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Information Retention of Audio Based Public Service Announcements: The Impact of Messages Created Using Different Production Methods

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INFORMATION RETENTION OF AUDIO BASED PUBLIC SERVICE ANNOUNCEMENTS: THE IMPACT OF MESSAGES CREATED USING DIFFERENT PRODUCTION METHODS

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Audio based public service announcements remain a relevant media for message dissemination although much of the research literature now focuses on video based messages. This study examines the effects of producer type on information retention of PSAs regarding issues targeted toward college students. To conduct this experiment, three professionally produced PSAs were selected and college students in second semester audio recording class produced three PSAs regarding the same topics with the same facts. Subjects were placed into groups using a Latin Squares where they were exposed to one variation of each of the three PSAs. Subjects completed the listening activity and immediately completed a cued recall survey. Two weeks later, subjects were given a web-based free recall survey. No significant difference was found in regards to producer type in regards to cued recall. The results of this study show that students were more likely to retain information from PSAs they found to be interesting or entertaining regardless of the producer type. Future research is necessary to further investigate the impact producer type has on the information retention rates of PSAs targeted to college students.

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CHAPTER 1

INTRODUCTION

The public service announcement (PSA) provides pro-social information on a variety of topics including forest fires, seat belt safety, and crime. Using characters and memorable verbiage, Smokey the Bear, Crash Test Dummies, and Scruff McGruff have helped uncountable numbers of citizens make informed decisions (Ad Council, 2002). PSAs send and reinforce messages that have typically been disseminated by parents and social institutions such as schools, churches, recreational sports leagues, and so forth. These are messages that by nature would not be commercially viable; as a result, the PSA becomes an ideal avenue for disseminating these messages.

For college students, PSAs can be an important means of transmitting information. The PSA has existed in one form or another since the start of the Ad Council in 1941, thus the current traditional college student has been exposed to PSAs their entire life. Upon entering college and moving from the comforts and stability of home, students find themselves in a period of great personal transition. PSAs, being a constant in their life, can be a potentially valuable way to provide them with information and guidance as they mature.

The PSA remains a viable means of message transmission. Advances in media technology have changed how messages are transmitted to an audience. The declining cost of professional grade production equipment coupled with multiple outlets for user-generated content has spurred a new form of competition in the media market. Is it worth hiring a professional media production team to create messages? With many new music stars, television shows and comedians finding their fame through being discovered by producers and networks

via user generated content host sites such as YouTube, many questions are raised. Would the world have a case of "Bieber Fever" without YouTube? Would Comedy Central keep their ratings without Workaholics or Tosh.0? Moreover, does the audience actually care who produces their media? How does the producer impact message construction and reception?

This study seeks to explore the use of PSAs within the changing media climate. It focuses on public service announcements to study information retention of messages disseminated via audio PSAs targeting a college audience. Campus related media, like college television and radio stations, have the task of catering to multiple audience demographics. At the same time, the natural connection of campus radio to college students suggests that PSAs on these stations can reach students in a time of transition and maturation. In this study, professionally produced PSA messages are studied alongside student-generated messages containing the same facts and information.

Statement of the Problem

To understand the context of this study, it is important to consider past studies, psychographics, the importance of college radio and the nature of the student audience. Taken together, these factors demonstrate the need to study how producer attributes impact PSAs.

Past Studies

The public service announcement (PSA) has been studied extensively. Many studies focus on production value in video based PSAs. Adsinger, Austin and Pinkleton (2001) attempted to understand how pro-social messages (messages designed to promote social norms) regarding alcohol abuse reach their audience. The researchers looked at message characteristics

in PSAs and advertisements to discern what elements young adults favored in PSAs. Major factors in subjects' evaluations of the messages were the production quality or the aesthetic and technical value of the production, as well as how realistic or relatable the PSAs appeared. While the focus on video based PSAs can be utilized in creating audio only PSAs, there is a need for medium specific research in order to effectively create messages for audio only dissemination.

Cappella (2006) used behavior change theories along with information processing and message effects theories to examine the effectiveness of cancer related messages. Rather than look at behavior change alone, Cappella's meta-analysis notes the importance of theory rather than relying only on message testing. In addition, the importance of treating behavior change and information processing as complementary rather than dichotomous processes is noted. This study does involve the theory of information processing, yet many other PSA studies primarily investigate behavior change. There is a need to study effective message design so the intended audience is able to accurately process and retain information before behavior change is possible.

While the literature surrounding PSAs is vast and varied, there is a noted lack of research regarding production characteristics utilized in PSAs targeted to specific demographics (Wolburg, 2001; Andsager, Austin & Pinkleton, 2001; Lang et. al, 2004). Many current studies focus on various appeals used in PSAs, the effectiveness of PSAs in eliciting behavior change and in facilitating interpersonal communications. However, the majority of these studies involve video based PSAs (Lang et. al, 2005; Panic, 2011; Andsager, Austin & Pinkleton, 2001; Nan, 2008; Igartua, Cheng & Lopes, 2003; Lang et. al, 2004). Paek, Hove, Jeong & Kim (2011) studied producer effects and their impact on persuasive appeals in video based PSAs. The audio

only PSA has been largely overlooked, leaving these producers with little direction as to how to create a PSA that effectively targets college students or most other audiences.

This study examines the production characteristics along with information encoding, storage and retrieval of audio based PSAs. By combining production characteristics and information processing theory along with the concept of using psychographics and demographics to tailor messages, it is hoped that the results will be useful for script writers, audio production technicians and producers of PSAs so that messages are created in a way that accurately target the specific audiences for which PSAs are intended.

Demographics and Psychographics

The demographics and psychographics of the traditional college student are changing. Each generation has its own quirks, and today's traditional college age students are no exception. Evaluation of what constitutes effective content in PSAs is vital to the success of the message. Poorly planned or non-targeting PSAs may not be resonating with the intended audience. Well-planned PSA campaigns targeting specific populations can raise awareness of pro-social messages (Lee & Park, 2012). The fluctuation in college enrollment and availability of funding options contribute to the ever-changing demographic and psychographic characteristics of the current traditional college student (Shaprio, et. al., 2012).

When studying information processing and change in attitudes or behaviors, it is important to consider demographics like age, education and ethnicity (Flora & Maibach, 1990). In looking at current college students, new media forms must also be considered. As Croft (2008) points out, new media have changed paid media messages thus creating a need to change PSA messages as well. Both commercial and PSA messages are broadcast through the same

media. In order for the PSA to garner attention, the messages should be at the same aesthetic level as commercial messages (Paek, Hove, Jeong & Kim, 2011).

The ability to process information as well as how that information is processed varies based on the age of the audience. Students born after 1990 are considered to be members of the Net Generation, iGeneration, or Generation Z (Geck, 2006). These students, along with many of those considered to be a part of the Millennial generation, defined by Strauss and Howe (1991) as those born between 1982-2000, have grown up in a world full of technology; using computers, video game systems, and mobile devices to connect with family and friends via electronically mediated communication (Brumberger, 2011). Members of the iGeneration have grown accustomed to the Internet-based world and devote large chunks of time to personally relevant online activities (Geck, 2006). Research by Brumberger (2011) shows more than half of study participants, who are part of the iGeneration, spend five or more hours per day on the computer.

Fundamental differences occur in processing information and thinking in the iGeneration, in part due to their reliance on and ownership of mobile devices (Jones & Edwards, 2009). Smartphones are beginning to emerge as the new norm, leaving so-called "simple phones" in the past. Along with smartphones, netbooks, ultra-portable tablet computers and e-readers with Internet access, the prevalence of free Wi-Fi in public areas has also changed how the younger generation accesses information. Nielsen reports from February 2012 show 50% of US mobile subscribers own smartphones while the other 50% own feature phones or simple phones. This shows a drastic change from October 2010 when 29% of subscribers owned smartphones and 71% owned simple phones (Nielsen, 2013). The ease of accessing mobile media creates another set of obstacles for media production professionals, as there are more avenues to access media

than ever before. Media should be similar and accessible via mobile device as young consumers are using mobile devices more often (Luckman, 2012).

Importance of College Radio

College radio helps to define student identity by giving the students a source of information, entertainment and a means to identify with a university community. While the over 1,400 licensed college radio stations make up a relatively small percentage of the total radio stations in the United States (Wall, 2007), their importance to students can be far greater than commercial stations. While college stations have not been extensively studied, they are a prime channel for disseminating messages to students as well as the local community. Although new media such as the Internet, mobile web, and mobile apps tend to be the go to source for breaking news and information, college radio has its own advantages. It is often able to broadcast when new media may not be able to such as during off campus power outages, when cellular service is blocked or during other emergency situations. It also has the added advantage of being a common source of information, identity and entertainment for students. This element of attention can be particularly important to the production and effectiveness of audio PSAs.

Student Audiences

Research by Pilling and Brannon (2007) shows college students are more likely to pay attention to pro-social messages they feel are specifically tailored to them on an individual level. Creating a campus safety campaign that effectively engages students and produces the desired response takes knowledge, planning and perseverance. The lack of change in the PSA over time coupled with the major changes seen in the digital-age college student has created a dilemma in PSA creation. Continuing to produce messages using the traditional methods of PSA creation

may not effectively influence information retention or behavioral change in the intended audience. Revamping PSA creation methods has the possibility of influencing a countless number of diverse students to make better health and safety decisions.

College radio stations have the ability to broadcast messages regarding safety in a proactive manner by using PSAs to promote pro-social health and safety related messages to the student body as well as the surrounding communities. With technological advances in personal computing, laypersons now are able to create near professional quality audio recordings using their personal computers and free audio recording and editing software such as Audacity and Garage Band.

These factors suggest a fertile yet challenging ground for future PSA development. Easy access to technology provides the tools for production. This same explosion of technology has created Millennial and iGeneration members whose models of information acquisition and processing differ markedly from prior generations. Between the various avenues for unregulated user-generated content on the web, students are inundated with information created by laypersons. Rather than traditional regulated media forms, students use information in long form blogs, micro-blogs, social networking, Wikipedia and other new media platforms to form opinions and gather information. In trying to reach these students, are the traditional professional producers or the user generated content producers or peer producers more effective? This is a critical question and the focus of this study.

Purpose of the Study

The focus of this study is on producer attributes and information retention of audio PSAs targeted to college students. The literature provides evidence that iGeneration students receive

and therefore process information in different ways than prior generations and have multiple media sources competing for their attention. They are also at a transitional point in their lives where they are maturing and becoming independent in their decision-making.

This research explores how the producer effects of a PSA can influence the retention, interest and entertainment value of audio PSAs for college students. This study explores differences in PSA production methods; specifically it examines if professionally produced or peer produced PSAs will lead to increased retention, interest and entertainment value. This information may be useful to those who are creating PSA messages targeting traditional college students. A *post hoc*, cross-balanced experimental design with a two-week follow-up was used to gauge initial and delayed information recall. In addition, the research examines various demographic factors and their influence on the impact of producer effects. Professionally produced PSAs are compared to PSAs produced by students at the institution where the study is being conducted.

As its theoretical foundation, this study uses the Limited Capacity Model of Motivated Mediated Message Processing or LC4MP (Lang, 1999). College students are in a time of growth and transition and, especially for iGeneration students, there are many forms of new and traditional media competing for their attention. In such a context, will professional or peer produced PSAs be more effective? This study explores this issue essentially examining if professional expertise or peer commonalities are more effective so that the information may be shared with producers of media to create appropriate messages.

Research Questions & Hypotheses

This study explores how producer effects impact the retention of information and the attention paid to PSAs by college students. The study was conducted using a *post hoc* experiment with a counter balanced design. A paper based survey was distributed post listening to gauge immediate recall and a web-based survey administered two weeks later to gauge longer term recall. To test this, each participant was exposed to specific professionally produced PSAs and PSAs produced by second semester audio students at the university where the study was conducted.

The grand research question for this study is: What are the effects of producer attributes on the information retention of audio based public service announcements targeted to college students? In regard to producer attributes, is the producer a professional or a peer? Two sets of public service announcements are in use, one created by professionals, and the other created by peers of the subjects used in the study.

The subjects for this study have been recruited from a communications department at a mid-sized, Eastern public university that offers programs from the undergraduate through the doctoral level. The institution is primarily undergraduate in nature with 85% of the students pursuing the baccalaureate degree. Students from the second semester audio class in the Communications Media department created the peer produced PSAs. These students have completed coursework covering the theoretical basis of audio recording for voice overs and instruments, sound design, studio acoustics and both analog and digital recording systems. The professional PSAs were drawn from various online sources, including the Center for Disease Control and the Ad Council. Both peer and professional PSAs will focus on the same topics.

The first three research questions examine professional versus peer produced audio PSAs and how they impact information retention, level of interest and level of entertainment. Information retention includes immediate and longer-term recall. In addition to the general research questions, the study examined the demographics of gender, GPA, age, class rank and number of prior communications courses to determine if these provide additional insights and explanatory power.

RQ1: Is there a significant difference in information retention between professionally produced and peer produced audio PSA messages?

H1.1: There will be no significant difference in information retention between professionally produced and peer produced audio PSAs.

H1.2: There will be no significant difference based on gender in information retention between professionally produced and peer produced audio PSAs.

H1.3: There will be no significant difference based on GPA in information retention between professionally produced and peer produced audio PSAs.

H1.4: There will be no significant difference based on age in information retention between professionally produced and peer produced audio PSAs.

H1.5: There will be no significant difference based on class rank in information retention between professionally produced and peer produced audio PSAs.

H1.6: There will be no significant difference based on the number of communications classes in information retention between professionally produced and peer produced audio PSAs.

H1.7: There will be no significant difference based on the production course index in immediate information retention between professionally produced and peer produced audio PSAs.

RQ2: Is there a significant difference in level of interest between professionally produced and peer produced audio PSA messages?

H2.1: There will be no significant difference in level of interest between professionally produced and peer produced audio PSAs.

H2.2: There will be no significant difference based on gender in level of interest between professionally produced and peer produced audio PSAs.

H2.3: There will be no significant difference based on GPA in level of interest between professionally produced and peer produced audio PSAs.

H2.4: There will be no significant difference based on age in level of interest between professionally produced and peer produced audio PSAs.

H2.5: There will be no significant difference based on class rank in level of interest between professionally produced and peer produced audio PSAs.

H2.6: There will be no significant difference based on the number of communications classes in level of interest between professionally produced and peer produced audio PSAs.

H2.7: There will be no significant difference based on the production course index in level of interest between professionally produced and peer produced audio PSAs.

RQ3: Is there a significant difference in level of entertainment between professionally produced and peer produced audio PSA messages?

H3.1: There will be no significant difference in level of entertainment between professionally produced and peer produced audio PSAs.

H3.2: There will be no significant difference based on gender in level of entertainment between professionally produced and peer produced audio PSAs.

H3.3: There will be no significant difference based on GPA in level of entertainment between professionally produced and peer produced audio PSAs.

H3.4: There will be no significant difference based on age in level of entertainment between professionally produced and peer produced audio PSAs.

H3.5: There will be no significant difference based on class rank in level of entertainment between professionally produced and peer produced audio PSAs.

H3.6: There will be no significant difference based on the number of communications

classes in level of entertainment between professionally produced and peer produced audio PSAs.

H3.7: There will be no significant difference based on the production course index in level of entertainment between professionally produced and peer produced audio PSAs.

The fourth research question looks at how level of interest and entertainment impact information retention. The natural assumption is that the PSAs that students find more interesting and entertaining are more likely to be successfully processed and stored. As a result, higher levels of information retention would be expected.

RQ4: Do increased level of interest and level of entertainment in PSA messages lead to increased information retention?

H4.1: The greater the level of interest, the greater the level of information retention from audio PSAs.

H4.2: The greater the level of entertainment, the greater the level of information retention from audio PSAs.

Research question 5 examines the demographic factors that may influence free (delayed) recall. Students have immediate recall measures as well as the free recall measures, which were collected approximately two weeks after the immediate recall measures. A higher level of information recall is expected for PSAs that students rated as having a higher interest or entertainment level.

RQ 5: What factors influence free recall of information from professionally produced and peer produced PSAs?

H5.1: There will be no significant difference in level free (delayed) recall between professionally produced and peer produced audio PSAs.

H5.2: There will be no significant difference based on gender in free (delayed) recall between professionally produced and peer produced audio PSAs.

H5.3: There will be no significant difference based on GPA in free (delayed) recall between professionally produced and peer produced audio PSAs.

H5.4: There will be no significant difference based on age in free (delayed) recall between professionally produced and peer produced audio PSAs.

H5.5: There will be no significant difference based on class rank in level of free (delayed) recall between professionally produced and peer produced audio PSAs.

H5.6: There will be no significant difference based on the number of communications classes in free (delayed) recall between professionally produced and peer produced audio PSAs.

H5.7: There will be no significant difference based on the production course index in free (delayed) recall between professionally produced and peer produced audio PSAs.

Definition of Terms

The following items have been defined to ensure understanding of the study:

Public Service Announcement or PSA

A pro-social message intended to raise awareness or influence a change in attitude or behavior towards a particular issue or cause.

Interest Level

The amount of attention to or concern exhibited by a listener in response to a particular message measured by a 4 point Likert scale ranging from extremely interesting to not at all interesting.

Entertainment Value

The amount of amusement or enjoyment a particular message provides to a listener measured by a 4 point Likert scale ranging from extremely entertaining to not at all entertaining.

Production Knowledge

The amount of prior knowledge a participant has regarding the production process, measured by a numerical index. This first of these measures is based on the number of Communications Media production courses the subject has completed at the time of the experiment. A second form, the index, differentially weights basic and advanced production courses.

Pro-Social

A favorable social behavior; pro-social messages typically include health and safety related concerns, volunteering, and so forth.

Audio PSA

A public service announcement without visual accompaniment; messages are delivered via auditory channels.

Peer

An individual who is currently enrolled as a Communications Media major or minor at the University where the study was conducted.

Producer Attributes

Assess if the producer of the PSA is professional and a student peer.

Professional

An individual employed or contracted by an entity that creates PSA messages.

Delimitations & Limitations

This study will take place at a mid-sized (enrollment 15,000 students) state funded university with a primarily undergraduate focus with approximately 15% enrollment at the graduate level. The university draws from a range of socio-economic and demographic groups. It is in some respects typical of the general region; minority students make up approximately 15% of the total student population and females' account for 55% of enrolled students. In the state where the study was conducted, according to 2012 United States Census data, approximately 16% of residents are minorities and 51% of the state residents are female. While the sample is similar to the population of the state as a whole, the sample is not representative of the college population or the state as it focuses only on students with production courses.

The PSAs used in the study are solely audio based. The messages that were peer produced for this are also not representative of the college population – the students who created the PSAs were all Caucasian with the exception of one African American student enrolled in the course. The students were overwhelmingly male and many were within two semesters of graduation.

The number of PSAs included in the experiment is also a limitation. The researcher purposively chose the PSAs as messages likely to impact students. The messages included involve issues of health and wellness, binge drinking, and texting and driving; all subjects pertinent in the life of a traditional college student. In addition, the duration of the study is

approximately two weeks. A study with an additional follow up would better gauge the rate of information retention over a longer period of time.

Having provided an overview of the study, an examination of the literature is the next step. This is presented in Chapter 2.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

This study is designed to compare information retention based on facts included in student-produced campus safety related PSAs with professionally-produced PSAs regarding the same subject matter and using the same facts. In order for PSAs to be effective, they must reach their intended audience and influence that audience to modify their existing behavior. The literature examining this issue originates from several different areas. Research regarding the subject is qualitative and quantitative, derived from the fields of sociology, psychology, medicine, media studies, advertising, marketing, communication, and various other areas.

These areas will be explored to create a review that covers the historical aspect of the PSA and it functions, PSA research, and the medium of interest in the study. The various theoretical frameworks used in PSA research and the theoretical framework employed for this study will be detailed. Targeting PSAs to different demographics will also be included, along with an overview of the college demographic and the issues PSAs address within the subculture. Together, these topics create the blueprint for an informed outline of creating PSAs that may more effectively capture the attention of the modern traditional college student, thus changing how PSAs attempt to reach their target audience. This informed outline is empirically tested by the research study as outlined in chapter 3.

PSA History and Purpose

The PSA can trace its lineage to World War II. At this point in United States history, it was necessary to quickly disseminate messages to large numbers of people. In order to be

effective, the messages had to be memorable and prompt the listener to make a behavioral change. Today the purpose of the PSA, remains the same, but the types of information provided and the overall purpose of the message have changed.

History

One speech prompted the formation of what is now known as the Ad Council. In November 1941, James Webb Young's 30-minute speech, "What action can be taken?" led to the creation of an advertising council just days before the United States entered World War II (Kulkarni & Jeong, 2010; Dessart, 1982). Young, a university professor whose formal education ended at grade eight, had been named the founding father of the Ad Council. The original Ad Council hoped to preserve advertising in addition to spreading messages related to the war effort. The effort to create jobs and increase production by some businesses was being questioned. At the same time, advertisers were being criticized by the public because they were the voice of the businesses (Ad Council, 2002). Young's influence was paramount in the effort to protect advertisers and the business system as a whole.

The creation of the PSA came to fruition as radio broadcasters and advertisers offered their services to help garner support for the WWII effort. A variety of print advertisements, outdoor billboards, and radio spots carried messages from the newly named War Advertising Council, which was an official part of the Office of War Information (Dessart, 1982). From 1942 to 1945, four major campaigns were created, with three of these campaigns directly related to the war: "Women in War Jobs," "Buy War Bonds," and "Loose Lips." Throughout WWII, the War Advertising Council created and propagated the home front media campaign using free air time, loaned production space, and volunteer talent.

During this time, Smokey the Bear was also introduced to the public in an effort to prevent forest fires caused by humans. Smokey the Bear has been identified as one of the most recognizable fictional characters, with PSAs featuring Smokey the Bear still in circulation at the present time. Created in 1944 at Foote, Cone and Belding in Los Angeles, Smokey the Bear is recognized by 95% of adults and 88% of children as being related to forest fire prevention ("Masters of Choice," 2002). The Smokey the Bear campaign exemplifies the goals of the PSA. The spokesperson and message have been integrated into American culture and continue to spread information regarding the prevention of forest fires today.

After the war, President Roosevelt urged the War Advertising Council to continue their work; subsequently, the council took on a new name and role. The new privately-held, non-profit Advertising Council changed the aim of the War Advertising Council while staying true to its fundamental mission. For more than 70 years the Advertising Council, now known as the Ad Council, has relied on volunteer time, talent, and facilities to produce messages that are delivered to the American public. The messages focus on non-profit and government agencies, helping to promote pro-social messages in a variety of areas. The Ad Council is responsible for memorable campaigns over the years, starting with the war related classics and moving toward some of the more recent campaigns including Vince and Larry, the Crash Test Ddummies; Scruff McGruff, the crime watchdog, and the catchphrase "friends don't let friends drive drunk" ("Masters of Choice," 2002).

Public service announcements not only influence the audience, but they also act as a medium for educating, informing, and increasing awareness of health and societal issues (Kulkarni & Jeong, 2010). According to the Ad Council (2002), a PSA is defined as:

> an announcement for which no commercial charge is made by the broadcasters or by the nonprofit agency, government body, or individual providing the message, the purpose of which is to improve the health, safety, welfare, or enhancement of people's lives and the more effective and beneficial functioning of their community, state or region. Such messages shall not be commercial, political, or designed to influence legislation. (LaMay, 2002 p. 5).

Public service announcements have played an important role in swaying public opinion since the early 1940s. Traditionally, messages were designed to be carried on a specific medium (Blackman, 1998). Early audio-based programming, including variety programs, drama series, and quiz shows, started to scale back on the radio due to television drawing viewers for these types of programming in the late 1940s and 1950s, thus causing a decline in potential radio listeners for these PSA messages (Vivian, 2005). Although approximately 93% of consumers listen to radio each week, new channels for audio based programming are gaining leverage in the market (Arbitron, 2013). Audio-based programming has made a move toward the Internet and satellite radio options. The reach of traditional radio has not changed much over the decades, however, the Internet and streaming have expanded its reach. In addition, the prevalence of visual media has altered PSA dissemination.

The 1950s brought about a revolution in media. Televisions were more common, diverting attention from other media to the screen (Vivian, 2005). This change created the need for visually based PSAs. Throughout the latter part of the 20th century, the visual medium remained the major means of transmission employed for PSA dissemination (Dessart, 1982). With innovations in technology, media consumption of the average American has changed

drastically from the 1950s. While traditional TV and AM/FM radio remain the most commonly used media, the Internet, game consoles, and mobile devices are now also vying for consumer attention. Nielsen's "A Look Across Media: The Cross-Platform Report" from 2013 charts weekly media consumption as shown in table 1.

Table 1

Weekly Media Consumption 2013

Medium	Traditional TV	AM/FM Radio	Internet / Computer	Internet Video	Game Console	Video on Mobile Device	DVD/Blu-Ray
Hours per week	31.5	14	1.5	1.5	1.5	1.3	1.3

Also important to note, 167,142,000 viewers are watching at least some portion of traditional television on a time-shifted basis, by using DVR or on-demand features to view television programming. With many DVR and on-demand programs, the viewer is able to fast-forward or skip non-program related content. Consequently, the actual viewership of commercial or PSA spots is difficult to accurately assess.

With the growth of new media technologies and the ability for anyone to contribute to the body of media, the PSA must compete for audience attention. As a result, the PSA currently faces the need to change in order to avoid obsolescence. The PSA is facing a curious dilemma as it seems to have "quit" working (Bernthal, Rose & Kaufman, 2008). PSAs are effective in bringing attention to the subject matter at hand, but there is a lack of success in creating behavior change based on these messages. Rather than be abandoned completely, the PSA must employ an alternative approach in order to reach the intended audience (Treise, Wolburg, & Otnes, 1999).

In order to make such a change, many factors must be taken into account, starting with the functional purpose of PSAs.

PSA: The Functional Purpose

Mass media messages, including PSAs, are created for a variety of reasons. These messages commonly provide information and attempt to persuade consumers or motivate them to make a particular decision (Borzekoqski & Poussaint, 1999). To accomplish this, multiple appeals are used to influence audiences to change their behavior or attitudes toward the subject in question. Although emotional, rational, and fear-based appeals have been researched most heavily, there are also appeals to sex, culture, hedonism, and utilitarianism (Kulkarni & Jeong, 2010). Research on various appeals has produced findings that suggest certain appeals may be more effective than others in PSA message creation.

PSAs have the ability to generate various emotional responses to appeals, which influence persuasion (Nan, 2008). Emotional appeals tend to work better with audiences who are less involved with the message topic (Kolter & Armstrong, 1991). Rational appeals that present logical, information-based messages appear to be more effective with those less involved with the PSA topic (Shead, et. al., 2010). Studies regarding the use of fear appeals in PSAs have found that when young adults are shown consequences of a lack of behavior change, they lose a sense of freedom, thus increasing the attractiveness of the behavior in question (Lennon, Rentfro, & O'Leary, 2010). Many other studies have found similar results regarding health and safety related PSAs (Koch & Lomore, 2009; Eckstein, 2012; Ahn, et. al., 2010).

PSA Research

Different measures are taken within PSA production to create messages the intended audience will identify with, recall, and employ when making behavioral decisions. According to Kulkarni & Jeong, (2010), the successful PSA incorporates viewer self-interest, goals, needs, and wants to create an influential message. Popular ways to aid in audience comprehension of PSAs are to use celebrity or well-known experts as endorsers, and to use rational or emotional appeals in framing the message (Kulkarni & Jeong, 2010). Although rational messages are generally less memorable than those with emotional appeals, within the category of emotional appeals those employing negative methods are more memorable than those using positive methods (Flora & Maibach, 1990). Research conducted by Johnson, Flora and Rimal (1997) and cited by Kulkarni & Jeong (2010) notes that messages featuring male endorsers tend to be more fact-based than their female endorser counterparts, who tend to employ more emotional-based messages. PSAs often influence negative emotions by the use of startling imagery in depicting health and societal issues (Kulkarni & Jeong, 2010). Lee and Davie (1997) found in their research regarding AIDS messages that college women were more likely to recall the highly emotional spots. The same study found that gender showed no impact on the recall of drinking and driving PSAs.

A common PSA plan for behavioral change on the college campus involves the use of normative messages to influence the audience. While social norms are often cited as the basis of PSA messages, such norms have been criticized as being too general, vague, or contradictory (Cialdini, Reno & Kallgren, 1990). Although the plan of action within a social norms campaign is to show the audience a portrait of normal behavior, at times the opposite is achieved (Cialdini, 2003). The audience is shown that although society approves of one action, there are many

people still indulging in the opposite action. To combat this issue, social norms campaigns must align the descriptive norms with the injunctive norms, thus showing what actions should occur in conjunction with the actions that should not be occurring in order to squelch any ideas that the injunctive norm behavior is acceptable whatsoever. When an activity is widespread but socially unacceptable (underage drinking on a college campus, for example), PSA creators must send clear, normative messages that include both the descriptive norm and the injunctive norm working in tandem to be effective (Cialdini, 2003).

As found in seminal research by Rogers (1983), and Rogers and Deckner (1975), in theory, the use of fear appeals is meant to encourage cautious motivation, incite fear and promote actions that are self-protective. In practice, use of fear appeals targeted to change behavior related to drug use, driving issues (drinking and driving, as well as distracted driving), and sex practices have shown mixed results. Within the young adult demographic, most feel the messages are directed to others, finding the message irrelevant to their lives or thinking they will not suffer consequences from their actions (Lennon, Rentfro, & O'Leary, 2010).

Research by Atkin and Freimuth (2001) examines PSA producers who are often artists that put aesthetic elements before effective message design characteristics. Santa and Cochran (2008) suggest research into specific elements of PSAs and how the elements of messaging, production and aesthetics influence reception. In addition, Atkin and Freimuth (2001) suggest creating multiple PSAs using the same message, as the repeated use of one PSA may cause a decrease in effectiveness. A common PSA tactic involves the use of normative messages to influence the audience. This study specifically focuses on the audio-based PSAs and employs normative messages and narrative techniques to create messages.

The Medium of Interest: Audio

The medium of interest in this study is audio, particularly the aspects of audio being broadcast via an aural only medium. Aural only messages have three main transmission channels: face-to-face or mediated communication; radio in the traditional sense; and radio in the more non-traditional sense such as satellite, podcast, or web-based broadcast. The denotative definition of radio has not always been used as it is in current times. The notion that "media are not fixed objects: they have no natural edges" was explored by Carolyn Marvin in 1988. In this study, audio as a medium has no natural edges. Audio based messages can be broadcast via radio. Lacey (2008) makes the argument that radio as a medium has made a shift from the original sense and is now used to describe audio-based messages transmitted via a variety of audio only channels. This change is reflected in the renaming of the *Journal of Radio Studies* to the *Journal of Radio and Audio Media*. This study examines messages created by professional and peer producers. These messages are purely aural, lending the possibility that they may be disseminated via radio broadcast.

Audio Production

Audio production as a field has changed much from its inception, when recording was mechanically- based and required a high level of knowledge in both performance for recording and the actual recording process. The move from mechanical recording to analog recording created many opportunities to take a simple voice and create a sonic landscape where sound was able to paint a vivid picture for the listener. Moreover, the shift from analog recording to digital recording has afforded many changes and challenges with the medium. Audio production curriculum in higher education is often seen as a precursor to other media like television and film

(McClellan, 2001). In teaching audio production, the concepts of the sonic stage, panning, volume, and frequency, and the importance of scriptwriting or message crafting are equally important. Without proper production techniques, the best scriptwriting will fail and vice versa.

The use of quality audio in media production can make the difference between a professional and an amateur production. The use of high-quality audio adds to a production by affecting emotions and creating responses to the message (Musburger & Kindem, 2009). The use of panning, volume and frequency are paramount in recording and mixing audio.

Many digital audio recording workstations include the elements necessary to create exceptional audio without the use of additional processors or plugins (Savage, 2009). The process of mixing audio requires a trained ear and experience, which many students studying audio have acquired. The ability to build a mix that effectively creates mental images that are coded, processed, and recalled requires the listener to use sensory skills and cognitive processing to extract meaningful information (Rodero, 2012). These production attributes help to craft a message that can be effectively processed by the audience. Also important in this process is the actual verbiage and sound effects used in the creation of the message.

Audio Based Messaging

Some producers and directors find that sound and visuals must be able to stand on their own (Musburger & Kindem, 2009). In these instances, scriptwriting is of utmost importance. Audio and radio related messages have often been referred to as a theater based in the mind (Bolls, 2002). Creating a theater in the listener's mind requires expertise in preproduction and production. Crafting scripts that effectively target the audience requires attention to information processing theory, persuasion, and basic human communication theory. In processing audio-

based messages, there is a relationship between distance and interpersonal communication (Barboutis, 2013). Messages are created for a mass audience, yet are transmitted in a one-to-one or one-to-many dissemination. The key is to create messages that "create, reinforce, modify, or extinguish connections" that currently exist in the audience (Gass & Seiter, 2007). The current study posits that similarities between the producer and the audience may be helpful in creating effective messages.

Examination of Theoretical Constructs

The PSA has been extensively studied using multiple methods and theoretical constructs. The purpose of many studies is to investigate behavior change or persuasive impact of the message. This section will discuss various selections of PSA research, reviewing popular theoretical constructs used in PSA research including Cognitive Dissonance Theory, the Message Interpretation Process (MIP) Model, and the Elaboration Likelihood Model. A brief review of commonly used theoretical constructs is warranted to justify the choice of the theoretical framework in this study: the Limited Capacity Model for Motivated Mediated Message Processing.

Cognitive Dissonance

The Theory of Cognitive Dissonance has been used extensively in research related to PSAs (Austin, et. al., 1999; Borzekowski & Poussaint, 1999; Wimer, 2003; Abrams, 2012). Cognitive dissonance and the PSA share a common foundation history. After WWII, social psychologists focused heavily on examining the influence groups have on an individual (Cooper, 2007). Leon Festinger (1954) created Social Comparison Theory, which is used as a framework to understand how groups influence individuals. Festinger next developed the notion of cognitive

dissonance. Simply, people do not like inconsistency. The more inconsistency a person faces in their life, the more they will attempt to reduce this inconsistency. By using cognition, the idea of dissonance can be applied to any psychological concept. Humans, by nature, have many cognitions or pieces of knowledge (Cooper, 2007). These cognitions may not always be in the person's current state of awareness. Some of the cognitions co-exist with no other thought. Yet, when cognitions are related to each other but conflicting, people feel a state of unrest. This notation of conflicting cognitions was used to develop the Cognitive Dissonance Theory.

Leon Festinger's (1954) Cognitive Dissonance Theory deals with the concepts of attitude formation and attitude change. The Cognitive Dissonance Theory involves two major parts: the first, cognitive thinking, and the second, psychological conflict induced by holding two contradictory beliefs simultaneously. Festinger's theory suggests there are two possible outcomes in such a situation. The person involved will either be uncomfortable enough due to the dissonance that they change their behavior to achieve equilibrium in their thinking and beliefs, or the person will avoid further information or situations that may lead to increased dissonance. As this theory sheds light on the decision making process, it is applicable to the area of PSAs where the ultimate goal is behavior change.

PSA audiences are inundated with conflicting messages. Research by Wimer (2003) used technology and Cognitive Dissonance Theory to engage college students in the creation of six to eight minute videos used as a medium to convey facts regarding various health topics to fellow students with the intention of creating a behavior change. Wimer found that peer educator approaches and media literacy were related and contributed to students' ability to process messages. A similar study involving undergraduate students was conducted by Abrams (2012),

although results remain unpublished. Abrams used Prospect Theory, Attribution Theory, Social Cognitive Theory, and Cognitive Dissonance as background information to provide students with information related to persuasion. Students created 60-90 second PSAs and used them as a discussion tool in class. Attitudes toward the project and effectiveness were gathered but not reported in the study. While Cognitive Dissonance Theory can be applied to PSA research, this study will not use that particular theoretical construct as the purpose of the study is to gauge information retention rather than attitudes toward cognitions and behavioral change.

ELM

In the Elaboration Likelihood Model, Petty and Cacioppo postulate information processing to be determined by many factors. These factors are involvement, motivation, distraction, source credibility, need for cognition, and relevance (Petty and Cacioppo, 1986). ELM is commonly used to study persuasive messages. An important aspect of ELM is that the receiver must be able to put forth effort in evaluating and processing the message. Petty and Cacioppo's model suggests that the receiver's evaluation of persuasive messages is based on two variables: personal experience and available information (Lee & Davie, 1997). Level of issue involvement is paramount when investigating persuasive communication. ELM predicts that the use of credible and attractive spokespersons will not affect those who are highly involved in the message and use central processing in making sense of the message (Shead, et. al., 2010). Lee and Davie (1999) note that since PSAs involve messages that may be personally relevant to the individual, they will likely be highly involved in the message processing.

Those who are highly involved, will process information about the central argument of a message, such as message quality and persuasiveness. This route is known as central processing.

New information gathered from the PSA along with existing information lead the viewer to make a judgment that can result in behavior change (Shead, et. al., 2010). Those who engage in central processing are more likely to exhibit behavior change (Flora & Maibach, 1990). The effectiveness of information based messages using rational appeals is greater among those highly involved compared with messages employing testimonials via emotional appeals (Braverman, 2008).

People who are less highly involved process information about the message source, like credibility and attractiveness, otherwise known as peripheral processing. If the viewer deems the source to be credible or attractive enough, they may accept the message without regard for the persuasiveness of the message (Shead, et. al., 2010). Calvert, Cocking and Smrcek (1991) note understanding televised content, like that found in PSAs, is divided into two mutually exclusive categories: for me and not for me. When the message is considered for me, the viewer pays attention more, retains more and elaborates on the message (Lee & Davie, 1997). The use of celebrities or other notable spokespersons helps to create higher levels of credibility or attractiveness, thus creating greater likelihood that the message is processed with some scrutiny, albeit through the peripheral route (Shead, et. al., 2010). In this study, identifying information, such as the source of a message, was removed in order to reduce indications of producer attributes. The ELM was not used in this study for that reason.

Message Interpretation Process (MIP) Model

The Message Interpretation Process (MIP) Model is a more recent development in message processing theory. MIP was conceptualized in the 1990s. This model builds upon Bandura's (1986) Social Cognitive Theory; Goldman, Brown and Christiansen's (1987)

Expectancy Theory; and Chen and Chaiken's (1999) Complementing Dual-Process Theories of Persuasion. At its base, MIP theorizes that decision making involves two routes, affective and logical. These routes interact and create a benchmark for decision making and beliefs (Austin et. al., 2002). Logic-based processing is also noted to be able to reduce emotional or affective-based processing (Austin, Chen, & Grube, 2006). Processing routes are determined by analyzing "desirability, perceived realism, norms and perceived similarity, identification, expectancies, and behavior" (Austin et. al., 2002). The interaction between the perceived realism of the message, perceived similarity of portrayals, desirability of portrayals, and identification with portrayals leads to expectancies which influence behavior (Austin, Pinkleton & Fujioka, 1999).

Many of the studies involving the MIP model use content analysis and survey techniques to derive results. Research by Austin, Pinkleton and Fujioka (1999) investigated the effects of production and message quality, along with persuasiveness in assessing prosocial alcohol related messaging. Although assumptions of the MIP model were supported by the research, there is little research on the MIP model that does not involve E. W. Austin as an author. Many of the articles regarding MIP involve information processing in regards to alcohol related messages. Although one PSA in this study is related to alcohol, there is little research on MIP related to any other type of message. There has also been very little research involving experiments testing the MIP model. For these reasons, the MIP model is not used in the current research study.

Limited Capacity Model of Motivated Mediated Message Processing

This study will use information processing theory, specifically the Limited Capacity Model of Motivated Mediated Message Processing, or LC4MP, to investigate the effect producer characteristics have on information retention of PSA messages. Many recent inquiries into the

effectiveness of PSAs have focused on behavioral change as the dependent variable. A more recent and data-driven model, the LC4MP attempts to explain how people process mediated messages. The LC4MP addresses the human mind's ability to encode, store, and retrieve information. This model, conceptualized by Lang (2006), has five major assumptions: a) People have a limited capacity for information processing; b) People are motived either by approach or avoidance; c) Media are comprised of redundant information presented via sensory channels and formats; d) Human behavior is a dynamic process; and e) Communication is a continuous, interactive process. These assumptions influence a person's ability to encode, store, and retrieve information.

The model does not focus on effects, specific content, or a specific medium. The proposed study seeks to find a relation between PSA producer qualities and information retention, thus making the LC4MP an ideal theoretical construct. The manipulation of certain aspects of the third assumption will be used to determine effects on information retention. The various compositions of the media will be studied to investigate the effects of the producer on storage, encoding, and information retrieval.

LC4MP

Content, media, and goals are variables within the LC4MP that can lead to different outcomes for the receiver. These variables can determine the amount of the message that is processed, how it is processed, and what parts of the message are encoded, stored, and retrieved (Lang, 2006). In the simplest terms, the LC4MP assumes people have a limited capacity for the cognitive processing of messages; the processing is a result of the interaction between the structure and content of the message, and the motivation and goals of the receiver (Fox et. al.,

2004). These assumptions cover the three dimensions of cognitive processing: encoding, storage, and retrieval. The three dimensions of cognitive processing are constant, continuous, and simultaneous (Lang, 2006). As people are limited capacity processers, not all sub-processes are fully completed for every message. Message complexity, content, and structure combined with the receivers' previous knowledge, goals, and frame of reference determine how the processing is performed (Fox et. al, 2004).

Sub-processes

The first sub-process in the LC4MP is encoding, which involves selecting the message from competing noise and translating the message into code (Beebe, Beebe, & Redmond, 2010). Encoding does not involve verbatim translation of the message from the source, but rather the individual selects certain aspects of the message to decode. The selection is automatic and unconscious. The non-selected aspects of the message are lost as they have not been encoded. Encoding is measured by Lang et. al. (2005) using recognition.

The second sub-process in the LC4MP is storage, or the linkage of the newly encoded information with previously stored information (Baddeley, 1990). The more links there are between the new piece of information and the previously stored information, the more likely the new information is to be included in an individual's long-term memory. Not all information that is encoded is properly stored. Due to low resource allocation, some encoded information is only poorly stored (Lang, 2006). Storage is measured by Lang et. al. (2005) using cued recall.

The third sub-process in the LC4MP is retrieval. This sub-process involves retrieving previously stored information, which requires either controlled or automatically allocated resources. Memory has been conceptualized by Lang (2006) as "bits of information linked to

one another." Bits that are active spread their activation to other related bits, which in turn help with the process of retrieving bits related to the information contained in the message. Retrieval is measured by Lang et. al (2005) using free recall techniques.

These three sub-processes are simultaneous and continuous. Resources for these sub processes are allocated from the same limited and fixed pool. Cognitive overload occurs when the message requires more resources to process than are available. This in turn creates a deficit in the performance on one or more of the sub-processes, depending on the demands of the message.

The processing of resources involves two separate types of allocation: automatic and controlled (Potter, Lang, & Polls, 2008). The first type of processing is controlled processing, meaning the listener processes information based on their goals and interests. This type of processing varies greatly from person to person. Stimuli that are novel, signal, or motivation fall into the second type of processing: automatic processing.

In automatic processing, certain aspects of the environment lead to the automatic allocation of processing resources. Another route to automatic processing involves an orienting response. An orienting response is prompted by novel and signal stimuli. Novel stimuli are stimuli that are new to the environment: a teacher turning on the lights after a movie clip; a student dropping a book or otherwise making a loud noise; or a new person walking into the room (Lang, 2006). Signal stimuli are stimuli that a person has learned to attend to, like their name. Novel stimuli are generally the same for all people whereas signal stimuli can vary from person to person.

Motivational stimuli are also automatically allocated for processing. This includes stimuli related to survival; both appetitive motivation and aversive motivation are included in this category. According to Lang (2006), appetitive motivation includes aspects related to the survival of the individual and the species. Aversive motivation systems help protect from danger. While these motivational aspects are generally the same for each person, there is the possibility that an individual may have a learned response to a stimulus, which creates variance in motivational stimuli from person to person (Lang, 2006).

Measures

There are three sets of measures used in studying information processing with the LC4MP. The first involves secondary reaction time. Subjects are exposed to a stimulus and are required to complete secondary tasks during some or all of the exposure. The inclusion of a secondary task is used to measure resources allocated for information processing. Typically, when processing requires more cognitive load, the secondary task reaction time is delayed. Bolls and Lang (2003) studied high and low imagery audio based messages using an experiment to gauge secondary-task reaction times. Participants listened to high and low imagery messages and were tasked with pressing a button when they heard an audio tone unrelated to the message at hand. Participants were exposed to visual messages on a television screen while listening to half of the high and low imagery messages. The primary task in this experiment was listening to the audio messages. Additional tasks were added to the stimulus to gauge encoding. Results suggest that high-imagery audio based advertisements require an amount of processing similar to visual-based encoding.

The second set of measures involves physiological data obtained by measuring participant heart rate, muscle movement, or galvanic skin response. To determine an orienting response, these types of measures are utilized. Wise, Alhabash and Eckler (2013) studied online "window" shopping using physiological data obtained when participants were given the task of browsing an array of topics or looking at a specific product. Participants viewed various products, either arranged generally with multiple products on one page, or arranged specifically with one product shown. During the experiment, researchers tracked participant heart rate as they navigated through various webpages searching for products. Results suggest that online window shoppers automatically allocated resources to encoding information when they encountered specific product pages.

The final method of data collection in the LC4MP method requires the use of recall and recognition measures. Lee and Faber (2007) utilized this method in their research on product placement in online games. The researchers designed a realistic online game with integrated in game product placement for a hypothetical pet food, deodorant, and gasoline. Immediately after playing the game, participants were asked to recall the brand names they had seen on the in-game advertisements. In the Lee and Faber research, there was no delayed recall data collection, which is a limitation of the study. The current study employs both an immediate cued recall survey along with a delayed free recall study in order to more accurately gauge information encoding, storage, and retrieval.

The current study utilizes the LC4MP model method using recall and recognition measures. Although this method is, comparatively speaking, the simplest of the three measures, it is the most applicable to the subject matter being researched. Within the context of the study,

secondary task reaction time measures would not be conducive to measuring information retention of audio based PSAs. The use of physiological measures is unavailable at the study location. Due to cost constraints and convenience, this method was not considered. The use of cued recall and free recall surveys is sufficient for measuring the information retention of the audio based PSAs being tested in this study.

Targeting PSAs to Specific Demographics

In an ever-changing world, the factors that influence successful PSA creation shift over time. With advances in technology and the move toward a globalized economy, one may think creating all-inclusive PSA messages would be helpful in spreading messages regarding health and societal matters in the most efficient manner. Although efficiency is generally regarded positively, efficiency in creating all-inclusive PSA messages is ineffective as the world remains diverse. In creating successful targeted PSAs, demographic information including age, and culture, as well as psychographic information is important.

Demographics

Evaluation of content used in PSAs is vital to the success of the message. Well-planned PSA campaigns targeting specific populations can raise awareness of pro-social messages (Lee & Park, 2012). When studying information processing and change in attitudes or behaviors, it is important to consider demographics like age, education, and ethnicity (Flora & Maibach, 1990). Lennon, Rentfro, and O'Leary (2010) found that PSAs should target males and females differently. Males respond to strong visual elements in their PSAs, whereas the females' response was based on the threat and their susceptibility to the threat. It was also found that PSAs targeting young adults were no more effective than ones targeting the general public. In

fact, the PSAs targeting general audiences were more effective in the eyes of the young adults (Lennon, Rentfro, & O'Leary, 2010). Generational marketing looks at three major considerations which include the persons' life stage; current conditions such as war, technology, and economy; and lastly, cohort experiences that help to form ideals and values of the generation (Wolburg & Pokrywczynski, 2001). This does not specifically include age, although one may assume it should, based on the consideration of a person's life stage. In modern times, a person's life stage is not always narrowly defined by their age. For example, young adults do not feel as much pressure to marry, or to have children after marriage (Bramlett &Mosher, 2002). Life stage also varies based on culture, socioeconomic status, and other considerations.

Age

The ability to process information, as well as how information is processed, varies in many ways based on the age of the audience. Students born after 1990 are considered to be members of the Net Generation, iGeneration, or Generation Z (Geck, 2006). Members of the Millennial generation and iGeneration are known as digital natives due to their upbringing full of new technologies like computers, video game systems, and mobile devices used to connect with family and friends via electronically mediated communication (Brumberger, 2011). Members of the iGeneration have grown accustomed to the Internet-based world and will devote large chunks of time to personally relevant activities (Geck, 2006). Research by Brumberger (2011) shows more than half of study participants spend five or more hours per day on the computer.

Fundamental differences emerge in processing information and thinking in the iGeneration, in part due to their reliance on and ownership of mobile devices (Jones & Edwards, 2009). Smartphones are beginning to emerge as the new norm, leaving so called "simple

phones" in the past. Along with smartphones, netbooks, ultra-portable tablet computers, and e-readers with Internet access, the prevalence of free Wi-Fi and mobile networks in public areas has also changed how younger generations process information. Neilsen reports from February 2012 show 50% of US mobile subscribers own smartphones while the other 50% own feature phones or simple phones. This shows a drastic change from October 2010 when 29% of subscribers owned smartphones and 71% owned simple phones (Neilsen, 2013).

Culture

Cultural diversity can cause difficulties in message transmission and encoding. Cultural orientation and cultural atmosphere can turn a widely successful PSA into a major flop if the PSA is simply used "as is" in a different cultural realm. Effectiveness of message appeals varies from culture to culture. Murray-Johnson et. al. (2001) contends that threats to family members are more effective in collectivist cultures and personal threats more effective in individualistic cultures. Hofstede (1983) and Minkov & Hofstede (2012) propose five dimensions of cultural orientation by which a society's cultural atmosphere can be determined. These five dimensions include "tolerance for power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, and the importance of context in social interaction".

Cultural diversity takes into account "national culture, ethnicity, language, gender, job position, age, and disability" (Frey, 2002). Finding a cultural group where members share all of the same aspects of life will not happen, but in response to PSA messages, Lee and Davie (1997) found that birth country and relationship with the host country had an influence on recall of PSA appeals. Characteristics of the receiver or the message can result in ineffective messages. Within the viewer, there may be varying cultural or religious beliefs that block the effective receipt of

the message; or it could be political views, socioeconomic status, and so forth. Within the message, there may be a lack of clarity, an issue with the communicator or the channel (Lee & Davie, 1997). Studies have reported that culturally homogeneous groups have better communication climates than culturally heterogeneous groups (Frey, 2002). The element of culture is an important one to consider when creating PSA messages for any group, especially one as diverse as college students.

Safety and the College Age Generation

A newfound push of "college for all" has created a differing climate in the demographic and sociographic landscape of both community college and traditional four-year institutions (Kalogrides & Grodsky, 2011). With the expectation that all high school graduates will go to college, pro-social PSAs may be even more important. Students entering college under these pretenses have been noted to fall into a belief that there are no penalties for poor academic and social behavior (Rosenbaum, 2001). The idea that all students will be able to succeed proves to be an issue for faculty members and student affairs professionals. Colleges face the responsibility of keeping students safe from harm. Although colleges do have an emergency management plan in place, physical and psychological harm to students does exist (Connolly, 2012). These factors create a pressing issue for administrators and campus safety officials who are now facing the issue of ensuring safety for all students on campus.

College Age Generation

The ever-changing college age consumer has been a coveted market for advertisers since the 1920s. Then noted for the size, their trendsetting ability, brand loyalties, high standard of living, tendency to be early adopters and their influence on their parents, the college market has

not changed much in contemporary times, remaining an important subset of consumers for advertisers and marketing professionals as the spending power of the college student is greater than in the past (Wolburg & Pokrywczynski, 2001). Once a student reaches college, they experience a move toward independence in decision making, shying away from relying on their parents to make important decisions for them (Ahn, et. al., 2010). Recent numbers on student misconduct report an increase in the variety of types of students attending college and their reasons for attendance. Morrisette (2001) found that more emotionally disturbed students are enrolling in courses. In addition, this study found that students find themselves in the position of a consumer with tuition dollars being used as currency for grades without regard for behavior on or off campus.

Non-profit organizations are bolstering their attempts to communicate with college students through the use of PSAs as the number of students involved with health and societal issues is increasing (Kulkarni & Jeong, 2010). PSA producers commonly use fear appeals as a way to influence behavior modification when creating prosocial messages. Due to this, the college generation creates a curious situation for PSA producers.

Well planned PSA campaigns targeting specific populations can raise awareness of pro-social messages (Lee & Park, 2012). When studying information processing and change in attitudes or behaviors, it is important to consider demographics like age, education, and ethnicity (Flora & Maibach, 1990). Within the young adult demographic, most feel the messages are directed to others, finding the message irrelevant to their lives or thinking they will not suffer the consequences from their actions (Lennon, Rentfro, & O'Leary, 2010). Some reasons as to why the college generation remains unaffected when shown fear appeals stem from media. The

exposure to violence in video games, movies, and television may have desensitized the age group to such appeals (Lennon, Rentfro, & O'Leary, 2010). Rather than relying on the use of fear appeals, PSA producers should consider other types of appeals in targeting college students.

Campus

The campus environment is changing, and a campus concerned with safety recognizes this, as campus safety and health have an impact on student success. Although efforts have been made to raise awareness, destructive influences still affect campuses (Rund, 2002). At the same time, an emerging emphasis on living-learning communities may be a positive step in reducing destructive decisions.

Campus Safety Issues

The campus environment is changing and a campus concerned with safety recognizes this as campus safety and health have an impact on student success. Although efforts have been made to raise awareness, destructive influences still affect campuses (Rund, 2002). In assessing student safety, there are many issues that need to be examined. Although there are other issues involving safety such as rape, sexual assaults, physical violence, and robberies, this study will not focus on these issues due to their sensitive nature. In addition, recent research conducted by Baker and Boland (2011) found that both students and faculty felt overwhelmingly safe in classrooms and when walking alone on campus during daylight and nighttime hours. This particular study will be assessing student behaviors related to binge drinking, texting and driving, and awareness of methods to combat communicable diseases.

This changing environment should be examined by those creating PSA messages to effectively target the intended audience. Although the use of PSAs cannot be seen as the only response to campus safety issues, starting with general awareness campaigns can be an effective first step in creating behavior change that may result in increased campus safety.

Creating Effective Messages

This study seeks to find a connection between producer attributes and information retention. In order for listeners to retain information, they must encode, store, and retrieve the information they have heard. Research by Lennon, Rentfro and O'Leary (2010) notes that specifically targeted PSA messages are no more effective than those targeting general populations. This study seeks to further Lennon, Rentfro and O'Leary's research by selecting an alternative sample.

Research by Pilling and Brannon (2007) shows that college students are more likely to pay attention to pro-social messages they feel are specifically tailored to them on an individual level. College campus officials have the ability to broadcast messages regarding safety in a proactive manner by using PSAs to promote pro-social health and safety related messages to the student body as well as the surrounding communities. With technological advances in personal computing, laypersons now are able to create near professional quality audio recordings using their personal computers and free audio recording and editing software such as Audacity.

How should campus safety PSAs be produced to target their intended audience? A few plans come to mind. First, video equipment, editing software, and creative students are among the amenities available on a college campus. College students' tendency to respond in a positive manner to PSAs involves how well they feel the PSA is tailored to them on an individual level

(Pilling & Brannon, 2007). Thus, creating effective PSAs targeting students can be completed implementing basic models of communication and produced using resources already available on campus.

Using appeals that catch the attention of the student is vital to the success of any PSA campaign. The effectiveness of informational and testimonial appeals in drunk driving PSAs targeted toward college students may be diminished due to the fact that students are already aware of the risks associated with such practices; consequently, PSA messages used to hinder these practices are ineffective (Weber, Dillow & Rocca, 2011). A more effective appeal to use in PSAs is narrative processing. Cole (1997), as cited in Weber, Dillow and Rocca (2011) noted that the individual's ability to immerse themselves in the characters life creates a natural influence in creating a basis for the individual to understand their own life. Entertainment education, a process involving designing media purposefully to entertain and educate, has worked for many causes similar to those which are promoted in PSAs (Singhal & Rogers, 2004). Attention, comprehension, motivation, and attitudes are variables that influence PSAs ability to change behaviors. This behavior change is also influenced by the viewer's predispositions and attitudes toward the message (Lee & Davie, 1997).

Technology has changed the way people communicate across all age groups. While some suggest moving the PSA to an Internet based delivery system, the use of Internet and Web 2.0 technologies in dissemination of messages brings about important issues to consider such as competing or contradictory comments and messages in participatory environments such as YouTube (Walther, DeAndrea, Kim & Anthony, 2010). While the move to Internet-based PSAs may seem more effective for the current college aged student, studies have shown that some

students feel this is highly intrusive (Snorgrass, 2009). Most important though, as the iGeneration is more media literate, production quality is a key element to be aware of in PSA creation. Low quality productions lacking realism and relevance tend to miss adolescent and young adult audiences, as they do not pay attention to such PSAs, therefore losing the chance of influencing these demographics (Andsager, Austin & Pinkleton, 2001).

By encouraging the students to create PSAs for their own campus, many of the key areas in engaging this population are hit. The students will be involved, which lends itself to the iGeneration mentality, and also means that the students will be able to create PSAs that are applicable to their own lives. Students are more likely to pay attention to PSAs that directly influence them. Students who are highly involved in the topic of the message are more easily influenced. By allowing students to create PSA campaigns for their own campus, changing the audience into the producer, personal influence will be shown. In addition, student involvement in creation, in theory, would correlate with student interest. By placing the onus of creation and production on the student, the college targeted PSA may have a chance to survive the iGeneration, as well as future generations.

CHAPTER 3

METHODS

As detailed in Chapter 1, the focus of this study is on examining the impact of professional versus peer-produced audio public service announcements (PSAs) on college students. Specifically, the study will examine information retention, interest and entertainment value. As a corollary, the relationship among level of interest, entertainment and information retention will also be examined.

Given the developing literature on iGeneration students and how they receive and process information, this is a valuable study for communications and education. Traditional methods of persuasion and message construction should be examined in order to effectively communicate PSA messages targeted toward iGeneration students. In addition to approaching information in a different way, these students are in a key transitional point into adulthood and are faced with media sources competing for their attention. Students in this generation are exposed to more media consumption methods than previous generations. Exploring the information retention of messages created by professional outlets as compared to those created by student peers may show that differences in producer attributes can contribute to a change in information retention rates.

To examine this question, a *post hoc* experimental methodology with a counterbalanced design was used. An experimental design is one of the oldest traditions in mass media research as it can provide strong evidence for cause-and-effect relationships (Wimmer & Dominick, 2006; Buddenbaum & Novak, 2001).

Subjects will be assigned to one of six groups with each group receiving a different ordering and combination of the stimuli – a set of professionally and peer-produced audio PSAs. In addition to the initial assessment, a follow-up free recall survey will be administered two weeks after the initial exposure to test information retention. This approach is consistent with the Limited Capacity Model of Motivated Mediated Message Processing or LC4MP (Lang, 2000) as the model uses an immediate cued recall followed by a delayed recall questionnaire to gauge information processing.

Developing and Presenting the Stimulus

The first step in the research process was identifying the specific audio PSAs that would serve as the stimuli for the experiment. The professionally produced PSAs were selected from the pool of PSAs available at the university's radio station and online through various professional PSA outlets. The station is a federally licensed student/community organization and broadcasts on the FM-band reaching a potential audience of about 90,000 listeners. Given its university and community-oriented role, the station has a large catalog of PSAs on hand.

The researcher did an extensive search of the available PSAs to find those on topics that would be relevant to college students and that contained sufficient detail to test information retention. After consultation with faculty, other graduate students and undergraduates in audio production, three health and safety PSAs were selected. These dealt with the topics of binge drinking, texting and driving, and the flu vaccine. The transcripts of the professional PSAs are in Appendix A.

Once the professional PSAs were selected, students in a second semester audio production course agreed to work with the researcher to create PSAs that addressed the same

issues and content but that reflected their aesthetics and messaging techniques. The peer PSAs incorporated the same set of information but the presentation format, language and sonic images were different. Several alternate PSAs were produced and the researcher, in consultation with the peer-producers, determined which to select for the experiment. The scripts for the peer-produced PSAs are in Appendix B.

As a result, six PSAs were selected –one being professionally produced and the other peer produced for each topic. Of the six PSAs, two were 30 seconds and four were 60 seconds long. The PSAs were then assembled into six groups of three, each based on topic and producer type. These six groups were the basis for the counterbalanced design that determined the specific PSAs and their order of presentation to the subjects. These are provided in Table 2.

Table 2

Counter-Balanced Design Topics: Population, Sample and Subjects

Group	**PSA Type**		
A	Professional Binge Drinking	Professional Texting	Student Flu
B	Professional Binge Drinking	Student Texting	Professional Flu
C	Student Binge Drinking	Professional Texting	Professional Flu
D	Student Binge Drinking	Student Texting	Professional Flu
E	Student Binge Drinking	Professional Texting	Student Flu
F	Professional Binge Drinking	Student Texting	Student Flu

The research was conducted at Indiana University of Pennsylvania. IUP is a mid-sized, state system school in the northeast United States. Located in a rural area, the school has a student/community based FM radio station with a 30 mile broadcast radius. It reaches most of the county in which the university is located, as well as parts of adjacent counties. The

population of the service area creates a potential audience of about 90,000 people. The Communications Media Department at IUP is production oriented and was the second largest undergraduate program on campus in Fall 2012.

The university started a transition in 2006 from traditional dorm rooms to suite-style living learning facilities said to "provide designated areas for faculty-student discussions and activities that enhance student interaction and multicultural awareness" ("*Crimson Snapshot,*" 2012). The *Crimson Snapshot*, an easy-to-find and easy-to-follow description of selected campus statistics, notes that research has shown that the living learning style of student housing boasts many positive aspects for transitioning students. Students who live in the living learning housing are said to have higher grades and fewer alcohol/drug issues. These claims have yet to be substantiated at the campus in question, so although noted, this will not have a great impact on the study itself.

Campus demographics are varied and diverse, creating a complex living environment full of multi-faceted individuals who need to be open to affirming students different from themselves and to accept other students openly (Rund, 2002). As shown by the institution website, 13% of students enrolled in 2010 were minorities, 42.7% female, 57.2% male, and 4% international students. While the numbers for international students appear low, within that 4% of total enrollments, more than 71 countries are represented. Almost 88% of students' enrollments are from within the state and the other approximately 8% from out of state. There are no easily attained solid numbers as to which students come from urban areas compared with rural areas, which is a major distinction within the in-state students. The actual student population at this institution is more diverse than it appears in numerical form.

The institution was chosen due to geographic convenience and size. It has a total student body of about 15,000 students with approximately 13,000 undergraduate students in the 2012-2013 academic year. In Fall 2010, 92% of students were traditional age and 29% of students lived on campus. In addition to the main campus, these numbers include two regional campuses with enrollments of approximately 365 students.

As producer effects and the Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) were the foundations for this study, the decision was made to select subjects from various courses in the Communications Media Department at IUP using purposive and convenience sampling methods. Subjects were recruited from non-audio based production courses as shown in Table 3.

Table 3

Communications Media Courses Used for Sample Selection

Course Number and Title	**Sections and Potential Enrollments**
COMM240 Basic Graphics	COMM240_001 30 COMM240_002 30
COMM251 Television Production	COMM251_001 20 COMM251_002 20 COMM251_003 20 COMM251_004 20
COMM271 Basic Photography	COMM271_001 30 COMM271_002 30
COMM306 2D Games	COMM306_001 25
COMM348 Animation	COMM348_001 22
COMM349 Radio Production	COMM349_001 21
COMM351 Adv. Video Production	COMM351_001 20 COMM351_001 20
COMM371 Photography II: The Print	COMM374_001 25
COMM451 Broadcast News Process	COMM451_001 20

These students were selected with the assumption that they did not possess high-level audio skills that may bias their feelings toward the production methods used in the PSAs.

However, they did have an awareness of the production process in general, including pre-production, production and post-production aspects.

The instructors of these courses agreed to allow the researcher to visit their class. Students were briefed by the researcher during their class about an email to be sent requesting their participation in a research study regarding public service announcements. Students in the classes were invited to participate and any questions the students had were addressed. The class visit script is included in Appendix C. Students were not made aware that they would be specifically tested on information retention, but that rather they would be surveyed on information included in the PSA. Students were also not made aware of the differing production methods used in PSA creation, primarily the peer versus professional producer roles.

Students in the classes were then sent a follow-up email asking them to participate (included in Appendix D). The email included a link for the first of three surveys included in the research design. Students who elected to participate were directed to take a screening survey in Qualtrics to collect simple demographic data to be used in grouping participants. The survey also asked for times when the students were available to listen to the PSA messages in the laboratory environment. This survey text is included in Appendix E. Subjects who responded were then contacted and asked to report to the lab at their selected time.

The Experimental Procedure

Based on their responses to the first survey, students were assigned to one of the six experimental groups. The assignments sought to maintain a roughly equal distribution across groups based on gender, GPA, and number of prior Communications Media courses. These groups contained between 12 and 13 subjects each. The grouping is shown in Table 4.

According to Buddenbaum and Novak (2001) experiments should have at least 30 participants per group. With 12-13 subjects per group, at least 36 subjects will be exposed to each PSA in this research design.

Table 4

Subjects and Topics by Counter-Balanced Group

Group	**Number**	**PSA Type – Presentation Order**		
A	12	Professional	Professional	Student
B	13	Professional	Student	Professional
C	12	Student	Professional	Professional
D	12	Student	Student	Professional
E	13	Student	Professional	Student
F	12	Professional	Student	Student

Students who agreed to listen to the PSAs reported to the lab at their specified time. Based on their group assignment, they were placed at a computer and provided the applicable audio PSAs and a set of headphones. They then listened to each of their assigned PSAs twice. Upon completion of this task, subjects were given a targeted survey to complete. This survey is included in Appendix F. Each subject's survey was assigned an ID number so it could be paired with the follow-up survey.

Following completion of this activity, the subjects were free to leave but were reminded there would be a follow-up online survey in two weeks. They were also advised that students who completed the demographic survey, listening portion, and survey portions of the experiment would be entered into a raffle for a prize.

Students who listened to the PSAs and filled out the targeted PSA survey were contacted via email two weeks after their initial exposure to the PSAs in the laboratory. At this time,

students were asked to complete a second survey. This survey used a free recall approach to gauge their longer-term retention of the information from the PSAs. The free recall is an important element of LC4MP because longer term processing, or information retention, is measured. Please see Appendix G for the survey. Those not responding in three days were sent a follow-up email.

Following completion of the last survey, participants were contacted with an email debriefing them on the purpose and focus of the experiment. The winner of the prize was also contacted by email.

Data Analysis

Data was collected using three self-response surveys. The first survey, the screening and selection survey, was used to collect data regarding demographic information and availability to complete the study. This data was used to assemble roughly equivalent groups.

The second survey, the immediate post-stimulus survey, provided information on the immediate recall of information included in the PSAs. This also collected information regarding interest and entertainment value. The immediate post-stimulus survey also served as a baseline for the free recall portion the study. The last survey, the free recall survey, was used to collect data related to longer-term information retention. This free recall survey is consistent with the methods of the LC4MP. The final survey is used to tie in the screening and selection survey along with the immediate post-stimulus survey.

Confidentiality, Treatment of Subjects and Data

Student responses to the first survey, the demographic information, were downloaded from Qualtrics. A small number of students completed a paper based version of this study. All information from the paper based surveys were entered into an Excel spreadsheet by the principle investigator then destroyed. Each student was assigned an identification number to be used for the remainder of the data collection process.

Information from the second survey, the cued recall, was collected via a paper based survey administered directly following the listening portion of the experiment. Upon completion of the study, these surveys were destroyed. Two weeks after the listening portion, the web based free recall survey was administered. All data from the free recall survey was then added to the Excel spreadsheet. All data were collected and stored according to Indiana University of Pennsylvania's subject and data protection policies.

CHAPTER 4

FINDINGS

Introduction

In this study, the impact of producer attributes on information retention, level of interest and level of entertainment in audio PSAs targeted to college students were examined. The study examines the relative effect of professionally produced or student (peer produced) PSAs in this context. From the literature review, the evidence indicates that iGeneration students receive and process information differently and are confronted with multiple media sources. As the Limited Capacity Model of Motivated Mediated Message Processing or LC4MP (Lang, 2000) serves as the theoretical foundation for the study, a *post hoc*, cross-balanced experimental design is used. To the test the retention effect of LC4MP, the initial experiment is supplemented by a two-week follow-up to gauge delayed information recall.

The Stimulus

As detailed in Chapter 3, the stimulus was selected by identifying specific audio PSAs that were professionally produced and targeted at a student audience. Students in a second semester audio production course then created audio PSAs that involved the same information but incorporated their production perspectives and aesthetics. Using a counterbalanced design, the professional and student PSAs were assembled into six sets for presentation to the subjects.

Demographics of the Subjects

Using purposive and convenience sampling, subjects for the experiment were recruited from production courses at Indiana University of Pennsylvania during the Fall 2013 semester. As explained in Chapter 3, these students were selected because they have a familiarity with the production process in general but not specifically high-level audio production. To recruit

subjects, the researcher visited 15 sections of the selected courses. From this effort, 93 students completed the initial survey and 74 participated in the experiment and 67 completed all parts of the experiment.

Gender

Table 5 presents the profile of the subjects by gender and possible differences are examined in hypotheses 1.2, 2.2 and 3.2. The table includes a breakout of those who completed the initial survey, did the actual experimental stimulus and completed the delayed, free recall portion. More females than males completed all portions of experiment. Mortality rates for male participants were higher in the initial portions of the study although males were more likely to complete all portions of the study.

Table 5

Subjects Participating in Each Phase of the Study by Gender

Gender	Initial Survey	Cued Recall	Free Recall	Total N	% of Total N	% Completing All
Females	4	5	31	40	43.0%	77.5%
Males	15	3	35	53	57.0%	66.0%
Total	19	8	66	93	100.0%	71.0%

GPA

One concern in the study was whether a student's academic achievement might influence their immediate and delayed recall performance. Data on the distribution of students by GPA is presented in Table 6 and tested in hypotheses 1.3, 2.3 and 3.3. All participants had a cumulative GPA of at least 2.0, with the most students in the 3.0-3.49 range. Participants with a 3.50 GPA or greater were more likely to complete all portions of the experiment with 86.2% total completion. Of those falling into the 2.0 – 2.49 GPA category, 80.0% completed all portions of

the study. It is important to note that the 2.0-2.49 GPA category had the lowest number of participants, with 5 students falling into this category.

Table 6

Subjects Participating in Each Phase of the Study by GPA

GPA Range	Initial Survey	Cued Recall	Free Recall	Total N	% of Total N	% Completing All
3.50-4.00	2	2	25	29	31.2%	86.2%
3.00-3.49	10	1	22	33	35.5%	66.7%
2.50-2.99	6	5	15	26	28.0%	57.7%
2.00-2.49	1	0	4	5	5.4%	80.0%
Total	19	8	66	93	100.0%	71.0%

Age

Data showing the breakout of subjects by age is included in Table 7. In determining the age ranges, two factors guided the classification scheme. First, as one PSA focused on binge drinking, those who were under the legal drinking age of 21 years old were combined into a single category - the 18-20 year olds. The 24 or older category would isolate those who were no longer of typical undergraduate age and may be non-traditional students. Hypotheses 1.4, 2.4 and 3.4 explore the impact of age. The non-traditional age students were the only category to attain a 100% completion rate. This may be attributed to their maturity levels. Approximately 59% of participants were in the 21-23 age category.

Table 7

Subjects Participating in Each Phase of the Study by Age

Age	Initial Survey	Cued Recall	Free Recall	Total N	% of Total N	% Completing All
18-20	9	2	23	34	36.6%	67.6%
21-23	10	6	39	55	59.1%	70.9%
24 or Older	0	0	4	4	4.3%	100.0%
Total	16	8	66	93	100.0%	71.0%

Year in School

The next demographic element examined was the class rank (i.e., year in school) of the subjects. As subjects were selected from production courses and many of these require prerequisites, the number of freshmen was expected to be lowest and the largest pool was expected to be juniors and seniors. From Table 8, these assertions are shown to be correct. The majority of participants were juniors or seniors, with both classes equally represented. The influence of class rank was tested in hypotheses 1.5, 2.5 and 3.5. Of those who completed the initial survey, a total of 71% completed the entire experimental process. Seniors had the highest completion rate at 77.5% and freshman the lowest at a 0% completion rate. It is important to note that only one freshman was included in the sample.

Table 8

Subjects Participating in Each Phase of the Study by Year in School (Class Rank)

Major	Initial Survey	Cued Recall	Free Recall	Total N	% of Total N	% Completing All
Freshman	1	0	0	1	1.1%	0.0%
Sophomore	5	1	6	12	12.9%	50.0%
Junior	7	4	29	40	43.0%	72.5%
Senior	6	3	31	40	43.0%	77.5%
Total	19	8	66	93	100.0%	71.0%

Communications Media Production Courses Taken

Tables 9 and 10 provide information on the production courses taken by the subjects. In Table 9, a summary count is provided while Table 9 shows a count by individual course. This data is used in examining hypotheses 1.6, 1.7 and 1.8. There are approximately 16 total production courses offered in the Communications Media department. Students who choose this major must take at least 2 production courses in order to graduate. All students who had taken 7 or more production courses completed the experiment in its entirety. Fewer participants fall into

the category of 5-6 or 7 or more total production courses, but these participants had higher completion rates than students who have taken 1-2 or 3-4 production courses.

Table 9

Subjects Participating in Each Phase of the Study by Number of Production Courses

Production Courses	Initial Survey	Cued Recall	Free Recall	Total N	% of Total N	% Completing All
1-2	7	3	21	31	33.3%	67.7%
3-4	10	3	29	42	45.2%	69.0%
5-6	2	1	10	13	14.0%	76.9%
7 or More	0	0	6	6	6.5%	100.0%
Total	19	8	66	93	100.0%	71.0%

Extrapolating the data and delving further into the particular types of production courses in which students have enrolled, it is shown that 100% of participants who have enrolled in Documentary Photography, 3D Game and Simulation Design and Development, 3D Modeling and Animation for Games and Simulations, and Electronic Imaging completed all portions of the study.

Table 10

Subjects Participating in Each Phase of the Study by Specific Production Courses Taken

Course	Title	Initial Survey	Cued Recall	Free Recall	% Completing All
COMM 240	Communications Graphics	10	2	30	71.4%
COMM 249	Basic Audio Recording Techniques	6	3	29	76.3%
COMM 251	Television Production	12	4	45	73.8%
COMM 271	Beginning Photography	12	1	31	70.5%
COMM 306	2D Digital Game Development	1	0	9	90.0%
COMM 340	Advanced Communications Graphics	1	0	2	66.7%
COMM 348	Animation	1	0	11	91.7%
COMM 349	Radio Production	2	0	8	80.0%
COMM 351	Advanced Video Production	5	4	23	71.9%
COMM 371	Photography II : The Print	1	0	9	90.0%
COMM 374	Documentary Photography	0	0	5	100.0%
COMM 406	3D Game and Simulation Design and Development	0	0	5	100.0%
COMM 408	Media Field Studies	3	3	15	71.4%
COMM 446	3D Modeling and Animation for Games and Simulations	0	0	1	100.0%
COMM 449	Advanced Audio Recording Techniques	1	3	5	55.6%
COMM 471	Electronic Imaging	0	0	5	100.0%
	Total Courses Taken	55	20	233	75.6%

Majors and Minor

Given the focus on production courses, the expectation from the beginning of the study was that the vast majority of the subjects will be majors in Communications Media. As seen in Table 11, this expectation did hold up. Half of the participants with no tie to Communications Media completed each part of the study, with two of the four who started finishing all three parts.

Table 11

Subjects Participating in Each Phase of the Study by Communications Media Major/Minor Status

Major	Initial Survey	Cued Recall	Free Recall	Total N	% of Total N	% Completing All
Comm Major	17	8	61	86	92.5%	70.9%
Comm Minor	0	0	3	3	3.2%	100.0%
Neither	2	0	2	4	4.3%	50.0%
Total	19	8	66	93	100.0%	71.0%

Counter-Balanced Groups

Table 12 provides the information on the clips provided to each of the counter-balanced groups and Table 13 indicates the number of subjects from each group completing each stage of the experimental design. Note that subjects were assigned to groups when they reported for the cued recall portion of the experiment. As a result, these percentages are based on the 74 students who participated in the cued recall at a minimum not the full 93 that responded to the initial survey.

Table 12

Initial Subjects, Producer Attributes and PSA Topic by Counter-Balanced Groups

Group	Number	Clip 1	Clip 2	Clip 3
A	12	Professional	Professional	Student
B	13	Professional	Student	Professional
C	12	Student	Professional	Professional
D	12	Student	Student	Professional
E	13	Student	Professional	Student
F	12	Professional	Student	Student
Total	93			

Subjects were roughly grouped according to GPA. Each group had approximately one student with a GPA below 2.50. The majority of students in each group had a GPA of 3.0 – 3.5

or 3.5 to 4.0. The placement of these students into groups was completed in a convenience-based rotation.

Table 13

Most Portions of the Study Completed by Counter-Balanced Groups

Counter-Balanced Group	Finished Cued Recall Only	Finished Free Recall	Total N	% of Total N	% Completing All
A	0	12	12	16.2%	100.0%
B	1	12	13	17.6%	92.3%
C	2	10	12	16.2%	83.3%
D	4	8	12	16.2%	66.7%
E	1	12	13	17.6%	92.3%
F	0	12	12	16.2%	100.0%
Total	8	66	74	100.0%	89.2%

In Table 13, the number of students stopping at each stage, cue recall at the time of the experiment or delayed recall two weeks later, is presented. As can be seen from the table, two of the groups had 100% completion rates for all portions of the experiment. Group D had the lowest proportion of students completing all phases of the experiment.

Findings

The first step in analyzing the data was creating the composite measures for the independent variable of production knowledge and for the four elements of our dependent variable. These include production knowledge, immediate and delayed information retention, level of interest and level of entertainment. Following this task, attention is turned to the particular research questions and hypotheses.

Composite Measures and Indices

Composite measures used in this research were defined by the research and shared with experts in the field in order to effectively gauge the intended measures.

Production Courses

As presented in the definition of terms in Chapter 1, production knowledge is gauged by the number of production courses. A simple count of production courses is used as one variable. This provides a range of variability from 0 to 16 and thus produces a more robust measure that enables the use of applicable interval/ratio statistics including t-tests, correlations, and ANOVA. In addition, an index was created that weights the production courses taken with a basic class weighted at one and an advanced class at two. These were then combined into four categories for the analysis.

In terms of the dependent variables, measures were created for each of the four elements. These include both immediate recall and delayed recall for information retention, level of interest and level of entertainment. For each subject, this would result in separate scores on the variables for their professionally produced and peer-produced PSAs. As a result, there were eight dependent variable scores for each of the subjects.

Immediate Recall

For immediate recall, the data for the measure was taken from the cued recall survey administered immediately after exposure to the PSAs. The measure was constructed by taking the number of correct answers on each of the factual recall items minus the number of incorrect items divided by the number of possible correct items in the question. These were taken from the factual recall questions for the flu vaccine, binge drinking, and texting and driving PSAs.

Delayed Recall

This measure used data from the free (delayed) recall survey administered approximately two weeks after the experiment. As with immediate recall, these elements were separated into a professional and peer PSA total.

Level of Interest

This measure was also taken from the cued recall survey. For each PSA, subjects responded to a four-point scale on level of interest that ranged from extremely interesting to not at all interesting. As with the other dependent variable measures, the mean of the scores for each PSA was used and a subjects interest scores calculated for their professional and peer PSA measures.

Level of Entertainment

Also taken from the cued recall survey, this measure used the same procedure as the interest measure to create separate professional and peer PSA measures. In this case, the four-point scale ranged from extremely entertaining to not at all entertaining.

Statistical Techniques

For the first three research questions, the impact of producer type on information recall, level of interest and level of entertainment are studied. In the fifth question, the delayed recall portion of the experiment is investigated. For each of these four research questions, both an overall relationship as well as incorporating the particular demographic variables is studied. The first hypothesis in each set tests only the producer characteristics to the dependent variable, the other six hypotheses look at the independent demographic variables to the dependent variable

directly using a one-way ANOVA. This results in seven hypotheses for each of the research questions. Following the one-way analysis, a factorial analysis is then done pairing producer type with each of the six demographic variables to determine if there is an interaction effect present.

In terms of statistical analysis, each hypothesis begins with a test for the homogeneity of variances using Levene's statistic. For RQ1 on immediate recall and RQ5 on free recall, the measurement variables were interval/ratio. In these cases, a One-Way ANOVA F-test was used if the Levene's test was not significant. If the Levene's test is significant, indicating there is a problem with the homogeneity of variances, then a Welch's F was used instead of the standard F- test. The Welch's F is able to accommodate situations where the assumption of homogeneity of variances is not met.

For RQ2 and RQ3, the dependent variables of interest and entertainment were measured using a four-point ordinal scale. In cases where there are a limited number of options on an ordinal scale, Welch's F is better able to adjust for this than the standard ANOVA. Thus, Welch's F is used for the one-way tests for these RQs.

Following the one-way analysis, the factorial analysis was conducted for each of the hypotheses in these four research questions. In conducting the factorial analysis, a Levene's test was used to check for homogeneity of variances. However, as the Welch's F test is not viable for a two-way analysis, the standard F-test of the factorial analysis was used. Given the nature of the F-test, and the methodology used by SPSS for factorial ANOVA, the use of the SPSS F-test in this case does not create a statistical issue (Leech et. al., 2011; Norusis, 2008).

The fourth research question focused on possible relationships between the independent variables. These were examined using Spearman *rho* with a follow-up Welch's F and factorial analysis.

Research Questions

RQ1: Is there a significant difference in information retention between professionally produced and peer produced audio PSA messages?

The first research question looks at the impact of producer effects on information retention by focusing on immediate recall. The measure for the dependent variable was based on the percentage of correctly recalled items from the posttest taken immediately after exposure to the audio stimuli.

> H1.1: There will be no significant difference in immediate information recall between professionally produced and peer produced audio PSAs.

Table 14

Immediate Information Recall by Producer Type

PSA Topic	Producer Type	N	Mean	Std Dev	Std Err	Welch's F	Significance
All Topics	Professional	111	88.57	10.102	.959	0.569 df=1,207	0.452*
	Peer	111	87.39	12.988	1.233		
	Total	222	87.98	11.624	.780		

Note. Levene's = 9.306 (df=1,220)
*p = .003

The first hypothesis looks at the impact of producer effects alone on immediate information recall. Given that the Levene's test was significant, a Welch's F was used. As seen in table 14, there was no significant difference in the percentage of immediate information recall based on professionally and peer produced PSAs. This table also shows the difference in mean scores between professionally and peer produced PSAs is very small compared to the relatively large standard deviations for the two groups.

Having looked at the overall pattern of producer type to immediate recall, next each PSA was examined to see if the topic may have had an effect. To do this a one-way ANOVA was calculated separately for each PSA topic. For all three topics the Levene's test was not significant so a straight F value was used for the ANOVA.

As seen from table 15 when looking at each PSA topic independently, all three show a significant difference between professional and peer produced PSAs. For two of the topics, binge drinking and texting and driving, the professionally produced PSAs saw a higher level of immediate recall, approximately 5% in each case. In contrast, for the flu topic, the peer produced PSA had a much higher percentage of immediate recall by almost 8 percentage points. Production quality, nature of content and other factors may be at play, suggesting there is no consistent blanket effect of producer type.

Table 15

Immediate Information Recall by PSA Topic and Producer Type

PSA Topic	Producer Type	N	Mean	Std Dev	Std Err	F-value	Significance
Flu	Professional	37	88.77	7.386	1.214	17.417 df=1,72	.000*
	Peer	37	96.05	7.611	1.251		
	Total	74	92.41	8.300	.965		
Binge Drinking	Professional	37	81.08	10.664	1.753	4.302 df=1,71	.042**
	Peer	37	75.47	12.540	2.062		
	Total	74	78.27	11.900	1.383		
Texting & Driving	Professional	37	95.84	5.62	.923	10.227 df=1,64	.002***
	Peer	37	90.64	8.14	1.338		
	Total	74	93.24	7.42	.862		

Note. Flu - Levene's = .120 (df=1,72); Binge - Levene's = 2.436 (df=1,72); Texting - Levene's = 3.219 (df=1,72)
*p = .730
**p = .123
***p = .077

H1.2: There will be no significant difference based on gender in immediate information recall between professionally produced and peer produced audio PSAs.

The first demographic variable examined was the impact of gender. As seen in Table 16 the Levene's test was not significant and a straight F value was used. Comparing female to male scores in total, there was no significant difference due to gender. This is to be expected as the means were less than one point apart (females 87.75; males 88.19)

Table 16

Immediate Information Recall by Gender – One-Way ANOVA

Dependent Variable	Gender	N	Mean	Std Dev	Std Err	F-value	Significance
Immediate Recall	Female	108	87.75	11.760	1.132	.080 df=1,220	.778*
	Male	114	88.19	11.541	1.081		
	Total	222	87.98	11.624	.780		

Note. Levene's = .020 (df=1,220)
*p = .888

The next step in the analysis was to go beyond a one-way ANOVA and compare the two independent variables, gender and producer type, to see if there is an interaction effect between the two on immediate recall. Table 16 shows the mean, SD and N for each possible category of

gender and producer type. Overall, we can see that the difference between males and females differs by less than 2 percent points between professionally produced, peer produced and total.

Table 17

Immediate Information Recall by Gender and Producer Type

Producer	Gender	Mean	Std. Deviation	N
Professional	Female	89.35	9.032	52
	Male	87.87	10.991	59
	Total	88.57	10.102	111
Peer	Female	86.26	13.738	56
	Male	88.53	12.196	55
	Total	87.39	12.988	111
Total	Female	87.75	11.760	108
	Male	88.19	11.541	114
	Total	87.98	11.624	222

Note. Levene's = 3.603 (df=3,,218)
*p = .014

Given the relatively small differences between male and female scores by producer type, one would not expect to find a significant difference using a factorial analysis. As shown in table 18, it can be seen that neither producer type, gender, or producer type and gender together produce a significant finding. Thus it can be concluded that gender in isolation or in combination with producer type does not have a significant impact on immediate recall.

Table 18

Factorial Analysis of Immediate Information Recall by Gender and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	279.800a	3	93.267	.687	.561	.009
Intercept	1715859.899	1	1715859.899	12645.962	.000	.983
Producer Type	81.679	1	81.679	.602	.439	.003
Gender	8.718	1	8.718	.064	.800	.000
Producer Type and Gender	193.891	1	193.891	1.429	.233	.007
Error	29579.201	218	135.684			
Total	1748106.509	222				
Corrected Total	29859.001	221				

Note. [a]. R Squared = .009 (Adjusted R Squared = -.004)

H1.3: There will be no significant difference based on GPA in immediate information retention between professionally produced and peer produced audio PSAs.

One possible consideration in the level of immediate recall would be the students' overall academic capability. To examine this, GPA is used as an indicator of student performance. As seen in table 19, the Levene's test for homogeneity of variance was not significant. A one-way ANOVA with a standard F value was used.

Looking at the impact of GPA on immediate information recall there is no significant pattern. As table 19 shows, the students in the lowest GPA group actually had the highest level of recall, followed closely by the students in the highest GPA range. It should be noted that that relatively small number (n=12) for the lowest GPA category may have been somewhat of a confounding factor.

Table 19

Immediate Information Recall by GPA – One-Way ANOVA

Dependent Variable	GPA	N	Mean	Std Dev	Std Err	F-value	Significance
Immediate Recall	3.50-4.00	81	88.22	12.046	1.338	.275 df=3,218	.843*
	3.00-3.48	69	87.96	11.153	1.343		
	2.50-2.99	60	87.18	12.238	1.580		
	2.00-2.49	12	90.38	8.755	2.527		
	Total	222	87.98	11.624	.780		

Note. Levene's = 1.147 (df=3,218)
* p = .331

Examining the impact of GPA and producer type, table 20 shows the relative distribution of scores. Perhaps most interesting is that in both the professional and peer GPA categories, the lowest GPA group actually preformed the highest.

Table 20

Immediate Information Recall by GPA and Producer Type

Producer	GPA	Mean	Std. Deviation	N
Professional	3.50-4.00	89.56	9.121	42
	3.00-3.48	87.39	11.358	36
	2.50-2.99	87.91	10.557	28
	2.00-2.49	92.31	5.439	5
	Total	88.57	10.102	111
Peer	3.50-4.00	86.79	14.547	39
	3.00-3.48	88.58	11.068	33
	2.50-2.99	86.54	13.677	32
	2.00-2.49	89.01	10.748	7
	Total	87.39	12.988	111
Total	3.50-4.00	88.22	12.046	81
	3.00-3.48	87.96	11.153	69
	2.50-2.99	87.18	12.238	60
	2.00-2.49	90.38	8.755	12
	Total	87.98	11.624	222

Note. Levene's = 3.122 (df=7, 214)
*p = .004

To look at the interactive effects between GPA and producer type, a factorial analysis was done and the results are displayed in table 20. As can be seen from the table, neither producer type nor GPA independently or as an interaction between the two variables produces a significant result. In all 3 cases, the partial ETA square values are minimal and the adjusted r square, which takes account of both factors, is negligible (r sq = -.012).

Table 21

Factorial Analysis of Immediate Information Recall by GPA and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	352.510a	7	50.359	.365	.922	.012
Intercept	969136.920	1	969136.920	7028.803	.000	.970
Producer Type	75.767	1	75.767	.550	.459	.003
GPA	120.764	3	40.255	.292	.831	.004
Producer Type and GPA	161.389	3	53.796	.390	.760	.005
Error	29506.491	214	137.881			
Total	1748106.509	222				
Corrected Total	29859.001	221				

Note. [a] R Squared = .012 (Adjusted R Squared = -.021)

The next independent variable examined was the age of the student. One may argue that older students may be more mature and attentive; a counterargument would be that younger students who are adapting to college life may be more attuned to messages that may help them with that process.

> H1.4: There will be no significant difference based on age in immediate information retention between professionally produced and peer produced audio PSAs.

Looking at the impact of age on immediate recall, a straight F value was used as the Levene's test was not significant. As can be seen from Table 22, there is no significant difference in level of recall based upon age. It is interesting to note that degree of variability was quite high, ranging from a 92% recall rate for 18 year olds to a low of 82% for 23 year olds. However the large SD and small number of cases in some categories undermines any potential pattern.

Table 22

Immediate Information Recall by Age – One-Way ANOVA

Dependent Variable	Age	N	Mean	Std Dev	Std Err	F-value	Significance
Immediate Recall	18	3	92.31	13.323	7.692	1.016 df=6,215	.416*
	19	6	85.90	13.249	5.409		
	20	66	89.04	11.294	1.390		
	21	87	88.33	11.425	1.225		
	22	27	88.32	11.949	2.300		
	23	21	82.42	13.791	3.009		
	24 or Older	12	88.46	8.362	2.414		
	Total	222	87.98	11.624	.780		

Note. Levene's = .654 (df=6,215)
*p = .687

Table 23 provides the breakout by age and producer type. Here it is seen that the range of correct answers extends from 77% for 23 year olds and peer produced PSAs to 100% for 18 year olds and professionally produced PSAs. However the relatively small number of 18 year olds in the study does cloud the results.

Table 23

Immediate Information Recall by Age and Producer Type

Producer	Age	Mean	Std. Deviation	N
Professional	18	100.00		1
	19	84.62	13.323	3
	20	87.91	11.238	35
	21	88.46	9.560	46
	22	92.31	9.730	11
	23	87.69	9.730	10
	24 or Older	87.69	8.771	5
	Total	88.57	10.102	111
Peer	18	88.46	16.318	2
	19	87.18	16.013	3
	20	90.32	11.404	31
	21	88.18	13.334	41
	22	85.58	12.833	16
	23	77.62	15.558	11
	24 or Older	89.01	8.722	7
	Total	87.39	12.988	111
Total	18	92.31	13.323	3
	19	85.90	13.249	6
	20	89.04	11.294	66
	21	88.33	11.425	87
	22	88.32	11.949	27
	23	82.42	13.791	21
	24 or Older	88.46	8.362	12
	Total	87.98	11.624	222

Note. Levene's = 1.009 (df= 13, 208)
*p = .444

Turning to a factorial analysis of age and producer type (Table 24), it is seen that no significant difference emerges between the variables independently or together. The adjusted r square is only .003. This suggests that factors other than age and producer type alone would need to be explored to look for any type of significant pattern.

Table 24

Factorial Analysis of Immediate Information Recall by Age and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	1850.594a	13	142.353	1.057	.398	.062
Intercept	515168.812	1	515168.812	3825.820	.000	.948
Producer Type	168.370	1	168.370	1.250	.265	.006
Age	841.524	6	140.254	1.042	.399	.029
Producer Type and Age	954.961	6	159.160	1.182	.317	.033
Error	28008.407	208	134.656			
Total	1748106.509	222				
Corrected Total	29859.001	221				

Note. [a] R Squared = .062 (Adjusted R Squared = .003)

H1.5: There will be no significant difference based on rank in immediate information retention between professionally produced and peer produced audio PSAs.

The fourth demographic variable looked at student rank and its impact on student information recall. In this case the Levine's value was significant so the Welch's F-test was used. As Table 25 shows, the difference in means between the three ranks is minimal with a variation of about 0.5 percentage points. While the SD ranges from 10 to 15 percentage points. As a result, there is no significant difference in immediate recall based on class rank.

Table 25

Immediate Information Recall by Rank – One-Way ANOVA

Dependent Variable	Rank	N	Mean	Std Dev	Std Err	Welch's F	Significance
Immediate Recall	Sophomore	21	88.28	15.311	3.341	.025 df=2,53	.975*
	Junior	99	88.11	10.613	1.067		
	Senior	102	87.78	11.826	1.171		
	Total	222	87.98	11.624	.780		

Note. Levene's = 3.844 (df=2,219)

* p = .023

Table 26 presents the breakout of rank and producer type. The range is minimal across groups with a low of 86.39% and a high of 89.23%, a difference of less than 3% points. At the same time, the SDs vary considerably, suggesting that there will not be an overall pattern.

Table 26

Immediate Information Recall by Rank and Producer Type

Producer	Rank	Mean	Std. Deviation	N
Professional	Sophomore	87.41	16.596	11
	Junior	88.15	8.254	50
	Senior	89.23	10.191	50
	Total	88.57	10.102	111
Peer	Sophomore	89.23	14.595	10
	Junior	88.07	12.665	49
	Senior	86.39	13.158	52
	Total	87.39	12.988	111
Total	Sophomore	88.28	15.311	21
	Junior	88.11	10.613	99
	Senior	87.78	11.826	102
	Total	87.98	11.624	222

Note. Levene's = 3.482 (df=5, 216)
*p = .005

As Table 27 shows, this expectation is confirmed in the factorial analysis. There is no significant pattern among the independent variables individually or as combined. The adjusted r square is minimal at -1.05. This suggests that rank and producer type do not have an impact on immediate information recall and other factors may need to be studied.

Table 27

Factorial Analysis of Immediate Information Recall by Rank and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq[a]
Corrected Model	230.677a	5	46.135	.336	.891	.008
Intercept	1032345.818	1	1032345.818	7526.133	.000	.972
Producer Type	4.528	1	4.528	.033	.856	.000
Rank	7.043	2	3.521	.026	.975	.000
Producer Type and Rank	147.027	2	73.514	.536	.586	.005
Error	29628.324	216	137.168			
Total	1748106.509	222				
Corrected Total	29859.001	221				

Note. [a]. R Squared = .008 (Adjusted R Squared = -.015)

H1.6: There will be no significant difference based on the number of communications production classes in immediate information retention between professionally produced and peer produced audio PSAs.

The fifth demographic variable examines if the number of production classes a student has taken will impact their immediate recall. One possible assumption is that students who have a greater number of production classes may be more sensitive to production characteristics and messages and thus have a higher level of recall.

As Table 28 shows, there tends to be a higher level of information recall as the number of production classes increases, with the highest level of information recall being among those who have 7 or more production classes. However the second highest category is for those who have had 2 or fewer production classes. In this case the Levene's test was not significant and standard F-value revealed there was no significant relationship between the number of production classes and immediate recall. While the high scores of those completing 7 or more production classes appears logical, the smaller number of students may be a factor. An interesting speculation is whether for those who have had 0 to 2 production classes have a degree of enthusiasm or a lack

of production sophistication that makes them more able to focus on the message rather than production characteristics. This may be an interesting element for further study.

Table 28

Immediate Information Recall by Production Classes – One-Way ANOVA

Dependent Variable	Production Classes	N	Mean	Std Dev	Std Err	F-value	Significance
Immediate Recall	0 - 2	75	88.62	11.820	1.365	.741	.528*
	3 - 4	96	86.94	11.334	1.157	df=3,218	
	5 - 6	33	87.88	11.543	2.009		
	7 or more	18	91.03	12.722	2.999		
	Total	222	87.98	11.624	.780		

Note. Levene's = .120 (df=3,218)
*p = .949

As seen in table 29 whether for peer or professionally produced PSAs, the highest percentage of immediate recall was with those who had the most production classes. Here however, the pattern is more confused as the second highest for professionally produced PSAs were those with 5 to 6 classes (90.05%) whereas for peer produced PSAs, that same group had the lowest immediate recall percent. This does suggest that producer values may become an issue as students take more production classes.

Table 29

Immediate Information Recall by Number of Communications Production Courses and Producer Type

Producer	Production Classes	Mean	Std. Deviation	N
Professional	0 - 2	88.87	10.981	38
	3 - 4	87.07	9.504	47
	5 - 6	90.05	9.328	17
	7 or more	92.31	10.879	9
	Total	88.57%	10.102	111
Peer	0 - 2	88.36	12.772	37
	3 - 4	86.81	12.948	49
	5 - 6	85.58	13.434	16
	7 or more	89.74	14.896	9
	Total	87.39	12.988	111
Total	0 - 2	88.62	11.820	75
	3 - 4	86.94	11.334	96
	5 - 6	87.88	11.543	33
	7 or more	91.03	12.722	18
	Total	87.98	11.624	222

Note. Levene's = 1.470 (df=7, 214)
*p = .179

As shown in table 30 the factorial analysis for producer type and production classes shows no significant patterns. Given the variability seen in the percentage in immediate recall this is not unexpected. An adjusted r square of -.015 shows the lack of relationship.

Table 30

Factorial Analysis of Immediate Information Recall by Number of Communications Production Courses and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq[a]
Corrected Model	502.187a	7	71.741	.523	.817	.017
Intercept	1145465.258	1	1145465.258	8350.006	.000	.975
Producer Type	138.667	1	138.667	1.011	.316	.005
Production Classes	301.251	3	100.417	.732	.534	.010
Producer Type and Production Classes	126.587	3	42.196	.308	.820	.004
Error	29356.814	214	137.181			
Total	1748106.509	222				
Corrected Total	29859.001	221				

Note. [a] R Squared = .017 (Adjusted R Squared = -.015)

As a final demographic variable, an index of production courses where advanced courses carry double the weight of other courses is examined. The purpose of this is to explore if advanced courses would have an impact on immediate recall. As shown in table 51, there is a lack of any clear pattern with the production course index leading to higher levels of immediate recall. While those with the highest production course index do have the highest recall percentage, the pattern for the lower three categories is inconsistent. The F-value in this case shows there is no significant relationship.

> H1.7: There will be no significant difference based on the production course index in immediate information retention between professionally produced and peer produced audio PSAs.

Table 31

Immediate Information Recall by Production Course Index – One-Way ANOVA

Dependent Variable	Production Course Index	N	Mean	Std Dev	Std Err	F-value	Significance
Immediate Recall	0 - 2	57	87.85	12.501	1.656	1.547 df=3,218	.203*
	3 - 4	45	88.55	10.707	1.596		
	5 - 8	96	86.70	11.463	1.170		
	9 or more	24	92.31	11.342	2.315		
	Total	222	87.98	11.624	.780		

Note. Levene's = .328 (df=3,218)
*p = .805

In Table 32, looking at producer type and production course index, it is seen that those with the highest production count index do not have the highest scores on immediate recall. It is also worthy of notice that the second highest scores tend to be for those whose course index value is 3 or 4, and the lowest is for those with index score of 5 to 8. This again suggests a very confused pattern, suggesting other factors are at work.

Table 32

Immediate Information Recall by Production Course Index and Producer Type

Producer	Production Course Index	Mean	Std. Deviation	N
Professional	0 – 2	87.91	11.549	28
	3 – 4	88.14	10.634	24
	5 – 8	87.79	8.967	46
	9 or more	93.49	9.340	13
	Total	88.57	10.102	111
Peer	0 – 2	87.80	13.562	29
	3 – 4	89.01	11.033	21
	5 – 8	85.69	13.370	50
	9 or more	90.91	13.682	11
	Total	87.39	12.988	111
Total	0 – 2	87.85	12.501	57
	3 – 4	88.55	10.707	45
	5 – 8	86.70	11.463	96
	9 or more	92.31	11.342	24
	Total	87.98	11.624	222

Note. Levene's = 1.666 (df= 7, 214)
*p = .119

In Table 33, the factorial analysis for immediate recall, production course index and producer type is presented. As the table shows, there are no significant patterns with the independent variables or the interactive effect. Given the lack of a consistent directionality in production course index and recall level as seen in table 25, this is not surprising.

Table 33

Factorial Analysis of Immediate Information Recall by Production Course Index and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq[a]
Corrected Model	776.536a	7	110.934	.816	.575	.026
Intercept	1368802.888	1	1368802.888	10072.180	.000	.979
Producer Type	41.767	1	41.767	.307	.580	.001
Production Course Index	588.011	3	196.004	1.442	.231	.020
Producer Type and Production Course Index	94.186	3	31.395	.231	.875	.003
Error	29082.465	214	135.899			
Total	1748106.509	222				
Corrected Total	29859.001	221				

Note. [a] R Squared = .026 (Adjusted R Squared = -.006)

Information Retention Summary

The summary results of the analysis for immediate information recall are presented in Table 34. As can be seen from the table, the only significant findings were when looking at PSA type individually compared to producer type. This suggests that the quality of the presentation and the nature of the message may be the most important factors in information recall. In turn, the demographic variables examined do not seem to have an impact. In aggregation, neither does the producer type. None of the interactive effects were significant.

Various factors could be at work here, including, the sophistication of the students, the variability of the format, presentation and quality of the PSA productions, and even prior knowledge or exposure to the topic areas. These are all elements for potential further studies.

Table 34

Information Retention by Producer Type - Summary

Hypotheses	Independent Variable 1	Independent Variable 2	IV2 – DV Significance	Interactive Significance
H1.1	Producer Type		No	
	Flu		Yes	
	Binge Drinking		Yes	
	Texting and Driving		Yes	
H1.2	Producer Type	Gender	No	No
H1.3	Producer Type	GPA	No	No
H1.4	Producer Type	Age	No	No
H1.5	Producer Type	Class Rank	No	No
H1.6	Producer Type	Production Classes	No	No
H1.7	Producer Type	Production Course Index	No	No

RQ2: Is there a significant difference in level of interest between professionally produced and peer produced audio PSA messages?

For RQ2, the examination shifts to investigating what variables impact the level of interest. As pointed out in our discussion of statistical approaches, Welch's F is used for the one-way analyses here. Given an ordinal scale with only four options, Welch's F is the appropriate statistic to use.

H2.1: There will be no significant difference in level of interest between professionally produced and peer produced audio PSAs.

Table 35

Level of Interest by Producer Type

PSA Topic	Producer Type	N	Mean	Std Dev	Std Err	Welch's F	Significance
All Topics	Professional	111	2.89	.802	.076	7.967 df=1,220	.005*
	Peer	111	2.59	.767	.073		
	Total	222	2.74	.797	.053		

Note. Levene's = .871 (df=1,220)
* p = .352

In terms of interest, the first hypothesis looks at how producer effects impact level of interest. A significant difference is found from the Welch's F with peer produced PSAs showing a significantly greater level of interest. As the interest scale is inverted, a higher value indicates a lower level of interest. Here we see that peer produced PSAs (2.59) had a greater level of interest than professionally produced PSAs (2.89), which rated 0.30 worse on a 1 to 4 scale.

Having found a significant overall pattern, the next step was to examine the differences within each of the three topics. Essentially, the focus here is on whether a similar pattern is found when looking at each PSA topic in isolation.

Table 36

Level of Interest by PSA Topic and Producer Type

PSA Topic	Producer Type	N	Mean	Std Dev	Std Err	Welch's F	Significance
Flu	Professional	37	3.32	.626	.103	13.603 df=1,67	.000*
	Peer	37	2.70	.812	.133		
	Total	74	3.01	.785	.091		
Binge Drinking	Professional	37	2.78	.750	.123	6.964 df=1,72	.010**
	Peer	37	2.32	.747	.123		
	Total	74	2.55	.779	.091		
Texting & Driving	Professional	37	2.57	.835	.137	1.138 df=1,69	.290***
	Peer	37	2.76	.683	.112		
	Total	74	2.66	.763	.089		

Note. Flu - Levene's = 1.440 (df=1,72); Binge - Levene's = .195 (df=1,72); Texting - Levene's = 2.460 (df=1,72)
*p = .234
**p = .660
***p = .121

Table 36 shows there is a significant difference between professionally produced and peer produced PSAs on the flu and the binge drinking topics. In both cases, subjects found the peer-produced PSAs more interesting than the professionally produced ones. For texting and driving, the professionally produced PSAs were seen as more interesting; however the difference was not statistically significant.

> H2.2: There will be no significant difference based on gender in level of interest between professionally produced and peer produced audio PSAs.

For level of interest, the first demographic variable in question was gender. Table 37 shows that the Levene's test is significant, further strengthening the value of using a Welch's F. When comparing gender, the means differed by only .08, and the Welch's F showed no significant difference.

Table 37

Level of Interest by Gender – One-Way ANOVA

Dependent Variable	Gender	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Interest	Female	108	2.70	.889	.086	.517 df=1,220	.473*
	Male	114	2.78	.701	.066		
	Total	222	2.74	.797	.053		

Note. Levene's = 8.805 (df=1,220)
*p = .003

Following up on the one-way ANOVA, the two variables, gender and interest level, were compared to gauge the possible interaction effects between the variables in terms of level of interest. As Table 38 shows, the differences between male and female scores in each category are minimal.

Table 38

Level of Interest by Gender and Producer Type

Producer	Gender	Mean	Std. Deviation	N
Professional	Female	2.88	.922	52
	Male	2.90	.687	59
	Total	2.89	.802	111
Peer	Female	2.54	.830	56
	Male	2.65	.700	55
	Total	2.59	.767	111
Total	Female	2.70	.889	108
	Male	2.78	.701	114
	Total	2.74	.797	222

Note. Levene's = 3.428 (df=3,218)
*p = .018

Table 39 presents the factorial analysis, which as expected, shows there is not a significant interaction between producer type and gender on level of interest. It should be noted that there is a significant difference on level of interest when looking at producer type in isolation of gender. This reflects the pattern found in Table 35 where the individual PSA topics were examined by producer type.

Table 39

Factorial Analysis of Level of Interest by Gender and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq[a]
Corrected Model	5.302a	3	1.767	2.853	.038	.038
Intercept	1667.302	1	1667.302	2691.139	.000	.925
Producer Type	4.864	1	4.864	7.850	.006	.035
Gender	.243	1	.243	.392	.532	.002
Producer Type and Gender	.153	1	.153	.247	.620	.001
Error	135.062	218	.620			
Total	1811.000	222				
Corrected Total	140.365	221				

Note. [a] R Squared = .038 (Adjusted R Squared = .025)

H2.3: There will be no significant difference based on GPA in level of interest between professionally produced and peer produced audio PSAs.

Another factor to explore was whether the level of interest could be explained by academic capability. GPA is used as an indicator of academic capability. As Table 40 shows, there is no significant pattern between GPA and level of interest. Perhaps most noteworthy is that the means for students in the three GPA groups 2.5 and above are similar and for those in the 2.00 to 2.49 GPA category, the mean is significantly lower (i.e., higher interest level). This indicates that students with lower GPAs regarded the PSAs as more interesting.

Table 40

Level of Interest by GPA – One-Way ANOVA

Dependent Variable	GPA	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Interest	3.50-4.00	81	2.79	.737	.082	1.205 df=3,49	.318
	3.00-3.48	69	2.74	.902	.109		
	2.50-2.99	60	2.77	.745	.096		
	2.00-2.49	12	2.33	.778	.225		
	Total	222	2.74	.797	.053		

Note. Levene's = 2.517 (df=3,218)

* p = .059

Looking at GPA and producer effect on level of interest, Table 41 shows a similar pattern to what was seen in Table 39, the overall level of interest. Again, the lowest GPA category had a markedly greater level of interest than the higher GPA categories.

Table 41

Level of Interest by GPA and Producer Type

Producer	GPA	Mean	Std. Deviation	N
Professional	3.50-4.00	2.95	.697	42
	3.00-3.48	2.92	.906	36
	2.50-2.99	2.86	.756	28
	2.00-2.49	2.40	1.140	5
	Total	2.89	.802	111
Peer	3.50-4.00	2.62	.747	39
	3.00-3.48	2.55	.869	33
	2.50-2.99	2.69	.738	32
	2.00-2.49	2.29	.488	7
	Total	2.59	.767	111
Total	3.50-4.00	2.79	.737	81
	3.00-3.48	2.74	.902	69
	2.50-2.99	2.77	.745	60
	2.00-2.49	2.33	.778	12
	Total	2.74	.797	222

Note. Levene's = 1.853 (df=7,214)
*p = .079

A factorial analysis was done as a next step to look at the interactive effects of GPA and producer type on level of interest. As Table 42 shows, neither producer type nor GPA independently or interactively produces significant results. The partial ETA square values and adjusted r square are extremely minimal reflecting this lack of a clear pattern.

Table 42

Factorial Analysis of Level of Interest by GPA and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq[a]
Corrected Model	7.365a	7	1.052	1.693	.112	.052
Intercept	873.675	1	873.675	1405.767	.000	.868
Producer Type	1.903	1	1.903	3.061	.082	.014
GPA	2.064	3	.688	1.107	.347	.015
Producer Type and GPA	.465	3	.155	.249	.862	.003
Error	132.999	214	.621			
Total	1811.000	222				
Corrected Total	140.365	221				

Note. [a] R Squared = .052 (Adjusted R Squared = .021)

H2.4: There will be no significant difference based on age in level of interest between professionally produced and peer produced audio PSAs.

The third demographic value was the age of the student. We wanted to explore if the level of interest would be greater for younger students. The PSAs used are intended for college students. Younger students, who are making health and safety related decisions on their own for the first time without the help of parents or other adult figures in their lives, may be expected to be more attuned to these PSAs. This would be reflected in a greater level of interest. As Table 43 shows, there is a significant relationship between age and level of interest. Looking at the data in Table 43, there is a general pattern that the level of interest declines (a higher mean value) as the age of the student increases.

Table 43

Level of Interest by Age – One-Way ANOVA

Dependent Variable	Age	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Interest	18	3	1.33	.577	.333	6.349 df=6,20	.001*
	19	6	2.67	.516	.211		
	20	66	2.88	.775	.095		
	21	87	2.71	.776	.083		
	22	27	2.26	.764	.147		
	23	21	2.90	.625	.136		
	24 or Older	12	3.42	.669	.193		
	Total	222	2.74	.797	.053		

Note. Levene's = .921 (df=6,215)
*p = .481

Table 44 provides detail by producer type and age on the level of interest. The significant pattern found by level of interest and age is reflected in the table, as in general terms, it is found that the level of interest declines (i.e., higher mean value) in the older students for both professional and peer produced PSAs. This pattern is not as clear as the one found for GPA but it does show somewhat of a similar trend.

Table 44

Level of Interest by Age and Producer Type

Producer	Age	Mean	Std. Deviation	N
Professional	18	1.00		1
	19	3.00	0.000	3
	20	2.91	.742	35
	21	2.91	.784	46
	22	2.36	.924	11
	23	3.00	.667	10
	24 or Older	3.80	.447	5
	Total	2.89	.802	111
Peer	18	1.50	.707	2
	19	2.33	.577	3
	20	2.84	.820	31
	21	2.49	.711	41
	22	2.19	.655	16
	23	2.82	.603	11
	24 or Older	3.14	.690	7
	Total	2.59	.767	111
Total	18	1.33	.577	3
	19	2.67	.516	6
	20	2.88	.775	66
	21	2.71	.776	87
	22	2.26	.764	27
	23	2.90	.625	21
	24 or Older	3.42	.669	12
	Total	2.74	.797	222

Note. Levene's = 1.028 (df=13,208)
*p = .428

The factorial analysis in Table 45 shows no significant pattern for the interaction effect. It appears that while age has an impact, producer type does not create an interaction effect with age.

Table 45

Factorial Analysis of Level of Interest by Age and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq[a]
Corrected Model	26.089a	13	2.007	3.653	.000	.186
Intercept	445.029	1	445.029	810.025	.000	.796
Producer Type	.956	1	.956	1.740	.189	.008
Age	19.773	6	3.295	5.998	.000	.148
Producer Type and Age	2.309	6	.385	.700	.650	.020
Error	114.276	208	.549			
Total	1811.000	222				
Corrected Total	140.365	221				

Note. [a] R Squared = .186 (Adjusted R Squared = .135)

H2.5: There will be no significant difference based on rank in level of interest between professionally produced and peer produced audio PSAs.

Table 46 looks at the next demographic variable. The Welch's F-value shows no significant difference by rank in level of interest. The degree of variability is minimal across the ranks ranging from 2.69 for seniors to 2.81 for juniors. The standard deviations were also similar ranging from .771 to .829.

Table 46

Level of Interest by Rank – One-Way ANOVA

Dependent Variable	Rank	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Interest	Sophomore	21	2.71	.784	.171	.586	.560*
	Junior	99	2.81	.829	.083	df=2,57	
	Senior	102	2.69	.771	.076		
	Total	222	2.74	.797	.053		

Note. Levene's = .427 (df=2,219)

*p = .653

Table 47 explores the distribution between rank and producer type. While the mean scores between professionally and peer produced PSAs are relatively larger, the variability by

rank within each of the producer types is quite small. With the relatively large standard deviations, this would reduce the chances of a significant difference.

Table 47

Level of Interest by Rank and Producer Type

Producer	Rank	Mean	Std. Deviation	N
Professional	Sophomore	2.91	.701	11
	Junior	2.94	.843	50
	Senior	2.84	.792	50
	Total	2.89	.802	111
Peer	Sophomore	2.50	.850	10
	Junior	2.67	.801	49
	Senior	2.54	.727	52
	Total	2.59	.767	111
Total	Sophomore	2.71	.784	21
	Junior	2.81	.829	99
	Senior	2.69	.771	102
	Total	2.74	.797	222

Note. Levene's = 1.169 (df=5,216)
*p = .325

The factorial analysis is presented in Table 48. It confirms that there is no interactive impact between producer type and rank on level of interest, while also reflecting that producer type alone does have an impact, consistent with what was seen in Table 36 above.

Table 48

Factorial Analysis of Level of Interest by Rank and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	5.717a	5	1.143	1.834	.107	.041
Intercept	994.254	1	994.254	1594.969	.000	.881
Producer Type	3.529	1	3.529	5.662	.018	.026
Rank	.728	2	.364	.584	.559	.005
Producer Type and Rank	.089	2	.045	.072	.931	.001
Error	134.648	216	.623			
Total	1811.000	222				
Corrected Total	140.365	221				

Note. [a] R Squared = .041 (Adjusted R Squared = .019)

H2.6: There will be no significant difference based on the number of communications classes in level of interest between professionally produced and peer produced audio PSAs.

One possible consideration is whether students with more production courses are more sensitive to production characteristics and messaging that may make them more apt to find the PSAs interesting. The fifth demographic variable, number of production courses, looks at the impact of the number of producer effects and level of interest.

As seen in Table 49, students who have taken 3-4 or 7 or more total production classes have similar mean scores. Those who have taken between 5-6 courses have the highest means indicating the lowest levels of interest. This may reflect a degree of saturation in the learning process where students' interest levels are skewed by their growing knowledge of production and messaging skills. However, this may be a transitional phase with interest levels returning as students move beyond the 5-6 course level.

Table 49

Level of Interest by Production Classes – One-Way ANOVA

Dependent Variable	Production Classes	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level Interest	0 - 2	75	2.64	.799	.092	1.276 df=3,67	.290*
	3 - 4	96	2.74	.824	.084		
	5 - 6	33	2.97	.810	.141		
	7 or more	18	2.78	.548	.129		
	Total	222	2.74	.797	.053		

Note. Levene's = 1.766 (df=3,218)

* p = .155

From Table 49, we see no statistically significant pattern between the number of production classes and level of interest (F=1.325, df=3,218). The least interest level was seen in the group with 5-6 production courses. Those students with slightly less or more production course experience rated some 0.2 points higher in interest (i.e, lower mean). This may suggest that there is a critical point where students' interest levels diminish then recover as their production skills and orientation further develops.

Table 50 shows the overall pattern between number of production classes and producer type. The patterns seen in Table 49, where classes were analyzed independently, holds for the professional and the total categories. For the peer categories, the students with 7 or more production classes rated just slightly lower in interest than the other categories. Perhaps these more advanced production students perceived lower quality aesthetics and production in the peer-produced PSAs that undermined their interest.

Table 50

Level of Interest by Number of Courses and Producer Type

Producer	Production Classes	Mean	Std. Deviation	N
Professional	0 - 2	2.74	.760	38
	3 - 4	2.87	.850	47
	5 - 6	3.29	.772	17
	7 or more	2.89	.601	9
	Total	2.89	.802	111
Peer	0 - 2	2.54	.836	37
	3 - 4	2.61	.786	49
	5 - 6	2.63	.719	16
	7 or more	2.67	.500	9
	Total	2.59	.767	111
Total	0 - 2	2.64	.799	75
	3 - 4	2.74	.824	96
	5 - 6	2.97	.810	33
	7 or more	2.78	.548	18
	Total	2.74	.797	222

Note. Levene's = 1.044 (df=7,214)
* p = .401

As seen with the other analyses for level of interest, no pattern was found in terms of an interactive effect between producer type and the number of production classes taken (see Table 51). The lack of pattern suggests that that the combination of production classes and producer type together may create a degree of variability that obscures possible differences.

Table 51

Factorial Analysis of Level of Interest by Number of Courses and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	8.772a	7	1.253	2.038	.052	.062
Intercept	1127.447	1	1127.447	1833.490	.000	.895
Producer Type	4.142	1	4.142	6.735	.010	.031
Production Classes	2.384	3	.795	1.292	.278	.018
Producer Type and Production Classes	1.389	3	.463	.753	.522	.010
Error	131.593	214	.615			
Total	1811.000	222				
Corrected Total	140.365	221				

Note. [a]. R Squared = .062 (Adjusted R Squared = .032)

H2.7: There will be no significant difference based on the production course index in level of interest between professionally produced and peer produced audio PSAs.

An index of production courses is explored as the final demographic variable in examining level of interest. In this index, advanced courses carry double the weight of lower level production oriented courses. As seen in Table 51, there is a lack of a clear pattern regarding level of interest and the production course index. The means vary by 0.12 with the lowest interest level (highest mean of 2.79) being students with a score of 9 or more on the production course index, and the highest interest (lowest mean of 2.67) being students scoring 3-4 on the index.

Table 52

Level of Interest by Production Course Index – One-Way ANOVA

Dependent Variable	Production Course Index	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Interest	0 - 2	57	2.72	.796	.105	.279 df=3,85	.840*
	3 - 4	45	2.67	.739	.110		
	5 - 8	96	2.78	.861	.088		
	9 or more	24	2.79	.658	.134		
	Total	222	2.74	.797	.053		

Note. Levene's = 1.587 (df=3,218)
* p = .194

One possibility is that it is not the number of production courses but the sophistication of those production courses that has an impact on the level of interest. Students who take more high-level courses are likely to be more attentive to or interested in the PSAs. While Table 52 shows that there is no significant relationship in this regard, we see an almost U-shaped pattern where level of interest is lowest in those with the lowest and highest number on the course index. This may suggest that a modest level of production experience actually enhances the level of interest slightly when advanced courses are involved.

Table 53

Level of Interest by Production Course Index and Producer Type

Producer	Production Course Index	Mean	Std. Deviation	N
Professional	0 - 2	2.82	.772	28
	3 - 4	2.75	.737	24
	5 - 8	2.98	.882	46
	9 or more	3.00	.707	13
	Total	2.89	.802	111
Peer	0 - 2	2.62	.820	29
	3 - 4	2.57	.746	21
	5 - 8	2.60	.808	50
	9 or more	2.55	.522	11
	Total	2.59	.767	111
Total	0 - 2	2.72	.796	57
	3 - 4	2.67	.739	45
	5 - 8	2.78	.861	96
	9 or more	2.79	.658	24
	Total	2.74	.797	222

Note. Levene's = .862 (df=7,214)
*p = .538

When the mean level of interest by producer type was examined, as seen in Table 53, there is a very mixed pattern. Overall, the professional PSAs show a lower level of interest (higher mean) for every category of the production course index. This suggests the relationship found looking only at the single variable, production course index, may have been influenced by aggregating the two producer types. Separating those shows possible differences in the overall levels between professional and peer produced PSAs.

Table 54

Factorial Analysis of Level of Interest by Production Course Index and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	6.082a	7	.869	1.385	.213	.043
Intercept	1298.054	1	1298.054	2068.642	.000	.906
Producer Type	3.981	1	3.981	6.344	.013	.029
Production Course Index	.556	3	.185	.295	.829	.004
Producer Type and Production Course Index	.595	3	.198	.316	.814	.004
Error	134.283	214	.627			
Total	1811.000	222				
Corrected Total	140.365	221				

Note. [a] R Squared = .043 (Adjusted R Squared = .012)

While some differences do emerge when the production course index and producer type are considered together, the next question is whether there is a significant interactive impact on level of interest. As Table 53 shows, the F-value is not significant (F=.316, df=3,214) and there is not a statistically significant interactive effect of the production course index and producer type with level of interest.

Level of Interest Summary

The summary results of the analysis for level of interest are presented in Table 55. As can be seen from the table, one set of significant findings were when PSA topics were compared individually by producer type. The other significant finding was age and interest.

Table 55

Level of Interest by Producer Type - Summary

Hypotheses	Independent Variable 1	Independent Variable 2	IV2 – DV Significance	Interaction Significance
H2.1	Producer Type		No	
	Flu		Yes	
	Binge Drinking		Yes	
	Texting and Driving		No	
H2.2	Producer Type	Gender	No	No
H2.3	Producer Type	GPA	No	No
H2.4	Producer Type	Age	Yes	No
H2.5	Producer Type	Class Rank	No	No
H2.6	Producer Type	Production Classes	No	No
H2.7	Producer Type	Production Course Index	No	No

RQ3: Is there a significant difference in level of entertainment between professionally produced and peer produced audio PSA messages?

The third research question looks at the impact of producer effects on entertainment value. Participants rated each PSA on entertainment value using a 4 point Likert scale where 1 was extremely entertaining and 4 was not at all entertaining.

H3.1: There will be no significant difference in level of entertainment between professionally produced and peer produced audio PSAs.

Table 56

Level of Entertainment by Producer Type

PSA Topic	Producer Type	N	Mean	Std Dev	Std Err	Welch's F	Significance
All Topics	Professional	111	3.27	.808	.077	30.778 df=1,220	.000*
	Peer	111	2.66	.837	.079		
	Total	222	2.96	.876	.059		

Note. Levene's = .265 (df=1,220)
* p = .607

The first hypothesis looks at the impact of producer type on entertainment value. A Welch's F was used as the statistic for the level of entertainment as the dependent variable was an ordinal scale with only four possible points. Overall, the entertainment level was rated much

lower (i.e., a higher mean) for the professionally produced PSAs by 0.60 points on a four-point scale. As table 56 shows, this difference is statistically significant at a p< .00095.

Next, the individual PSAs were examined to see if the topic itself impacted the level of entertainment. Using the Welch's F, a significant difference was found in the level of entertainment for the flu and binge drinking PSAs. Again, the peer produced PSAs were rated more highly on level of entertainment. As Table 57 shows, these differences were even greater with differences in the 0.90 range for flu and binge drinking. Here, the peer produced PSAs were clearly seen as more entertaining. In contrast, texting and driving showed no significant difference between the entertainment levels on professionally and peer produced PSAs with a difference in rating of only 0.03.

Table 57

Level of Entertainment by PSA Topic and Producer Type

PSA Topic	Producer Type	N	Mean	Std Dev	Std Err	Welch's F	Significance
Flu	Professional	37	3.76	.435	.072	34.561 df=1,53	.000*
	Peer	37	2.81	.877	.144		
	Total	74	3.28	.836	.097		
Binge Drinking	Professional	37	3.30	.702	.115	23.273 df=1,70	.000**
	Peer	37	2.43	.835	.137		
	Total	74	2.86	.881	.102		
Texting & Driving	Professional	37	2.76	.895	.147	.019 df=1,70	.890***
	Peer	37	2.73	.769	.126		
	Total	74	2.74	.829	.096		

Note. Flu - Levene's = 8.017 (df=1,72); Binge - Levene's = 1.476 (df=1,72); Texting - Levene's = .310 (df=1,72)
*p = .006
**p = .121
***p = .579

As with immediate information recall and level of interest, the results for the flu and binge drinking PSAs here are consistent in showing significant differences. However, while the flu PSA saw higher interest, entertainment and immediate recall, the binge drinking PSA showed

higher interest and entertainment but lower recall levels. Finally, the texting and driving PSA did not show a significant difference in interest or entertainment levels but did see significantly higher immediate recall for the professionally produced PSAs.

> H3.2: There will be no significant difference based on gender in level of entertainment between professionally produced and peer produced audio PSAs.

The analysis of demographic variables for level of entertainment begins with gender. As Table 58 shows, there is no significant difference based on gender in entertainment level. The means differed by 0.06 by gender, showing relative consistency with the 0.08 difference in means when looking at overall level of interest and gender.

Table 58

Level of Entertainment by Gender – One-Way ANOVA

Dependent Variable	Gender	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Entertainment	Female	108	2.94	.940	.090	.224 df=1,212	.636*
	Male	114	2.99	.815	.076		
	Total	222	2.96	.876	.059		

Note. Levene's = 2.821(df=1,220)
* p = .094

The two variables, gender and producer type were compared using a two-way ANOVA to measure any possible interaction effects between the variables and level of entertainment. Table 59 shows the differences in scores in each category by gender are negligible.

Table 59

Level of Entertainment by Gender and Producer Type

Producer	Gender	Mean	Std. Deviation	N
Professional	Female	3.25	.860	52
	Male	3.29	.767	59
	Total	3.27	.808	111
Peer	Female	2.64	.923	56
	Male	2.67	.747	55
	Total	2.66	.837	111
Total	Female	2.94	.940	108
	Male	2.99	.815	114
	Total	2.96	.876	222

Note. Levene's = 1.227 (df=3,218)
*p = .283

Table 60 shows the factorial analysis. In this case, there is no significant difference when investigating interaction effects between producer and gender on level of entertainment.

Table 60

Factorial Analysis of Level of Entertainment by Gender and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	20.894a	3	6.965	10.202	.000	.123
Intercept	1945.622	1	1945.622	2850.098	.000	.929
Producer Type	20.696	1	20.696	30.317	.000	.122
Gender	.064	1	.064	.094	.760	.000
Producer Type and Gender	.001	1	.001	.001	.970	.000
Error	148.818	218	.683			
Total	2120.000	222				
Corrected Total	169.712	221				

Note. [a] R Squared = .123 (Adjusted R Squared = .111)

H3.3: There will be no significant difference based on GPA in level of entertainment between professionally produced and peer produced audio PSAs.

To assess the impact of academic achievement level for level of entertainment, GPA was investigated as a possible explanation. There is no significant pattern, as shown in Table 61,

when looking at GPA and level of entertainment. Students in the three highest GPA brackets rated entertainment level essentially the same with a difference of only 0.04. Those in the lowest GPA category did have a higher entertainment value (i.e., lower mean) by about 0.20 points but the difference was not significant.

Table 61

Level of Entertainment by GPA – One-Way ANOVA

Dependent Variable	GPA	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Entertainment	3.50-4.00	81	2.96	.843	.094	.197 df=3,48	.898*
	3.00-3.48	69	3.00	.874	.105		
	2.50-2.99	60	2.97	.901	.116		
	2.00-2.49	12	2.75	1.055	.305		
	Total	222	2.96	.876	.059		

Note. Levene's = .477 N (df=3,218)
*p = .699

Delving deeper into the analysis, Table 61 examines producer effect on level of entertainment by producer and GPA. In this breakdown, the professionally produced PSAs show a lower entertainment rating (i.e., a higher mean) across the GPA brackets. Even the highest rated (i.e., lowest mean) GPA category in the professionally produced group was seen as less entertaining that the lowest score by GPA category in the peer produced group.

Table 62

Level of Entertainment by GPA and Producer Type

Producer	GPA	Mean	Std. Deviation	N
Professional	3.50-4.00	3.31	.749	42
	3.00-3.48	3.31	.710	36
	2.50-2.99	3.25	.844	28
	2.00-2.49	2.80	1.643	5
	Total	3.27	.808	111
Peer	3.50-4.00	2.59	.785	39
	3.00-3.48	2.67	.924	33
	2.50-2.99	2.72	.888	32
	2.00-2.49	2.71	.488	7
	Total	2.66	.837	111
Total	3.50-4.00	2.96	.843	81
	3.00-3.48	3.00	.874	69
	2.50-2.99	2.97	.901	60
	2.00-2.49	2.75	1.055	12
	Total	2.96	.876	222

Note. Levene's = 3.229 (df=7,214)
*p = .003

As a next step, a factorial analysis was computed to look at interactive effects on GPA and level of interest. As Table 63 shows, there is no significant interaction effect for GPA and producer type on level of entertainment.

Table 63

Factorial Analysis of Level of Entertainment by GPA and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	22.380a	7	3.197	4.644	.000	.132
Intercept	1054.278	1	1054.278	1531.345	.000	.877
Producer Type	7.544	1	7.544	10.958	.001	.049
GPA	.571	3	.190	.277	.842	.004
Producer Type and GPA	1.152	3	.384	.558	.643	.008
Error	147.332	214	.688			
Total	2120.000	222				
Corrected Total	169.712	221				

Note. [a] R Squared = .132 (Adjusted R Squared = .103)

H3.4: There will be no significant difference based on age in level of entertainment between professionally produced and peer produced audio PSAs.

The next demographic variable examined was age. One factor to consider was whether the PSAs were reaching a student audience. The question was whether they found the PSAs more entertaining reflecting the targeting was accurate. A secondary consideration was if the student produced PSAs would be seen as less entertaining for older students. Table 64 shows there is indeed a significant pattern. Level of entertainment was greatest (i.e., lowest mean value) for the youngest age brackets and, in general, decline with age.

Table 64

Level of Entertainment by Age – One-Way ANOVA

Dependent Variable	Age	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Entertainment	18	3	1.33	.577	.333	6.829 df= 6,20	.000*
	19	6	2.67	.516	.211		
	20	66	3.08	.829	.102		
	21	87	3.00	.835	.090		
	22	27	2.48	.975	.188		
	23	21	3.00	.775	.169		
	24 or Older	12	3.67	.651	.188		
	Total	222	2.96	.876	.059		

Note. Levene's = 1.137 (df=6,215)
* p = .342

Data in Table 65 shows a breakdown of age by producer type. Again, 18 year-olds show the greatest levels (lowest means) for entertainment. In regards to the professionally produced messages, students who were 20, 21, or 24 and older showed the lowest levels of entertainment. When looking at the peer produced messages, students in the 20, 23, and 24 or older categories showed the lowest levels of entertainment. There is no clear pattern for age, but the trend shows that the youngest students found the messages more entertaining. It is important to note that the younger age categories represented fewer students than those in the older categories.

Table 65

Level of Entertainment by Age and Producer Type

Producer	Age	Mean	Std. Deviation	N
Professional	18	1.00		1
	19	3.00	0.000	3
	20	3.31	.718	35
	21	3.35	.737	46
	22	2.73	1.104	11
	23	3.30	.823	10
	24 or Older	4.00	0.000	5
	Total	3.27	.808	111
Peer	18	1.50	.707	2
	19	2.33	.577	3
	20	2.81	.873	31
	21	2.61	.771	41
	22	2.31	.873	16
	23	2.73	.647	11
	24 or Older	3.43	.787	7
	Total	2.66	.837	111
Total	18	1.33	.577	3
	19	2.67	.516	6
	20	3.08	.829	66
	21	3.00	.835	87
	22	2.48	.975	27
	23	3.00	.775	21
	24 or Older	3.67	.651	12
	Total	2.96	.876	222

Note. Levene's = 2.306 (df=13,208)
*p = .007

As Table 66 shows, there is significance between producer type and age alone, but there is no significance when looking at producer type and age as an interactive effect. This suggests that age and producer effect have an impact when looked at in isolation, as seen above, but not together.

Table 66

Factorial Analysis of Level of Entertainment by Age and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	42.357a	13	3.258	5.321	.000	.250
Intercept	498.216	1	498.216	813.704	.000	.796
Producer Type	2.982	1	2.982	4.871	.028	.023
Age	20.755	6	3.459	5.650	.000	.140
Producer Type and Age	1.590	6	.265	.433	.857	.012
Error	127.355	208	.612			
Total	2120.000	222				
Corrected Total	169.712	221				

Note. [a] R Squared = .250 (Adjusted R Squared = .203)

H3.5: There will be no significant difference based on rank in level of entertainment between professionally produced and peer produced audio PSAs.

Student rank was next in the analysis of level of entertainment. There is no significance pattern shown across rank and level of entertainment (Table 67). The relative standard deviations ranged from 0.882 to 0.964 while the means ranged from 2.86 to 3.02. As expected with such great overlap in these two statistics, there is no significant difference in regards to rank and immediate recall.

Table 67

Level of Entertainment by Rank – One-Way ANOVA

Dependent Variable	Rank	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Entertainment	Sophomore	21	2.86	.964	.210	.406 df=2,55	.669*
	Junior	99	3.02	.857	.086		
	Senior	102	2.93	.882	.087		
	Total	222	2.96	.876	.059		

Note. Levene's = .447 (df=2,219)

* p = .640

The distribution between rank and entertainment level is presented in Table 68. The relative lack of difference in means for the professional produced PSAs across rank is expected due to the lack of significance. This also holds true for the peer produced PSAs.

Table 68

Level of Entertainment by Rank and Producer Type

Producer	Rank	Mean	Std. Deviation	N
Professional	Sophomore	3.18	.874	11
	Junior	3.26	.828	50
	Senior	3.30	.789	50
	Total	3.27	.808	111
Peer	Sophomore	2.50	.972	10
	Junior	2.78	.823	49
	Senior	2.58	.825	52
	Total	2.66	.837	111
Total	Sophomore	2.86	.964	21
	Junior	3.02	.857	99
	Senior	2.93	.882	102
	Total	2.96	.876	222

Note. Levene's = .250 (df=5,216)
*p = .939

Table 69 presents a factorial analysis across rank. It is seen that the producer effect alone shows a significant difference, while rank alone and producer type in conjunction with rank are not significant. This differs slightly from what is found in Table 66 where producer type and age both show significance.

Table 69

Factorial Analysis of Level of Entertainment by Rank and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	22.232a	5	4.446	6.512	.000	.131
Intercept	1144.188	1	1144.188	1675.791	.000	.886
Producer Type	13.195	1	13.195	19.325	.000	.082
Rank	.670	2	.335	.491	.613	.005
Producer Type and Rank	.742	2	.371	.544	.581	.005
Error	147.479	216	.683			
Total	2120.000	222				
Corrected Total	169.712	221				

Note. [a] R Squared = .131 (Adjusted R Squared = .111)

H3.6: There will be no significant difference based on the number of communications classes in level of entertainment between professionally produced and peer produced audio PSAs.

Number of production courses, the fifth demographic, looks at the impact of the production courses in regards to producer effects and level of entertainment. The thought in this is that students with more production experience may attend to PSA messages differently than those with less production experience.

Table 70

Level of Entertainment by Number of Production Classes – One-Way ANOVA

Dependent Variable	Production Classes	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Entertainment	None	75	2.97	.930	.107	.707 df=3,61	.551*
	1 - 2	96	2.94	.856	.087		
	3 - 4	33	3.12	.740	.129		
	5 - 6	18	2.78	1.003	.236		
	7 or more	222	2.96	.876	.059		
	Total	75	2.97	.930	.107		

Note. Levene's = .751 (df=3,218)
*p = .523

As shown in Table 70, students who have taken 3-4 production classes have the highest mean scores indicating they see the lowest levels of entertainment. Those who have taken 1-2 courses and seven or more courses have similar means. This may show a relationship between having not enough production experience, or reaching a saturation point where production experience leads students to find more interest in the production aesthetics and attend less to the entertainment value of the messages. A Welch's F is used for comparison of the means. Overall, there is no significant difference between production experience and level of entertainment.

Table 71

Level of Entertainment by Number of Courses and Producer Type

Producer	Production Classes	Mean	Std. Deviation	N
Professional	0 - 2	3.26	.860	38
	3 - 4	3.19	.825	47
	5 - 6	3.47	.624	17
	7 or more	3.33	.866	9
	Total	3.27	.808	111
Peer	0 - 2	2.68	.915	37
	3 - 4	2.69	.822	49
	5 - 6	2.75	.683	16
	7 or more	2.22	.833	9
	Total	2.66	.837	111
Total	0 - 2	2.97	.930	75
	3 - 4	2.94	.856	96
	5 - 6	3.12	.740	33
	7 or more	2.78	1.003	18
	Total	2.96	.876	222

Note. Levene's = .543 (df=7,214)
*p = .801

The overall pattern between number of production courses and producer type is shown in Table 71. From here, it is seen that professionally produced PSAs are least entertaining (i.e., highest mean scores) for students who have taken between 5-6 production courses. Interestingly,

students who have taken 7 or more production courses have the lowest mean scores in regards to peer produced PSAs seeing them as most entertaining. However, their scores are markedly worse for professionally produced PSAs. This may be due to the fact that these students have extensive production knowledge and may be more attuned to the messages constructed by their peers. No definitive pattern is found between production course experience and level of entertainment. In both cases, students with between 5-6 production courses have the lowest entertainment ratings as seen by the highest means (2.75 professionally produced and 3.12 for peer produced). This could be a factor for further study.

Table 72

Factorial Analysis of Level of Entertainment by Number of Courses and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	23.760a	7	3.394	4.977	.000	.140
Intercept	1269.973	1	1269.973	1862.078	.000	.897
Producer Type	19.399	1	19.399	28.443	.000	.117
Production Classes	1.376	3	.459	.672	.570	.009
Producer Type and Production Classes	1.543	3	.514	.754	.521	.010
Error	145.952	214	.682			
Total	2120.000	222				
Corrected Total	169.712	221				

Note. [a] R Squared = .140 (Adjusted R Squared = .112)

The factorial, analysis for production courses and producer type is in Table 72. It shows no significant interaction effect for these two independent variables on entertainment level.

H3.7: There will be no significant difference based on the production course index in level of entertainment between professionally produced and peer produced audio PSAs.

To gauge level of entertainment, a production course index where advanced courses carry double the weight of a lower level course was used. Table 73 shows that there is a lack of

significance regarding level of entertainment and the production course index. The means vary from 2.89 to 3.02, with the greatest entertainment level coming from the lowest and highest production course index categories and the two middle categories showing the lowest entertainment levels. However, the scores are close and the pattern is not significant.

Table 73

Level of Entertainment by Production Course Index – One-Way ANOVA

Dependent Variable	Production Course Index	N	Mean	Std Dev	Std Err	Welch's F	Significance
Level of Entertainment	0 - 2	57	2.89	.859	.114	.302 df=3,77	.824*
	3 - 4	45	3.02	1.011	.151		
	5 - 8	96	3.00	.808	.082		
	9 or more	24	2.88	.947	.193		
	Total	222	2.96	.876	.059		

Note. Levene's = 2.416 (df=3,218)
*p = .067

In regard to professionally produced messages, students' entertainment levels fall with the increase in the production courses index. With peer produced messages, the relationship is roughly reversed. Means for peer produced messages range from 2.62 to 2.76 in the lower production index areas, but drop to 2.27 when students are in the highest production index category. This may suggest that students with more production experience are somewhat more attuned to messages produced by their peers.

Table 74

Level of Entertainment by Production Course Index and Producer Type

Producer	Production Course Index	Mean	Std. Deviation	N
Professional	0 - 2	3.18	.819	28
	3 - 4	3.25	.944	24
	5 - 8	3.30	.756	46
	9 or more	3.38	.768	13
	Total	3.27	.808	111
Peer	0 - 2	2.62	.820	29
	3 - 4	2.76	1.044	21
	5 - 8	2.72	.757	50
	9 or more	2.27	.786	11
	Total	2.66	.837	111
Total	0 - 2	2.89	.859	57
	3 - 4	3.02	1.011	45
	5 - 8	3.00	.808	96
	9 or more	2.88	.947	24
	Total	2.96	.876	222

Note. Levene's = 1.226 (df=7,214)
*p = .290

Table 75 uses a factorial analysis to see if a significant interaction pattern emerges here. The analysis shows there is no interaction effect with a very low adjusted r square of only 0.12.

Table 75

Factorial Analysis of Level of Entertainment by Production Course Index and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq
Corrected Model	23.390a	7	3.341	4.887	.000	.138
Intercept	1495.484	1	1495.484	2187.185	.000	.911
Producer Type	20.376	1	20.376	29.800	.000	.122
Production Course Index	.973	3	.324	.474	.700	.007
Producer Type and Production Course Index	1.720	3	.573	.839	.474	.012
Error	146.322	214	.684			
Total	2120.000	222				
Corrected Total	169.712	221				

Level of Entertainment Summary

Table 76 presents the summary results of the analysis for entertainment level. Significant findings exist for producer type in total and for producer type in the categories of flu and binge drinking. As with interest level, age also showed a significant pattern. But again, none of the interaction effects are significant.

Table 76

Level of Entertainment by Producer Type - Summary

Hypotheses	Independent Variable 1	Independent Variable 2	IV2 – DV Significance	Interaction Significance
H3.1	Producer Type		Yes	
	Flu		Yes	
	Binge Drinking		Yes	
	Texting and Driving		No	
H3.2	Producer Type	Gender	No	No
H3.3	Producer Type	GPA	No	No
H3.4	Producer Type	Age	Yes	No
H3.5	Producer Type	Class Rank	No	No
H3.6	Producer Type	Production Classes	No	No
H3.7	Producer Type	Production Course Index	No	No

RQ4: Do increased level of interest and level of entertainment in PSA messages lead to increased information retention?

Prior to conducting the analysis of interest and entertainment to information retention, the first step was to do a correlation matrix to see if patterns existed between these three variables. This was done using a Spearman *rho* test. As Table 77 shows, there is a strong significant correlation between level of interest and level of entertainment. Both interest and entertainment level have no association with information recall as their Spearman *rho* are very small, less than .01, showing no pattern at all.

Table 77

Spearman rho – Dependent Variables

		Interest	Entertainment	Immediate Information Recall
Interest	Spearman's rho Significance N	1.000		
Entertainment	Spearman's rho Significance N	.696 .000 222	1.000	
Immediate Information Recall	Spearman's rho Significance N	.002 .981 222	.009 .894 222	1.000

H4.1: The greater level of interest, the greater the level of immediate information retention from audio PSAs.

As a follow up to the correlation, an examination was undertaken to determine if there was a difference between level of interest and immediate information recall. As the Levene's was significant a Welch's F was used in this case. As Table 78 shows, and as would be suggested by the correlation matrix, there was no pattern between level of interest and information recall.

Table 78

Level of Interest and Immediate Information Recall

Dependent Variable	Level of Interest	N	Mean	Std Dev	Std Err	Welch's F	Significance
Immediate Information Recall	Extremely	12	87.82	12.472	3.600	.106 df=3,46	.956*
	Very	70	87.36	12.005	1.435		
	Mildly	103	88.42	12.085	1.191		
	Not	37	87.94	9.515	1.564		
	Total	222	87.98	11.624	.780		

Note. Levene's = 3.099 (df=3,218)
*p = .028

H4.2: The greater level of entertainment, the greater the level of immediate information retention from audio PSAs.

Next, the level of entertainment was also examined to determine if there was an influence on immediate information recall. As the Levene's test was significant, a Welch's F was used in this case. As Table 78 shows, and as expected from the correlation results, there was no pattern between entertainment level and immediate recall.

Table 79

Level of Entertainment and Immediate Information Recall

Dependent Variable	Level of Entertainment	N	Mean	Std Dev	Std Err	Welch's F	Significance
Immediate Information Recall	Extremely	14	90.11	13.967	3.733	.541 df=3,53	.656*
	Very	47	86.09	12.795	1.866		
	Mildly	94	88.13	12.079	1.246		
	Not	67	88.63	9.502	1.161		
	Total	222	87.98	11.624	.780		

Note. Levene's = 4.220 (df=3,218)
*p = .006

Having looked at interest and entertainment independently, the next step would be to determine if there is an interactive effect between the two and information recall. Table 80 presents the mean immediate recall scores by level of interest and entertainment.

Table 80

Interest by Entertainment for Immediate Recall

Level of Interest	Level of Entertainment	Mean	Std. Deviation	N
Extremely	Extremely	89.74	13.323	9
	Mildly	82.05	8.882	3
	Total	87.82	12.472	12
Very	Extremely	88.46	18.311	4
	Very	86.03	11.708	38
	Mildly	88.46	12.215	24
	Not	92.31	8.882	4
	Total	87.36	12.005	70
Mildly	Extremely	100.00		1
	Very	86.32	17.532	9
	Mildly	87.91	12.489	63
	Not	89.74	9.330	30
	Total	88.42	12.085	103
Not	Mildly	94.23	3.846	4
	Not	87.18	9.743	33
	Total	87.94	9.515	37
Total	Extremely	94.23	3.846	4
	Very	87.18	9.743	33
	Mildly	87.94	9.515	37
	Not	94.23	3.846	4
	Total	87.18	9.743	33

Note. Levene's = 2.433 (df=11,210)
*p = .007

Table 81 presents the factorial analysis for interest and entertainment. Although there is a high correlation between entertainment and interest (see Table 77), there is no interactive effect between the two impacting immediate information recall. As the measures of interest and entertainment were taken at the time of the cued recall survey, this may be a confounding factor. Another consideration may be that the homogeneity of variance problem could be contributing to this as the Levene's test was significant.

Table 81

Factorial Analysis of Interest and Entertainment for Immediate Recall

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq
Corrected Model	799.160a	11	72.651	.525	.885	.027
Intercept	493888.855	1	493888.855	3569.072	.000	.944
Interest	221.879	3	73.960	.534	.659	.008
Entertainment	325.683	3	108.561	.785	.504	.011
Interest and Entertainment	432.536	5	86.507	.625	.681	.015
Error	29059.841	210	138.380			
Total	1748106.509	222				
Corrected Total	29859.001	221				

RQ 5 – Is there a significant difference in free (delayed) information recall between professionally produced and peer produced audio PSA messages?

The first step was to look for patterns between the four dependent variables; interest level, entertainment, immediate recall, and free recall. As found with RQ 4, there is a strong correlation with interest and entertainment value as seen in Table 82. While no pattern exists between interest level and entertainment level with immediate recall, there is a significant relationship for the two with free recall. There is a positive correlation between the level of interest and the level of entertainment with the level of free recall. Thus, it appears that PSAs that are more interesting or more entertaining have a more lasting effect on information retention. The greater the level of interest or the greater the level of entertainment, the higher the free recall and the more likely subjects are to remember information long term. There was no relationship between immediate recall and interest or entertainment level, but it shows an interesting relationship with free recall. It should be pointed out that the strongest correlation was between level of interest and entertainment (Spearman *rho* = .696, p> .000). This does imply that there is a relationship between the two dimensions that, it appears, may reinforce the longer-term free recall.

Table 82

Correlation Analysis of Variables Including Free Recall

		Interest	Entertainment	Immediate Information Recall	Free (Delayed) Recall
Interest	Spearman's rho Significance N	1.000			
Entertainment	Spearman's rho Significance N	.696 .000 222	1.000		
Immediate Information Recall	Spearman's rho Significance N	.002 .981 222	.009 .894 222	1.000	
Free (Delayed) Recall	Spearman's rho Significance N	.162 .023 198	.168 .018 198	.100 .161 198	1.000

In Table 83, the mean free recall scores for inter and enter are shown. It should be noted in this case that the Levene's test is not significant. In looking at the mean scores, there is a general, overall trend of higher free recall levels within each category of level of interest. Surprisingly, the highest recall was for those who found the PSAs not interesting and only mildly entertaining. However, there were only 3 subjects in that category so the results may be skewed.

Table 83

Interest by Entertainment for Free (Delayed) Recall

Level of Interest	Level of Entertainment	Mean	Std. Deviation	N
Extremely	Extremely	1.78	.972	9
	Mildly	1.67	.577	3
	Total	1.75	.866	12
Very	Extremely	1.50	1.732	4
	Very	1.50	1.000	36
	Mildly	1.27	.935	22
	Not	1.00	.816	4
	Total	1.39	1.006	66
Mildly	Extremely	2.00		1
	Very	1.14	1.069	7
	Mildly	1.46	1.212	52
	Not	1.43	.997	28
	Total	1.43	1.122	88
Not	Mildly	2.67	1.155	3
	Not	.79	.902	29
	Total	.97	1.062	32
Total	Extremely	1.71	1.139	14
	Very	1.44	1.007	43
	Mildly	1.46	1.136	80
	Not	1.10	.978	61
	Total	1.36	1.071	198

Note. Levene's = .903 (df=11,186)
*p = .538

The factorial analysis of interest and entertainment to free recall is presented in Table 84. From the table it is seen that while the two independent variables correlate highly, their interactive effect is not significant for free recall. This suggests that while interest and entertainment are somewhat related, they are tapping somewhat different elements and this impacts the potential level of recall.

Table 84

Factorial Analysis of Interest and Entertainment for Free (Delayed) Recall

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq
Corrected Model	19.170a	11	1.743	1.569	.111	.085
Intercept	134.383	1	134.383	120.956	.000	.394
Interest	1.902	3	.634	.571	.635	.009
Entertainment	6.387	3	2.129	1.916	.128	.030
Interest and Entertainment	9.913	5	1.983	1.784	.118	.046
Error	206.649	186	1.111			
Total	594.000	198				
Corrected Total	225.818	197				

As a starting point in examining free information recall, the number of items correctly recalled by subjects in the follow-up survey was used. The survey was administered roughly two weeks after the initial experiment.

> H5.1: There will be no significant difference in free (delayed) recall between professionally produced and peer produced audio PSAs.

Table 85

Free (Delayed) Recall by Producer Type

PSA Topic	Producer Type	N	Mean	Std Dev	Std Err	Welch's F	Significance
All Topics	Professional	100	1.29	.957	.096	.952 df=1,187	.331*
	Peer	98	1.44	1.176	.119		
	Total	198	1.36	1.071	.076		

Note. Levene's = 3.716 (df=1,196)
*p = .055

The first hypothesis examined the impact of producer effects alone on the free recall completed two weeks after the stimulus. As the Levene's test was so close to the significance level of p=.05, the decision was made to use a Welch's F test. From Table 85, it can be seen that

when all three PSA topics are considered together, there is no significant difference between professionally produced and peer produced PSAs for free (delayed) recall.

While the overall pattern of producer type to free (delayed) recall was not significant, the next step was to look at the individual topics to see if they had an impact. As seen above, looking at the individual PSA topics resulted in significant differences by producer type on immediate recall, interest, and entertainment for both the flu and binge drinking PSAs. For the texting and driving PSA, a significant difference by producer type was only found for immediate recall.

In the case of delayed recall, no significant difference was found on any of the individual PSA topics as seen in table 86. It should be pointed out, however, that a large difference did exist in the free recall for the flu PSA with the peer values noticeably higher than the professional. A relatively large standard deviation on the peer produced PSAs likely undermined any significant relationship.

Table 86

Free (Delayed) Recall by PSA Topic and Producer Type

PSA Topic	Producer Type	N	Mean	Std Dev	Std Err	Welch's F	Significance
Flu	Professional	30	1.23	.898	.164	2.299 df=1,82	.135*
	Peer	36	1.64	1.268	.211		
	Total	66	1.45	1.126	.139		
Binge Drinking	Professional	36	1.42	1.025	.171	.086 df=1,56	.770**
	Peer	30	1.33	1.241	.227		
	Total	66	1.38	1.120	.138		
Texting & Driving	Professional	34	1.21	.946	.162	.198 df=1,82	.658***
	Peer	32	1.31	.998	.176		
	Total	66	1.26	.966	.119		

Note. Flu - Levene's = 3.967 (df=1,64); Binge - Levene's = .469 (df=1,64); Texting - Levene's = .063 (df=1,64)
*p = .051
**p = .496
***p = .802

H5.2: There will be no significant difference based on gender in free (delayed) recall between professionally produced and peer produced audio PSAs.

As no overall pattern was found, next different demographic variables were examined to see if they introduced a significant pattern. The first of these was gender. In this case, the Levene's test was not significant and the F test produced a value of only .001, indicating no discernable pattern. As Table 86 shows, the difference in means by gender was extremely small (1.37 vs. 1.36) and the standard deviations were large and nearly identical (1.071 vs. 1.075). Given the closeness of these two measures, no discernable difference by gender would be expected.

Table 87

Free (Delayed) Recall by Gender – One-Way ANOVA

Dependent Variable	Gender	N	Mean	Std Dev	Std Err	F-value	Significance
Free (Delayed) Recall	Female	93	1.37	1.071	.111	.001 Df=1,196	.981*
	Male	105	1.36	1.075	.105		
	Total	198	1.36	1.071	.076		

Note. Levene's = .068 (df=1,196)
*p = .795

The next step is to conduct the factorial analysis of the two variables, gender and producer type, to see if there is an impact on free recall. Table 88 provides the descriptive statistics and shows the Levene's test is not significant.

Table 88

Free (Delayed) Recall by Gender and Producer Type

Producer	Gender	Mean	Std. Deviation	N
Professional	Female	1.22	.974	45
	Male	1.35	.947	55
	Total	1.29	.957	100
Peer	Female	1.50	1.149	48
	Male	1.38	1.210	50
	Total	1.44	1.176	98
Total	Female	1.37	1.071	93
	Male	1.36	1.075	105
	Total	1.36	1.071	198

Note. Levene's = 1.211 (df=3,194)
*p = .307

In Table 89, the data for a possible interaction effect is provided and it shows no significant pattern. Given the similarities in means by gender, this is not suspiring.

Table 89

Factorial Analysis of Free (Delayed) Recall by Gender and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	1.824a	3	.608	.527	.665	.008
Intercept	365.314	1	365.314	316.397	.000	.620
Producer Type	1.201	1	1.201	1.040	.309	.005
Gender	.000	1	.000	.000	.992	.000
Producer Type and Gender	.728	1	.728	.631	.428	.003
Error	223.994	194	1.155			
Total	594.000	198				
Corrected Total	225.818	197				

Note. [a] R Squared = .008 (Adjusted R Squared = -.007)

H5.3: There will be no significant difference based on GPA in free (delayed) recall between professionally produced and peer produced audio PSAs.

The next step involves looking at free recall to see if this was impacted by the students' overall academic standing. Using GPA as the measure, Table 90 shows the Levene's test was significant, so a Welch's F was calculated. The table shows there is a significant difference in

free recall with higher GPA students recalling far more items than lower GPA students. From Table 86, there is a fairly consistent pattern with a mean score of 1.71for the highest GPA and a steady decline to a mean score to 0.75 for the lowest GPA group. Thus, academic standing does have a significant impact on long-term recall.

Table 90

Free (Delayed) Recall by GPA – One-Way ANOVA

Dependent Variable	GPA	N	Mean	Std Dev	Std Err	Welch's F	Significance
Free (Delayed) Recall	3.50-4.00	75	1.71	1.183	.137	4.938 df=3,49	.004*
	3.00-3.48	66	1.21	1.031	.127		
	2.50-2.99	45	1.18	.806	.120		
	2.00-2.49	12	.75	.866	.250		
	Total	198	1.36	1.071	.076		

Note. Levene's = 3.031 (df=3,194)
*p = .031

Table 91 looks at the scores for GPA and producer type. Overall, we see the same consistent pattern with higher levels of recall among the highest GPA students. It is also noted that the standard deviations are much higher on the peer produced PSAs for the two highest classes of GPA. With the lower GPA students, the standard deviation is lower on peer produced relative to professionally produced. This may suggest that the free recall was more consistent among the weaker students on the peer produced PSAs whereas it was more variable for the stronger students.

Table 91

Free (Delayed) Recall by GPA and Producer Type

Producer	GPA	Mean	Std. Deviation	N
Professional	3.50-4.00	1.59	.993	39
	3.00-3.48	1.15	.857	34
	2.50-2.99	1.09	.921	22
	2.00-2.49	.80	1.095	5
	Total	1.29	.957	100
Peer	3.50-4.00	1.83	1.363	36
	3.00-3.48	1.28	1.198	32
	2.50-2.99	1.26	.689	23
	2.00-2.49	.71	.756	7
	Total	1.44	1.176	98
Total	3.50-4.00	1.71	1.183	75
	3.00-3.48	1.21	1.031	66
	2.50-2.99	1.18	.806	45
	2.00-2.49	.75	.866	12
	Total	1.36	1.071	198

Note. Levene's = 2.954 (df=7, 190)
*p = .006

The final component of the GPA analysis is presented in Table 92. Here a factorial analysis was used to determine if an interaction effect existed between producer type and GPA. As the table indicates, no such pattern exists. Given the differences in standard deviations seen in Table 87 above, this is not surprising.

Table 92

Factorial Analysis of Free (Delayed) Recall by GPA and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	18.167a	7	2.595	2.375	.024	.080
Intercept	172.988	1	172.988	158.283	.000	.454
Producer Type	.391	1	.391	.358	.550	.002
GPA	16.411	3	5.470	5.005	.002	.073
Producer Type and GPA	.313	3	.104	.096	.962	.002
Error	207.651	190	1.093			
Total	594.000	198				
Corrected Total	225.818	197				

Note. [a] R Squared = .080 (Adjusted R Squared = .047)

H5.4: There will be no significant difference based on age in free (delayed) recall between professionally produced and peer produced audio PSAs.

The next demographic examined was age. A Levene's test was calculated and was significant; however, given the lack of variability in the 18-year-old age group, a Welch's F could not be calculated. Welch's F requires that each cell have a level of variance. As the 18 year olds all had the same score, this test could not be calculated. Given these constraints, a one-way ANOVA F-value was used. It should be noted this F- value may be exaggerated due to the homogeneity of variance problem detected by the Levene's test. However, as the results were not significant by a wide margin, the conclusion is viable.

Table 93

Free (Delayed) Recall by Age – One-Way ANOVA

Dependent Variable	Age	N	Mean	Std Dev	Std Err	F-value	Significance
Free (Delayed) Recall	18	3	2.00	0.000	0.000	1.304 df=6,191	.257*
	19	6	1.50	1.378	.563		
	20	60	1.47	1.241	.160		
	21	81	1.44	1.012	.112		
	22	24	1.17	.868	.177		
	23	12	1.08	.900	.260		
	24 or Older	12	.75	.866	.250		
	Total	198	1.36	1.071	.076		

Note. Levene's = 2.274 (df=6,191)
* p = .038

Table 94 provides the detail by producer types and age for free recall. From the table, we can see a variable pattern when the professional and peer producer types are broken out. However, in looking at the total, there is a more or less steady decline in the number of items recalled with the older groups. This is the same measure as done in Table 93, which suggests a pattern but lacks significance because of some of the relatively large standard deviations.

Table 94

Free (Delayed) Recall by Age and Producer Type

Producer	Age	Mean	Std. Deviation	N
Professional	18	2.00		1
	19	.67	.577	3
	20	1.34	.971	32
	21	1.42	.932	43
	22	1.00	1.054	10
	23	1.17	1.169	6
	24 or Older	.80	.837	5
	Total	1.29	.957	100
Peer	18	2.00	0.000	2
	19	2.33	1.528	3
	20	1.61	1.499	28
	21	1.47	1.109	38
	22	1.29	.726	14
	23	1.00	.632	6
	24 or Older	.71	.951	7
	Total	1.44	1.176	98
Total	18	2.00	0.000	3
	19	1.50	1.378	6
	20	1.47	1.241	60
	21	1.44	1.012	81
	22	1.17	.868	24
	23	1.08	.900	12
	24 or Older	.75	.866	12
	Total	1.36	1.071	198

Note. Levene's = 2.299 (df= 13, 184)

*p = .006

Table 95 then provides the results of the factorial analysis for free recall. The results show that there is no interaction effect between producer type and age on free recall.

Table 95

Factorial Analysis of Free (Delayed) Recall by Age and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	14.730a	13	1.133	.988	.465	.065
Intercept	113.009	1	113.009	98.507	.000	.349
Producer Type	1.301	1	1.301	1.134	.288	.006
Age	8.859	6	1.476	1.287	.265	.040
Producer Type and Age	4.384	6	.731	.637	.701	.020
Error	211.089	184	1.147			
Total	594.000	198				
Corrected Total	225.818	197				

Note. [a] R Squared = .065 (Adjusted R Squared = -.001)

H5.5: There will be no significant difference based on class rank in level of free (delayed) recall between professionally produced and peer produced audio PSAs.

The fourth demographic variable examined was student rank. As the Levene's test was significant, a Welch's F was used to determine if there was a pattern by rank. As seen in Table 96, the Welch's F was not significant. While we do see free recall declining as rank increases, the relatively large standard deviations likely eliminate any significant pattern.

Table 96

Free (Delayed) Recall by Rank – One-Way ANOVA

Dependent Variable	Rank	N	Mean	Std Dev	Std Err	Welch's F	Significance
Free (Delayed) Recall	Sophomore	18	1.56	.984	.232	.775 df=2,48	.466*
	Junior	87	1.41	1.235	.132		
	Senior	93	1.28	.913	.095		
	Total	198	1.36	1.071	.076		

Note. Levene's = 4.683 (df=2,195)
*p = .010

In Table 97, we see the free recall scores broken out by professional and peer produced PSAs. While the pattern of declining recall for students at higher ranks holds for peer produced, it does not hold up for the professionally produced PSAs.

Table 97

Free (Delayed) Recall by Rank and Producer Type

Producer	Rank	Mean	Std. Deviation	N
Professional	Sophomore	1.22	.972	9
	Junior	1.36	1.026	45
	Senior	1.24	.899	46
	Total	1.29	.957	100
Peer	Sophomore	1.89	.928	9
	Junior	1.48	1.435	42
	Senior	1.32	.935	47
	Total	1.44	1.176	98
Total	Sophomore	1.56	.984	18
	Junior	1.41	1.235	87
	Senior	1.28	.913	93
	Total	1.36	1.071	198

Note. Levene's = 3.572 (df=5, 192)
*p = .004

The factorial analysis shows no significant interaction effect. Given the differences in the patterns of recall in professional and peer produced PSAs seen in Table 98, the interaction effects are expected to be washed out.

Table 98

Factorial Analysis of Free (Delayed) Recall by Rank and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	4.004a	5	.801	.693	.629	.018
Intercept	232.176	1	232.176	200.969	.000	.511
Producer Type	2.417	1	2.417	2.092	.150	.011
Rank	1.564	2	.782	.677	.509	.007
Producer Type and Rank	1.334	2	.667	.577	.562	.006
Error	221.814	192	1.155			
Total	594.000	198				
Corrected Total	225.818	197				

Note. [a] R Squared = .018 (Adjusted R Squared = -.008)

H5.6: There will be no significant difference based on the number of communications production classes in free (delayed) recall between professionally produced and peer produced audio PSAs.

The next independent variable examined was the number of production courses a student had taken. The assumption was that students who have taken more classes would be more attuned to production characteristics and message. In this section, the examination focuses on free recall. Table 99 presents the one-way ANOVA analyzing the number of production classes and free recall. As the Levene's test was significant, a Welch's F was calculated. Here a significant relationship was found between production classes and the amount of free recall. The pattern is interesting as recall was highest for those with seven or more production courses, but actually lowest for those with 5-6 courses. It is possible that the number of classes alone is an insufficient measure or that there is a threshold of a large number of classes needed before students reach a level of attentiveness that promotes long-term recall.

Table 99

Free (Delayed) Recall by Production Classes – One-Way ANOVA

Dependent Variable	Production Classes	N	Mean	Std Dev	Std Err	Welch's F	Significance
Free (Delayed) Recall	0 - 2	63	1.40	.959	.121	3.256 df=3,61	.028*
	3 - 4	87	1.36	1.181	.127		
	5 - 6	30	1.00	.788	.144		
	7 or more	18	1.89	1.132	.267		
	Total	198	1.36	1.071	.076		

Note. Levene's = 3.795 (df=3,194)
*p = .011

Table 100 examines the impact of the production classes of professional and peer produced PSAs. Overall, we see the same general pattern with students who took seven or more classes scoring the highest and those with 5-6 scoring the lowest. It is also interesting to note that students with 5-6 production classes saw the least overall variability in scores as evidenced by smaller standard deviation values.

Table 100

Free (Delayed) Recall by Number of Communications Production Courses and Producer Type

Producer	Production Classes	Mean	Std. Deviation	N
Professional	0 - 2	1.33	.890	33
	3 - 4	1.26	1.014	42
	5 - 6	.88	.719	16
	7 or more	2.00	1.000	9
	Total	1.29	.957	100
Peer	0 - 2	1.47	1.042	30
	3 - 4	1.44	1.324	45
	5 - 6	1.14	.864	14
	7 or more	1.78	1.302	9
	Total	1.44	1.176	98
Total	0 - 2	1.40	.959	63
	3 - 4	1.36	1.181	87
	5 - 6	1.00	.788	30
	7 or more	1.89	1.132	18
	Total	1.36	1.071	198

Note. Levene's = 2.024 (df=7, 190)
*p = .054

In Table 101, the factorial analysis presented examines if a pattern of interaction holds between producer type and production classes. Here the finding is that the interaction effect is not significant.

Table 101

Factorial Analysis of Free (Delayed) Recall by Number of Communications Production Courses and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	10.768a	7	1.538	1.359	.225	.048
Intercept	274.216	1	274.216	242.274	.000	.560
Producer Type	.281	1	.281	.248	.619	.001
Production Classes	8.816	3	2.939	2.596	.054	.039
Producer Type and Production Classes	.752	3	.251	.221	.881	.003
Error	215.050	190	1.132			
Total	594.000	198				
Corrected Total	225.818	197				

Note. [a] R Squared = .048 (Adjusted R Squared = .013)

One interesting finding here is that the significance level for production classes in the factorial analysis only reaches a level of .054 compared to the 0.28 seen in the one-way analysis with Welch's F in Table 99. This suggests that the Welch's F was better able to discern a difference and that the homogeneity of variance problem was potentially undermining the relationship.

H5.7: There will be no significant difference based on the production course index in free (delayed) recall between professionally produced and peer produced audio PSAs.

Table 102

Free (Delayed) Recall by Production Course Index – One-Way ANOVA

Dependent Variable	Production Course Index	N	Mean	Std Dev	Std Err	F-value	Significance
Free (Delayed) Recall	0 - 2	48	1.33	.907	.131	1.028 df=3,194	.381
	3 - 4	42	1.19	.969	.149		
	5 - 8	84	1.38	1.191	.130		
	9 or more	24	1.67	1.090	.223		
	Total	198	1.36	1.071	.076		

Note. Levene's = 1.882 (df=3,194)
*p = .134

The next step was to go beyond the simple number of production courses and to use a weighted index where higher-level courses are double the value of the lower level courses. In Table 102, the Levene's was not significant and an F-value was used. An interesting finding emerges here as the significant relationship between production courses and free recall found in H5.6 disappears when an adjustment is made for the basic versus advanced courses. This is a somewhat puzzling finding. However, it is consistent with the hypothesis for immediate recall, level of interest and level of entertainment. In all four cases, weighting the advanced course did not provide greater discrimination in the pattern of the dependent variable.

Table 103

Free (Delayed) Recall by Production Course Index and Producer Type

Producer	Production Course Index	Mean	Std. Deviation	N
Professional	0 – 2	1.21	.833	24
	3 – 4	1.22	.902	23
	5 – 8	1.28	1.037	40
	9 or more	1.62	1.044	13
	Total	1.29	.957	100
Peer	0 – 2	1.46	.977	24
	3 – 4	1.16	1.068	19
	5 – 8	1.48	1.320	44
	9 or more	1.73	1.191	11
	Total	1.44	1.176	98
Total	0 – 2	1.33	.907	48
	3 – 4	1.19	.969	42
	5 – 8	1.38	1.191	84
	9 or more	1.67	1.090	24
	Total	1.36	1.071	198

Note. Levene's = 1.336 (df= 7, 190)
*p = .235

In Table 103, the date for the production course index is broken out by producer type. As with production courses, it shows that the top group does have a higher level of recall. The group in the second highest category places second in all three cases – professional, peer and total. Thus, we are seeing some pattern in the production course index but it is not at a level that is statistically significant.

Table 104

Factorial Analysis of Free (Delayed) Recall by Production Course Index and Producer Type

Variable	Type III Sum of Squares	df	Mean Square	F-value	Sign	Partial Eta Sq [a]
Corrected Model	5.251a	7	.750	.646	.717	.023
Intercept	313.998	1	313.998	270.483	.000	.587
Producer Type	.645	1	.645	.555	.457	.003
Production Course Index	3.602	3	1.201	1.034	.379	.016
Producer Type and Production Course Index	.642	3	.214	.184	.907	.003
Error	220.567	190	1.161			
Total	594.000	198				
Corrected Total	225.818	197				

Note. [a] R Squared = .023 (Adjusted R Squared = -.013)

The factorial analysis is presented in Table 104. Given the lack of a clear pattern in the production course index measure to free recall, it is not suspiring that the interaction effect is not statistically significant.

Free (Delayed) Recall Summary

The summary results for the free recall hypotheses are shown in Table 104. None of the interaction effects between producer type and the six independent demographic variables were significant for delayed recall. When looking at producer type alone, the free recall was unique as there was no significant relationship by producer type or producer type and PSA topic. This is counter to the findings for interest, entertainment, and immediate recall where two of the categories were found significant for each. This suggests that for longer term recall, producer type may be less of a factor than other considerations while it may be more important in immediate recall, interest level and entertainment level.

Table 105

Free (Delayed) Recall by Producer Type - Summary

Hypotheses	Independent Variable 1	Independent Variable 2	IV2 – DV Significance	Interactive Significance
H5.1	Producer Type		No	
	Flu		No	
	Binge Drinking		No	
	Texting and Driving		No	
H5.2	Producer Type	Gender	No	No
H5.3	Producer Type	GPA	Yes	No
H5.4	Producer Type	Age	No	No
H5.5	Producer Type	Class Rank	No	No
H5.6	Producer Type	Production Classes	Yes	No
H5.7	Producer Type	Production Course Index	No	No

Looking at the demographic variables, significant relationships were found between GPA and free recall and the number of production classes and free recall. In the case of GPA, free recall levels increased as GPA level increased. This suggests that overall academic capability may be a more important factor in long term recall than producer type.

In the case of production classes, the odd pattern noted in Tables 95 and 96 was that those in higher numbers of production classes have the highest level of recall while those who have had 5-6 classes typically had the lowest level of recall. As the production course index that adjusts for higher-level courses was not significant, this produces a confused finding. It is possible that students may take multiple production courses, but the particular mix of courses for their level of engagement may not be sufficient to see an impact on free recall. Interestingly, the second highest group on the production course index had the second highest free recall score while the second highest on the un-weighted production classes' variable had the lowest score. This may suggest that while there may be no significant pattern for the index, there is some type of impact with classes.

Conclusion

In this chapter, producer type and the six demographic variables were compared to the four dependent variables (immediate recall, entertainment level, interest level and free recall). Using ANOVA, Welch's F and factorial analysis, it was found that there were no interaction effects between producer type and the six demographic variables with any of the four dependent variables. However, the analysis found that producer type had a degree of effect on immediate recall, level of interest and level of entertainment. Among the demographic variables only GPA, age and production classes had significant relationships with any of the dependent variables. These will be examined more closely in Chapter 5 where overall conclusions are presented.

CHAPTER 5

DISCUSSION & RECOMMENDATIONS

Introduction

The key focus of this study was to examine the impact of producer type in audio PSAs. The study focused on two primary dependent variables, immediate recall and free (delayed) recall, and two others, level of interest and level of entertainment. In addition to exploring the impact of producer type alone, the study included the six demographic variables of gender, GPA, age, rank, number of production courses and a weighted production course index. These six variables were examined for their direct impact and their interactive effect with producer type on the four dependent variables.

An important part of the focus of the study was to look at audio PSAs intended for college-aged students. As discussed in the introduction and literature review, college students are facing a transition from living at home to being independent while confronting a range of issues that may have significant impact on their health and safety. In particular, producer type was examined to see how it would effect their reactions to PSAs dealing with flu prevention, binge drinking and texting and driving. These are three issues that have particular salience to young adults.

Another dimension is that college radio can provide a focused channel of delivery to reach students during this transitional period. In such a context, the audio PSA has the potential to significantly influence behavior. While the study does not focus specially on radio, it does focus on the audio dimension and examines PSAs targeting, at least to some degree, to this college audience.

Methods

The method selected was an experimental design where students received the stimulus and an immediate *post hoc* assessment to test immediate recall and to collect information on level of interest and entertainment value. Approximately two weeks after the experiment, students were surveyed via email using *Qualtrics* to respond to a free recall portion to assess how much they remembered from the particular PSAs that they heard. A final component of preparing the analysis was matching the demographic information collected in the first survey, where subject participation was solicited, with the immediate *post hoc* and the delayed follow up survey. This approach provided the demographic information for analysis and the ability to examine and compare immediate and delayed recall.

One of the concerns in the study was the potential attrition rate from the initial survey to the *post hoc* cued recall and through the free recall portions. As was seen in Chapter 4, 93 students responded to the initial call to participate. Of this group, 19 did not proceed beyond the initial survey and 8 participated in the actual experiment but did not respond to the free recall portion. In total, 66 of the 93 potential subjects completed all aspects of the study, a completion rate of 71%.

The intended audience focused on Communications Media majors who encompassed 92% of the study. In addition, there were 3 Communications Media minors and 4 students who had taken Communications Media production courses but were not formally affiliated with the department. Students who had taken some production courses were the focus as their experience might make them more attentive to production elements. In addition, another element of the study was to see if producer effects had an impact on those studying production classes and

interested in communications media, these numbers confirm that the sample did reflect our target audience.

Discussion

Patterns on Dependent Variables

As a starting point for the discussion, it is helpful to look at the dependent variables to see if there is any inter-correlation that exits. As seen in Table 80, there is a high correlation between interest and entertainment levels. There is also a significant correlation of interest and entertainment to free recall. What was somewhat surprising, however, was that neither interest, entertainment, nor free recall had a significant correlation with immediate information recall.

The findings suggest that PSAs that are seen as interesting or entertaining will be more likely to have an impact on long term recall. In the short term, however, no such pattern exists. In the case of both interest and entertainment, the correlations to immediate recall are negligible and essentially zero. This suggests that when evaluating the impact of audio PSAs and level of entertainment or interest perceived, that using methodologies where immediate recall is studied may be missing the critical connection. Based on the LC4MP, these findings suggest that interest and entertainment do help create longer-term recall capability but this discrimination is not seen in the immediate short term. This suggests that the primary information that is entertaining or interesting is better encoded than the most recent information, what was just heard in the experiment.

Independent Variables: Producer Type

The primary focus of the study was to examine producer effects for audio PSAs. The intent of the study was to see if peer (student) or professionally produced PSAs would have a

greater impact on information retention. Secondarily, the investigation aimed to find if students found either producer type of PSAs more entertaining or interesting.

Pilling and Brannon (2007) found that participants were more likely to pay attention to PSA messages they felt were particularly targeted toward them. Participants who received more personalized messages thought the message affected their attitudes regarding drinking more. There was no measure for actual behavior change in the Pilling and Brannon study.

In this study, the peer produced PSAs were created to specifically target the experimental audience. Here, the findings are mixed. When looking at producer type independent of the PSA topic, a significant difference existed for level of entertainment but not for any of the other dependent variables. In terms of entertainment level, professionally produced PSAs were rated significantly higher by subjects than those produced by students.

Table 106

Summary of Findings – Independent Variables: Producer Type

Hypotheses	Independent Variable	Immediate Recall	Level of Interest	Level of Entertainment	Free (Delayed) Recall
X.1	Producer Type	No	No	Yes	No
	Flu	Yes	Yes	Yes	No
	Binge Drinking	Yes	Yes	Yes	No
	Texting and Driving	Yes	No	No	No

Focusing on the PSA topics separately, Table 106 shows a significant pattern with immediate recall for all three topics. For binge drinking and texting and driving, professionally produced PSAs show higher immediate recall. For the flu PSA, the peer produced PSAs fared better. The student produced flu and binge drinking PSAs were rated significantly higher on both level of interest and level of entertainment. There were no differences, based on producer type, in free recall.

Independent Variable: Demographics

The study also focused on demographic characteristics that may be considered in examining producer effects on audio PSAs. When investigating if peer (student) or professionally produced PSAs had a greater impact on information retention, six demographic variables were used. Each of these demographic variables was explored to investigate any possible effects on immediate recall, level of interest, level of entertainment and free (delayed) recall. Three of these variables showed significance when the hypotheses were tested (Table 107). Interestingly, there was significance in regards to GPA, age and production courses. There was no significance seen for gender, class rank, or production course index.

Table 107

Summary of Findings – Independent Variables: Demographics

Hypotheses	Independent Variable	Immediate Recall	Level of Interest	Level of Entertainment	Free (Delayed) Recall
X .2	Gender	No	No	No	No
X .3	GPA	No	No	No	Yes
X .4	Age	No	Yes	Yes	No
X .5	Class Rank	No	No	No	No
X .6	Production Classes	No	No	No	Yes
X .7	Production Course Index	No	No	No	No

Research by Kulkarni (2009) noted difference in message reception by gender for messages created using different appeals. Lee and Davie (1997) found that females were more likely to recall highly emotional PSAs regarding AIDS. These studies lead the researcher to believe there may be some significance when looking at level of interest or entertainment in regards to gender. Both the Kulkarni and Lee and Davie studies used college students as their sample so the lack of significance in this particular study is puzzling. The peer produced binge drinking and flu vaccine PSAs employed compelling narrative messaging techniques compared

with the information laden professional PSAs on the same topics. The flu PSA utilized a high level of sonic imagery, which many female students described as “disturbing,” “attention grabbing,” or simply “gross.” The lack of significance regarding gender is puzzling when compared with the data obtained from an informal analysis of the open-ended questions on the free recall survey.

The significance in free recall on GPA is not surprising as there is a differentiation in cognitive ability across the GPA categories. Taking into consideration that the GPA measure was self-reported and included both major and liberal studies courses, GPA may not be the most accurate measure of cognitive ability. A more detailed listening comprehension measure may have been more appropriate in gauging the subjects’ ability to encode, store and retrieve information related to the PSAs.

Age and class rank are another confused finding. While it was expected that class rank and age would have a correlation, lower class ranks including younger students and higher ranks including the older students, there was no statistic calculated to support this assertion. While there are differences in level of interest and level of entertainment in regards to age, there is no significant difference on those same measures regarding class rank. This may be due to differing maturity levels of students in particular age brackets, which is diminished when those age brackets are combined in the class rank measure.

Also interesting is the lack of significance in production course count and production course index across producer type. Although there is significance in free recall for production courses, there is no significant relationship for the production course index. This may be due to student exposure to a particular mix of production courses. The production courses were not

differentiated between those that focus more on message or narrative construction such as audio, video, and games as compared with a strictly visual medium like photography or graphics. Although photography and graphics may have messaging characteristics, the ability to use spoken words or moving visuals in conjunction with words creates a different type of experience for the producer and the media consumer.

Interaction Effects

Each of the demographic variables was tested using a factorial analysis to investigate any interaction effects between the variables and producer type. As seen in Table 108, in regards to gender, GPA, age, class rank, production classes and production course index, the interactive effects were not significant between the demographics and producer type in regards to immediate recall, level of interest, level of entertainment or free (delayed) recall. It is interesting to note that when tested in isolation, gender and class rank both showed significance in regard to level of interest.

Table 108

Summary of Findings – Interaction Effects of Producer Type and Independent Variables

Hypotheses	Independent Variable	Immediate Recall	Level of Interest	Level of Entertainment	Free (Delayed) Recall
X .2	Gender	No	No	No	No
X .3	GPA	No	No	No	No
X .4	Age	No	No	No	No
X .5	Class Rank	No	No	No	No
X .6	Production Classes	No	No	No	No
X .7	Production Course Index	No	No	No	No

The lack of significant interaction effects across the board suggests there is some other factor or factors that may be contributing to immediate recall, level of interest, level of

entertainment and free recall. While Paek, Hove, Jeong and Kim (2011) found their sample to favor PSAs created by peer producers in regards to message importance, there was no effect on behavioral intention. Results from Paek, Hove, Jeong and Kim (2011) found that there were no interaction effects between producer type and issue involvement or behavioral intention. The results from the current study are similar. While participants may have favored particular elements of a PSA based on producer type, there was no statistically significant difference in the level of information retained from that message when including an interaction effect with any of the six independent variables.

Limitations

This study examined the effects of different producer types on information retention in college safety related PSAs. Despite the sample size and participation rates being acceptable for an experimental research study, there are limitations to be noted.

In creating the stimulus, the students charged with producing the peer PSA messages were predominantly Caucasian males who were within one semester of graduating. There were limited females in the peer producer pool and there were no non-Caucasian females. The peer producers did match fairly well with the experiment sample. Although race was not a demographic recorded as a part of this study, the sample was not representative of the population of college students as a whole or even at the university where the study was conducted. Additionally, some students in the sample were able to recognize the voice talents from the student produced PSA messages. No concrete answers were provided by the researcher if subjects inquired as to who created each PSA message. Future studies may want to ask for race

as a demographic, employ a more diverse sample and use unknown voice talent in order to generalize the results.

The number of PSAs used in the experiment was limited. In order to obtain a sufficient sample size, the PSAs chosen were between 30 seconds and one minute, and each student was exposed to three PSAs. Exposing students to more or less PSAs may show differences in retention rates based solely on the amount of time students are listening to the messages. The issues of primacy and recency may also come into play. Students may have been more apt to remember information from the first PSA they listened to or the final PSA based on the group in which they were placed. To account for this, students were not instructed to listen to the PSAs in any particular order.

The free recall portion of the study was completed via a web-based survey. This was chosen for convenience sake. Rather than require students to physically visit a laboratory setting multiple times, students were only required to visit the setting for the actual stimulus exposure. While this may have helped to boost sample size, the lack of control over the environment is a limitation. Students were supervised during the listening portion of the experiment but the demographic (screening) and free (delayed) recall surveys were both completed online via Qualtrics. For students who may not have acceptable Internet access, this may have been a barrier to volunteering for or completing the study in entirety. Fortunately, the number of non-completions from the cued to the free recall stage were minimal with 66 of 74 students (89%) doing both portions.

Recommendations for Future Research

For future research regarding this topic, a mixed method study should be employed. While the quantitative data is interesting and telling in regards to exploring statistical significance, there is no indication as to what particular elements of the PSA are causing the significance or, in this study, the lack of significance.

The sample for this study consisted of students who had at least basic level production skills in at least one area. Students with more production experience may have been more focused on the production elements rather than the message at hand. The experiment had a slight deception factor as students were not told to specifically listen to the PSA messages for the content or production aesthetics. Informing students of the purpose of the experiment or including a question to gauge their personal involvement level in the message topic may have added additional data that could have offered additional findings.

A second area for future study is the non-production student as the subject of research. In this study, a key element was seeing if the production experience of the subject had an influence on the dependent variables. This was found to be a factor only with the free (delayed) recall. However, while this group was the focus of the study, the production experience alone makes them an atypical audience. An added dimension here is the increasing use of consumer grade production tools such as iMovie, Audacity, and iPhoto and Gimp. Two potential questions emerge. The first is if there is a difference between those who have had college-level production courses and those who have not. A second element would be if those who use consumer-grade, entry level software align more closely with non-production or production subjects in the dependent variables. The college level courses typically go beyond software and technical

aspects to consider aesthetics and messaging. Do these elements differentiate these students from casual users? A valuable tool in this context might be a self-reported media knowledge index. Another dimension here would be focusing on students with extensive audio production experience to see how these advanced students, who are preparing to be professionals in the field, would compare to non-production or non-audio production students.

Another potential area of exploration is looking at producer effects and video PSAs. The approach of examining student versus professional generated product with student subjects provides an interesting and viable research methodology. Transferring the methodology used here to the video realm would provide a mechanism to see if producer effects impact other media forms.

The producer effect could also be reversed. Here one could examine student versus professional PSAs with adults. In such an analysis, one element to consider is if the level of technological engagement and media savvy impacts the dependent variables of recall, entertainment and interest. Essentially, the research would look for characteristics that create similar groups and may be a more meaningful discriminator than age. It is possible that the degree of technological adoption is more important than chronological age. Recent statistics show that a large proportion of older adults are becoming significant users of Web 2.0 technologies. These individuals may respond differently than non-users in their age group.

Many PSA researchers look into specific appeals used in PSA creation. Nan (2009) researched the use of emotional appeals in PSA creation. Student producers in the current study generally used different appeals than the professional producers. The flu vaccine employed an emotional appeal (disgust) in the peer produced version but an informative approach in the

professional version. The binge drinking PSA used a narrative social norm approach for the peer PSA and an informative approach for the professional version. The texting and driving PSA used a narrative humorous approach for the peer produced and an informative message for the professional production version. Future research on the current topic may want to explore the types of appeals used in addition to the producer attributes.

In addition to examining the types of appeals, the personal relevancy and potential threat of particular PSA topics would be an additional area of study. Do topics on subjects that have possible serious consequences to the individual, such as substance abuse and personal safety, have a greater impact than those dealing with less threating issues such as recycling and energy conservation. Is there a difference based on the expected behavior change? For example, PSAs on addiction focus on reversing a damaging behavior. In contrast, PSAs on controlling student loan costs and planning for retirement may elicit different responses. Finally, whether the theme and delivery is positive or negative, realistic or fantasy, somber or comedic could all be additional areas for exploration.

Further research may include the use of student scriptwriters but professional production teams to create the PSA messages to give both producer types an aesthetically polished message. Technology is rapidly changing. The use of high quality production equipment is becoming less important, but the aesthetic recording and mixing expertise of a professional production technician cannot be entirely replicated by an amateur or low level professional production technician.

Conclusion

This exploratory study serves as a solid basis for further research regarding producer effects. This study offered few significant findings, which is significant in its own right. The lack of significant findings demonstrates that further research is necessary in order to find specific information regarding differences in information retention based on producer attributes. Significant findings were obtained when we looked at individual PSA topics and individually for some demographic variables. However, interaction effects of producer types and the demographic variables were not found. This suggests that producer type may not directly impact the standard demographic factors commonly used. Instead, elements of an individual's media usage and savvy as well as message elements may be more important.

The relationship between interest and entertainment and free (delayed) recall is also noteworthy. As we find do not find such a relationship with immediate recall, this suggests that different methodologies may need to be examined for this area. Considering the findings and the many avenues of possible research, this remains a fruitful area for exploration.

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Appendix A: PSA Scripts Professional

1. Professional Binge Drinking PSA (:30)

Binge drinking, a common and dangerous behavior for all ages, is defined as four or more drinks for a woman and five or more drinks for a man over a short period of time. This risky pattern of drinking contributes to over half of the 79 thousand deaths due to alcohol each year, and a range of health and social problems, including unintended pregnancy, sexually transmitted diseases, interpersonal violence, and death through car crashes.

Most binge drinkers are adults who drink too much from time to time and are not alcohol-dependent or alcoholics.

Effective strategies to create an environment that discourages binge drinking include increasing alcohol taxes, reducing the number of places where people can purchase alcohol and reducing the days and hours when alcohol is sold.

Binge drinking is a clear health threat for the drinker and for society. Be responsible to your family, your community, and yourself. Don't binge drink.

2. Professional Texting and Driving (0:30)

These are the sounds of people taking their eyes off the road. Texting and driving is more than distracting, it's dangerous. Do us all a favor, when you're on the road stay off the phone.

3. Professional Flu Vaccine (1:00)

Flu season is here and it's time to get vaccinated. Each year, thousands of people in the US are hospitalized or die from influenza.

The most important thing you can do to protect yourself is to get a flu vaccine each year. It's recommended for everyone six months of age and older. It's especially important for people at high risk for complications from the flu. This includes young children, pregnant women, adults 65 and older, and people with certain chronic medical conditions, such as asthma, heart disease, and diabetes.

Give yourself and your loved ones the gift of health this year. Put 'getting a flu vaccine' on your to-do list.

Appendix B: PSA Scripts Peer

1. Peer Binge Drinking PSA (:30)

Voice 1 – "Chug! Chug! Chug!" Narrator- "Binge drinking… this is defined as 4 or more drinks for a woman or 5 or more drinks for a man over a short period of time." Voice 2 – "Only one keg tonight, Danny?! Don't be goin' soft on us now" Narrator- "This type of drinking is discouraged by raising taxes and restricting purchases". Voice 3 "Hey Danny boy, wanna come up stairs with me?" Narrator "Unplanned pregnancies, relational violence and STD's are contributed to binge drinking." Voice 4 – "Yo bro, you okay? You're never like this bro" Narrator- "Binge drinkers are not always alcoholics or alcohol dependent." Voice 5 "Danny, you shouldn't drive! Danny! Danny!" Narrator "Binge drinking contributes to 50% of the 79,000 alcohol related deaths per year. Don't be a Danny."

2. Peer Texting and Driving (0:30)

Narrator- "When you get an OMG text about your BFF getting a car for her birthday when you're driving home, you may get a little bit distracted. And when you being texting her your plans for a road trip to the beach, you may not notice that you car is on a one-way trip to that cool little lake that you went to as a kid… I hope you like swimming!" Narrator 2 – "Texting and driving don't mix, kind of like how your car and lakes don't mix. Don't text and drive"

3. Peer Flu Vaccine (1:00)

Narrator- "Not everyone washes their hands, not everyone uses a tissue" Girl – "Hey! Can I have a sip of that?" Guy – "Sure!" Narrator – "Not everyone thinks before they act. Thousands of people die or are hospitalized each year due to the flu. Get your flu vaccine today… What have you touched?"

Appendix C: Script for In-Class Solicitation

Hello-

As some of you know, I'm Miss Fulton. I teach audio and 408 in the Comm. Media Department. I'm also in the PhD program. I am currently writing my dissertation and need your help.

My dissertation is about public service announcements. I'm looking for students who will listen to 3 PSAs and answer 2 questionnaires about the PSAs they heard. The whole process will take about 45 minutes of your time total.

First, you'll receive an email from me after this class. If you choose to participate, there is a link in the email that you will click. The link will take you to Qualtrics where you will answer a few demographic questions and select a time to come listen to the PSA messages in Stouffer Hall. The listening portion will take approximately 30 minutes of your time. After listening to each PSA twice, you will be presented with a paper based survey related to the information included in the PSAs.

Approximately two weeks after listening to the PSAs you will be contacted via email and asked to respond to a second survey.

If you complete this survey, the listening portion with the survey and a second survey you will be entered to win an electronic tablet device.

Your participation is voluntary. Individual responses will be kept confidential and will not be tied with any identifying information. You participation will have no impact on your grade or your standing in the Department.

If you have any questions, please let me know now or you can email me.

Thank you for your time!

Appendix D: Follow Up Email

Greetings!

As discussed in your recent production class, your help is needed with research regarding public service announcements. If you would like to participate in this project, please click the link included in this email. This survey will take no more than 5 minutes of your time.

As a part of this survey, you will be selecting a time to listen to 3 PSA messages in a laboratory setting in Stouffer Hall. This portion of the research will take approximately 30 minutes of your time. After listening to each PSA twice, you will be presented with a paper based survey related to the information included in the PSAs.

Approximately two weeks after listening to the PSAs you will be contacted via email and asked to respond to a second survey. This survey will take no more than 10 minutes of your time.

If you complete this survey, the listening portion with the survey and a second survey you will be entered to win an electronic tablet device. Your participation is voluntary. Individual responses will be kept confidential and will not be tied with any identifying information.

Please click on the following link to take the demographic survey.

https://iup.qualtrics.com/SE/?SID=SV_8lgG4Ut5vVN8xzn

Thank you very much for your time, help, and cooperation on this matter.

Lacey A. Fulton, M.A.

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Appendix E: Screening Survey

QS Thank you for your time in this important dissertation research. Your participation in this survey is voluntary and individual responses will be kept confidential. Your responses will remain anonymous. If at any time you do not wish to continue the survey, you may quit by closing your web browser. This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724/357-7730).

- ❍ Please select this response to continue (1)

Q1 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

Q8 What is your age?

- ❍ Under 18 (1) – If student identifies themselves as under 18, they are thanked and the survey ends. They are not included in the study.
- ❍ 18 (2)
- ❍ 19 (3)
- ❍ 20 (4)
- ❍ 21 (5)
- ❍ 22 (6)
- ❍ 23 (7)
- ❍ 24 (8)
- ❍ 25 or older (9)

Q2 Are you a Communications Media major or minor?

- ❍ Major (1)
- ❍ Minor (2)
- ❍ Neither (3)

Q3 What is your academic classification?

- ❍ Freshman (fewer than 30 earned credits) (1)
- ❍ Sophomore (30-59 earned credits) (2)
- ❍ Junior (60-89 earned credits) (3)
- ❍ Senior (90 earned credits or more) (4)

Q4 What is your approximate GPA?

- ❍ 3.5 - 4.0 (1)
- ❍ 3.01 - 3.49 (2)
- ❍ 2.5 - 3.0 (3)
- ❍ 2.01 - 2.49 (4)
- ❍ Under 2.0 (5)

Q5 Which of the following COMM courses have you taken? Please include courses in which you are currently enrolled.

- ❑ COMM240 Communications Graphics (1)
- ❑ COMM249 Basic Audio Recording Techniques (2)
- ❑ COMM251 Television Production (3)
- ❑ COMM271 Beginning Photography (4)
- ❑ COMM206 2D Digital Game Development (5)
- ❑ COMM340 Advanced Communications Graphics (6)
- ❑ COMM348 Animation (7)
- ❑ COMM349 Radio Production (8)
- ❑ COMM351 Advanced Video Production (9)
- ❑ COMM371 Photography II : The Print (10)
- ❑ COMM374 Documentary Photography (11)
- ❑ COMM406 3D Game and Simulation Design and Development (12)
- ❑ COMM408 Media Field Studies (13)
- ❑ COMM446 3D Modeling and Animation for Games and Simulations (14)
- ❑ COMM449 Advanced Audio Recording Techniques (15)
- ❑ COMM51 Broadcast News Process (16)
- ❑ COMM471 Electronic Imaging (17)

Q6 Please provide the following information. This information will be used for scheduling and logistics purposes only.

First Name (1)

Last Name (2)

IUP Email Address (3)

Q7 Please choose one of the following times for listening to the PSAs and filling out the first survey. This process will take approximately 30 minutes of your time.

- ❍ Saturday, September 28 10:00 am (1)
- ❍ Saturday, September 28 11:00 am (2)
- ❍ Saturday, September 28 12:00 noon (3)
- ❍ Saturday, September 28 1:00 pm (4)
- ❍ Saturday, September 28 2:00 pm (5)
- ❍ Saturday, September 28 3:00 pm (6)
- ❍ Monday, September 30 10:00 am (7)
- ❍ Monday, September 30 11:00 am (8)
- ❍ Monday, September 30 12:00 pm (9)
- ❍ Monday, September 30 1:00 pm (10)
- ❍ Tuesday, October 1 9:00 am (11)
- ❍ Tuesday, October 1 10:00 am (12)
- ❍ Tuesday, October 1 11:00 am (13)
- ❍ Tuesday, October 1 12:00 noon (14)
- ❍ Tuesday, October 1 1:00 pm (15)
- ❍ Tuesday, October 1 2:00 pm (16)
- ❍ Wednesday October 2 12:30 pm (17)
- ❍ Wednesday October 2 1:30 pm (18)
- ❍ Wednesday October 2 2:30 pm (19)
- ❍ Wednesday October 2 3:30 pm (20)
- ❍ Wednesday October 2 4:30 pm (21)
- ❍ Thursday October 3 10:00 am (22)
- ❍ Thursday October 3 11:00 am (23)
- ❍ Thursday October 3 12:00 pm (24)
- ❍ Thursday October 3 1:00 pm (25)
- ❍ Thursday October 3 2:00 pm (26)
- ❍ Thursday October 3 3:00 pm (27)
- ❍ Tuesday October 8 12:00 noon (28)
- ❍ Tuesday October 8 1:00 pm (29)
- ❍ Tuesday October 8 2:00 pm (30)
- ❍ Tuesday October 8 3:00 pm (31)
- ❍ Wednesday October 9 12:30 pm (32)
- ❍ Wednesday October 9 1:30 pm (33)
- ❍ Wednesday October 9 2:30 pm (34)
- ❍ Wednesday October 9 3:30 pm (35)

Appendix F: Cued-Recall (Targeted) Survey

Q1 Which of the following facts do you recall from the PSA regarding the flu shot?

- ❑ The flu vaccine is recommended only for people who have a pre-existing illness (1)
- ❑ Thousands of people die or are hospitalized each year due to flu (2)
- ❑ The flu is different each year (3)
- ❑ There is only one type of flu shot (4)
- ❑ The flu vaccine is recommended for everyone 6 months of age or older (5)
- ❑ The flu vaccine is not always effective (6)
- ❑ High risk people are encouraged to get the flu vaccine (7)
- ❑ You only need to get the flu vaccine once in your lifetime (8)
- ❑ If you have diabetes you can not get a flu vaccine (9)
- ❑ Women are more likely to get the flu than men (10)
- ❑ High risk persons include young children, pregnant women, those 65 and older and people with asthma, heart disease and diabetes (11)
- ❑ High risk persons include teenagers, pregnant women, those 70 and older and people with asthma, heart disease, and high blood pressure (12)
- ❑ The flu vaccine is only available as a nasal spray (13)

Q2 Who do you think created the flu shot PSA?

- ❍ Someone around your age (peer) (1)
- ❍ Someone older (professional) (2)

Q14 How interesting did you find the flu shot PSA to be?

- ❍ Extremely interesting (1)
- ❍ Very interesting (2)
- ❍ Mildly interesting (3)
- ❍ Not interesting at all (4)

Q15 How entertaining did you find the flu shot PSA to be?

- ❍ Extremely entertaining (1)
- ❍ Very entertaining (2)
- ❍ Mildly entertaining (3)
- ❍ Not entertaining at all (4)

Q3 Which of the following facts do you recall from the PSA regarding binge drinking?

- ❑ Binge drinking is only a problem at college (1)
- ❑ Binge drinking is defined as 4 or more drinks for a woman over a short period of time (2)
- ❑ Binge drinking is defined differently for men and women (3)
- ❑ Binge drinkers are always alcoholics (4)
- ❑ Binge drinking is defined as 5 or more drinks for a man over a short period of time (5)
- ❑ Binge drinking contributes to unplanned pregnancy, STDs, relational violence and death (6)
- ❑ Higher alcohol taxes and restrictions on purchasing alcohol discourage binge drinking (7)
- ❑ Binge drinking is relatively safe if you are not an alcoholic (8)
- ❑ Binge drinking contributes to 30% of the 79,000 alcohol related deaths per year (9)
- ❑ Binge drinkers are not always alcoholics or alcohol dependent (10)
- ❑ Binge drinking happens mostly in bars (11)
- ❑ Binge drinking contributes to 50% of the 79,000 alcohol related deaths per year (12)
- ❑ Binge drinking contributes to HIV, injuries requiring hospitalization and STDs in women (13)

Q4 Who do you think created the binge drinking PSA?

- ❍ Someone around your age (peer) (1)
- ❍ Someone older (professional) (2)

Q16 How interesting did you find the binge drinking PSA to be?

- ❍ Extremely interesting (1)
- ❍ Very interesting (2)
- ❍ Mildly interesting (3)
- ❍ Not at all interesting (4)

Q17 How entertaining did you find the binge drinking PSA to be?

- ❍ Extremely entertaining (1)
- ❍ Very entertaining (2)
- ❍ Mildly entertaining (3)
- ❍ Not at all entertaining (4)

Q5 Which of the following facts do you recall from the PSA regarding texting and driving?

- ❑ Texting and driving is best when using a voice to text program (1)
- ❑ Texting and driving is distracting and dangerous (2)
- ❑ Texting and driving contributes to more accidents than drinking and driving (3)
- ❑ Texting and driving is illegal in most states (4)
- ❑ When you text and drive, you are the only person in danger (5)
- ❑ When you are driving you should always use a hands free device (6)
- ❑ Texting and driving should be done at stop lights or stop signs (7)
- ❑ It is more safe to text and drive at night (8)
- ❑ Texting and driving is socially acceptable (9)
- ❑ When you are on the road, stay off the phone (10)
- ❑ Texting and driving is only an issue with smart phone users (11)
- ❑ Texting and driving is more dangerous for teenage drivers (12)
- ❑ The only safe way to text and drive is to hand your phone to a passenger (13)

Q6 Who do you think created the texting and driving PSA?

- ❍ Someone around your age (peer) (1)
- ❍ Someone older (professional) (2)

Q18 How interesting did you find the texting and driving PSA to be?

- ❍ Extremely interesting (1)
- ❍ Very interesting (2)
- ❍ Mildly interesting (3)
- ❍ Not at all interesting (4)

Q19 How entertaining did you find the texting and driving PSA to be?

- ❍ Extremely entertaining (1)
- ❍ Very entertaining (2)
- ❍ Mildly entertaining (3)
- ❍ Not at all entertaining (4)

Q7 Do you pay attention to PSA messages you hear on the radio?

- ❍ Yes (1)
- ❍ No (2)

Q8 Do you pay attention to PSA messages you see on television, YouTube or social networking sites?

- ❍ Yes (1)
- ❍ No (2)

Q9 What do you think makes a PSA memorable?

Q12 Which PSA did you like the best?

- ❍ Texting and Driving (1)
- ❍ Binge Drinking (2)
- ❍ Flu Vaccine (3)

Q13 Why did you like this PSA the best?

Appendix G: Free (Delayed) Recall Survey

Q1 What is your assigned ID number? Please look at the folder you were given as you entered the lab.

Q2 What do you remember about the Texting and Driving PSA?

Q3 What do you remember most about the Binge Drinking PSA?

Q4 What do you remember most about the Flu Vaccine PSA?

Q5 Which PSA do you recall more information from?

- ❍ Texting and Driving (1)
- ❍ Binge Drinking (2)
- ❍ Flu Vaccine (3)

Q6 What about this PSA caused you to recall more information?