for males and female were similar for high achieving students. However, females scored higher in the course than males for lower achieving students (Kupczynski et al., 2014). Kupczynski et al. (2014) also found that of students struggling in the online course, females were more likely to be successful. This could indicate that finding ways to personally connect with the information and how material is presented, such as how females relate the material to their personal lives and experiences, might help students succeed in their courses.

Online courses are becoming more popular and many students are now choosing to pursue a degree online. From 2000 to 2008 enrollment in distance education at the undergraduate level increased from 8% to more than 20% with many schools developing more and more programs this increase is likely to continue (National Center for Education Statistics, 2011). Looking at the variables responsible for successful learning online, such as discussion strategies, is one way to increase the understanding of online student dynamics.

Previous research has suggested that men and women may learn differently and have different communication approaches in learning environments. For example, some students are more confident in discussions that occur synchronously (at the same time) such as those in traditional classrooms or in live chats versus typical asynchronous

discussions (Junco, Merson, & Salter, 2010). Students familiar with communication technologies employed in online classrooms are also more communicative than students who are less familiar with non-educational communication technologies including technologies such as cellular phones and online chat forums (Junco et al., 2010). Females are more confident in online technologies when it comes to written communication, whereas males are more comfortable in online interactions, such as video games or virtual labs in science classes (Junco et al., 2015). Although males and females may use online learning technologies at the same frequency, typical gender based competencies can vary thus affecting how they learn in online environments (Junco et al., 2010). With differences in the use of communication technologies, the use of online learning discussions is likely to be affected.

Other studies have shown that the gender of the learner may affect learning styles and how students communicate in classrooms (Brajer & Gill, 2000; McCabe, 2014; Savicki & Kelley, 2000). Brajer and Gill (2010) found that women were more communicative in online discussions and tried to relate material to their personal lives while men referenced academic material and rarely used personal examples. In addition to the content of posting there is research to support the idea that men are competitive in their online postings and are more likely to disagree, even search out posts to disagree with, while women are more likely to respond only to posts they agree with and offer affirmations (Arbaugh, 2000; Xu & Jaggers, 2013). These gender differences were noted in several studies.

To date, only one study conducted by Guiller and Durndell (2006) has specifically investigated students in an online psychology course. Communication patterns in

discussion board responses of 197 first year introductory psychology students, not specifically psychology major students, were observed. It was found that women are more likely to be supportive in their replies and offer agreement while men are more likely to offer additional information or an opposing point of view (Guiller & Durndell, 2006). This is similar to the findings of other major students; however the make-up of the introductory psychology class did not specify the declared majors or the gender make-up of the class. The need for understanding this population is that the make-up of psychology major students is heavily female at almost 75% of students.

Asynchronous online courses are becoming very popular for degree seekers. Finding ways to create an effective learning environment will help universities and institutions be more competitive and help their students succeed in completing their educational goals. Understanding the dynamics that impact student learning is crucial to improving course design and the learning process. Looking at variables responsible for learning online, such as discussion strategies and how they might differ amongst students based on gender is one way to increase the understanding of online student dynamics and discussion board engagement.

The major sections of this chapter will review literature on the nature of learning theories and the developments that lead to the viability of online learning. A look at the enrollment and growth rates of online learning, as well as the gender make-up of psychology major students is reviewed. The benefits of using specific discussion strategies in learning are also explored. Research into how communication affects learners, specifically online learners is also reviewed. Research studies that investigated

online communication in asynchronous courses, as well as the one study specific to psychology major students are also discussed.

Search Strategies

While reviewing the literature, research articles that were related to the topic were explored. This included research into the historical foundations of communication in the classroom and educational approaches as well as the perceived benefits of communication in the classroom. This study will look specifically at literature on communication in the online environment, including asynchronous communication types, online education and the use of discussion forums, and the dynamics of online education in general. As the focus of this study is on gender differences in communication, research on gender differences in traditional classrooms, as well as current research on gender differences in communication in online classrooms was also reviewed. Lastly, current research on the gender makeup of online psychology students was reviewed to understand the population, and how the ratio of females to males might impact communication in the online classroom.

When reviewing the literature several databases were utilized including PsycINFO, PsycARTICLES, Sage Premier, Expanded Academic ASAP, Academic Search Complete, ProQuest, ERIC Database, Google Scholar and Thoreau Multi-Database Search. Initially the years searched were 2010 to 2016. When the years were expanded there was significantly more literature on the topic available. Thus the years searched were predominately 2005-2016; though in some searches the years were expanded to investigate classic literature relevant to the topic such as learning theories

and the history of online education. The types of literature that was searched for included peer-reviewed journal articles, e-books and books.

Searches included many different search terms that were enhanced with Boolean operators and truncation. Keywords used in searching the literature included: *online learning, learning, communication, discussion, college, undergraduate, psychology students, psychology majors, student communication, Socratic method, Socratic method teaching, discussing, male communication patterns, female communication patterns, college discussions, asynchronous discussions, electronic communication, learning theories, education communication, and symbolic convergence theory*.

After the literature was reviewed, it was organized into different categories. For this literature review, the content was organized to slowly build into a comprehensive understanding of the topic. To begin, within the literature review, research on online education in general, including online educations statistics, how many students take courses online and the makeup of different major students were considered. Next research that was specifically done with only psychology students was reviewed, with a focus on the gender makeup of this population.

To better understand the topic of online communication in general, the literature review summarizes research on educational approaches, including the introduction of communication strategies in traditional classrooms, the benefits of communication in learning and student performance, and educational theories that support effective discussion strategies.

Next, literature on the gender differences in communication will be reviewed. Literature includes gender differences in communication both in and out of the

classroom. As the focus of this study is on gender differences in online education, a specific section is devoted to reviewing current research on gender differences in online classrooms. There is one research article that is specific to psychology students, but not necessarily psychology major students. Lastly, a review of the different methodologies used in these research articles will be described.

Theoretical Foundation

The theoretical framework for this study will include two different theories. The first is social learning theory; more specifically, the theory that learning in a social context requires different types of communication and modeling behaviors (Smith & Mackie, 2005). Social learning theory is a conceptual framework as it explains and predicts behaviors (Frankfort-Nachmias & Nachmias, 2008). Looking at the gender differences in discussion strategies of asynchronous undergraduate psychology major students from a social learning theory perspective can help explain the data gathered in the study, as well as predict how the data will turn out. Another theory to be used in this is study is symbolic convergence theory. This theory overlaps with the social learning theory framework and attempts to explain behaviors within a social context. Symbolic convergence theory predicts that groups will conform to the majority (McCabe, 2014).

While several studies have suggested men and women have different types of discussion strategies, it has not been established within the population of psychology major students (Gullier & Durndell, 2006; Kupczynski et al., 2014; McCabe, 2014). As the make-up of psychology students is primarily female, social learning theory might predict that male psychology students are more likely to have similar discussion strategies to their female counterparts (Kupczynski et al., 2014; Smith & Mackie, 2005;

U.S. Department of Education, 2014). Symbolic convergence theory might predict that males adopt their discussion strategies to match how their female counterparts communicate by being exposed to predominately female discussion strategies.

These theories provide a framework for understanding potential differences or similarities in discussion strategies of asynchronous online undergraduate psychology students. Symbolic convergence theory predicts that as the population is predominately female, that male undergraduate psychology students may exhibit discussion strategies that are typically seen in female students. However, without data specific to the asynchronous online undergraduate psychology major student population it is impossible to support these predictions. Using these theories to provide a framework can help in defining and creating the study while also providing a perspective on how to interpret and explain the data that was gathered and analyzed.

Online Education

Due to advances in learning technologies, a new array of educational opportunities has become available for students seeking degrees. Tracking trends in online education in the United States has shown that enrollment in online learning is increasing substantially faster than any other learning medium (Allen & Seaman, 2006). In the past several years, while the exponential growth rate is slowing, it is remaining relatively steady. In the decade from 2002 to 2012 there was an increase from 1.6 million students taking at least one online course to 7.1 million students taking an online course. This is a compounded growth rate of 16.1%; for comparison, growth rates for face-to-face classes have increased at a compound rate of 2.5% annually (Allen & Seaman, 2014).

Perhaps one reason for the continual increase in online college enrollment is the availability of online public schools. Between 2009 and 2010 the use of online education mediums doubled to close to 27% of all high school students taking at least one online class, according to Project Tomorrow's annual survey (Nagel, 2010). In this survey, almost 300,000 kindergarten to 12th grade students were surveyed. It was also found that the use of online platforms in middle school is also increasing with 21% of middle school students taking at least one online class.

Nagel (2010) noted that the results of the survey also indicated that the demand for online classes was high. Many students surveyed wanted to take online courses, but the openings for online classes were not meeting the demand. This survey demonstrates that students are "eager to personalize their learning with technologies they are already comfortable with [and] schools are not fully capitalizing on this interest" (Nagel, 2010, para. 5). Considering the effects of prior online education experience prior to enrolling in college might impact the results of this study.

In addition to increases in enrollment, the perceived quality of online education is also increasing. In 2006, 65% of academic leaders in the southern states thought that online education was equal or superior to face-to-face learning (Allen & Seaman, 2006). This was up from 56% in 2003 (Allen & Seaman, 2006). A more recent survey found that in 2012, 77% of academic leaders found that learning outcomes in online education courses were equal to or superior to traditional face-to-face classes (Allen & Seaman, 2014). The quality of online educational programs is parallel to live classrooms.

Schools may offer online education in a variety of different ways, including varying degrees of blended or hybrid classes, where students meet in a classroom but also

work with an online platform, while other institutions offer classes strictly online, where students can complete work either synchronously or asynchronously (Allen & Seaman, 2006). Even students that are in traditional education settings taking face-to-face classes may have the opportunity to take online classes. In total, of the students attending a four year college in 2012, 33.5% have taken at least one online course.

Gender Dynamics in Psychology Major Students

In 1997 it was estimated that 1.5 million students take an introductory or general psychology course each year (Buskist, 1997). In the 2011–2012 school year, there were 1.8 million undergraduate degrees conferred in the United States. Of those degrees, 6% were in the field of psychology, making psychology the fourth most select major of the year (NCES, 2014). These statistics have been fairly consistent throughout the years with approximately 6% of degrees every year being conferred to psychology major students (Goldstein, 2010). The popularity of psychology as a major has remained consistent.

Psychology is unique in that the field has significantly more female students than male students. In a recent National Center for Education Statistics survey, it was found that there were 117,300 psychology students, with 90,000 female students and 27,300 male students (NCES IPEDS, 2016). This data suggests that make-up of psychology students is predominately female, with close to 75% of the student population being female. This data is similar to other studies which suggest that female psychology major students outnumber male psychology major students, with conservative estimates ranging from 75% and up (U.S. Department of Education, National Center for Education Statistics, 2014). Of these students, 20–24% of undergraduate psychology students will

go on to a graduate school; 8–10% of undergraduate psychology students will continue their education to the completion of their doctorate degree (Snyder & Dillow, 2010).

Educational Approaches

Learning can be accomplished in a myriad of different ways. Traditionally, dating back thousand s of years, learning occurred at the hands of a skilled master. Students would learn a trade by working directly with someone who was well accomplished (Tweed & Lehman, 2002). Throughout the years approaches to learning began to differ. Perhaps one of the more notable shifts in the paradigm of education came with the introduction of Socratic Questioning (Tweed & Lehman, 2002). Socratic Questioning, sometimes referred to as the Socratic Method, was developed by Socrates in the late 400s B.C. Socrates encouraged his students to question their beliefs, question the beliefs of others and engage in these dialogues (Feldman, 2011; Tweed & Lehman, 2002). Plato, an early philosopher and student of Socrates, was also an advocate for exercising the mind by questioning what we think we know. At the time, this was not always a popularly held belief (Edgar, 2012; Schunk, 2004). While communication based education has very early roots in history, it did not become prevalent until relatively recently. This was perhaps due to more popular beliefs such as that knowledge was acquired through experiences with the environment rather than reflection and reason (Schunk, 2004). Learning approaches will often vary based on the content to be learned.

While traditionally education was at the hands of skilled craftsperson, the enactment of the 1862 Morrill Act in the United States granted access to higher education to a more liberal set of students. The Morrill Act, also known as the Land Grant College Act, set out to establish higher learning institutions in every state. This would essentially

allow all social classes to obtain a higher education (Lightcap, n.d.) This allowed students of all standings to study not only reading and writing, but also various vocations. This was an important cultural turning point in the United States as the industrial revolution creating a growing need for individuals trained and education in various vocations (Edgar, 2012).

It was not until the early 1920s that scientists began to think more critically about approaches to learning. Pavlov's experiments with animals began to gain recognition for their application to human learning (Feldman, 2011). However, the education system in America began to take on a more industrial approach. Much like the assembly lines in the factories, students were pushed through their education with very little personal involvement (Edgar, 2012). This type of mass production of students continued until World War II.

It was at this time there were several factors that would change the course of education. The first was that it became apparent that simple reading skills were not sufficient. The military required individuals who could not only read the material, but could also understand it. This type of learning had not been taught previously as the focus was more on instilling facts and processes rather than encouraging thinking (Edgar, 2012; McNiel, 2006). The other major event that would influence higher education during this period was the introduction of the "G.I. Bill of Rights" which provided educational benefits to service members (Edgar, 2012; Gagne, 1985). It was these events that put higher education in the spot light and soon more and more approaches to learning would be introduced.

This caused an influx of learning approaches, from the traditional lecture to the introduction of various new learning theories (Feldman, 2011; Liliberte, 2005). The 1960s and 1970s saw the introduction of many learning theories. Some of the theories that emerged were behaviorism, operant conditioning, cognitivism, social learning, social constructivism, multiple intelligences and brain-based learning. All of these theories explored how learning should occur (Edgar, 2012; Laliberte, 2005). It was perhaps the social constructivist theory that reintroduced the importance of communication and searching for meaning in learning (Feldman, 2011). This caused a shift in educational approaches.

Social constructivism is based around several different approaches to learning including self-reflection, but also collaborative and cooperative learning. This type of approach is typically successful in older student populations; such as college students (Laliberte, 2005). Traditional brick and mortar schools typically had a lecture based education style. This typically involved students listening to an instructor talk about the topic and very rarely involved the students communicating but rather using rote memorization to demonstrate their understanding of a topic (Tweed & Lehman, 2002). However, instructors who adopted constructivist approaches began to allow students to work together and take more control of their learning through discussions about topics rather than lectures about topics.

Another cultural shift that impacted how student learn was the introduction of the personal computer in the 1980s. Many people thought the personal computer would make the teacher obsolete, but it proved to be a useful tool in education (Edgar, 2012). Then in the 1990s with the development of the internet, approaches to learning shifted again. The

internet gave students access to more information than they could ever learn. While this made many people skeptical about the internet's usage in classrooms, the ability to reach new forms of information and learning media has demonstrated how invaluable the internet can be in education (Edgar, 2012; Leigh, 2006). With that, came the introduction of online learning programs.

With the introduction of electronic means of communication, like electronic mail (email), online chat forums, and online discussion forums, educators and institutions embarked on a new approach to classroom communications as the needs of the students were changing. Students now needed to find a way to effectively communicate in an online environment (Davies, 2001; Edgar, 2012). These new approaches using newer educational technologies provided great benefits for the students.

Benefits of Communication in Education

Having students involved in communicating their learning is a more recent trend which signals a shift in roles and responsibilities. The instructor/lecturer is no longer solely responsible for student learning. Students now must take an active role. There are many benefits of students participating in their own learning.

Research has shown that when students communicate with others about what they are learning their achievement improves (Black & Williams, 1998; Davies, 2001; Sternberg, 1996). This suggests that students not only retain more information, but are developing a deeper understanding of the material. Students that can then demonstrate their learning to an audience, such as in live presentations or discussions, and receive feedback and feel more supported in their learning (Davies, 2001; Sutton, 1997; Wiggins,

1993). This encourages students to be more active in their learning and pursue higher learning goals.

When students are engaged in the classroom, such as live discussions the process can be conducive to higher learning. For example, a student may be involved in selecting a topic to discuss, constructing their argument or presentation, and seeking out feedback. This can guide students in the understanding of the material and help them derive meaning from their learning (Davies, 2001; Jensen, 1998; Kohn, 1999; Stiggins, 2000). Using student communication in this manner can increase not only a student's learning but also his or her self-efficacy. Davies (2001) explained that "when students communicate their learning… they are able to examine the depth, the detail, and the range of their own learning to figure out their strengths and what they need to work on next" (p. 48). By having student be accountable to themselves, it can increase learning outcomes.

Communication in the classroom must be productive and successful in order for students to benefit from it. Davies (2001) explained that successful communications involve students taking the lead. In a brick and mortar classroom this might include students demonstrating their knowledge, having an active audience, and allowing the audience to respond. This type of successful communication strategy for learning can be applied in online settings as well. The typical online communication involves a student posting a main discussion question and replying to other students.

A main component to the discussion board set up in most online classes is the requirement for students to reply to their peers. Replying to other students focuses the communication and gives the speaker and audience a purpose (Davies, 2001). This allows

both the presenter and the audience to select, collect, and reflect on the topic. The result is that students are more likely to be successful because they are able to communicate the topic with an audience (Davies, 2001). This approach is echoed in many online classrooms where students are asked to communicate a topic to peers, and comment on other students' posts as well.

Communication in the classroom can be effective for a variety of different reasons. In the short term, students are able to receive feedback on how they are communicating and understanding the material. In the long term, students are able to practice being an active learner and increase their confidence in their ability to learn (Davies, 2001). Davies (2001) explained that "when students learn, self-assess, and…. show their learning… they are developing the skills and habits of self-directed, independent, lifelong learners" (p. 49). This can enhance the learning experience of all students.

Gender Differences in Communication

There are many different ways that students can communicate in the classroom. How students communicate may be influence by a variety of factors including age, socioeconomic status, and life experiences. It has also been found in several different research articles that gender may play a role in how students communicate (Brizendine, 2006; Leaper & Ayres, 2007). Looking at gender as a variable in communication is important to understanding gender in communication based learning.

To understand this dynamic better in students it is important to look at gender differences in communication overall. Researchers have conflicting findings when it comes to analyzing how much people talk based on gender. Brizendine (2006) found that

on average women use three times as many words as men in written communication. In contrast, Leaper and Ayres (2007) found that in the majority of cases that males talk more than females in online mediums. However, when looking specifically at communication patterns of students based on gender, it was found that males are more likely to dominate classroom discussion, even from an early age (Holmes, 2004). In yet another attempt to research gender differences in word counts, Mehl et al. (2007) found that statistically there is no significant difference in the amount of words a person uses based on gender.

Perhaps it should be assumed, while the literature is split in whether men or women talk more, that communication patterns are influenced by the environment as well. For example, Tannen (1990) and Aries (1998) found that situations can influence how genders approach communication. Men are more likely to be more talkative in public settings, like classrooms, while women are more likely to engage in personal communications that build relationships. This supports the findings of Holmes (2004) in that males are more communicative in the classroom setting.

Another interesting finding when considering the environment was that the gender of the professor might influence how the students communicate. It was found in numerous studies that both male and female undergraduate students are more comfortable talking with female professors and feel closer to female professors thus are more engaged (Bettinger & Long, 2005; Rask & Bailey, 2002). This provides an interesting look at the dynamics of gender in student-teacher communications.

When it comes to using electronic mail to communicate older research suggests that men are more likely to prefer email communication (Herring, 2000). Recent research into student use of email suggests that women are more comfortable using email as a

means of communication, maintain social contacts, and generally see email as useful communication tool (Howard, Raine, & Jones, 2001; Jackson et al., 2001; Wasserman & Richmond-Abbott, 2005). Female students are more likely to put in more thought when using email in educational settings and send longer messages (Baron, 2004; Lightfoot, 2006). The comfort level of females in asynchronous communications may translate to online learning platforms.

Communication patterns have been studied numerous times in classrooms on campuses across the country. However, with the recent influx and availability of online classes and institutions, research understanding these dynamics in a virtual world is really only just beginning. As online learning platforms offer asynchronous discussions, it gives students more time to consider what they want to contribute, than say a synchronous discussion in a live class. The previous findings in face to face classrooms might not translate to the complex and diverse population of online students.

Gender Differences in Written Communication

To understand gender differences in discussion strategies in online education, it is important to look at gender differences in written communications. There have been a variety of different types of studies that look into gender differences in written communications.

Differences in written communication have also been researched in online classes. One such study was conducted by Mehl et al. (2007) where word counts were used to determine if written discussion strategies in college students varied by gender. It was found that women on average used 550 more words than men. This contrasts with the findings of Leaper and Ayres (2007) who found that male students posted more

frequently and had higher word counts than female students. Also looking at word counts of posters in synchronous chats online, Herring (2003) found that it was males that posted more frequently and had longer postings than females.

Leaper and Ayres (2007) found that men were more assertive in their communication than females who were more affiliative. Teten (2005) explained that women use more affective markers, such as expressing empathy, as well as use more hedge word like “perhaps” while men use more referential language and profanity. This was also found to be true in a study conducted by Herring (2003) who found that males assert their opinions as facts, and are more adversarial in their approach to communicating with others. It was also found that female are more likely to post short messages, post messages of support, apologize, or only respond to posts they can align with.

While many might believe that gender has no impact on written communication in online environments, this is simply not the case. While the gender of the poster (the person writing online) might not be obvious or disclosed, there are several key markers that help distinguish genders as discussed here. In fact, male and female written communication approaches are so different in online mediums, such as social media, that one study found that reviewers could accurately guess the poster’s gender 75% of the time (Teten, 2005). This indicates that there are clear male communication patterns and clear female communication patterns seen in online communications.

Gender Differences in Online Classrooms

Several research studies have suggested that similar to in face to face classrooms, the gender of general education online students might have an impact on learning styles

and how students communicate with their peers (Brajer & Gill, 2000; Junco et al., 2010; Savicki & Kelly, 2000). For example Brajer and Gill (2010) found that women were more communicative in classrooms and in online discussions. This included trying to relate material to their personal lives by giving personal examples and experiences as well as continuing conversations and responding to more than one student. It was found that men are more likely to focus on the face value of the material and only engage in discussion to further academic content (Brajer & Gill, 2010). These are clear differences in how males and females approach online discussions.

In addition to frequency of postings, the variable of communication has been studied in regards to the type and tone of communication. In one study it was found that men are more competitive in their posts and select peers to respond to based on their ability to outperform or correct the original student who posted (Arbaugh, 2000). Women were more likely to offer agreement or relay an experience or story related to the original poster's thoughts. This research was in in business, science and engineering classes and may not be applicable to the psychology major student population (Arbaugh, 2000; Xu & Jaggers, 2013). Investigating psychology majors with this approach may yield different results.

While communication patterns between males and females have been researched in both live classes and online classes, they have not been specifically researched with online psychology major students. As the population of undergraduate psychology major students is predominately female, it is possible that the current research findings using online courses with a more balanced gender ratio might not apply. Discussion strategies

in seasoned online students might change during the course of their education and should be investigated as well.

Online Discussion Strategies

When looking at online communication it is also important to consider discussion strategies. Students will most often comply with discussion prompts regarding content requirements, however, there are still discussion strategies and approaches students may utilized differently. For example, students may be prompted to offer an alternative opinion and support it, or share an insight they learned from their peer's post. How students approach their replies may differ, even though the requirements are the same.

Tsai et al. (2015) identified four different online discussion strategies while researching online communication patterns. These four discussion strategies include Elaboration, Interaction, Comprehension, and Anxiety. In explaining these strategies, Tsai et al. (2015) defined comprehension as the level in which a responder evaluates the other person's thinking, and whether the person they are replying to is supporting their opinions logically or not. Interaction is defined as the extent to which a person exchanges their ideas on the discussion board, for example, offering their opinion that contrasts with another person's opinion. Elaboration was the level at which a person integrates thoughts and proposes new ideas, for example if they simply reword a person's post in their reply, or if they expand on it. Lastly, Tsai et al. (2015) defined Anxiety as the level of fear or apprehension a person has in participating in discussions.

Undergraduate Discussion Requirements

Before researching the discussion strategies of the online undergraduate psychology population, it is important to understand what most universities require of

their students. While discussions may change from week to week, similar types of content are required. For example, many discussion prompts ask students to provide an example, or a personal example, that relates to the material presented that week. This may increase the likelihood that students will use examples and stories in their discussion replies as well; a typical "female" discussion approach as identified by both Arbaugh (2000) and Xu and Jaggers (2013). In addition, some universities require that students use in-text citations in their reply to a peer; this is a typical "male" discussion approach (Arbaugh, 2000; Xu & Jaggers, 2013). Thus, the discussion reply approach specific to online students may be influenced by the discussion requirements.

However, in discussion replies, students are prompted to "ask a probing question, share an insight from having read your colleague's posting, offer and support an opinion, validate an idea with your own experience, make a suggestion or expand on your colleague's posting" (L. Nassen, personal communication, 2016). This does leave some choice in how students approach their discussion reply. For example, three of the four categories identified by Tsai et al. (2015) can be seen the discussion reply prompts for a specific well known for-profit university students (Anxiety is a personal attribute and how the student feels while posting in the discussion and cannot be correlated with discussion reply content). Sharing an insight would be an elaborative discussion strategy, while offering an opinion would be an interactive discussion strategy. Investigating gender differences in how Walden students approach discussion replies based on the given prompts might yield interesting findings.

Methods of Researching Communication

Current researchers utilized a variety of different methodologies when conducting research in gender differences in communication in online classroom. Several studies reviewed used a mixed methods approach. This included using observation as means for collecting data then coding the data for quantitative analysis. For example, Guiller and Durndell (2006), used a total of 699 discussion board posts that were observed and coded for meaning (538 were posted by females, 161 were posted by males). They were coded using various attributes, such as posts being positive, posts being negative, posts being supportive, posts being combative, posts using predominately female approaches, and posts using predominately male approaches. These observations were then subject to a process referred to by Guiller and Durndell (2006) as supercoding; where the data was analyzed using the quantitative findings of the observations. It was found that females were more likely to be supportive and offer positive opinions while males were likely to be negative in their postings.

In a similar study, Dalampan (2006) also used observation of discussion postings. For their study, 19 students (9 males, 10 females) participated. In total, 589 postings were observed and analyzed. The posts were compiled into transcripts, one for female postings, and one for male postings. Using the "Find and Replace" function in Microsoft Word, linguistic qualifiers (but, if, I think, probably, may/might, often and though) and intensifiers (only, never, very, every, and always) were searched. The results of the study were mixed (Dalampan, 2006). Observing actual discussion posts with a larger participant pool might provide clearer results.

Again, using actual student responses to collect data, Brajer and Gill (2010) utilized an electronic survey. In the survey, which was emailed out to students, they asked participants to answer two open-ended questions (one on the parking situation on campus and the other on their major and why they selected it). The questions themselves were not related to the topic of the study, but were rather used to observe how the students responded. The word counts of responses were then examined using gender as an explanatory variable. A multivariate regression framework was used to explain the word counts in the respondents' emails. Brajer and Gill (2010) found that females used more words in response to the survey questions than males.

Strictly quantitative approaches have also been used to research communication patterns in online classrooms. Some researchers utilized surveys and questionnaires. For example, Kupczynski, et al. (2014) collected data from 959 education major students at a university. The data they collected using a demographics survey included gender, course grades, and cumulative G.P.A. After the data was collected they attempted to run a one-way ANOCVA to determine if the independent variable, gender, was related to the dependent variable, course grade. However, assumptions of the ANCOVA were not met, so they ran a simple mean effect tests to determine if there were significant gender differences at three different G.P.A. levels: low (25^{th} percentile), medium (50^{th} percentile), and high (75^{th} percentile). Gender differences were only significant in the lower G.P.A. levels, where females significantly outscored males (Kupczynski et al., 2014). This suggests that not only do men and women communicate differently, but that some communication strategies might be more effective than others.

In a study on the communication patterns of Taiwanese university students, researchers created an online survey to assess students' attitudes towards web-based learning. This survey was called the Web-based Learning Attitudes Survey (WLAS) and utilized a 5-point Likert scale. This survey was created to measure five areas: access, social structure, content, pedagogy, and community relationships (Che & Tsai, 2007). The reliability of the scales was, respectively, 0.80, 0.87, 0.79, 0.72, and 0.76 with an overall reliability of 0.88. The scales developed by the researchers were deemed to have a satisfactory reliability in assessing student attitudes towards online learning (Che & Tsai, 2007).

In a recent research study, using a mixed method approach, researchers developed a DSS-A which measures asynchronous discussion strategies in online classrooms. This scale has12 items that measure four factors in online discussions: Elaboration, Interaction, Comprehension, and Anxiety. The overall reliability of this scale is 0.71 (Tsai et al., 2015). The use of this scale to measure discussion strategies in asynchronous online psychology major students could prove useful in determining any gender differences.

Overall, researchers investigating communication in online settings utilize mixed methods approaches including observations of actual discussions, such as Guiller and Durndell (2006) and Dalampan (2006). Using a survey methods are also and effective means for collecting data on this topic. Bajer and Gill (2010) used an open-ended survey to observe how students respond, gathering quantitative data on word counts in responses. Kupczynski et al. (2014) also used email surveys to gather demographic data to investigate if gender is a variable that influences overall course grades.

Instruments were also used to research gender differences in discussion strategies of asynchronous online students. Creating their own surveys to measure students' engagement in discussions, Chen and Tsai (2007) developed a Likert Scale, while Tsai et al. (2015) also developed a scale to measure 4 different factors in asynchronous discussion strategies.

Conclusion

Overall, the idea that gender might influence discussion strategies has been established in classes conducted on campus. Limited investigation into this phenomenon in online classrooms has supported this idea as well. These studies however have been predominately in the field of science and technology and not the social sciences like psychology. The only study that looked at gender differences in online communication styles in the social sciences only included first year students in an introductory psychology class, not psychology major students. As the make-up of psychology major students is so heavily weighted with females it should be investigated if there are discussion strategy differences in this field. To date there is no study that supports the idea that the previous findings will absolutely translate to American undergraduate psychology major students at an online university.

It is important to understand the impact of gender on psychology students for several reasons. The first is that instructional designers and faculty may be able to alter their courses to incorporate different learning strategies or develop new ways to engage students through different approaches on the discussion board. Understanding how gender influences psychology students might also be important for the field of psychology. As more and more women are entering the field the number of male

psychologists may begin to decline. Cynkar (2007) suggested that as the “feminization trend continues… the field will reach a point where the numbers are too disproportional” (para. 17). Finding ways to draw male students to the field will be important if these trends continue.

In chapter 3, I will discuss the research methodology for the proposed study and how this gap in the literature will be addressed.

Chapter 3: Methodology

Introduction

The purpose of this quantitative study was to examine the gender differences in discussion strategies of asynchronous online undergraduate psychology major students at an online university. I considered participants psychology major students if they had declared their undergraduate major as psychology. Asynchronous online courses were courses that have a standard format with weekly discussion boards where students are required to post a main post and respond to at least one peer. Discussion board posts do not need to be posted within the same day, but main and response posts and must occur within the same week.

In this chapter, I will address the research questions and hypotheses, and how they were tested. In addition, I discuss the research design and rationale, including how this research plan was supported by other research approaches in the field. I also highlight the target population and sampling procedures for this study. I also discuss the instrumentation that I used in this study, including validity and reliability. Recruitment procedures, including how participants were given informed consent are also a focus in this chapter. The chapter ends with a brief discussion of threats to validity, as well as ethical concerns of this study.

Research Questions and Hypotheses

Research Question 1: What is the difference in the discussion strategy Elaboration between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education?

$H_1$1: There is a significant difference in the discussion strategy of Elaboration in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience..

$H_0$1: There is not a significant difference in the discussion strategy of Elaboration in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience...

Research Question 2: What is the difference in the discussion strategy of interaction between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education?

$H_1$2: There is a significant difference in the discussion strategy of interaction in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

$H_0$2: There is not a significant difference in the discussion strategy of interaction in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

Research Question 3: What is the difference in the discussion strategy of comprehension between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education?

$H_1$3: There is a significant difference in the discussion strategy of comprehension in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

$H_0$3: There is not a significant difference in the discussion strategy of comprehension in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

Research Question 4: What is the difference in the discussion strategy of between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education?

$H_1$4: There is a significant difference in the discussion strategy of Anxiety in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

$H_0$4: There is not a significant difference in the discussion strategy of Anxiety in online asynchronous undergraduate psychology major students based on gender when controlling for level in program and previous experience.

Addressing the Research Questions

In order to test the research questions and hypotheses a series of statistical analyses were run. Data were analyzed using a *t*-test in SPSS. This compared the population means and assessed whether the two groups (males and females) are statistically different from each other on each level of discussion strategies including Elaboration, Interaction, Comprehension, and Anxiety.

In addition, an ANCOVA was also run to control for level in program and prior experience with online education. This statistical test determined if these variables contribute to the discussion strategies reported by the participants.

Research Design and Rationale

The independent variable in this study is gender. The dependent variables include the four different types of discussion strategies, which include Elaboration, Interaction, Comprehension, and Anxiety. The two covariates are level in program and previous experience with online education prior to enrolling in current program.

The research design for this study was a non-experimental survey design. Data were collected using an online survey that included demographic information as well as the DSS-A to measure students' discussion strategies in academic online asynchronous discussions.

There were no perceived time constraints with this method of research. The only consideration with this study is that it would continue until the required number of surveys had been completed. I first posted the survey to the Walden participant pool. After a month of this approach only 3 surveys had been returned. As an alternative recruitment method, I live collected surveys using social media by contacting groups specific to undergraduate psychology majors. Many school affiliated groups did not want to allow posts from students at another school as they preferred to support only their student researchers. There were four Facebook groups that did allow me post an advertisement for my survey. After two weeks of live recruiting, only one additional survey was completed. As a final recruitment strategy, I paid for SurveyMonkey's targeted audience feature. This strategy allowed me to recruit participants in SurveyMonkey's participant pool who would be targeted with emails and cell phone notifications inviting them to participate in my survey. After a week of targeted audience

recruitment, I collected 133 survey responses. Of these responses, 16 were discarded as incomplete because the participants exited the survey before completing all questions.

Many researchers have used online surveys to collect data from online students. For example, Tsai et al., (2015) utilized electronic surveys to gather data on discussion strategies of online students. Kupczynski et al. (2014) also collected data on gender differences in online learning from over 950 students using survey methods. A web-based learning survey was also developed to send electronically to students to gather data on attitudes towards asynchronous learning (Chen & Tsai, 2007). Online surveys have been successful in current research methods involving online students.

Methodology

Population

The target population for this study included all undergraduate psychology major students taking asynchronous, online courses at an online based institution. The target population was not restricted by age, experience, country of origin, or any other factor. The approximate population size of all undergraduate psychology major students in the United States is around 400,000 students (NCES, 2014).

The undergraduate psychology major population at a specific for-profit University based in the United States fluctuates between 600 and 1,500. As of April 2016, the current population was approximately 1,000 undergraduate psychology major students. The gender ratio at this for-profit university is higher than the national average, with 81% of the undergraduate psychology major population being female (P. Costello, personal communication, 2016). The targeted population for this study was asynchronous online undergraduate psychology major students at this and any online university.

Sampling and Sampling Procedures

Sampling this population included three strategies. The first was to obtain permission from the IRB to recruit Walden students using the participant pool. The survey was posted in the participant pool on October 7, 2016. On November 6, 2016 only 3 surveys had been returned. The IRB was consulted again, and approval to live recruit participants using social media was approved, and began on November 17, 2016. Requests to post an invitation to participate in the survey were sent out to 17 Facebook groups. Only 10 responded, and of those, only 4 granted permission. After a month, only one additional survey had been collected. The IRB was consulted again, and permission to use SurveyMonkey's targeted audience feature was given on December 27, 2017. The survey was pushed out to SurveyMonkey's participant pool and by January 7, 2017 an additional 129 surveys had been returned resulting in a total of 133 surveys returned (16 were discarded as incomplete).

Computing effect size for an ANCOVA can be done in different ways, including looking at effect sizes for *r* and *d* tests. The d-family test is typically used when looking at specific contrasts, like comparisons of differences between genders (Field, 2012). Thus for this research, Cohen's *d* effect size index was used. As is standard in a priori sample size estimates, the alpha level was set at .05 (Grace-Martin, 2016). Using G*Power to determine a sample size for an ANCOVA with 4 levels (the four discussion strategies) and 2 covariates (level in program and previous experience) a sample size of 211 participants was required for a medium effect size of $f = .25$ with an alpha of .05 and a power of .80 (Faul, Erdfelder, Buchner, & Lang, 2013). A sample size of 86 participants was required for a large effect size of $f = .40$ with an alpha of .05 and a power of .80

(Faul, et al., 2013). I was able to collect 117 completed surveys. When running this sample size through G*Power to determine the achieved power, a sample size of 117 participants, with a medium effect size of .3, and an alpha of .05 achieves a power level of .95.

Procedures for Recruitment, Participation, and Data Collection

Recruiting participants was done electronically through a for-profit university's student participant pool. Live surveys were also collected using student run social media groups, predominately on Facebook. These groups were contacted for permission prior to posting links to the survey. Last, targeted audiences using SurveyMonkey's participant pool were also invited to take part in the survey. Demographic information that was collected included gender, year or level in program, and experience with online classes prior to enrolling in program (see Appendix A).

Participants were provided informed consent prior to opening the survey. Participants acknowledged they had read the informed consent and agreed to participate in the survey prior to accessing the survey. The survey remained anonymous, so signatures were not required. Data was then collected using an internet survey host provider called SurveyMonkey.

Participants had the option to exit the survey and the study at any point if they no longer wished to continue. If a participant wishes to exit the survey in the middle of participation, they only need to exit their browser. There were 16 participants that did not continue the survey to completion. If participants completed the survey and submitted it, their survey was added to the data collected. Once a participant had finished the survey,

they received a notification thanking them for completing the survey and informing them their participation was now complete. There was no follow-up procedure.

Instrumentation and Operationalization of Constructs

The instrument that was used in this research study was the DSS-A (Tsai et al., 2015; see Appendix B). The authors first developed this survey to test the differences between how online students communicate compared to how students in a classroom communicate (the companion survey was the Discussion Strategies Scale- F2F [face to face]). This survey was first used on 363 Taiwanese university students in a technology program. These participants had experience in both asynchronous online courses and face to face courses (Tsai et al., 2015).

This scale was appropriate to this study because the DSS-A measures discussion strategies such as Elaboration, Interaction, Comprehension, and Anxiety of online students. It was developed with a specific focus of online asynchronous students in mind. It was also appropriate to use because it lends itself well to online surveys.

Permission to use the DSS-A instrument is available in Appendix C. This scale contains 12 items that cover four factors of online discussion strategies: Elaboration Interaction, Comprehension, and Anxiety. According to Tsai et al. (2015), the discussion strategy of Comprehension measures and evaluates the other person's thinking before replying. For example, a person using this strategy will determine if the person they are replying to is logical in their support. The discussion strategy of interaction is the extent to which a person exchanges ideas, like offering contrasting opinions in the discussion board. Elaboration, according to Tsai et al. (2015), is the level in which a person integrates their own thoughts, such as if they support the original posters ideas, or if they

offer new insights. A person's level of hesitation or fear in posting is measured by level of Anxiety. The reliability of these factors is as follows: Elaboration .77, comprehension .66, interaction .74, and Anxiety .71. The overall reliability of this scale is 0.71 (DSS-A; Tsai et al., 2015).

The items in this scale are scored on a 5-point Likert scale with 1 being "not like me at all" to 5 being "very much like me." For example, one item on the survey (on the subscale for Comprehension) is "I pay attention to the flow of ideas which have been presented in the discussion" (Tsai et al., 2015). Another example of an item on this survey (on the subscale for interaction) is "I hope to get responses when I ask questions in a discussion" (Tsai et al., 2015).

When scoring the results of the survey, the subscales are separated (3 questions per subscale), and the average score of each subscale is then used. For example a participant responding to the comprehension subscale with a score of 3, 5, 4, would have an average comprehension score of 4. A higher score correlates to a positive response for each discussion strategy. For the subscale of Anxiety, the results must be reversed before scoring (Tsai et al., 2015).

Prior to completing the DSS-A, participants were asked a few questions to gather demographic information, including gender, which was either male or female, their year in program including four possibilities, either freshman, sophomore, junior, or senior and how many previous online classes they had prior to enrolling in their current program, which was measured as a continuous variable.

Threats to Validity

Threats to external validity include the ability of this study to be generalized to all asynchronous online undergraduate psychology major students. This study was only advertised to students at larger well-known online universities in the United States, those on certain Facebook groups and those registered with SurveyMonkey's participant pool. This may exclude universities that are not as well-known or smaller universities, as well as students that do not participant in social media. Recruiting only through these means excludes members of the population. Using social media and an online survey host's participant pool might also skew results as these participants may have more online experience than other students.

The threats to internal validity include participants that did not accurately respond to the survey. Assuming that most participants did not willfully answer incorrectly, this threat to internal validity was addressed in the construction of the online survey and notifications that the survey is designed for asynchronous online undergraduate psychology major students. Response items in the survey were clearly marked to eliminate possible confusion when responding to the survey questions.

Ethical Procedures

Agreements to recruit participants were collected prior to the start of data collection. Recruitment began at an American for-profit university's student participant pool. Next, advertisements were posted on social media web pages. These pages were not university affiliated but created by students, for students. Administrators of these webpages were contacted as a courtesy prior to posting advertisements for the survey. School pages from the for-profit American institution were be targeted. This population

will only be recruited through the participant pool. Lastly, a targeted audience was recruited using a survey host provider's participant pool which was paid for by the researcher. This cost $4 per survey response, and targeted participants that identified as either full or part time students at an undergraduate school using emails and cell phone notifications.

Participants gave informed consent prior to the commencement of the survey. They were informed that the survey was optional, they could exit at any time simply by closing their internet browser, and when they completed the survey their participation in the research study was complete. They were not be contacted after the completion of the survey.

Ethical Protections

Data is stored within my account with the survey host provider, SurveyMonkey, and on my personal, password-protected home computer. The data collected will remain on the SurveyMonkey website storage for up to 5 years before it will be destroyed. Data on my personal computer will be stored indefinitely and protected with a password. Data is anonymous as personal information was not collected, ensuring participants' right to privacy.

Summary

In this chapter I detailed the research design of this study, which was a non-experimental survey design using the DSS-A to collected data on discussion strategies to determine if there are gender differences between male and female undergraduate psychology major students at an online university. I recruited participants through a for-profit American university's student participant pool. Participants were also live recruited

through ads on Facebook. The survey was available for participants online, through the internet host provider SurveyMonkey. Prior to entering the survey, a letter of informed was displayed detailing the study and the rights of the participants. As this survey was an anonymous survey, informed consent was gathered by checking a box that the participant agreed to continue.

The host provider SurveyMonkey will store data. All data is also stored on my personal computer and protected with a password. Threats to validity include the generalizability of the results, as the target population only included undergraduate psychology major students. Recruitment procedures might also only include students that are already comfortable conversing in online mediums, as recruitment was done through social media. Threats to internal validity might include participants not responding truthfully. To minimize this threat to internal validity, indications that the survey was for undergraduate psychology major students only was highlighted (so other major students do not attempt to take the survey). Also, questions and corresponding responses were clear so participants did not mistakenly mark an incorrect choice.

In chapter 4 I will include statistical analysis of the data collected for this study.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to examine the gender differences in discussion strategies of asynchronous online undergraduate psychology major students at an online university. I hypothesized that gender differences exist for each of the four discussion strategies outlined by Tsai et al. (2015), which I described in previous chapters. In this chapter I include a review of the purpose of this study and the research questions. I detail data collection procedures and experiences as well as and how I processed data. I performed an independent t-test for each of the four discussion strategies (Elaboration, Interaction, Comprehension, Anxiety). Finally, I ran an ANCOVA to determine if there were gender differences when controlling for the two covariates based upon of previous experience in online education (number of online courses taken) and level in program (freshman through senior). Finally, I provide a summary of this chapter.

The purpose of this quantitative study was to examine the gender differences in discussion strategies of asynchronous online undergraduate psychology major students at an online university.

Data Collection

I used several approaches to collect data. The first approach in data collection was presenting the survey in a university's student participant pool. This yielded three participants. After a month of recruitment and little progress, I made a request to the Walden University IRB to use live participant recruitment via advertising on social media. This resulted in only one additional survey response. I made a second request to

the Walden University IRB to use SurveyMonkey's targeted audience feature. This feature sent notifications and emails to the host provider, SurveyMonkey's participant pool. SurveyMonkey is an internet survey host provider that also allows anyone to sign up and receive notifications of surveys they might be eligible to participant in. Participants are given various incentives to participate in surveys Participants in this study received a 50 cent donation to a charity of their choice and the opportunity to win a $100 Amazon gift card provided by Survey Monkey. Survey responses through SurveyMonkey cost me $4 per completed survey. This method of recruitment resulted in 133 surveys during the period of October 31, 2016, through January 9, 2017. Of these 133 surveys, 16 were incomplete and were not included in data analysis.

The targeted audience through SurveyMonkey was limited to only currently enrolled students in an undergraduate psychology program, at both 2-year and 4-year institutions. Full time students as well as part time students were included in this targeted audience. Participants were made aware that the study was intended for psychology students in online programs.

Of the completed surveys returned that were be used in this analysis, 37 were male students and 80 were female students. This sample is representative of the population of interest and is proportional to the gender ratio seen in typical psychology major programs. This sample has a gender ratio of 32% male participants and 68% female participants.

Participants range in age from 18 to75. The majority of participants (50%) were between the ages of 18 and 25. Students from different levels in program were fairly

evenly represented. Of completed surveys (n = 177), 24.81% were freshman, 27.07% were sophomore, 18.80% were juniors, and 32.3% were seniors.

Participants also reported a wide range of previous experience with online learning, from no online classes (37.5%) to over 40 different types of online classes and training programs (>1%). Less than 10% of participants reported taking 10 or more online courses or training programs prior to enrolling in their current program. The mean reported previous experience with online learning was 3.35 online classes or training sessions, with a standard deviation of 5.879.

Results

I conducted an independent t-test to evaluate the hypotheses that there are gender differences in discussion strategies of online psychology major students using the four discussion strategies of Elaboration, Interaction, Comprehension, and Anxiety. Using IBM SPSS Statistics 23, the results of the surveys were uploaded and computed to combine the three survey questions for each of the four discussion strategies to create one variable for each discussion strategy for the purpose of understanding gender differences in the discussion strategy as a whole factor, rather than the sub-scale responses (see Table 1 for subscale questions). Using Levene's test for equality of variances, equal variances are assumed.

Table 1

Subscale Survey Questions

Survey question	Sub-scale score
I am used to integrating people's ideas around the end of such a discussion.	Elaboration 1
I repeat others' ideas in my own words in such a discussion.	Elaboration 2
I try to propose other related issues for further discussion in such a context.	Elaboration 3
I hope to get responses when I ask questions in such a discussion.	Interaction 1
I usually exchange my ideas with others as much as I can in such a discussion.	Interaction 2
I try my best to get consensus with others for a conclusion in such a discussion.	Interaction 3
I think of whether others' reasoning or opinions are logically sound in such a discussion.	Comprehension 1
I pay attention to the flow of ideas which have been presented in such a discussion.	Comprehension 2
I usually remind myself of the goal of our group task in such a discussion.	Comprehension 3
I always feel nervous in such a discussion.	Anxiety 1
I am afraid to have conflict with others in such a discussion.	Anxiety 2
I feel shy to talk in such a discussion.	Anxiety 3

Independent t-tests on Factors of the Discussion Strategies Scale-Asynchronous

Research Question One, asked what is the difference in the discussion strategy of Elaboration between male and female undergraduate psychology major students in an asynchronous online course. Results of the independent samples *t*-test showed that the mean level of Elaboration in males (M = 9.73, SD = 2.524, n = 37) and females (M = 10.05, SD = 2.755, n = 80) was not statistically significant at the .05 level of significance

($t(115) = .550$, $df = 115$, $p > .05$). Males and females did not differ in their use of Elaboration as an online discussion strategy (see Table2). The null hypothesis, which suggested that there was no significant difference in the strategy of Elaboration, cannot be rejected.

Research Question Two, asked what is the difference in the discussion strategy of interaction between male and female undergraduate psychology major students in an asynchronous online course. Results of the independent samples t-test showed that mean level of Interaction in males (M=10.33, SD = 2.788, n = 37) and females (M = 10.25, SD = 2.914, n = 80) was not statistically significant at the .05 level of significance ($t(115) = .885$, $df = 115$, $p>.05$). On average, the strategy of Interaction between males and females was not statistically significant (see Table 1). The null hypothesis which suggested that there was no significant difference in the strategy of Interaction cannot be rejected.

Research Question Three, asked, what is the difference in the discussion strategy of comprehension between male and female undergraduate psychology major students in an asynchronous online course. Results of the independent samples t-test showed that mean level of Comprehension in males (M = 12.11, SD = 2.436, n = 37) and females (M = 11.99, SD = 2.740, n = 80) was not statistically significant at the .05 level of significance (t(115) = .819 , df = 115, $p>.05$). On average, the strategy of Comprehension between males and females was not statistically significant (see Table 2). The null hypothesis which suggested that there was no significant difference in the strategy of Comprehension cannot be rejected.

Research Question Four, asked, what is the difference in the discussion strategy of Anxiety between male and female undergraduate psychology major students in an asynchronous online course. Results of the independent samples t-test showed that mean level of Anxiety in males (M = 10.03, SD = 3.329, n = 37) and females (M = 10.20, SD = 3.477, n = 80) was not statistically significant at the .05 level of significance ($t(115)$ = .800 , df = 115, p>.05). On average, the strategy of Anxiety between males and females was not statistically significant (see Table 2). The null hypothesis which suggested that there was no significant difference in the level of Anxiety cannot be rejected.

Table 2

t tests Between Genders on the Discussion Strategies Scale-Asynchronous

DSS Factor		*M*	*SD*	*t*
Comprehension	Male	12.11	2.436	.819
	Female	11.99	2.740	
Anxiety	Male	10.03	3.329	.800
	Female	10.20	3.477	
Elaboration	Male	9.73	2.524	.550
	Female	10.05	2.755	
Interaction	Male	10.33	2.788	.885
	Female	10.25	2.914	

Analysis of Covariance on Discussion Strategies Scale-Asynchronous Factors

After the t-tests were computed, an ANCOVA analysis was conducted to determine if there were gender differences in discussion strategies when controlling for participants' previous experience with online learning and level in program. Research

Question One asked, what is the difference in the discussion strategy of Elaboration between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education. A one-way ANCOVA was conducted. A preliminary analysis evaluating the homogeneity-of-regression (slopes) assumption indicated that the relationship between the covariates and the dependent variable of Elaboration did differ significantly as a function of the independent variable of gender, $F(2, 115) = 3.104$, $p = .049$ (see Table 3).

Table 3

Analysis of Covariance for the Discussion Strategy of Elaboration by Gender

Source	*SS*	*df*	*F*	*p*
Gender with previous experience and level in program	41.968	2	3.104	.049
Error	749.963	112		
Total	805.957	115		

Research Question Two asked, what is the difference in the discussion strategy of interaction between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education. A one-way ANCOVA was conducted to determine a statistically significant difference between genders on the discussion strategy of Interaction controlling for previous experience and level in program. A preliminary analysis evaluating the homogeneity-of-regression (slopes) assumption indicated that the

relationship between the covariate and the dependent variable Interaction did differ significantly as a function of the independent variable gender, $F(2, 113) = 6.054$, $p = .003$ (see Table 4).

Table 4

Analysis of Covariance for Discussion Strategy Interaction by Gender

Source	*SS*	*df*	*F*	*p*
Gender with previous experience and level in program	89.821	2	6.054	.003
Error	848.050	111		
Total	920.661	114		

Research Question Three asked, what is the difference in the discussion strategy of comprehension between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education. A one-way ANCOVA was conducted to determine a statistically significant difference between genders on the discussion strategy of Comprehension controlling for previous experience and level in program. A preliminary analysis evaluating the homogeneity-of-regression (slopes) assumption indicated that the relationship between the covariates and the dependent variable Comprehension did not differ significantly as a function of the independent variable gender, $F(2, 115) = 2.292$, $p = .106$ (see Table 5).

Table 5

Analysis of Covariance for Discussion Strategy Comprehension by Gender

Source	*SS*	*df*	*F*	*p*
Gender with previous experience and level in program	31.309	2	2.292	.106
Error	771.682	113		
Total	802.991	115		

Research Question Four asked, what is the difference in the discussion strategy of anxiety between male and female undergraduate psychology major students in an asynchronous online course when controlling for level in program and previous experience in online education. A one-way ANCOVA was conducted to determine a statistically significant difference between genders on the discussion strategy of Anxiety controlling for previous experience and level in program. A preliminary analysis evaluating the homogeneity-of-regression (slopes) assumption indicated that the relationship between the covariates and the dependent variable Anxiety did not differ significantly as a function of the independent variable gender, $F(2, 115) = 2.440$, $p = .092$ (see Table 6).

Table 6

Analysis of Covariance for Discussion Strategy Anxiety by Gender

Source	*SS*	*df*	*F*	*p*
Gender with previous experience and level in program	55.936	2	2.440	.092
Error	1314.039	112		
Total	1351.060	115		

Analyzing the Significance

After the initial research questions were answered and it was found that there were two factors that had a significant difference between genders when controlled for previous experience and level in program further analysis of the data was done to look at possible relationships that might explain the significance. In order to determine where this difference was, first a chi-square test was conducted. A 2x2 contingency table was used. To determine the categories, a mean score (3.35), of the covariate "previous experience" was used to create two categories, above the mean and below the mean (see Table 7). Using the chi-square calculator, the chi-square statistic was 0.131, $p = .717$, which is not significant. The previous experience of male and female undergraduate psychology major students is not a significant factor in the differences between male and female undergraduate psychology majors.

Table 7

Chi-Square Contingency Table

	3.35 or less	3.36 or more
Male	28 (27.2) [0.20]	9 (9.8) [0.07]
Female	58 (58.8) [0.01]	22 (21.2) [0.03]

*(expected totals) [chi-square statistic]

Next, I looked at the mean gender differences in each factor by level in program (see Table 8). For mean score, the total of all three survey responses were combined to create a global score for each discussion factor. This is a total score out of 15, where the higher the score equates to a participant being more likely to engage that discussion strategy.

Table 8

Mean Gender Differences in Global Elaboration and Global Interaction by Year in Program

	Elaboration	*SD*	Interaction	*SD*
Male-				
Freshman	9.0	3.12	9.89	2.02
Sophomore	10.21	2.25	9.28	2.58
Junior	10.14	2.79	10.00	3.00
Senior	11.16	3.48	13.00	2.00
Female-				
Freshman	8.89	2.69	10.5	2.74
Sophomore	10.35	2.53	10.15	2.97
Junior	9.83	2.24	10.25	2.63
Senior	10.25	2.79	10.32	3.29

Looking at Table 8, it is clear that level in program does have a relationship on discussion strategies for male psychology major students. From first year students (Freshman) to final year students (Senior), the likelihood to engage in both discussion strategies increases. The most difference is on the discussion strategy of interaction from a mean of 9.89 as a freshman to a mean of 13.00 as a senior.

Female psychology major students do not show this same increase on discussion strategies as male psychology major students. There is no real increase in the use of either discussion strategy. It changes inconsistently from year to year. If anything, the mean scores on the discussion variable of interaction decrease slightly from 10.5 to 10.32 over time in program.

Summary

After a thorough analysis of the collected data, the two of the null hypotheses for this study were not rejected. There is no significant difference between genders for the discussion strategy factors of Anxiety and Comprehension when controlling for previous experience with online education and level in program. There were significant differences between genders for the discussion strategy factors of Elaboration and Interaction when controlling for previous experience and level in program. Chapter 5 will include a discussion of the results including an interpretation of the findings, limitations of the study, recommendations and implications.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

I focused on whether significant gender differences existed in discussion strategies among online undergraduate psychology major students while controlling for previous experience with online education and level in program. In this study I used a non-experimental survey design, and distributed online surveys to undergraduate students who identified as psychology major students. Because psychology major students are predominately female, this population is unique from other groups of students. Based on prior research, I hypothesized that a gender disparity could have influenced communication patterns, and discussions strategies of this population (Lightfoot, 2006; Smith & Mackie, 2005). For this reason, I researched to determine whether gender differences existed in the discussion strategies (Elaboration, Interaction, Comprehension, Anxiety) among online undergraduate psychology major students. The findings of this research study revealed that no significant difference between men and women in discussion strategies when controlling for level in program and previous online learning experience.

Interpretation of the Findings

The findings of this research study support the null hypotheses for Research Question 3 and Research Question 4 that no gender differences exist in discussion strategies of asynchronous online undergraduate psychology major students when controlling for previous experience in online education and level in program. This is true for two of the discussion strategies (Comprehension, Anxiety) as well as each individual survey item of the DSS-A. The best conclusion drawn from this research is that the online

environment is apparently neutral when it comes to gender. Both male and female psychology major students seem to respond in a similar way in their discussions.

The null hypotheses for Research Question 1 and Research Question 2 could not be rejected as significant gender differences existed in the discussion strategies of Elaboration and Interaction when controlling for year in program and previous experience. Further analysis revealed that the covariate of previous experience did not significantly affect discussion strategies. The covariate of level in program (Freshman, Sophomore, Junior, Senior) was the covariate that significantly affected gender differences in the two discussion strategies of elaboration and interaction.

I found that overall, the mean score for males in both discussion strategies, increased as the level in program increased. This indicates a higher likelihood to engage in those types of discussion strategies. For example, the biggest mean difference is seen in the discussion strategy of interaction, where the mean score for male Freshmen is 9.89 (*SD* = 2.02) and the mean score for male seniors is 13 (*SD* = 2). This can be interpreted to mean that as male psychology majors progress through their program they begin to want more interactions in discussions. This is the opposite for females, as the mean score for female freshmen in Interaction is 10.5 (*SD* = 2.74) and the mean score for female seniors is 10.32 (*SD*= 3.29). This suggests the desire for interaction barely changes over time, and if anything, slightly decreases as a female psychology major progresses through their program.

These findings are different from the findings of previous research studies on gender differences in discussion strategies discussed earlier, which suggested that males and females communicated differently in classrooms (Brizendine, 2006; Leaper & Ayres,

2007). The differences in findings suggest that perhaps males are becoming more similar to one another in their online communication patterns and discussion strategies. This makes sense when considered through the lens of symbolic convergence theory. Gender differences in communication patterns are typically notable, as explained by Leaper and Ayres (2007). However, in the case of this research, there are no significant gender differences. In this study, lack of significant differences between discussion strategies between males and females may be an important finding in that it does not fit with some previous research. But the results do support at least one research study, reported in the last year.

When looking at more recent research published in the last year, the findings from this study are consistent with research by Chai, Wu, Shen, Li, and Zhang (2016) who found that there were not significant gender differences in communication patterns in college students when it came to online communications (not specifically online learning discussions). This finding could suggest that communication patterns, and discussion strategies are evolving with technology and are changing rapidly. Findings from 5 years ago may no longer be relevant. Further research into the changing communication patterns of online students, is important. This is especially true in the case for psychology major students because the gender ratio is so skewed. Understanding how male psychology majors adapt to the growing majority of female students will give instructional designers a unique look, and important factors to consider when designing courses tailored toward greater inclusion.

Limitations of the Study

This research study was not without limitations. The first limitation of this study was in successfully accessing a participant pool. Issues with recruitment led the researcher to make revisions to the original recruitment strategy, which ultimately resulted in using a survey host provider's targeted audience feature. While the population targeted was narrowed to only undergraduate students enrolled at least part time in a two or four year institution, participant parameters could not be narrowed down to only psychology major students within this feature. Although the consent form notified participants they needed to be online psychology majors, it is possible participants did not fully meet the inclusion criteria of this research study.

Another limitation is that participant recruitment relied on SurveyMonkey's online targeted audience feature. Therefore, this recruitment strategy excluded all undergraduate online psychology major students not affiliated with SurveyMonkey.

The online survey design could also be another limitation. Participants self-reported their responses to questionnaire items presented on a Likert-scale. Self-reporting bias may have impacted the results if participants viewed themselves and how they participate differently than how they actually participate in online discussions. There was little that could be done to prevent self-reporting bias.

Recommendations

While the findings from this study suggest that there are no gender differences in discussion strategies of online undergraduate psychology major students, there are still recommendations. As a limitation of this study was in participant recruitment, a recommendation for future research might be to access and use only participants verified

to be undergraduate psychology majors; perhaps targeting university participant pools for recruitment. Using recruitment strategies that afford the researcher to accurately target undergraduate psychology major students might yield different results.

Another recommendation for future research might be to examine other covariates that might impact discussion strategies. For example, age might impact discussion strategies. In their study on creativity in virtual work, Martins and Shalley (2011) found that age can have a significant impact on virtual communications in different types of situations. Another covariate might be the type of institution the student is enrolled in. There are several different types of online colleges, from local community colleges, two year institutions, four year institutions, for profit-universities and so on. A major difference between these types of school is their structure. For instance, most for-profit schools offer greater flexibility while non-profit schools offer degrees at lower prices (Indiana University, 2016). These differences in institutions might impact how students at those schools communicate online. For example, there might be gender differences in communication patterns of asynchronous online undergraduate psychology major students when controlling for institution type (2 year, 4 year, nonprofit, for-profit). Looking at all possible factors that might influence how psychology major students interact and engage in discussions and determining if there are differences in some way can aid in understanding this population and how to meet their needs in regards to creating more engaging online discussions to enhance their learning experience.

Another recommendation for future research might be to compare gender differences of psychology majors to other majors to determine any differences between different types of student populations. This would be an interesting area to focus on

because understanding communication differences between different majors will add to the knowledge base. It could help instructional designers design more encompassing classes for students outside of their program (like for engineering students required to psychology courses). It could also help schools find ways to be more accommodating to different students in different majors. Lastly, it could help schools find ways to bridge gaps between students in classrooms creating a better learning experience for all. This research might focus on male students in particular as they are minority among psychology major students. Researchers might want to compare discussion strategies between male psychology majors and other social science majors, or even majors in different fields, like engineering or math.

As there were no significant gender differences in discussion strategies between male and female online psychology majors in this study, future researchers might also want to investigate factors that might contribute to this lack of difference. Qualitative studies might be conducted to investigate the experiences of male psychology students to determine why male psychology students have similar discussions strategies to females as opposed to normal gender differences in discussion strategies seen in other majors. There may be personality characteristics associated with students that select psychology as a major. These in term could be related to communication patterns and discussion strategies. For example, are males psychology majors more likely to have more elaborative and supportive discussion strategies (identified as more feminine traits) because of the nature of field? Does the disposition of the student draw them to psychology and thus the lack of gender differences in discussion strategies occurs before

the course begins rather than due to exposure of female communication patterns and discussion strategies?

Implications

The results of this study showed there were no significant gender differences in discussion strategies of asynchronous online psychology major students. However, that does not necessarily mean that there are not potential implications for social change. Through reviewing the literature it was found that the gender ratio in this population is more disproportionate than other majors. Acknowledging this and considering how different genders communicate within the psychology classroom can help instructors find more engaging ways to interact in their classrooms.

Instructional designers might also consider how the information provided by this study could be used to develop more comprehensive courses. Creating more engaging and comprehensive courses can lead to positive social change through impacting students on a personal level and allowing them to explore topics in ways tailored to their unique learning experiences. Reeves (2011) explained that instructional designers must consider the audience, in this case the students, before developing teaching materials. Reeves explained that the hardest part of instructional design is thinking like and understanding how students think. By utilizing research in the field, a better understanding of students can be obtained. This can also lead to greater positive social change by creating more knowledgeable practitioners in psychology that have great tools and understanding to be successful in their field.

In this study it was found that there was no significant difference between males and females on the DSS-A subscale for Anxiety 2 which measures students' feelings on

engaging in conflicts in discussions. The mean score for this subscale score for both genders combined was 3.38, suggesting that psychology major students prefer not to engage in debates and shy away from it as psychology major students are fearful of conflicts in online discussions, This information could be used by instructional designers and incorporated into their courses, including either avoiding debates in discussions and translating these types of debates to written or group assignments, or make sure the discussion guidelines for debates are clear.

Another example of how the findings of this study might help instructional designers understand psychology majors can be the findings from the subscale score for Elaboration, which suggests students like to discuss issues related to the topics in online discussions. There were no significant gender differences for this variable and the mean was 3.44 which suggested a high level of agreement. An instructional designer might consider incorporating related issues into their discussions. For example, in a typical discussion in an introductory psychology class for learning and behavior students might be asked to discuss a topic like operant conditioning. Included in the discussion, an instructional designer knowing students like to use related issues, might require students to find new research in learning theories, or discuss how learning theories have evolved with technology.

Lastly, the findings from the DSS-A subscale score for Anxiety can be used by instructional designers and instructors. This variable suggests that there is a high level of anxiety and shyness when approaching online discussions. Knowing this, instructional designers might find a way to incorporate more ice-breakers in the first week so students can get to know one another. This might alleviate some anxiety. Instructors could also

consider a different approach to working with students the first week or first couple of weeks of class. Knowing that students might be nervous might influence how, and how often, an instructor replies to discussions.

Another implication at an individual level might be that students could recognize that there is not a right or wrong way to communication and engage in discussions. This might make them more willing to participate, and less apprehensive, thus they might get more out of their classroom discussions and better themselves through their education.

Conclusion

While the results of this study were not significant, there are important aspects that were learned that instructional designer and instructors should consider. In order to be effective educators, it is important to understand the student population. This is especially true in online education settings where rapid advancements in technology are changing the face of higher education. It is important to know how to engage with students so they can get the most out of their educational experience. As technology advances, it is important to investigate the unique characteristics of the population of psychology major students. Understanding how this population functions within an online environment and how to provide them with the most engaging and comprehensive education possible will strengthen the field in the future.

References

Allen, I. E., & Seaman, J. (2007). *Making the grade: Online education in the United States, 2006, Southern Edition*. (ERIC Number ED530101) (ISBN-0-9766-7148-4).

Allen, I. E., & Seaman, J. (2014). Grade change: Tracking online education in the United States, 2013. *Babson Survey Research Group and Quahog Research Group, LLC*, *3*(5), 1–40. http://www.babson.edu/Pages/default.aspx

Arbaugh, J. B. (2000). An exploratory study of the effects of gender on student learning and class participation in an internet-based MBA course. *Management Learning*, *31*(4), 503–519. doi:10.1177/1350507600314006

Aries, E. (1998). Gender differences in interactions: A reexamination. In Canary, D. J. & Dindia, K. (eds.) *Sex differences in communication*. Mahwah, NJ: Lawrence Erlbaum Associates.

Baron, N. (2004) See you online: Gender issues in college student use of instant messaging. *Journal of Language and Social Psychology*, *23*(4), 397–423. doi:10.1177/0261927X04269585

Bettinger, E. P., & Long, B. T. (2005) Do faculty serve as role models? The impact of instructor gender on female students. *AEA Papers and Proceedings*, *95*(2), 152–157. doi:10.1257/000282805774670149

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education*, *5*(1), 7–75**.** doi:10.1080/0969595980050102

Brajer, V., & Gill, A. (2010). Yakity-yak: Who talks back? An email experiment. *Social Science Quarterly*, *91*(4), 1007-1024. doi:10.1111/j.1540-6237.2010.00746.x

Brizendine, L. (2006). *The female brain.* New York, NY: Morgan Road Books.

Buchner, A., Faul, F., & Erdfelder, E. (n.d.) *G*Power*. Retrieved from, http://www.gpower.hhu.de

Buskist, W. (1997). Future of introductory psychology textbook: A survey. *Teaching of Psychology, 24*, 119–122. http://teachpsych.org/top/index.php

Chai, C., Wu, X., Shen, D., Li, D., & Zhang, K. (2016). Gender differences in the effect of communication on college students' online decisions. *Computers in Human Behavior 65*, 117-188. Doi: http://dx.doi.org/10.1016/j.chb.2016.07.012

Chen, R. & Tsai, C. (2007). Gender differences in Taiwan university students' attitudes towards web-based learning. *CyberPsychology & Behavior, 10*(5), 645–654. Doi: 1089/cpn.2007.9974

Cynkar, A. (2007). The changing gender composition of psychology. Retrieved from, http://www.apa.org/monitor/jun07/changing.aspx

Dalampan, A. E. (2006). Gender issues in computer-mediated communications. *TESL* Working Paper Series, 4(2), 59–66. https://hpu.edu/CHSS/English/TESOL/ProfessionalDevelopment/TESOL_WPS/index.html

Davies, A. (2001). Involving students in communicating about their learning. *NASSP Bulletin 85*(621), 47–52. doi:10.1177/019263650108562106

Edgar, D. W. (2012). Learning theories and historical events affecting instructional design in education: Recitation literacy toward extraction literacy practices. *SAGE Open* 1–9. doi:10.1177/2158244012462707

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2013). G*Power Version 3.1.7 [computer software]. Uiversität Kiel, Germany. Retrieved from http://www.psycho.uni-duesseldorf.de/abteilungen/aap/gpower3/download-and-register

Field, A. (2012) Effect sizes. Retrieved from, http://www.statisticshell.com/docs/effectsizes.pdf

Frankfort-Nachmias, C., & Nachmias, D. (2008). *Research methods in the social sciences* (7th ed.). New York, NY: Worth Publishing.

Gagne, R. M. (1985). *The conditions of learning and theory of instruction* (4th ed.). New York, NY: Holt, Rinehart & Winston.

Guiller, J. J., & Durndell, A. A. (2006). 'I totally agree with you': Gender interactions in educational online discussion groups. *Journal of Computer Assisted Learning*, *22*(5), 368–381. doi:10.1111/j.1365-2729.2006.00184.x

Grace-Martin, K. (2016). The effect size: The most difficult step in calculating sample effect size estimates. Retrieved from, http://www.theanalysisfactor.com/sample-size-most-difficult-step/

Herring, S. C. (2003). Gender and power in online communication. Retrieved from, https://scholarworks.iu.edu/dspace/bitstream/hand le/2022/1024/WP01-05B.html

Holmes, J. (2004). Women talk too much. In Goshgarin, G. (ed.) *Exploring language* (10th Edition). New York, NY: Pearson.

Howard, P. E., Rainie, L. & Jones, S. (2001). Days and nights on the internet: The impact of diffusing technology. *American Behavioral Scientist*, *45*(3), 383–404. doi:10.1177/00027640121957259

Indiana University (2016). All colleges are not created equal: For-profit vs. non-profit schools. Retrieved from, http://info.ipfw.edu/blog/all-colleges-are-not-created-equal-for-profit-vs.-non-profit-schools

Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001). Gender and the internet: Women communicating and men search. *Sex Roles, 44*(5/6), 363–379. https://link.springer.com/journal/11199

Jensen, E. (1998). *Teaching with the brain in mind.* Alexandria, Va.: Association for Supervision and Curriculum Development.

Junco, R., Merson, D., & Salter, D. W. (2010). The effect of gender, ethnicity, and income on college students' use of communication technologies. *Cyberpsychology, Behavior, and Social Networking*, *13*(6), 619–627. doi:10.1089/cyber.2009.0357

Kohn, A. (1999). *The schools our children deserve.* New York: Houghton Mifflin.

Kupczynski, L., Brown, M., Holland , G. & Uriegas, B. (2014). The relationship between gender and academic success online. *Journal of Educations Online, 11(*1), 1–14. Retrieved from, ERIC databases.

Laliberte, M. D. (2005). A (very) brief history of learning theory. Worcester Polytechnic Institute. Retrieved from, http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCMQFjAA&url=http%3A%2F%2Fwww.humanities.uci.edu%2Feastasian%2Fjapanese%2FCourses%2FPedagogy%2F2006%2FLecture_ppt%2F10_LearnTheoryHistory.ppt&ei=osJcVdSpEMLZoAT9u4H4Bg&usg=AFQjCNHiKt2RA8JmHHuCnAnEl7yqp--k-Q&bvm=bv.93756505,d.cGU

Leaper, C. & Ayres, M. M. (2007). A meta-analytic review of gender variations in adults' language use: Talkativeness, affiliative speech, and assertive speech. *Personality and Social Psychology Review, 11*(4), 328–363. http://journals.sagepub.com/loi/psr

Leigh, D. (2006). *A brief history of instructional design*. Retrieved from http://www.pignc-ispi.com/articles/education/brief%20history.htm

Lightcap, B. (n.d.). The Morrill Act of 1862. Retrieved from, http://www3.nd.edu/~rbarger/www7/morrill.html

Lightfoot, J. M. (2006). A comparative analysis of e-mail and face-to-face communication in an educational environment. *Internet and Higher Education 9,* 217-227. doi:10.1016/j.iheduc.2006.06.002

Martins, L.L. & Shalley, C. E. (2011). Creativity in virtual work: Effects of demographic differences. Small Group Research 42(5), 536–561. doi:10.1177/1046496410397382

McNeil, S. (2006). *The history of instructional design: Empirical knowledge base for education*. Retrieved from http://www.coe.uh.edu/courses/cuin6373/idhistory/index.html

Mehl, M. R., Vazire, S., Ramierz-Esparza, N., Slatcher, R. B., & Pennebaker, J. W. (2007). Are women really more talkative than men? *Science 317*, 82. doi: 10.1126/science.1139940

Nagel, D. (2010). Report: Online learning nearly doubles among high school students. *The Journal*. Retrieved from, https://thejournal.com/articles/2010/06/29/report-online-learning-nearly-doubles-among-high-school-students.aspx

National Center for Education Statistics (2011). Learning at a distance: Undergraduate enrollment in distance education and degree programs. Retrieved from, http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154

NCES (2014). Undergraduate degree fields. Retrieved from, https://nces.ed.gov/programs/coe/indicator_cta.asp

NECS IPEDS (2016). Postsecondary education: Undergraduate degree fields. Retrieved https://nces.ed.gov/programs/coe/pdf/coe_cta.pdf

Rask, K. N. & Bailey, E. M. (2002). Are faculty role models? Evidence from major choice in undergraduate institutions. *Research in Economic Education*, *33*(2), 99–124. edsgcl.87207234

Reeves, A. R. (2011) *Where great teaching begins: Planning for student thinking and learning.* Alexandria, VA: ASCD

Schunk, D. H. (2004). *Learning theories: An educational perspective.* Upper Saddle River, NJ: Pearson.

Smith, E. R. Mackie, D. M. (2005). *Social psychology* (3rd edition). New York, NY: Psychology Press.

Snyder, T.D., & Dillow, S.A. (2010). Digest of education statistics 2009 (NCES 2010-013). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. (Revised on 2-2-2011).

Sternberg, R. (1996). *Successful intelligence: How practical and creative intelligence determines success in life.* New York: Simon and Schuster.

Stiggins, R. (2000). *Student-involved classroom assessment* (3rd edition). Upper Saddle River, N.J.: Prentice Hall.

Sutton, R. (1997). *The learning school.* Salford, England : Sutton Publications.

Tannen, D. (1990). *You just don't understand: Women and men in conversation*. New York, NY: Morrow.

Teten, D. (2005). Gender differences in spoken and written communication. Retrieved from, http://www.thevirtualhand shake.com/2005/03/19/gender-differences-in-spoken-and -written-communication/

Tsai, M-J., Laing, J-C., Hou, H-T., & Tsai, C-C. (2015). Males are not as active as females in online discussion: Gender differences in face-to-face and online discussion strategies. *Australasian Journal Of Educational Technology*, *31*(3), 263–277. https://ajet.org.au/index.php/AJET

Tweed, R. G., & Lehman, D. R. (2002). Learning considered within a cultural context: Confucian and Socratic approaches. *American Psychologist*, *57*(2), 89-99. doi:10.1037/0003-066X.57.2.89

U.S. Department of Education, National Center for Education Statistics (2014). Earned degrees conferred, 1949-50 and 1959-60; Higher education general information survey (HEGIS), "degrees and other formal awards conferred" surveys, 1967-68 through 1985-86; Integrated postsecondary education data system (IPEDS), "Completions Survey" (IPEDS-C:87-99); and IPEDS Fall 2000 through Fall 2011, Completions component. (This table was prepared July 2012.).

U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS). (2012). Fall 2012, Completions component. (This table was prepared July 2013.).

Wasserman, I. M., & Richmond-Abbott, M. (2005). Gender and the internet: Causes of variation in access, level, and scope of use. *Social Science Quarterly, 86*(1), 25–270. doi:10.1111/j.0038-4941.2005.00301.x

Werner, E., & R. Smith (1992). *Overcoming the odds: High risk children from birth to adulthood.* Ithaca, N.Y.: Cornell University Press.

Wiggins, G. (1993). *Assessing student performance: Exploring the purpose and limits of testing.* San Francisco: Jossey-Bass.

Xu, D., & Jaggars, S. S. (2013). Adaptability to online learning: Differences across types of students and academic subject areas. CCRCWorking Paper 54. Retrieved form ERIC databases.

Appendix A: Demographic Survey Questions

Please respond to the following questions as accurately as possible:

Gender: Male or Female

Age: Respond in year.

Previous experience with online education courses prior to enrolling in college courses (to include any online education program such as high school courses)- please list from 0 (no experience) to the number of online courses you have taken:

Current Year in Program: Freshman/Sophomore (less than halfway finished with courses to degree completion) or Junior/Senior (more than halfway finished with courses to degree completion).

Appendix B: Discussion Strategies Scale-Asynchronous (DSS-A)

Tsai, M-J. (2015)

Guidance: Please answer each of the 12 items on a 5-point Likert scale (from 1 = *not like me at all* to 5 = *very much like me*) while considering the following two discussion contexts independently based on your own discussion experience:

Context 1 (DSS-A): Asynchronous online discussion context (e.g., your former online discussion experience or the online group forums experienced in this current course)

Items:

1. I always feel nervous in such a discussion.* (Anxiety 1)
2. I hope to get responses when I ask questions in such a discussion. (Interaction 1)
3. I am afraid to have conflict with others in such a discussion.* (Anxiety 2)
4. I usually exchange my ideas with others as much as I can in such a discussion. (Interaction 2)
5. I feel shy to talk in such a discussion.* (Anxiety 3)
6. I try my best to get consensus with others for a conclusion in such a discussion. (Interaction 3)
7. I think of whether others' reasoning or opinions are logically sound in such a discussion. (Comprehension 1)
8. I pay attention to the flow of ideas which have been presented in such a discussion. (Comprehension 2)
9. I usually remind myself of the goal of our group task in such a discussion. (Comprehension 3)

10. I am used to integrating people's ideas around the end of such a discussion. (Elaboration 1)
11. I repeat others' ideas in my own words in such a discussion. (Elaboration 2)
12. I try to propose other related issues for further discussion in such a context. (Elaboration 3)

* Items to be scored in reverse before summing a total score.

Appendix C: Permission to Use Discussion Strategies Scale- Asynchronous

Original Email Request to use survey sent on December 12, 2015.

Shawna Burtis <shawna.burtis@waldenu.edu>
Dec 12
to mjtsai99
Hello Dr. Tsai,
My name is Shawna Burtis and I am currently a student at Walden University (Minnesota, USA). I am in the process of starting my dissertation on the gender differences in communication patterns of asynchronous online undergraduate psychology major students. I think your Discussion Strategies Scale-Asynchronous (which you developed in your article "Males are not as active as females in online discussion: Gender differences in face-to-face and online discussion strategies") would provide rich and valuable data for my study.
I am therefore asking permission to use your DSS-A survey in my dissertation project.
If you have any questions, please let me know.
Thank you for your time and consideration.
Shawna Burtis, MS
Student, Ph.D. Psychology
Shawna.Burtis@waldenu.edu
ShawnaBurtis@yahoo.com
425.299.2455
Silverdale, WA- PST

Reply-
Meng-Jung Tsai_Gmail <mjtsai99@gmail.com>
Dec 13
to Shawna.Burtis@waldenu.edu
Hello Shawna,
Surely. You have my permission to use DSS-A for your dissertation research.
Best,
Meng-Jung Tsai

Reply-
Shawna Burtis <shawna.burtis@waldenu.edu>
Dec 15
to Meng-Jung
Thank you so much Dr. Tsai. I truly appreciate it.
Shawna Burtis, MS
Student, Ph.D. Psychology
Shawna.Burtis@waldenu.edu
ShawnaBurtis@yahoo.com
425.299.2455
Silverdale, WA- PST