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Public Service Announcements to Promote Physical Activity

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This is to certify that the doctoral dissertation by

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Walden University
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Abstract

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MS, Walden University, 2014

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Psychology

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Abstract

The World Health Organization (WHO) promotes physical activity as a primary way to maintain health, but many individuals do not participate in this health-promoting behavior. Despite the potential for public service announcements (PSAs) to communicate health information and promote behavioral change, no prior research on developing video PSAs to promote physical activity was found. The purpose of this quasi-experimental study was to examine how affective and information video PSAs for a public health campaign affect future levels of intention to engage in physical activity. The PSAs were developed and filmed specific for this study using the model of goal directed behavior (MGDB) as the foundation for PSA development. Participants were recruited to view PSAs with the message foci of empathy, fear, information, and combination messages to determine which focus area is perceived to be most persuasive for promoting physical activity. This research examined moderating effects of current physical activity habits related to the duration of physical activity and the covariance with stage of change readiness. Differences in perceived effectiveness between the different message foci were found with participants perceiving the empathy video as most effective, followed by combination, with fear and information being perceived as least effective. For participants who meet WHO recommendations for exercise activity, the PSA based on fear was most effective, with fear also being most effective for those participants right below that level of physical activity. Many participants (61%) had a positive affect while watching the four PSA videos. Social implications related to improving public health communication through video PSAs that effectively promote health behavior change.

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Introduction

The World Health Organization (WHO) promotes physical activity as one of the primary ways to maintain a healthy body. It is recommended that all individuals engage in exercise to reduce risks of injury and noncommunicable diseases (NCDs) like cardiovascular disease, ischemic stroke, type 2 diabetes, and different types of cancers. Additionally, physical activity is associated with improvements in mental health, with reduced injuries and falls, and with weight management.

Physical activity (PA) should entail at least 150 minutes of moderate to vigorous intensity each week (World Health Organization, 2017). However, many individuals do not participate in this health-promoting behavior. Across the world, many populations do not meet the minimum guidelines and, in fact, live a sedentary lifestyle, resulting in physical inactivity being the fourth leading cause of death worldwide (Friederichs et al., 2014). Within the United States, the Centers for Disease Control and Prevention (Centers for Disease Control and Prevention [CDC]; 2016) reported that in 2014, just under 24% of American adults engaged in PA. Because of the health risks associated with physical inactivity, there is a need to develop effective methods for communicating public health information in a way that is both informative and motivating.

Prior inconsistent research results have prompted the need to look further into the relationship between promoting a behavior change and communicating public health information (Ruben, 2016). In researching the model of goal-directed behavior (MGDB), an extension of the theory of planned behavior (TPB), Esposito, van Bavel, Baranowski,

and Duch-Brown, helped practitioners make significant strides to understand personal motivation, behavioral change, and communication-focused PA intention (2016).

A literature review of PA research showed that studies using MGDB were limited within the United States and found no prior use of a video public service announcements (PSA) with MGDB as a framework. Instruction using multiple learning styles plays a key role in creating effective communication platforms. Research has shown that video PSAs are effective communication platforms because of a number of strengths: they are typically less than a minute in duration, they are aimed at real audiences, and they can reach persons of many educational levels (Selfe & Selfe, 2008).

In this quantitative quasi-experimental study, I explored the use of the MGDB in the development of a video PSA to promote PA intention. This study expands research on the MGDB when it is used to promote PA and fills research gaps by investigating the use of the video PSA as an effective tool for disseminating public health information to motivate PA and by elucidating best practices for promoting PA in the United States. In this study, I measured the PE of each message foci by comparing stage of change readiness via the University of Rhode Island change assess scale (URICA), the participant positive and negative affective responses via the positive and negative affect schedule (PANAS), and how the participants rate the effectiveness of each PSA via the perceived effectiveness rating scale (PERS).

Background to the Problem

There are immediate benefits for those who regularly engage in physical activities. The benefits are not limited to improvements in strength and flexibility; Hogan,

Mata, and Carstensen (2013) found that people who engage in regular PA have enhanced cognitive processing and greater mood control. The WHO reported that inactivity is one of the leading causes of obesity, which is itself a leading cause of preventable illness, such as diabetes, high blood pressure, cardiac disease, and joint issues (WHO, 2017).

According to the Office of Disease Prevention and Health Promotion (ODPHP), all persons can benefit from regular exercise, even those persons with current chronic illness. Specifically, the ODPHP reported that regular PA can lower the risk of early death, coronary heart disease, stroke, high blood pressure, type 2 diabetes, breast and colon cancer, falls, and depressive symptoms (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2017).

Additionally, for children and adolescents, PA can improve bone health, improve cardiorespiratory and muscular fitness, reduce levels of body fat, and reduce depressive symptoms (HealthyPeople.gov, 2017). Substantial empirical evidence surrounds the physiological, psychological, and medical reasons to maintain an active lifestyle. Additional research reports that men and women both benefit from physical activity on a 7-year follow up study (Bhui & Fletcher, 2000).

PSAs are messages of public interest, provided via media outlets at no cost to the public, designed to inform by raising awareness, to change public attitudes, and/or to change behavior toward a social issue. PSAs have been found to be effective at communicating information, and research has confirmed that their effectiveness can be measured (Bigsby, Cappella, & Seitz, 2013).

PSAs are currently used to promote topics such as smoking cessation, abstaining from drugs, and educating people to not drink and drive (Ad Counsel, 2017). Research has been able to measure perceived effectiveness (PE), which is the ability of a person to become aware of something and make a change based on that new information, when information is through PSAs (Bigsby et al., 2013).

Additionally, researchers have been able to determine the link between PE and actual effectiveness (AE), with specific focus on emotional response (Bigsby et al., 2013). Research has also found that exercise climate (the feelings people have related to comfort and feeling accepted) could affect motivation and how that can be applied to the creation of PSAs (Brown, Fry, & Little, 2013).

Theoretical Framework

I used the MGDB as the framework for PSA development in the proposed study. The model, developed from the TPB, adds desire, anticipated positive and negative emotions (Esposito et al., 2016). The inclusion of desire in behavior change theory incorporates people's wish to do something rather than just their feelings of obligation to do something (Esposito et al., 2016). The MGDB includes subjective norms (perceived social pressure), positive anticipated emotions (positive consequences), and negative anticipated emotions (negative consequences), which can influence behavioral intention (the likelihood that a person will engage in a specific behavior change), allowing PE to be measured (Esposito et al., 2016).

The results of this study will allow measurement of the PE of each message focus by comparing stage of change readiness, the participants' positive and negative affective

responses, and how the participants rate the effectiveness of each PSA. Prior research by Bigsby et al. (2013) supported the understanding that cognitive and emotional responses can predict intention to engage in a new behavior, a predictor of PE. This behavioral change model, previously tested with PA, can help inform researchers about the intellectual and emotional aspects of information processing within each person that may lead to a behavioral change (see Figure 1).

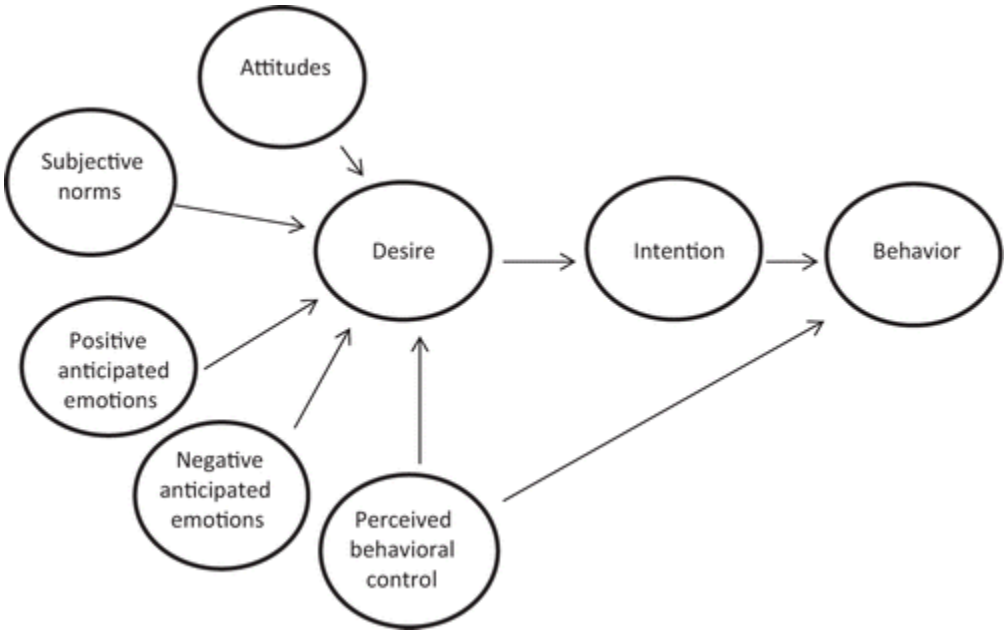


Figure 1. Model of Goal-Directed Behavior, by Esposito, van Bavel, Baranowski, & Duch-Brown, 2016 Used under Creative Commons Attribution-Share Alike 3.0 Unported Licence (https://creativecommons.org/licenses/by/3.0/

Problem Statement

Several notable U.S. health organizations, including the CDC (2016), the National Institutes of Health (n.d.), and the ODPHP (HealthyPeople.gov 2020, 2017), have promoted the benefits of engaging in regular PA. On an international scale, the WHO (2017) has named PA as one of the primary ways to maintain a healthy body and has

recommended that all individuals engage in PA as a way to reduce the risk of injury and the incidence of NCDs like cardiovascular disease, ischemic stroke, type 2 diabetes, and a variety of cancers.

Additionally, PA is associated with improvements in mental health, reduced incidence of injuries and falls, and weight control (WHO, 2017). New medical research has shown that regular PA is associated with improved brain health, bone density, and balance in both younger and older adults (Hogan, Mata, & Carstensen, 2013). Regular PA has been found to reduce depressive and anxiety-related mental health conditions (Schutte, Bartels, & de Geus, 2014). Importantly, PA has been found to be beneficial for all age groups, no matter the stage at which a person begins increased PA (Koeneman, Verheijden, Chinapaw, & Hopman-Rock, 2011).

However, across the world, many populations do not meet the minimum PA guidelines of 150 minutes of moderate-intensity aerobic PA throughout the week (WHO, 2017) and instead live sedentary lifestyles. This is problematic, because physical inactivity is considered to be the fourth leading cause of death worldwide (Friederichs et al., 2014). Within the United States, prior research has confirmed that many individuals do not participate in PA as a health-promoting behavior and 24% of adults reported inactive lifestyles in 2014 (CDC, 2016a; Friederichs et al., 2014). Furthermore, the CDC (2016a) has reported that between 17% and 29% of American adults in 41 states engaged in no leisure-time PA, defined as non-work-related PA (WHO, 2017), in 2015.

Owing to the health risks associated with physical inactivity, and the widespread physical inactivity reported among Americans, U.S. public health officials should

consider requirements for developing and communicating public health information in a way that is both informative and motivational and that will lead to health behavioral change. Furthermore, the WHO (Rimal & Lapinski, 2009) has recognized the need for health communications to relay the importance of health behavioral change. One means of widely conveying public health information is through PSAs.

Video PSAs have been found to be effective at communicating information, and research has confirmed that their effectiveness can be measured (Bigsby et al., 2013). Research has shown that video PSAs are an effective communication platform because they are typically less than a minute in duration, they are aimed at real audiences, and they can reach persons of many educational levels (Selfe & Selfe, 2008). To realize PSAs' communicative potential, it is essential that PSA developers understand the role message development, including the message's focus and delivery, plays in viewer response (Epton et al., 2015).

Despite the potential for PSAs to communicate health information and promote behavioral change, I found no prior research on developing video PSAs to promote PA. Although research on video PSAs for promoting PA is lacking, prior researchers have tested the relationship between promoting behavioral change and communicating public health information, albeit with inconsistent results, prompting researchers to look further into this relationship (Ruben, 2016). Choi, Chung, and Park (2013) focused their research on the transtheoretical model (TTM), which was used to understand behavior in relation to the stages of change theories. The stages of change consist of precontemplation,

contemplation, preparation, action, and maintenance. The concept is that people have to move through the stages to implement and maintain change.

Continued research on different behavioral change models, though reporting inconsistent results, has supported the MGDB as being most accurate in predicting behavioral intention (Esposito et al., 2016). Behavioral intention is the perceived likelihood or "subjective probability" that a person will engage in a specific behavior (National Institute of Health, n.d.). Researchers have been able to find causal links between PE of persuasive messages and AE, indicating a behavioral intention to make a change (Bigsby et al., 2013). To fill the research gap, the proposed quantitative quasi-experimental study will use the MGDB framework to test how PSAs can best be developed to promote health behavioral change, specifically, intention to engage in increased non-work-related PA, to address the concerns of U.S. health-promoting agencies.

Purpose of the Study

In this study I will use a quasi-experimental quantitative design to examine how the affective and information design of video PSAs for a public health campaign may affect future levels of PA among viewers. During this study I will test whether the independent variable of message focus (i.e., empathy, fear, information, and combination) within a video PSA can influence the dependent variable of viewers' intention to engage in PA. I hypothesize that video PSAs can influence a behavioral intention to engage in PA if the PSAs' message focus resonates with viewers. This

research may benefit those who develop PSAs that disseminate public health information and, in turn, the public who views.

Definition of Terms

Amount of time spent exercising: Current amount of time (in minutes) that a person is currently engaging in physical activity (World Health Organization, 2017).

Behavioral Intention: The likelihood that a person will engage in a specific behavior (Esposito et al., 2016).

Exercise: A subcategory to PA that is planned, structured, repetitive, and has a goal to maintain or increase one or more components of physical fitness (WHO, 2017).

Intensity of physical activity: Refers to how much work is being exerted by the body to perform an activity or exercise (CDC, 2015).

Message Focus: The dependent variable for this study, is considered one element of the development of a video PSA message (Santa and Cochran, 2008). The message focus will be empathy, fear, and information used by Santa and Cochran (2008) as the most likely elements to influence the perceived effectiveness of a PSA message. This study added a combination focus as well to expand the research.

Perceived Effectiveness: The independent variable for this study, is from the MDGB which includes desire in analyzing behavioral change (Esposito et al., 2016). Perceived effectiveness is the likelihood that a behavioral change will occur after the influence of a persuasive message (Bigsby et al., 2013).

Physical Activity: Defined as any body movement produced by skeletal muscles that requires the body to burn energy, including activities such as playing, household

chores, traveling, and recreation and those activities completed while at work (WHO, 2017).

Stage of Change: The stage of change, developed by Choi, Chung, and Park (2013), is a framework for moving through the behavioral change process. Prior research has shown that the farther along the stage of change, the more likely the readiness for change is (Santa & Cochran, 2008). Due to the fluidity of the actual stages, for this research study, only the contemplation stage and action stage will be used as covariates.

Research Questions and Hypotheses

This quasi-experimental research study is based on the overall research question do video PSAs with different message foci elicit a behavioral intention to engage in physical activity?

Research Question 1 (RQ1). Which video PSAs with different message foci (empathy, fear, information, and combination) elicits the strongest relationship between affective response (positive or negative) and perceived effectiveness to engage in physical activity?

Alternative Hypothesis (H_a1): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there is a relationship between affective score (positive or negative) as measured by PANAS and perceived effectiveness as measured by PERS?

Null Hypothesis ($H_0 1$): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there is no relationship between affective

score (positive or negative) as measured by PANAS and perceived effectiveness as measured by PERS?

Research Question 2 (RQ2). Which video PSAs message foci (empathy, fear, information, and combination) elicits the greatest difference in perceived effectiveness for intention to engage in physical activity.

Alternative Hypothesis (H_a2): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there are differences in perceived effectiveness as measured by the perceived effectiveness rating scale (PERS)?

Null Hypothesis ($H_0 2$): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there are no differences in perceived effectiveness as measured by PERS?

Research Question 3 (RQ3). Does having higher amounts of time spent exercising per week effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a3): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the amount of time a person exercises per week.

Null Hypothesis ($H_0 3$): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the amount of time a person exercises per week.

Research Question 4 (RQ4). Do people in different levels of stage of change have differences in perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) to engage in physical activity.

Alternative Hypothesis (H_a4): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there will be differences in perceived effectiveness as measured by the PERS and stages of change as measured by the University of Rhode Island change assessment scale (URICA).

Null Hypothesis ($H_0 4$): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there will be no difference in perceived effectiveness as measured by the PERS and stages of change as measured by the URICA.

Research Question 5 (RQ5). Does being in contemplation-stage of change effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a5): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-contemplation as measured by the URICA sub-score.

Null Hypothesis ($H_0 5$): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-contemplation as measured by the URICA sub-score.

Research Question 6 (RQ6). Does being in action-stage of change effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a6): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-action as measured by the URICA sub-score.

Null Hypothesis ($H_0 6$): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-action as measured by the URICA sub-score.

Limitations and Assumptions

Assumptions

I assumed that using video PSAs developed for other purposes and without consistency would impact reliability. For this reason, video PSAs are being developed and filmed to have the same foundation.

I assume that videos created specifically for this study would help ensure consistency across videos by using the same setting and the same actors. For that reason, the video PSAs are being story boarded and filmed for the specific intent of this research study. I assume that using the model of goal directed behavior is the appropriate behavior change model to use as a foundation to design the four video PSAs.

I am assuming that participants will be able to distinguish the different message focus for each video, thereby allowing perceived effectiveness to be measured accurately. To assure content validity of each message focus, a focus group was used to confirm the dialogue matched the message focus.

Another assumption is that participants will candidly complete all questionnaires and assessments to the best of their ability. I am assuming that no harm will come to participants while participating in this study.

Delimitations

There are a couple delimitations to this study. Participants who currently engage in PA for at least 150 minutes per week will be excluded from taking the survey. People who are already physically active at this level meet the WHO's guidelines for PA. I am assuming that they already have a personal reason to engage in regular PA.

Participant age range is adults 18 years and older. I assume children, adolescents, and young adults are more active than other age groups due to extra-curricular activities. I also assume that persons over the age of 65 will be less active than other age groups.

Additionally, in this study I did not focus on exercising as a form of physical activity but will instead use the broader level terms physical activity. Exercise is a specific type of physical activity and this study wanted to focus on motivating any type of moderate physical activity.

Limitations

A limitation to this study is participant sampling via Survey Monkey. While Survey Monkey should provide the needed sample size, because the survey is offered

online, it is composed of people who have access to the Internet and who have signed up to take surveys. Survey Monkey Audience reports that Internet users may skew the participant pool toward those people that have access to Internet and computers, who are more highly educated, have higher incomes, and are younger, than the overall general population.

Another limitation to this study is the number of video PSAs created. There is only one video PSA per message focus area. While each video is created with specific intent, if participants do not connect with the actors or setting, the message may not resonate with viewers.

Significance of the Study

The findings from this proposed quasi-experimental research study may be significant in their benefit to those who develop PSAs that disseminate public health information and, in turn, to the public who views the PSAs. Past research on the effects of inactivity on health (e.g., Hogan et al., 2013; Koeneman et al., 2011; Schutte et al., 2014), as discussed in the problem statement, supported the significance of this proposed research in aiding health communicators to improve the effectiveness of PSAs in promoting health behavioral change as it relates to PA.

Although previous literature has elucidated the role PA plays in a person's health, for the research data to extend to change in society, effective dissemination of the data is significant. Public health information is important, but it is not beneficial if it does not lead to behavior change. For example, the Ad Council (2017) reported several significant and measurable changes to society because of video "commercial" public health ad

campaigns (with a similar intention to PSAs), notably in the areas of autism awareness, children's oral health, and gay and lesbian bullying prevention. With these successes, this study aims to extend the Ad Council's findings to the area of PA. Developing video PSAs that promote health behavioral change will be of significant benefit to society.

Chapter Summary

In the proposed study I will adapt some of the research of Santa and Cochran (2008). Santa and Cochran compared the effectiveness of PSAs that specifically elicit different emotions on participants' intentions to stop drinking and driving. In the proposed study I will adapt Santa and Cochran's design for participants' intentions to engage in increased regular PA.

Santa and Cochran (2008) used several scales and questionnaires, including a demographic questionnaire, the Sensation Seeking Scale–V, and a questionnaire regarding previous experience with driving under the influence. Additionally, the researchers used the Fear Survey Schedule–III, the Social Desirability Scale, and stages of change measures (via an adapted version of the URICA) prior to participants viewing and evaluating the PSAs. After viewing the PSAs, Santa and Cochran's participants completed rating questionnaires, including the PANAS and an attention questionnaire.

In the proposed I study will utilize the same instruments and questionnaires as Santa and Cochran (2008), with a modification to measure PA intention. A deviation from the Santa and Cochran study will be the creation of three specific video PSAs as opposed to their use of multiple PSAs previously created by various organizations. Santa and Cochran also used multiple PSAs for each message focus area. In this study I will

create one PSA specific to each message focus area (empathetic, fearful, information, and combination). The benefit to creating a specific video PSA in each focus area is to have consistency in development and assurance that the message focus is accurate. Unlike Santa and Cochran, who utilized existing PSAs with different frameworks, the PSAs in this study I will use the MGDB as a framework to ensure consistency. A limitation to the creation of more than four PSAs is the time constraint, as full development of different PSAs would require more time and delay the research. A final deviation from the study is analysis of only behavioral intention as the dependent variable.

Chapter 2: Literature Review

Introduction

Across the world, many populations do not meet the minimum physical activity guidelines and live a sedentary lifestyle, resulting in physical inactivity being the fourth leading cause of death worldwide (Friederichs et al., 2014). Within the United States, approximately 35 states reported that between 17% and 29% of American adults engaged in no leisure time physical activity in 2015 (Centers for Disease Control and Prevention [CDC], 2016). Owing to the health risks associated with physical inactivity, public health officials should consider the developmental requirements for communicating public health information in a way that is both informative and motivating. Video public service announcements (PSAs) have become an effective method for presenting public health information to the public (Ad Council, 2017). It is of interest in this proposed study whether development of PSAs with different message foci elicits distinct responses in areas of perceived effectiveness and affective response. Additionally, in the study I will explore which message focus area, empathy, fear, information, or combination, results in the highest level of perceived effectiveness for intention to engage in physical activity.

Literature Search Method

The purpose of the literature search was to demonstrate the relationship among different works of scholarship in the area under investigation and identify gaps in the literature that may be filled by means of this proposed research study. Specific keywords and search terms are identified using the research problems and questions developed for the study, and these were utilized in the search. Keywords and search terms being used in

the search included *physical activity, obesity, age, motivation, perceived effectiveness, public service announcement, model of goal-directed behavior, theory of planned behavior, media campaigns*, and *public health communication*. Results found in abstracts, titles, and subject headings. The searches are being conducted using various search engines to sample differing views from psychology, medicine, and advertising. The dates searched in this area are from 2010 to 2017; however, with the exception of necessary seminal literature or articles deemed specifically relevant to the study for other reasons, during the search I focused on literature from the last 5–7 years. The databases included PsychINFO, Communication and Mass Media Complete, and MEDLINE. Only articles published in English are included. Studies that included exercise and PSAs for other areas of influence are being explored. Theoretical views are explored for the most recent research into behavioral change theory. Citations within articles related to this research led to additional sources that contained relevant information.

My goal for the literature review was to provide a comprehensive review that would meet the standards of primary research. An initial list of relevant articles and publications was developed that covered the entirety of search terms and keywords. Over time, the initial list was reduced to a more manageable number of references containing significant amounts of information critical to addressing the research problem and questions developed for the study. No predetermined number of references is deemed desirable, as long as there was a sufficient number of references related to each main point and variable discussed in the study to provide support for any eventual conclusions.

Theoretical Research Framework

The empirical evidence supporting the benefits to physical activity (WHO, 2017) coupled with the communication advantages of video PSA's (Ad Council, 2017) can be a benefit to society when there is a need to create a behavioral change (Santa & Cochran, 2008). Latimer, Brawley, and Bassett (2010) found that tailored PSA messages promoting physical activity resulted in greater results. The overall results of their research suggest that structured message content, including a focus on self-efficacy, could be beneficial in promoting a behavioral change.

General Physical Activity

The WHO (2017) has promoted physical activity as one of the primary ways to maintain a healthy body. Additionally, physical activity is associated with improvements in mental health, reduced injuries and falls, and reduced obesity. Physical activity should entail at least 30 minutes of moderate- to vigorous-intensity exercise most days of the week (WHO, 2017); however, the CDC (2016) found that the number of states reporting adults engaging in no leisure time physical activity, that is, physical activity not related to work, increased from 26.3%–36% in 2011 to 26.3%–48% in 2015.

The CDC's Division of Nutrition, Physical Activity, and Obesity has continued to monitor the health of Americans with a goal of improving the public's health (CDC, 2017). The reason for the continued monitoring of Americans is the rise in obesity, which has been reported to cost the U.S. health care system $147 billion annually (CDC, 2017). Secondary to obesity is the continued rise in preventable conditions or diseases, such as high blood pressure, high cholesterol, type 2 diabetes, heart disease, and certain cancers,

that also increase the burden on the U.S. health care system. Thus, it is vital that the public be made aware of factors related to inactivity and be persuaded to take action.

Other research supports the government's view of the need to include physical activity in a healthy lifestyle. Ford, Zhao, Tsai, and Li (2011) researched low-risk lifestyle behaviors and mortality. They focused on the relationship between people who never smoked, people who maintain a healthy diet, those who engage in adequate physical activity, and those who only consume moderate amounts of alcohol and their relationship to all-cause mortality within the United States. The researchers used data from the National Health and Nutrition Examination Survey (NHANES) III mortality study. Data were collected from 1988 through 1994 and included data from a representative sample of the U.S. population, with follow-up interviews and clinical examination of more than 20,000 participants. The research, which focused on physical activity, defined physical activity as participation in nine specific and up to four additional activities during a month. The ration of exertion was defined as moderate to vigorous intensity. Overall, the results supported previous research recognizing that maintaining health behaviors reduces all-cause mortality. A limitation of the study regarding physical activity was that duration of activity was not assessed. The researchers concluded that public health officials need to continue to promote a healthy lifestyle.

In addition to focusing on a healthy lifestyle, researchers have begun looking at the role physical activity plays in some mental health conditions. In meta-analysis research conducted by Schuch et al. (2017), physical activity and sedentary behavior were reviewed in people with major depressive disorder (MDD). Research has found that

people with MDD have on average a 10-year life-span reduction as compared to the general population, with cardiovascular and metabolic diseases being the primary factors contributing to the reduction. Schuch et al. noted that MDD and low levels of physical activity are bidirectional, suggesting that the depressive symptoms keep people from wanting to engage in physical activity, while the lack of physical activity or increase in sedentary behavior also contributes to MDD. The study included 2,901 participants, 78% female, all of whom had MDD and with an average age of 54 years (range, 21–77 years). The study showed that on average, people with MDD spend more than 8 hours per day in sedentary behavior, with at least 4 of those hours spent sitting. Their meta-regression analysis showed that older age people and female participants predict lower levels of moderate- and moderate-to-high-intensity physical activity. The research did show that people with MDD do engage in some low-level physical activity, but the research results indicate that 65% of people with MDD do not meet the minimum recommended physical activity guidelines.

Physical Activity and Age

Further research conducted by the U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion (2017) prompted the goal of increasing the health of Americans, with nutrition, physical activity, and obesity being among the leading health indicators. The researchers tracked the indicators over a decade as a way to assess the overall health of the country. An additional factor also being studied in the overall health of individuals is the link between individual personality and physical activity. Allen, Magee, Vella, and Laborde (2017) studied the bidirectional

relationship between personality and physical activity, finding that conscientiousness and openness are positively associated with physical activity. They examined more than 10,000 people, with just under one-half being men. Their age categories were 20–34 years, 35–49 years, 50–64 years, and 65 years and older. Allen et al. also found that that openness and physical activity are moderated by age, primarily in the middle age brackets, but not in the youngest or oldest. Sex was also found to be a moderating factor between the relationship of physical activity and change in conscientiousness, showing that women have a positive correlation between physical activity and conscientiousness, but men do not. A weakness of the study was that physical activity was addressed as a single-item question rather than through multiple items that accounted for different activity modes.

Understanding that age may be a factor in physical activity, Hogan, Mata, and Carstensen (2013) explored age differences in cognitive performance and affective experience after a single event of moderate exercise. The researchers completed an experimental study with two groups: Participants in one group completed 15 minutes of moderate-intensity exercise on a stationary bicycle, and the second, "control" group completed a review of neutral images. Participants completed pre- and post-assessments of working memory, and momentary affect experience was measured. The age groups were sorted by 19–39 years (young age), 40–64 years (middle age), and 65 years or older (older age), with 144 participants in all. The results demonstrated that a single event of exercise does have a positive effect on both affective experience and cognitive performance, regardless of participant age. Additionally, exercise also led to faster

reaction time on the working memory task than it did for the control group, regardless of age. A strength of the study was the age range of the participants, which ranged from 19 to 93 years.

Owing to changes in physical activity in older adults, Koeneman, Verheijden, Chinapaw, and Hopman-Rock (2011) researched determinants of physical activity (unstructured physical activity incorporated into everyday life) and exercise (structured, planned, and repetitive activities) needed to effectively promote an active lifestyle. Older adults were determined to be aged 55 years and older. While the researchers were not able to differentiate between physical activity and exercise on an overall scale, the authors were able to determine specific aspects. For physical activity, there was a positive correlation between both older male adults and younger people and general physical activity. The researchers were not able to draw more specific conclusions, apart from noting a positive correlation between older adults and the benefits of general physical activity. This is a positive result, because it allows flexibility for older adults in maintaining an active lifestyle. The study was able to show that while no evidence supported the efficacy of a specific form of exercise, the evidence supported a general overall healthy lifestyle. A limitation to the study was the publications and manuscripts used in the study.

Loprinzi (2017) furthered the knowledge in the area of physical activity and all-cause mortality, which was researched in 2011 by Ford et al. (Ford, Zhao, Tsai, & Li, 2011). While the 2011 research focused on a healthy lifestyle, which included moderate to intense physical activity and all-cause mortality, Loprinzi focused only on light-

intensity physical activity and all-cause mortality. The researcher also used data from years 2003–2006 of the National Health and Nutrition Examination Survey, with clinical follow-up through 2011. The study had 5,575 participants ranging in age from 20 to 85 years. Over the course of the longitudinal study, the researchers found, independent of moderate to intense physical activity and age (and other cofounders), that low-intensity physical activity is associated with reduced all-cause mortality. The results indicate that even low-intensity physical activity promotes a healthy lifestyle and should be promoted to the public.

As age continues to be a factor in physical activity, Steffener et al. (2016) investigated the relationship between education and physical activity and the difference between physiological age and chronological age (CA). The study included 331 adults in good health, with age 52 years being the dividing age between young and old. The researchers were able to calculate a physiologic measure of participants' brain age (BA). The researchers subsequently compared the difference between CA and BA by education and physical activity to determine the different values. The study results show that education and daily number of flight of stairs climbed (FOSC) are the only two significant predictors of a decrease in BA. Additional results show that BA decreases by approximately 1 year for each year of education and by just over half a year for each one additional FOSC daily. The researchers concluded that FOSC and education help maintain larger brain volume. This type of brain maintenance helps preserve brain activity measurements, such as cellular properties, neurochemical processes, volumetric levels, and system-level activation patterns. Steffener et al. suggested that there may be

people who naturally have larger brain volumes, which predisposes them to strive for education and physical activity. One limitation to the study was that the data were gathered from cross-sectional studies, and therefore causality could not be tested. Additionally, more longitudinal tests need to be conducted, as does research specific to why stair climbing, as opposed to other forms of physical activity, has an effect.

Another consideration of the impact of age and physical activity is that an estimated 20% of the population will be aged 60 years or older by the year 2050 (Taylor & Pescatello, 2016). Researchers continue to look at the affective experiences that lead to an increase in physical activity participation as we age. Taylor and Pescatello reported that higher age populations can be a concern to society owing to an increase in noncommunicable diseases and disabilities, which can lead to impacts on community economics. The researchers' meta-analysis focused on the affective experience of independent living older adults (aged 65 years and older) who participate in regular physical activity. Taylor and Pescatello cited the CDC from 2013, reporting that less than 16% of older adults meet the minimum required aerobic activity of 150 or more minutes per week of moderate-intensity or 75 or more minutes of vigorous-intensity and muscle-strengthening activity at least two times per week. Their analysis revealed that a minimal number of studies have focused on older populations but also that affective experiences play a role in the desire for older adults to participate in physical activity.

Physical Activity and Gender

Physical activity and its role between men and women has also been reviewed. Bhui and Fletcher (2000) reviewed general mood and anxiety states between men and

women when physical activity was a moderating factor. It was found that while men have more of a benefit to longer periods of daily activity, both genders do benefit from low-intensity exercise for long periods of time with a reduction in morbidity rate. It was noted that while women did have lower response rates, they also had high prevalence of anxiety and depressive states which could reflect a hormonal or physiological factor.

Further studies on physical activity and gender include a review of how physical activity and gender play a role in depressive symptoms. Zhang and Yen (2015) found that physical activity overall reduces depressive symptoms for both men and women. A more specific look showed depressive symptoms effected men differently than women. It was found that physical activity ameliorates moderate depressive symptoms in men, while it ameliorates mild, moderate, and moderately severe depressive symptoms in women. This supports existing research that regular moderate physical activity can benefit both men and women's overall mental health.

Amount of Physical Activity

The amount of physical activity needed by people to remain healthy has been research by government entities for years. The goal has been to establish standards that help people remain healthy and well informed. Bussmann and van den Berg-Emons (2013) advance the research in this area by defining commonly used terms in research such as physical activity, moderate, and sedentary. Additionally, they review quality of physical activity versus quality. They found in their research that sedentary time may play as significant a role in overall health as activity time. For the current study, the WHO standards are being used for consistency.

Magnan, Kwan, and Bryan (2013) found increased time spent exercising has a bidirectional relationship to increased positive affective belief about exercising. The positive affective belief about exercising also then had a positive effect by decreasing fatigue and decreasing negative affect during episodes of moderate intensity exercise. The research found that more cognition about exercising, such as setting goals, expectancies, motivation to participate, etc. also played a role in affective response about exercising. Ultimately the bidirectional relationship shows that self-efficacy may increase with positive affective experiences from moderate intensity exercise. This research reinforces the need for physical activity to be included in a healthy lifestyle.

Behavioral Change

Behavioral intention. Behavioral intention, defined by the National Institute of Health (n.d.), is a "person's perceived likelihood or subjective probability that he or she will engage in a given behavior." Behavioral intention is a thought process people engage in to decide if an actual behavioral change is going to occur. Considerations such as "do I intend to engage in this new behavior?" are rooted in personal concepts such as desire, motivation, and accountability in what may or may not occur if the behavior change is not implemented. In areas such as marketing, medical care, and research, behavioral intention is the most proximate predictor of behavior, and behavior is the variable most people are trying to influence.

Behavioral change theories go back to the 1950s with the formation of the health belief model (HBM). The HBM, developed by the U.S. Public Health Services, is a conceptual framework that helps explain motivation and the public's willingness to

engage in behavior change (Glanz, Rimer, & Viswanath, 2008). The HBM contains the concepts used to understand motivation, such as people's belief in susceptibility, perceived severity, perceived benefit, and perceived barriers. The HBM also makes use of action triggers that might encourage people to change. Finally, it also entails self-efficacy, a person's individual belief in his or her own ability to change, which is typically needed not only to change but also to sustain that change.

Understanding the relationship between intention and behavior is paramount to being able to promote a positive health change. Researchers continue to review behavioral intention as it relates to physical activity. Rhodes and Dickau (2013) completed a review of articles with the focus on the moderators that increase intention to engage in physical activity. Individual-level variables were intention stability, past behavior and habit, anticipated regret, perceived behavior control/self-efficacy, planning, cross-behavior conflict, neuroticism, extraversion, openness to experience and agreeableness, and contentiousness. Environmental variables had been limited in prior research, but a consistent variable was determined as proximity to recreation resources.

The researchers were able to determine that 38 different moderators are in the physical activity domain. The primary moderator that affected behavioral intention was intention stability. Intention stability was defined as a person maintaining the same motivational flux or strength over a period of time. The results demonstrate a positive correlation between intention stability and physical activity. Two secondary moderators on intention to engage in physical activity were found to be anticipated regret and conscientiousness. Anticipated regret is the feeling of regret from inactivity, and

conscientiousness was defined as achievement striving and self-discipline. The strength of Rhodes and Dickau's research helps confirm the ability to measure behavioral intention and that physical activity promotion could be more effective if behavioral intention were used to design public health information campaigns targeting a promotion to engage in physical activity.

Conner, McEachan, Lawton, and Gardner (2016) furthered the understanding about behavioral intention within health psychology. The goal of their research was to examine the intention–behavior gap within a broad scope of health-related issues and determine how the intention–behavior gap relates to motivation as a predictor of intention. Prior understanding was that intention is based on different cognitive beliefs, which then impact the intention of a behavioral change, where the focus is on attitudinal and normative motivational factors, controlling for perceived behavioral control/self-efficacy.

Their research also considered anticipated affective reactions (the reaction a person believes will occur if he or she completes/does not complete a behavior), injunctive norms (perceived pressure from others to complete the behavior), and descriptive norms (the perceived view of others about ourselves given the completed behavior) as moderating effects of behavioral intention for a health-related change. Finally, Conner et al. also included moral norms (perceived personal responsibility in completing or refusing to complete the behavior) as a possible influence on intention. Their study findings indicate that to promote health behavior change ideas, anticipated affective reactions should be included in presenting the information as a key to

influencing intention. In fact, it is the immediate effect that affect is able to bind the experience to the person, to reinforce the intended behavioral change.

Incorporating behavioral intention into their own research, Lienemann, Siegel, and Crano (2013) studied behavior intention factors when persuading people with depression to seek help without a boomerang effect causing negative stigma and depression. Depression is a treatable mood disorder that affects many areas of a person's life; left untreated, some people become suicidal. The balance is how to promote a behavioral change that does not negatively impact the public. This study included the concept of stigma. General stigma is perceived perceptions about others' negative beliefs and stereotypes. Self-stigma is the process of internalizing perceived negative attitudes and stereotypes, which plays a large role in decision making. Lienemann et al. were able to support the hypothesis that public service health campaigns that are not designed in an appropriate way could cause more general stigma and increase self-stigma. This supports the belief that both positive and negative affects must be considered in behavioral intention.

Another factor considered in behavioral intention is behavioral climate. Brown, Fry, and Little (2013) reviewed the effectiveness of the Perceived Motivational Climate in Exercise Questionnaire (PMCEQ). Their goal was to confirm the effectiveness of the PMCEQ to determine the type of climate that is most motivational within a gym setting so that exercise leaders can create a fitness setting that increases intention to exercise. It was asserted that an individual's perceptions about the motivational climate actually influence the individual's goal perceptions.

Motivational climates are categorized as either task involving (meaning an individual perceives that his or her best effort is recognized) or ego involving (meaning an individual perceives that only those with superior ability are recognized). Additionally, Brown et al. reviewed the Caring Climate Scale, which measures the level to which people feel their fitness center is caring. Their research supported a positive correlation between perceptions of a caring climate with task-involving climate and a negative correlation between perceptions of a caring climate with an ego-involving climate. A strength of their study was that results were equal across groups, indicating that the PMCEQ can be used for both men and women.

Behavioral change theory. Continuing the growth in understanding of behavioral change were models subsequent to HBM. Those theories later developed into self-determination theory (SDT), which is a similar concept to HBM focused on how a person views his or her need to change, how the person accepts this need, and if the person can fully endorse this need (van der Kaap-Deeder et al., 2014). The SDT model focuses on the understanding that without personal acceptance and endorsement for the need to change, most likely there will be no change, or the change will only be temporary. The two theories, though similar, are slightly different in that HBM focuses on more of the dimensions that might encourage change, such as perceived barriers to change and the social outcomes of the change.

Choi, Chung, and Park (2013) have focused their research on a third model, the transtheoretical model, which they used to understand behavior in relation to the stages of change theories. The stages of change consist of precontemplation, contemplation,

preparation, action, and maintenance. The concept is that people have to move through the progressive stages to implement and sustain a behavioral change. Additionally, some people may stay at the precontemplation stage, not realizing that they truly need to make a change. It is understanding the stages of change that practitioners can help people progress and make change.

Dishman, Thom, Rooks, Motl, Horwath, and Nigg (2009) researched the ability to use the stage of change model to measure post-action stage activity in relation to physical activity engagement. The research results included that while the post-action stage had predictive value, that it was limited and could falsify people as meeting the US Healthy People guidelines. A potential reason for negative results was the use of physical activity self-report measures, which can be imprecise. While the study did attempt to accurately classify descriptions of physical activity levels, including sedentariness, as a means of reliability, the longitudinal study had inconsistent results. It was suggested that future studies include longitudinal analysis that also attempts to assess the impact that a person's readiness to change has in adopting a new behavior change related to physical activity.

Additional research on the effective research value of stages of change was conducted by Herzog and Komarla (2011) in relation to smoking cessation. The researchers recognized that matching a person's stage to treatment approach may help people achieve their goal. The researchers concluded that while the stages are not fixed measurements, there is some value to their predictive ability. Because of the fluidity of

the stages, pre-contemplation and contemplation could be blended for future research as well as action and maintenance stages.

The growth of behavioral change theories led to the theory of planned behavior (TPB), used by Hobbs, Dixon, Johnston, and Howie (2013) in their research on physical activity. TPB focuses on cognitions that predict different behavioral beliefs. TPB is considered a parsimonious theory utilizing two proximal predictors of behavior: intention and perceived behavioral control. Research has found that intention is affected by beliefs and attitudes regarding a particular behavior, subjective beliefs, and behavioral control. The research conducted by Hobbs et al. targeted physical activity intention with results indicating that TPB can predict behavioral intention within individuals; however, TPB has limitations in that predictions are more accurate the closer in time the intention is to the event. Owing to perceived strengths and limitations of behavior change theories in predicting behavioral intention, research continued with a new model.

The model of goal-directed behavior (MGDB) developed from the TPB and includes the emotion of desire (Esposito, van Bavel, Baranowski, & Duch-Brown, 2016). The inclusion of desire in behavior change theory incorporates people's wish to do something rather than just their feeling of obligation to do something (Esposito et al., 2016). The MGDB includes subjective norms (perceived social pressure), positive anticipated emotions (positive consequences), and negative anticipated emotions (negative consequences), which can influence behavioral intention (the likelihood that a person will engage in a specific behavior change), allowing perceived effectiveness to be measured (Esposito et al., 2016).

This study will measure the PE of each message foci by comparing stage of change readiness, the participant positive and negative affective responses, and how the participants rate the effectiveness of each PSA. Prior research by Bigsby et al. (2013) supports the understanding that cognitive and emotional responses can predict intention to engage in a new behavior, a predictor of PE. This behavioral change model, previously tested with physical activity, can help inform researchers about the intellectual and emotional aspects of information processing within each person that may lead to a positive behavioral change.

Conceptual Framework for Public Service Announcements

Efficacy of Public Service Announcements

Video PSAs have been found to be an effective tool for communicating information in a persuasive way. The Ad Council (2017) reported several significant and measurable changes to society because of video "commercial" public health ad campaigns. Some notable changes have been in the areas of autism awareness, children's oral health, and gay and lesbian bullying prevention. Selfe and Selfe (2008) researched the benefits of multimodal forms of learning and of the PSA to learning and education. In multimodal learning, educators use multiple forms of communication, such as video clips, blogs, radio, screen, and animation, to convey a message. Selfe and Selfe indicated that people learn about and understand the world using different models of communication and that literacy is not static, meaning that information is discovered, changes, and accumulates through people's interactions. PSAs are an effective

communication platform because they are typically less than a minute in duration, aimed at real audiences, and can reach many educational levels (Selfe & Selfe, 2008).

Furthering the research on PSAs, Shen (2010) researched the message frame in video PSAs and how it affected individuals' cognitions and attitudes. Shen's targeted behavioral change was smoking cessation. Participants in the study viewed four randomized videos for three different PSAs, each with a different message frame: health consequences, secondhand smoke, and industry manipulation. Message frame was identified as a central organizing idea or story line that provides meaning or context to the information. To determine message frame affect, Shen reviewed measures of discrete emotions (emotional reactions), cognitive responses (thought processes), affective responses (participant response to the message) from the cognitive response data, relevance of cognition (to screen for irrelevant data), cognitive themes (health consequences, secondhand smoke, and tobacco industry), message sensation value (the value of the features within the video), attitude toward smoking, and smoking behavior. Results confirmed that message frame does impact the response to video PSA message, with a strong indicator for the application effect in framing. Also, individual cognitions of health consequences were found to predict attitudes.

Creating Behavioral Change

Santa and Cochran (2008) researched the use of video PSAs with the goal of informing future video PSA developers on best practices to create behavioral change. The purpose of their study was to determine if differing message foci had differing influences on viewers that could lead to behavioral change. Message focus was considered to be the

character of the emotional response viewers would have to the PSA, influencing viewers' decision making. Santa and Cochran used PSAs with an empathy focus to the message, a fear focus to the message, and a basic information focus to the message. As a comparison against the independent variables, negative affect, positive affect, and perceived effectiveness of message were all used as dependent variables. In the end, they found that PSAs with an empathy focus evoked the most negative affect, creating the most significant intention to engage in behavioral change.

Bigsby, Cappella, and Seitz (2013) suggested that being able to measure message effectiveness of the PSA would be useful for creators of public health campaigns as well as for researchers wanting to evaluate message effectiveness. Bigsby et al. focused on the importance of message effectiveness, suggesting longitudinal testing would be the most informative approach to confirm message effectiveness; however, the reality of longitudinal testing would be prohibitive to confirming actual effectiveness (AE). With the recognition that longitudinal testing is prohibitive, their research focused on the concept of perceived effectiveness (PE) of persuasive PSA messages. Using smoking cessation as their target behavioral change, the researchers were able to determine that PE is an indicator of AE. The study focused on emotions as variables (fear, pride, hope, guild, and anger) and included readiness to quit (motivation) to derive an aggregate PE score. Additionally, the researchers found that messages that were perceived as more effective by viewers influenced those viewers with an intention to engage in the new behavior that was consistent with the message, even when the message was considered difficult, such as in the area of smoking cessation. The limitation of the study was the use

of self-reported measures rather than longitudinal testing to confirm actual behavior change.

Austin, Muldrow, and Austin (2016) researched media literacy and different personality types to determine the effectiveness of media advertising. They reviewed two different groups of people: those who have a need for cognition (NFC) and those who have a need for affect (NFA). The researchers found that NFC individuals process information messages actively and analytically, whereas NFA individuals process information messages passively, affectively, and holistically. In their review, Austin et al. recognized that decision making is a learned skill using both cognitive and affective components of information. As information is gathered, individuals consider alternative ideas, qualities of the persuasive argument, and potential outcomes.

Health Communication

Health communication is necessary to forward information from government or professional agencies to the public. However, when the delivery method is not consistent with the communities' ability to process, there could be negative effects. Already mentioned earlier, Lienemann et al. (2013) reviewed the boomerang effect of PSAs and depression, in which the information is delivered in a way that stigmatizes the consumer and has a negative effect on depression and reduces behavioral intention to change.

There has been a growing understanding of the relationship between communication theories and actual health communication. Ruben (2016) focused on the needs of consumers to gain information from their health care practitioners, but with an understanding that information needs to be delivered in an effective, patient-centered

way. It has been understood that in a patient and practitioner setting, the power dynamic is different in that the goal of the practitioner may be different than the goal of the patient. In fact, the practitioner will speak from a viewpoint of what is best from a health perspective, but the patient may listen from a lifestyle perspective. Complicating the health communication is the reliability of the practitioner, possible alternative perspectives of family members, and potential misunderstandings arising from cross-cultural differences. It is important that research continues in a direction that promotes understanding of best practices in conveying health information to patients and the public.

Formative research should continue so that theoretically and empirically based health communication can be developed in an appropriate way to promote healthy lifestyles. Epton et al. (2015) used the TPB to create a three-phase research study. The study attempted to identify modal salient beliefs (the most commonly held beliefs) about fruit and vegetable intake, physical activity, binge drinking, and smoking to determine which beliefs predicted intention/behavior and the reasons underlying each belief that was targeted to a health message. The study confirmed prior research that health communication should target modal salient beliefs and intention to produce a desire for a new targeted behavioral change. A goal of this study is that future disseminators of heath communication messages can use this study as a model for developing health communication messages that have both a theoretical and empirical basis for a target population.

Friederichs et al. (2014) analyzed the development of the I Move computer-based physical activity program aimed at increasing the desire to maintain a physically active lifestyle. While the I Move program used SDT and motivational interviewing as a foundation, rather than traditionally used behavior change models, the goal of the developers was to increase health communication in a way that promoted an intention to engage in and maintain physical activity with a person-centered approach. Additionally, the research supports a growing trend within physical activity health communication: that information needs to be developed in a theoretical and empirical way, which will increase the likelihood of its effectiveness.

Message Focus

Independent Variables Empathy, Fear, Information, and Combination Approach

Santa and Cochran (2008) researched video PSAs and how the communication process within the PSA has a direct effect on intention to engage in a targeted behavior. They studied the effectiveness of existing video PSAs promoting anti–drinking and driving. Using existing PSAs, they found three common message focus areas: empathy, fear, information, and combination messages. These four focus areas are the independent variables that are used to determine how participants' emotional responses to the message foci influence PE of the message, creating a behavioral intention to change to the targeted behavior. To determine created behavioral intention, dependent variables of PE, negative affect, and positive affect were measured.

Overall, the results show that each message focus area elicits distinct responses for PE and positive affect. The message focus of empathy was found to be more effective

at eliciting a response than fear, and fear was found to be more effective than information messages. Santa and Cochran also discovered that the message focus would elicit different response based on the personalization of the topic. For example, people with previous driving under the influence (DUI) convictions had different PE than those persons without previous DUIs; in fact, the message had less effectiveness. This demonstrates that the message has to resonate with the public.

Message Response

The dependent variables of PE, negative affect, and positive affect influence behavioral intention. Studying the effects of genetics on behavior, Schutte, Bartels, and de Geus (2014) discussed how genetics may have a bidirectional relationship between mental health and exercise behavior. After completing a meta-analysis, the authors referenced twin genetic studies where it was found that twins have similar anxiety and depressive symptoms, but that the one twin who exercised had fewer symptoms. The culmination of the research suggests that genetic factors may influence lower levels of exercise behavior as well as anxiety and depressive symptoms.

Despite a possible genetic predisposition, research has also shown that the net positive effects of exercise, when greater than the net negative effects, can still enhance mood and are likely, then, to be repeated. This information has been supported by studies showing that a positive affective response during exercise is also associated with a greater voluntary participation to exercise at moderate to vigorous levels. Finally, supporting the behavioral change associated with regular exercise is the social–psychological effect that makes some individuals more inclined to regular physical

activity than others. Additionally, there are psychological gains, such as higher levels of self-confidence and self-efficacy, that enhance a positive affect and desire to engage in physical activity.

In looking at the role that negative and positive affects play in maintaining a healthful lifestyle, Taylor and Pescatello (2016) reviewed the relationship between affect and physical activity in older age adults (65 years and older). Their meta-analysis focused on three themes: the role of perceived value, enjoyment is key, and the impact of experience. The first theme, the role of perceived value, highlighted that older adults are more motivated for physical activity if they perceive a significant value, such as health benefits.

The second theme, enjoyment is key, highlighted that older adults prefer to gain enjoyment and emotional and social satisfaction in the physical activity. The third theme, impact of the experience, indicates that older adults place a high level of importance on the overall experience, feeling confident, and being able to sustain the activity. All the themes play a critical role in whether older adults have a positive or negative affective view of the physical activity, which will impact their desire to continue.

Chapter Summary

The present study contributes to the research in the areas of physical activity promotion, the promotion of a healthier lifestyle through physical activity, the improvements to public health communication, and public service announcement development. It is hypothesized that video PSAs with different message foci can elicit a behavioral intention to engage in physical activity if the message resonates with the

viewer. It is also predicted that the amount of time a person currently spends exercising will moderate the perceived effectiveness of the video PSAs. And finally, that a person's readiness to change may also affect their perceived effectiveness of the video PSAs.

Strengths of Prior Research

Overall, the strengths of prior research demonstrate that effective and targeted health communication is key to influencing a new behavior. Using health communication theory with behavioral change theory to develop a PSA appears to create the balance needed in public health communication platforms. Additionally, PSAs matching message foci to targeted behaviors tend to resonate more with the public, creating an intention to engage in a new behavior.

Weaknesses of Prior Research

A potential weakness of prior studies is that there is no consistent research format for testing behavioral intention to engage in physical activity. Also, prior research has indicated that PSAs used for research may have been created without confirmation of development foundation, and therefore each PSA could have been created with a different theory or model, thus making them inconsistent. Finally, as with most experimental research targeting physical activity, there are not many longitudinal studies, and therefore actual change cannot be confirmed. The most the studies test is intention to change; they do not test actual change. Future research in the area of physical activity could benefit from replicating PE studies and employing longitudinal practices.

Chapter 3: Research Method

Introduction

Across the world, many populations do not meet the minimum PA guidelines and live a sedentary lifestyle, resulting in physical inactivity being the fourth leading cause of death worldwide (Friederichs et al., 2014). Within the United States, approximately 35 states reported that between 17% and 29% of American adults engaged in no leisure-time PA in 2015 (CDC, 2016). Owing to the health risks associated with physical inactivity, public health officials should consider the developmental requirements for communicating public health information in a way that is both informative and motivating.

Video PSAs have become an effective method for presenting public health information to the public (Ad Council, 2017). I was interested in whether development of PSAs with different message foci could elicit distinct responses in areas of PE and affective response. Additionally, I explored which message focus area, empathy, fear, information, or a combination, results in the highest level of PE for intention to engage in PA.

The purpose of this study was to examine how the affective and information design of video PSAs for a public health campaign could affect future levels of physical activity among viewers. Within the study I tested whether message foci within a video PSA could influence viewers' intention to engage in physical activity. I hypothesized that video PSAs would influence a behavioral intention to engage in physical activity if the PSAs' message focus resonates with viewers.

This chapter includes the research design and approach, the independent variables (message foci), the setting and the sample of participants, the method of data collection and proposed analysis. Also included is a section on participant rights and ethical concerns.

The sample and participant section include information regarding Survey Monkey as the provider of the participants for a sample of the adult public in the United States 18 years old and older who did not meet the WHO minimum standards for physical activity.

Research Design and Approach

For this research study, I created four video PSAs with different message foci (empathy, fear, information, and a combination), using the MGDB as a framework for the message. The same framework in developing the four PSAs is being utilized to ensure that the PSAs were consistent, allowing for testing the only difference, message focus, to determine which PSA was most effective in eliciting intentions to engage in increased PA. The message foci of empathy, fear, and information are selected due to prior PSA research conducted by Santa and Cochran (2008). The message focus of combination is being added due to research on cognition and affect being important factors is changing exercising beliefs and habits (Conner, Rhodes, Morris, McEachan, & Lawton, 2011).

A moderating factor also in consideration in the perceived effectiveness of a video PSA to promote physical activity is the current amount of time a person spends exercising per week. Bussmann and van den Berg-Emons (2013) suggested that there are many factors that influence amounts of physical activity and sedentary lifestyle. Looking at the amount of time a person is currently engaged in prior to viewing PSA's may show

a moderating factor is the persuasiveness of the videos. As a covariate to my research questions, the current behavioral "stage of change" that someone is in is also being considered in potentially influencing the perceived effectiveness of the PSA videos. Developed by Choi, Chung, and Park (2013), stage of change is a framework for moving through the behavioral change process. Prior research has shown that the farther along the stage of change, the more likely the readiness for change is (Santa & Cochran, 2008). Due to the fluidity of the actual stages, for this research study, only the contemplation stage and action stage are being used as covariates.

Prior research studies that tested the effectiveness of PSAs in promoting health behavior change—in areas of health other than PA—typically used college students, and although the results of these studies are valid and beneficial, Bigsby et al. (2013) suggested that nationally representative adult samples are necessary for better understanding.

The survey is being completed online. The survey is being built within the Survey Monkey structure. A copy of questionnaires, scales, and permissions are included in Appendix D-I. A copy of the story board with dialogue is included in Appendix B.

Participants and Sample Size

I utilized a web survey using a national convenience sampling. For this study I am recruiting participants via Survey Monkey (i.e., a website utilizing prescreened respondents who have expressed a willingness to participate in surveys). Survey Monkey is a provider of research, business, and other types of surveys and is designed to reach a specific audience within a geographic area. The research study was limited to only adults

(18 years of age and older), with a demographic to account for people who already meet the physical activity recommendations promoted by the WHO of engaging in PA more than 150 minutes per week. Survey Monkey was useful because it also allowed for easy distribution and acknowledgement of the informed consent.

Survey Monkey is known for having participants represent a broad range of people and is advertised as representative of the population with the United States. However, because the application is web-based, the participant population may be slightly askew as participants must have Internet access to participate. The participants are also people who are willing to take such surveys; therefore, the participant pool may include more people who are slightly more educated and have slightly higher income levels than the average person.

Based on a sample size calculation for an anticipated medium effect size of .25, power of .8 and probability level of .05, and based on a minimum of four predictors or independent variables, the minimum sample size for ANOVA required would be 180. Using the same factors for MANOVA a minimum sample size would be 129 and for ANCOVA a minimum sample size would be 25.

Based on research on sample size and recent trends in under-sampling in social science research, Anderson, Kelley, and Maxwell (2017) suggest careful review of effect size and power. To ensure all analysis meets correct sample size with a small to medium effect, a sample size of 200 was collected (100 men and 100 women). Using 100 men and 100 women resulted in generalizable data specific to gender based on prior research (Bhui & Fletcher, 2000, Santa & Cochran, 2008).

Participants completed a demographic questionnaire and the University of Rhode Island Change Assessment scale (URICA) prior to viewing PSAs, participants then completed an attention question, the perceived effectiveness rating scale (PERS), rating the participants opinion of the effectiveness of the PSA, and then the Positive and Negative Affect Schedule (PANAS). Information approach, empathetic affect, fearful affect, and combination approach were measured to determine if the video PSA can influence the dependent variable of viewers' intention to engage in physical activity as measured by levels of PE of the PSAs. Participants then exited the survey upon completion of viewing all four videos and answering all post video questionnaires. At any time, a participant could have exited early and quit the survey. The results were downloaded from the Survey Monkey site in SPSS format for analysis.

The URICA is a self-reported measure that was developed at the University of Rhode Island Cancer Prevention Research Center and has been adapted and validated for exercise and was available for use for researchers without written permission. The attention question was a question used to confirm participant viewing of video PSA. This process was used by Santa and Cochran (2008). The question specific for this research study matched each video and was developed by the researcher. The PANAS, which was developed and validated for brief measures of positive and negative affect (Watson, Clark, and Tellegen, 1988) was available for researchers without permission. The PANAS was also used in prior video PSA research by Santa and Cochran. The PERS, used by Santa and Cochran (2008), is being adapted to measure perceived effectiveness of PSA promoting physical activity and was provided to use in this study.

Independent Variables

The independent variable of message focus (i.e., information, empathy, fear, and combination approach) within a video PSA is hypothesized to influence the dependent variable of viewers' intention to engage in PA. This is being measured using the PANAS scores and PSA rating questionnaire.

Prior research for video PSAs used existing PSAs for testing; however, to increase reliability of results and decrease developer inconsistencies, I developed the video PSAs for use specific to this study. The video story board (setting) is similar for all four videos, as well as actors and the roles they played. The dialogue has the MGDB as the foundation and is only different based on the message foci.

Dependent Variables

For this study, the dependent variable was the viewers' intention to engage in PA as measured by the PE of each PSA. Additionally, within this study I reviewed the moderating variable of current PA engagement measured in minutes to see if current levels of PA influenced the PE of each PSA. Finally, the covariate of the participants current stage of change readiness at the time of the study was measured by focusing specifically on the contemplation and action stage of change.

Procedures

The questionnaires and scales are being built within the Survey Monkey structure, with the PSAs randomized. Participants from Survey Monkey will be requested as a representative sample of the general adult ages 18 years of age and older residing within the United States. The Survey Monkey website will allow survey invitations to be open

the identified population of all adults across the United States. The survey also included a link that allowed for referral sampling. Invitations will be stopped when the desired number of completed surveys are reached. The results will be downloaded from the Survey Monkey site in SPSS format for analysis.

Research Questions and Hypotheses

This quasi-experimental research study is based on the overall research question do video PSAs with different message foci elicit a behavioral intention to engage in physical activity?

Research Question 1 (RQ1). Which video PSAs with different message foci (empathy, fear, information, and combination) elicits the strongest relationship between affective response (positive or negative) and perceived effectiveness to engage in physical activity?

Alternative Hypothesis (H_a1): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there is a relationship between affective score (positive or negative) as measured by PANAS and perceived effectiveness as measured by PERS?

Null Hypothesis ($H_0 1$): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there is no relationship between affective score (positive or negative) as measured by PANAS and perceived effectiveness as measured by PERS?

Research Question 2 (RQ2). Which video PSAs message foci (empathy, fear, information, and combination) elicits the greatest difference in perceived effectiveness for intention to engage in physical activity.

Alternative Hypothesis (H_a2): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there are differences in perceived effectiveness as measured by the perceived effectiveness rating scale (PERS)?

Null Hypothesis ($H_0 2$): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there are no differences in perceived effectiveness as measured by PERS?

Research Question 3 (RQ3). Does having higher amounts of time spent exercising per week effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a3): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the amount of time a person exercises per week.

Null Hypothesis ($H_0 3$): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the amount of time a person exercises per week.

Research Question 4 (RQ4). Do people in different levels of stage of change have differences in perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) to engage in physical activity.

Alternative Hypothesis (H_a4): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there will be differences in perceived effectiveness as measured by the PERS and stages of change as measured by the University of Rhode Island change assessment scale (URICA).

Null Hypothesis ($H_0 4$): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there will be no difference in perceived effectiveness as measured by the PERS and stages of change as measured by the URICA.

Research Question 5 (RQ5). Does being in contemplation-stage of change effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a5): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-contemplation as measured by the URICA sub-score.

Null Hypothesis ($H_0 5$): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-contemplation as measured by the URICA sub-score.

Research Question 6 (RQ6). Does being in action-stage of change effectively moderate the relationship between perceived effectiveness of video PSAs with different

message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a6): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-action as measured by the URICA sub-score.

Null Hypothesis ($H_0 6$): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-action as measured by the URICA sub-score.

Data Analysis

The research study included a one-way ANCOVA to determine whether people with higher amounts of time spent exercising per week will perceive video PSAs with different message foci with more effectiveness. The four PSA foci are the independent variable with the four PERS scores as the dependent variables with the covariable of the amount of time people exercise per week. The study ran non-parametric statistics, specifically, a Kendall's W test that assessed agreement among scale raters or participants. The test ranges from 0 to 1, with value 1 representing total agreement, where 0 represents no agreement. Additionally, the higher the mean rank score, the stronger the disagreement between the rankers.

Nonparametric statistics are beneficial due to their ease of use. This type of statistics can be used without the mean, sample size, standard deviation, or the estimation of any other related parameters when none of that information is available. Since

nonparametric statistics makes fewer assumptions about the sample data, its application is wider in scope than parametric statistics (Investopedia, 2018).

This study ran a one-way ANCOVA to determine whether people with higher amounts of time spent exercising per week perceived video PSAs with different message foci with more effectiveness. The four PSA foci are the independent variable with the four PERS scores as the dependent variables with the covariable of the amount of time people exercise per week. A MANOVA was run to determine if people in different levels of stage of change have differences in perceived effectiveness of video PSAs with different message foci. The 16 URICA scores (4 sub-scores for each PSA foci) are the independent variables with the four PERS scores as the dependent variable.

Finally, a one-way ANCOVA was completed to determine if people in contemplation-stage of change have differences in perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) to engage in physical activity. The four PSA message foci are the independent variables with PERS scores as the dependent variable, and a covariate of stage of change sub-score - contemplation. A one-way ANCOVA was completed to determine if people in action-stage of change have differences in perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) to engage in physical activity. The four PSA message foci were the independent variable with PERS scores as the dependent variables, and a covariate of stage of change sub-score - action.

Threats to Validity

According to Campbell and Stanley (1963), there are multiple factors that can threaten internal validity of experiments including history, maturation, testing, bias, and selection of subjects. Threats to internal validity could be impacted by testing issues; overall length of survey itself, understanding differences in the four different message foci, and openness while completing self-report assessment. Another threat to internal validity is potential bias (participants not resonating with actors or setting).

One threat to the external validity is sample selection. As mentioned previously, Survey Monkey may not have enough diversity to test all populations to generalize the results to the United States. If this occurs, generalizations may be made by geographic region or in general. External validity can be understood as the ability to generalize results to other participants, settings, and measures (Campbell &Stanley, 1963). Both internal and external validity threats have been taken into consideration for this dissertation. Specific discussions involving threats to internal and external validity will be further examined in Chapter 5.

Participant Rights and Ethical Considerations

Participants were able to opt out of this proposed study at any point during the study. Survey Monkey will only send the survey to adult participants 18 years and older. The informed consent was included at the beginning of the survey, as shown in Appendix A. There were no known risks for participants in this research study.

IRB approval was obtained from Walden University. All data from the survey instruments are being kept in a secure location. Participant surveys did not include names

or identification of personal information and were obtained in an anonymous format. All data will continue to be stored on password protected computers and all software is password protected.

Chapter Summary

This chapter described the research methodology including the use of self-administered questionnaires and assessments, study design and approach, population and sample size, data collection, data handling, data analysis, protection of human participants, and ethical concerns. Chapter 4 will describe the data collection and data analysis conducted to address the study's research question.

Chapter 4: Results

Introduction

The purpose of this quasi-experimental study was to examine how the affective and information design of video PSAs for a public health campaign may affect future levels of intention to engage in physical activity among viewers. This chapter includes a presentation of the results of the data collected. There will be a summary of the data collection procedures and an overview of the sample. The objective of this research was to answer the overall research question: Do video PSAs with different message foci elicit a behavioral intention to engage in physical activity?

Along with answering the overall research question, the results gained from this research study allowed deeper examination of the relationship between the moderating effects of the amount of physical activity engagement and the perceived effectiveness of the different message foci's. Additionally, the study allowed for additional examination of the role of stages of change as a covariate to the levels of perceived effectiveness of the video messages. A national sampling was used in this study to review generalizability of the results.

Data Collection

Primary data for this study is being collected through Survey Monkey, which is a web-based survey development and collection site. All participants were adults 18 years and older. The number of participants desired is 200 (100 male, 100 female) with 255 completing the survey, this allowed for data cleaning. Data cleaning is being performed to remove lines with incomplete responses and to remove lines where participants did not

answer the PSA “attention question” correctly. Data cleaning is necessary, but it can affect internal validity and possibly the outcome results (Wilcox, 2007). By removing results with incomplete data, the 200 results with complete data allow for consistent analysis in all areas.

Two MANOVAs are being conducted to understand the perceived effectiveness of each video message foci when compared to affective responses and when compared to overall stage of change readiness. Statistical comparison ranking is being analyzed to understand differences in perceived effectiveness of each message foci. One ANCOVA was run to understand the perceived effectiveness of message foci when moderated by amount of exercise the participants currently engage in. The other two ANCOVAs are being run to understand the perceived effectiveness of message foci when the participants were currently in the contemplation-state of change, and participants were currently in the action-stage of change.

Descriptive Statistics

The descriptive statistics are detailed in Table 1. The participants ranged in ages from 18–99 with ages being divided between seven age categories (18–24, 25–34, 35–44, 45–54, 55–64, 65–74, and 75 and older). 42% of participants were from the 25–34 age category, with 17% from the 45–54 age category, and 16.5% from the 35–44 age category. All other participants were either younger or older, with no one in the last category of 75 and older. Two hundred participants participated in the survey, 100 were men (50%) and 100 women (50%). Participants resided in 37 out of the 50 states with VA (18.5%), FL (1%), and CA (.7%) being the top for participation.

Years of education ranged from none at all to completed graduate school. 99% of participants were in category of 2 years of college or higher, with 43% of participants graduating college (4 years of college) and 16% completing graduate school. Approximate household income ranged between nine categories ($0–$24,999, $25k–$49,999, $50k–$74,999, $75k–$99,999, $100k–$124,999, $125k–$149,999, $150k–$174,999, $175k–$199,999, and $200,000 and up). 27% of participants fell into the $50k range, 26% of participants fell into the $25k range, and 19% of participants fell into the $0 range. Participants with children in the home under 18 years of range was 34%.

Table 1

Demographic Characteristics of the Sample

Variable	N	Range	Minimum	Maximum	Kurtosis	
					Statistic	Std. Error
Gender	200	1	1	2	-2.020	.342
Age	200	5	1	6	-.428	.342
Child in home < 18	200	1	1	2	-1.519	.342
Education Level	200	16	3	19	10.036	.342
State of Residence	200	50	1	51	-1.547	.342
Household Income	200	8	1	9	1.527	.342

Finally, the covariate variable of number of minutes of physical activity engaged in each week, over the past 2 weeks ranged from 1 minute–more than 150 minutes as illustrated in Table 2. Results showed 49% of participants reported 60 min or less of physical activity each week.

Table 2

Descriptive Statistics of Moderating Variable

Covariate	Frequency	Percent	Valid Percent	Cumulative Percent
1-30 minutes	49	24.5	24.5	24.5
31-60 minutes	49	24.5	24.5	49.0
61-90 minutes	29	14.5	14.5	63.5
91-120 minutes	28	14.0	14.0	77.5
121-150 minutes	18	9.0	9.0	86.5
> 150 minutes	27	13.5	13.5	100.0
Total	200	100.0	100.0	

Measurement Tools

The University of Rhode Island Change Assessment Scale, adapted for exercise, was used to understand participants readiness for change illustrated in Table 3. This is being conducted prior to video watching. After viewing each PSA, the Perceived Effectiveness Rating Scale was used to measure perceived effectiveness of each message foci illustrated in Table 4. The final assessment was the Positive and Negative Affect Schedule was used to measure participant affect illustrated in Table 5.

Table 3

Descriptive Statistics of Independent Variable – University of Rhode Island Change Assessment; Exercise Stage of Change

Variables	N	Mean	SD	Kurtosis Std.Error
PreCont-NoBelief in Exercise	200	13.19	2.695	.342
PreCont-Belief in Exercise	200	14.63	2.543	.342
Contemplation	200	13.75	2.120	.342
Action	200	11.51	2.189	.342
OverallReadiness	200	26.41	3.739	

Table 4

Descriptive Statistics of Independent Variable – Perceived effectiveness of Video PSA via results of Perceived Effectiveness Rating Scale

Variables	N	Mean	SD	Kurtosis Std.Error
PSAInfo	200	2.85	.466	.342
PSACombo	200	2.92	.395	.342
PSAEmpathy	200	2.97	.413	.342
PSAFear	200	2.93	.464	.342

Table 5

Descriptive Statistics of Dependent Variable – Positive and Negative Affect Schedule

Variables	N	Mean	SD	Kurtosis Std.Error
Positive	200	30.62	8.764	.342
Negative	200	19.37	9.124	.342

Analysis

Research Question 1 (RQ1). Which video PSAs with different message foci (empathy, fear, information, and combination) elicits the strongest relationship between

affective response (positive or negative) and perceived effectiveness to engage in physical activity?

Alternative Hypothesis (H_a1): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there is a relationship between affective score (positive or negative) as measured by PANAS and perceived effectiveness as measured by PERS?

Null Hypothesis ($H_0 1$): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there is no relationship between affective score (positive or negative) as measured by PANAS and perceived effectiveness as measured by PERS?

A one-way multivariate analysis of variance is being conducted on the influence of factor of Affect on perceived effectiveness of PSA message foci. Affect consisted of two levels (positive and negative) and message foci consisted of four levels (fear, empathy, information, and combination). All effects were statistically significant at the .05 significance. The main effect for positive affect type yielded a F ratio of $F(37, 57) = 15.35$, $p < .001$ indicating a significant difference between message foci. Negative affect type yielded an F ratio of $F(32, 57) = 23.97$, $p < .001$ indicating a significant difference between message foci with Fear (M = 2.93, SD = .464), Empathy (M = 2.97, SD = .413), Information (M = 2.85, SD = .466), and Combination (M = 2.93, SD = .396). Therefore, the null hypothesis was rejected.

The video PSA-Fear was not statistically significantly different for positive affect group $F(34, 165) = 2.037$, $p = .002$. The video PSA-Fear was statistically significantly for

negative affect group F(34, 165) = 3.019, $p < .0005$. The video PSA-Empathy was not statistically significantly for positive affect group F(33, 166) = 3.075, $p < .0005$. The video PSA-Empathy was statistically significantly for negative affect group F(33, 166) = 2.888, p < .0005. The video PSA-Information was not statistically significantly different for positive affect group F(39, 160) = 2.046, $p = .001$. The video PSA-Information was statistically significantly for negative affect group F(39, 160) = 2.925, $p < .0005$. The video PSA-Combination was statistically significantly for positive affect group F(31, 168) = 2,781, $p < .0005$. The video PSA-Combination was statistically significantly for negative affect group F(31, 168) = 2.738, p < .0005.

The results indicate participants with a positive affect will view fear, empathy, and information videos more negatively, with combination score being more well received. However, participants with negative affect viewed fear, empathy, and information videos more positively, with a negative view of combination video. The null hypothesis was rejected.

Research Question 2 (RQ2). Which video PSAs message foci (empathy, fear, information, and combination) elicits the greatest difference in perceived effectiveness for intention to engage in physical activity.

Alternative Hypothesis (H_a2): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there are differences in perceived effectiveness as measured by the perceived effectiveness rating scale (PERS)?

Null Hypothesis ($H_0$2): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there are no differences in perceived effectiveness as measured by PERS?

Kendall's W was run to determine if there was agreement between of the perceived effectiveness of the four PSA message foci. The perceived effectiveness rating scale was used to determine the effectiveness of each PSA message foci according to a 5-point scale from Strongly Disagree to Strongly Agree. The participants moderately agreed in their assessments of perceived effectiveness, $W = .419$, $p < .001$ as illustrated in Table 6, so we cannot reject the null hypothesis and cannot accept the alternative hypothesis.

Table 6

Interpretation of Kendall's W

Variables	Mean Rank
PSA Info*	2.65
PSA Fear*	2.99
PSA Combo*	3.05
PSA Empathy*	1.31

**The higher the mean rank score, the stronger the disagreement between rankers.*

A Kendall's W test is a nonparametric statistical test that assesses agreement among scale raters or participants. The test ranges from 0 to 1, with value 1 representing total agreement, where 0 represents no agreement. Additionally, the higher the mean rank score, the stronger the disagreement between the rankers. The results here show that 42% of participants agree that the message foci-empathy was most effective, with PSA-Combo being the least effective.

Nonparametric statistics are beneficial due to their ease of use. This type of statistics can be used without the mean, sample size, standard deviation, or the estimation of any other related parameters when none of that information is available. Because nonparametric statistics make fewer assumptions about the sample data, its application is wider in scope than parametric statistics (Investopedia, 2018).

The analysis involved running a sample *t*-test on PSA message foci variables to determine if a statistically significant difference existed between the four different message foci: fear, empathy, information, and combination for perceived effectiveness as illustrated in Table 4. Statistical significance was set at $\alpha = .05$, two-tailed. Outliers were reviewed and the variables from this data set were then examined for normality. Skewness values were all found to be less than three and kurtosis values were found to be less than 10, indicating that there were no serious violations of normality, thus, finalizing this data set for further analysis (Kline, 2011).

Perceived effectiveness of PSA focus fear reported ($M = 2.93$, $SD = .464$, $t(200) = 89.39$, $p = 0.000$) compared to PSA focus empathy ($M = 2.97$, $SD = .414$, $t(200) = 101.62$, $p = 0.000$), compared to PSA focus information ($M = 2.85$, $SD = .466$, $t(200) = 86.55$, $p = 0.000$), and compared to PSA focus combination ($M = 2.92$, $SD = .396$, $t(200) = 104.49$, $p = 0.000$). Perneger (1998) advised that when searching for significant associations with pre-established hypotheses, rather than adjusting alpha for multiple tests, it is more appropriate to describe what analyses have been performed and why, providing interpretations of each result, and then leaving reasonable conclusions of the results up to the reader.

A Pearson correlation was run to determine the relationship between the different PSA foci. There was a strong, positive correlation between PSA Info and PSA Combo, which was statistically significant, r(200) = .716, $p < .001$. There was a strong, positive correlation between PSA Info and PSA Empathy, which was statistically significant, r(200) = .757, $p < .00$. There was a strong, positive correlation between PSA Info and PSA Fear, which was statistically significant, r(200) = .796, $p < .00$.

Research Question 3 (RQ3). Does having higher amounts of time spent exercising per week effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a3): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the amount of time a person exercises per week.

Null Hypothesis ($H_0 3$): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the amount of time a person exercises per week.

A one-way analysis of covariance was conducted on the influence of perceived effectiveness of PSA message foci moderated by the amount of exercise a participant currently exercises illustrated in Table 8. Current levels of exercise consisted of six levels (1-30 min, 31-60 min, 61-90 min, 91-120 min, 121-150 min, and over 120 min) and message foci consisted of four levels (fear, empathy, information, and combination). All effects were statistically significant at the .05 level. Results showed that 49 participants

exercised 1-30 mins per week, 49 participants exercised 31-60 minutes per week, only 29 participants exercised 61-90 minutes per week, 28 participants exercised 91-120 minutes per week, 18 participants exercised 121-150 minutes per week, and 27 participants exercised over 150 minutes per week. These results reveal that of the 200 participants over 86% exercise less than the WHO recommendation for required physical activity.

Table 7

Physical Activity Minutes Moderating Message Foci

Variables	f	Sig.
PSA Fear	1.374	.236
PSA Empathy	1.074	.376
PSA Information	.935	.460
PSA Combination	1.343	.248

There was no statistically significant difference in "physical activity minutes" score for PSA message foci-fear $F(5, 194) = 1.374$, $p = .236$, partial $\eta 2 = .237$. There was no statistically significant difference in "physical activity minutes" score for PSA message foci-empathy $F(5, 194) = 1.074$, $p = .376$, partial $\eta 2 = .184$. There was no statistically significant difference in "physical activity minutes" score for PSA message foci-information $F(5, 194) = .935$, $p = .460$, partial $\eta 2 = .213$. There was no statistically significant difference in "physical activity minutes" score for PSA message foci-combination $F(5, 194) = 1.343$, $p = .248$, partial $\eta 2 = .185$. Overall results are illustrated in Figure 2.

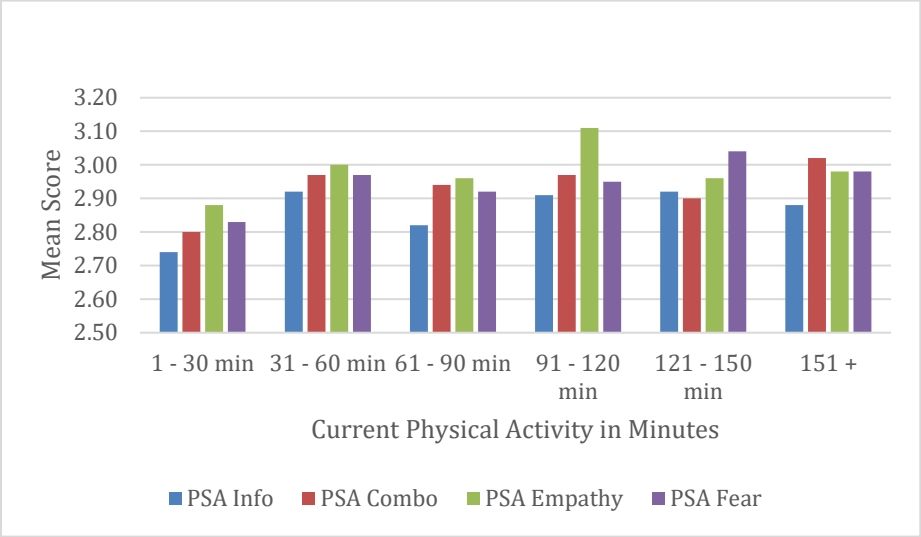


Figure 2. Participants who exercise. Participants mean response per PSI message foci as compared to the amount of physical activity they engage in per week.

The results indicate participants who currently engage in physical activity have a 23% certainty to correlate perceived effectiveness with Fear PSA, participants who currently engage in physical activity have a 21% certainty to correlate perceived effectiveness with Information PSA, participants who currently engage in physical activity have a 18% certainty to correlate perceived effectiveness with Empathy PSA, participants who currently engage in physical activity have a 18% certainty to correlate perceived effectiveness with Combination PSA, The null hypothesis has been rejected.

Research Question 4 (RQ4). Do people in different levels of stage of change have differences in perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) to engage in physical activity.

Alternative Hypothesis (H_a4): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there will be differences in

perceived effectiveness as measured by the PERS and stages of change as measured by the University of Rhode Island change assessment scale (URICA).

Null Hypothesis ($H_0$4): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there will be no difference in perceived effectiveness as measured by the PERS and stages of change as measured by the URICA.

In order to test the influence of readiness to change, an independent samples t-test was conducted, and the assumption of homogeneity was not met. This is indicated by the Levene's Test of Homogeneity of Variances, PSA Fear $F(25, 165) = 1.79$, $p = .020$, PSA Empathy $F(25, 165) = 1.60$, $p = .045$, PSA Information $F(25, 165) = 1.71$, $p = .026$, PSA Combination $F(25, 165) = 2.01$, $p = .005$.

PSA Fear with an alpha level of .05, p (.020) < α (.05), which indicates significance, the null hypothesis (no variance difference) is rejected – as such, indicating that the assumption of homogeneity of variance is not met. PSA Empathy with an alpha level of .05, p (.045) < α (.05), which indicates significance, the null hypothesis (no variance difference) is rejected – as such, indicating that the assumption of homogeneity of variance is not met. PSA Information with an alpha level of .05, p (.026) < α (.05), which indicates significance, the null hypothesis (no variance difference) is rejected – as such, indicating that the assumption of homogeneity of variance is not met. PSA combination with an alpha level of .05, p (.005) < α (.05), which indicates no significance, the null hypothesis (variance difference) is accepted – as such, indicating that the assumption of homogeneity of variance is met.

A one-way multivariate analysis of variance was conducted on the influence of readiness to change, as measure by the URICA and the perceived effectiveness of PSA message foci. There was no statistically significant difference in "readiness to change" score for PSA message foci-fear $F(34, 199) = 5.604$, $p < .005$. There was no statistically significant difference in "readiness to change" score for PSA message foci-empathy $F(34, 199) = 4.426$, $p < .005$. There was no statistically significant difference in "readiness to change" score for PSA message foci-information $F(34, 199) = 5.296$, $p < .005$. There was no statistically significant difference in "readiness to change" score for PSA message foci-combination $F(34, 199) = 3.385$, $p < .005$. Therefore, the null hypothesis is supported. Overall these results demonstrate that people who have an overall readiness to change belief in physical activity may view the fear PSA as most effective as illustrated in Figure 3.

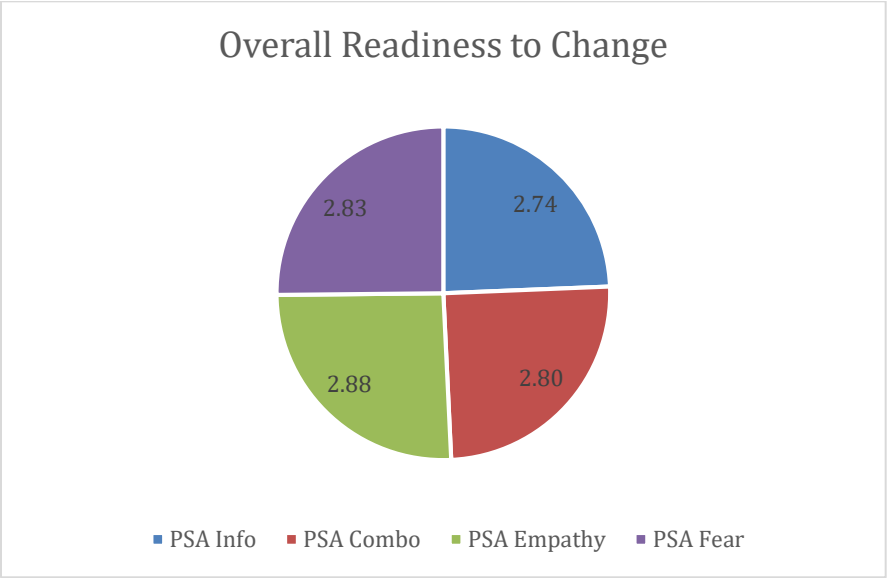


Figure 3. Participants overall readiness to change while view the four PSA videos.

Research Question 5 (RQ5). Does being in contemplation-stage of change effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a5): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-contemplation as measured by the URICA sub-score.

Null Hypothesis (H_05): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-contemplation as measured by the URICA sub-score.

In order to test the influence of stage of change-contemplation, an independent samples t-test was conducted, and the assumption of homogeneity was not met. This is indicated by the Levene's Test of Homogeneity of Variances, PSA Fear $F(34, 165) = 2.09$, $p = .001$, PSA Empathy $F(34, 165) = 1.42$, $p = .079$, PSA Information $F(34, 165) = 1.73$, $p = .013$, PSA Combination $F(34, 165) = 2.20$, $p = .0001$.

A one-way analysis of covariance was conducted on the influence of stage of change – contemplation, as measure by the URICA and the perceived effectiveness of PSA message foci. There was no statistically significant difference in "stage of change – contemplation" score for PSA message foci-fear $F(1, 163) = .232$, $p = .631$. There was no

statistically significant difference in "stage of change – contemplation" score for PSA message foci-empathy F(1, 163) = 2.032, p = .158. There was no statistically significant difference in "stage of change – contemplation" score for PSA message foci-information F(1, 163) = 4.002, p = .047. There was no statistically significant difference in "stage of change – contemplation" score for PSA message foci-combination F(1, 163) = .231, p = .631. Therefore, the null hypothesis is supported.

Overall these results demonstrate that people in contemplation stage of change may view the information PSA as most effective as illustrated in figure 4.

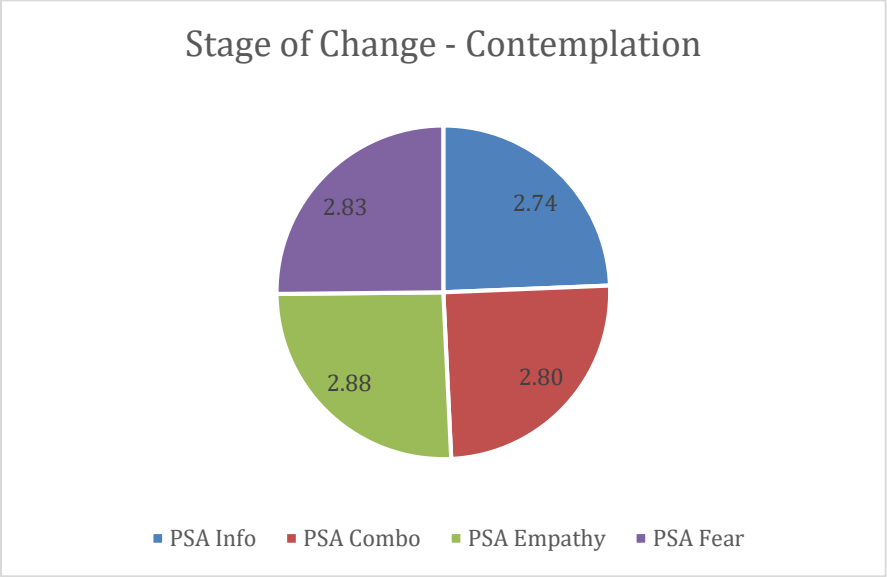


Figure 4. Participants in contemplation – stage of change while view the four PSA videos

Research Question 6 (RQ6). Does being in action-stage of change effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a6): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-action as measured by the URICA sub-score.

Null Hypothesis ($H_0 6$): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-action as measured by the URICA sub-score.

In order to test the influence of stage of change-action, an independent samples t-test was conducted, and the assumption of homogeneity was not met. This is indicated by the Levene's Test of Homogeneity of Variances, PSA Fear $F(34, 165) = 2.09$, $p = .001$, PSA Empathy $F(34, 165) = 1.42$, $p = .079$, PSA Information $F(34, 165) = 1.73$, $p = .013$, PSA Combination $F(34, 165) = 2.20$, $p = .0001$.

A one-way analysis of covariance was conducted on the influence of stage of change – action, as measure by the URICA and the perceived effectiveness of PSA message foci. There was no statistically significant difference in "stage of change – action" score for PSA message foci-fear $F(1, 163) = 12.96$, $p < .005$. There was no statistically significant difference in "stage of change – action" score for PSA message foci-empathy $F(1, 163) = 29.06$, $p < .005$. There was no statistically significant difference in "stage of change – action" score for PSA message foci-information $F(1, 163) = 42.80$, $p < .005$. There was no statistically significant difference in "stage of change – action" score for PSA message foci-combination $F(1, 163) = 9.44$, $p < .005$. Therefore, the null

hypothesis is supported. Overall these results demonstrate that people in action stage of change may view the information PSA as most effective as illustrated in figure 5.

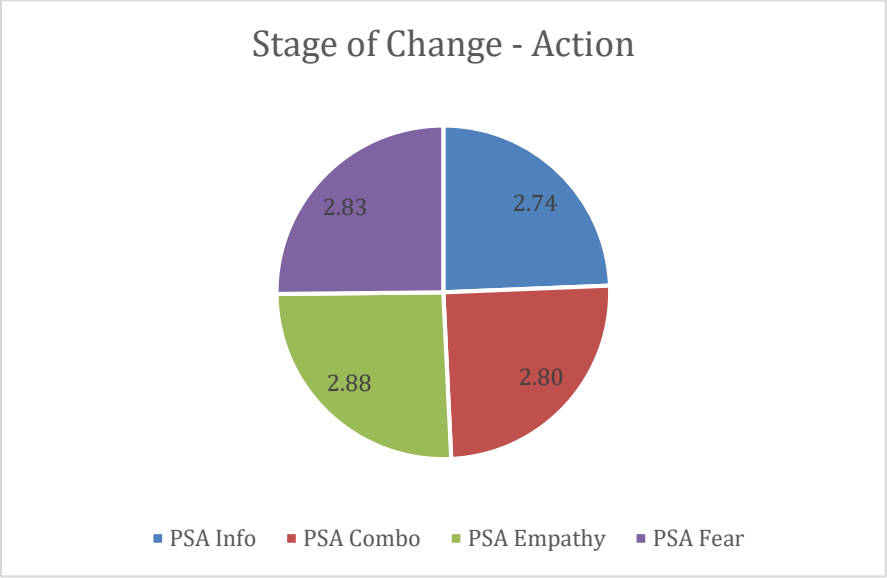


Figure 5 Participants in action – stage of change while view the four PSA videos

Additional Findings

Results indicated there was a positive, although minimal difference in the scores for females as compared to males for all message foci area as seen in Table 9. This is significant because PSAs can be designed based on message and not gender. In previous research Santa and Cochran (2008) found that females had a higher response to PSAs that effect the greater social good, rather than individualism. The results of this study resulted in both men and woman being more influence by the empathy PSA, with woman having a slightly higher response.

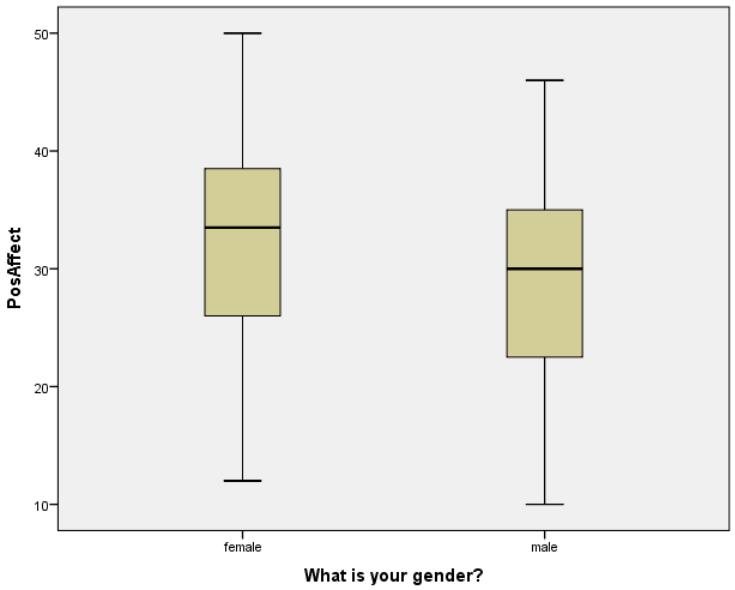
Table 8

Gender to PSA Message Foci

Variables		PSA Info	PSA Combo	PSA Empathy	PSA Fear
Female	Mean	2.89	2.94	3.02	2.95
	N	100	100	100	100
	SD	.539	.442	.486	.545
Male	Mean	2.81	2.91	2.93	2.92
	N	100	100	100	100
	SD	.378	.346	.414	.368

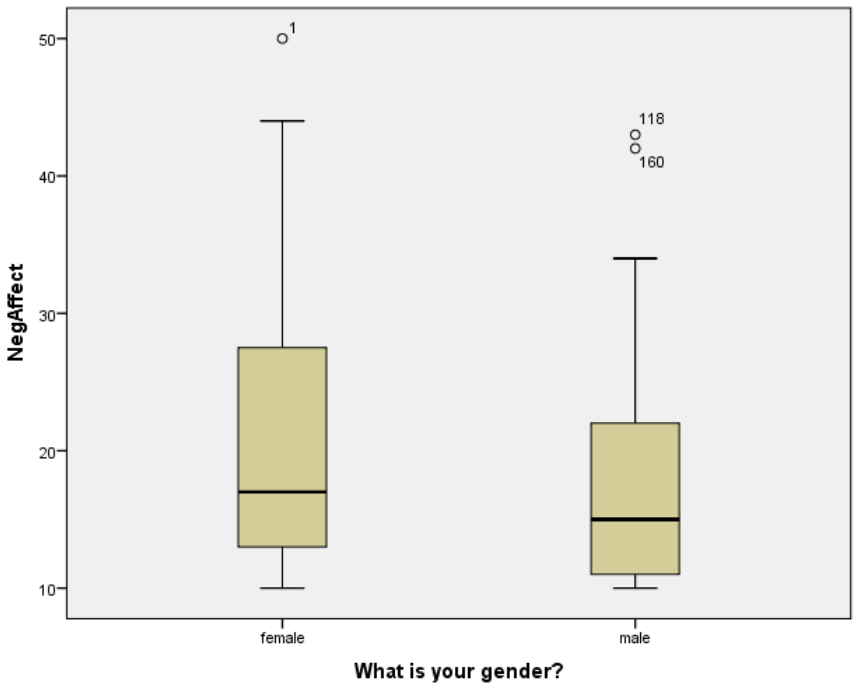
A boxplot can show whether a data set is symmetric (roughly the same on each side when cut down the middle) or skewed (lopsided). A symmetric data set shows the median roughly in the middle of the box. The results in Figure 6 show that there is more of a spread for both men and woman, when they have a positive affect. There were no outliers in the data, as assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box for people with Positive Affect.

Figure 6 Boxplot Positive Affect



For the negative affect there are outliers in the data, as assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box. The results in Figure 7 show that there is more of a spread for both men and woman, when they have a negative affect.

Figure 7 Boxplot Negative Affect



Summary of Results

The results of this study indicate differences in perceived effectiveness between the different message foci (fear, empathy, information, and combination). Overall the video PSA Empathy was viewed as most effective, while the video PSA information message was viewed as least effective. Results indicated via the PANAS that 61% of participants had a positive affect while watching the four PSA videos.

Stage of change results indicate over 28% of participants where in pre-contemplation (unaware that a change is needed), with 13% having no thoughts regarding exercise. Only 11% of participants were in the Action, Stage of Change. This was a presentation of the findings from data collected during this study. Section 5 is a discussion of the significance of the findings, interpretations, recommendations, suggestions for further research, and the implications for social change as a result of this research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

PSAs are messages of public interest, provided via media outlets at no cost to the public, designed to inform by raising awareness, to change public attitudes, and/or to change behavior toward a social issue (Bigsby, Cappella, & Seitz, 2013). In this study, I looked at message focus area as a means to determine if perceived effectiveness is a result of the core message. My approach was similar to a study conducted by Santa and Cochran (2008) targeting the message focus area "stop drinking and driving", as a way to reduce DUIs.

Rather than using pre-existing video PSAs I used video PSAs that I created specifically for this study. To continue the research in message focus area, this study included the focus area of empathy, fear, and information messages. The combination focus area is included to determine any correlations between fear, empathy or information approaches.

In the development process of the video PSAs, prior research is being reviewed to determine which behavior change model would be most effective as a core foundation for promoting change. The MGDB is being used as a theoretical framework for the study and as the framework for PSA development. This model included desire in behavior change theory which incorporates people's wish to do something rather than just their feelings of obligation to do something (Esposito et al., 2016). The MGDB includes subjective norms (perceived social pressure), positive anticipated emotions (positive consequences), and negative anticipated emotions (negative consequences), which can influence behavioral

intention (the likelihood that a person will engage in a specific behavior change), allowing PE to be measured (Esposito et al., 2016).

The development of the four PSAs using the MGDB allows for parallel reliability between the PSAs themselves. Parallel reliability can increase dependability in results (Trochim, 2006). Each dialogue included the feeling of desire by the main actor. This assured that not only was each message foci distinct but conveyed the wish to engage in physical activity. To increase consistency in testing, the same actors and setting were used to ensure the only difference between PSAs was the message foci area (empathy, fear, information, or combination). This allows for future researchers to retest results without having to locate the same or new PSAs that were developed by different sources.

This quasi-experimental research study was based on the overall research question do video PSAs with different message foci elicit a behavioral intention to engage in physical activity?

I addressed the following research questions and hypotheses:

Research Question 1 (RQ1). Which video PSAs with different message foci (empathy, fear, information, and combination) elicits the strongest relationship between affective response (positive or negative) and perceived effectiveness to engage in physical activity?

Alternative Hypothesis (H_a1): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there is a relationship between affective score (positive or negative) as measured by PANAS and perceived effectiveness as measured by PERS?

Null Hypothesis ($H_0$1): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there is no relationship between affective score (positive or negative) as measured by PANAS and perceived effectiveness as measured by PERS?

Research Question 2 (RQ2). Which video PSAs message foci (empathy, fear, information, and combination) elicits the greatest difference in perceived effectiveness for intention to engage in physical activity.

Alternative Hypothesis (H_a2): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there are differences in perceived effectiveness as measured by the perceived effectiveness rating scale (PERS)?

Null Hypothesis ($H_0$2): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there are no differences in perceived effectiveness as measured by PERS?

Research Question 3 (RQ3). Does having higher amounts of time spent exercising per week effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a3): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the amount of time a person exercises per week.

Null Hypothesis ($H_0$3): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the amount of time a person exercises per week.

Research Question 4 (RQ4). Do people in different levels of stage of change have differences in perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) to engage in physical activity.

Alternative Hypothesis (H_a4): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there will be differences in perceived effectiveness as measured by the PERS and stages of change as measured by the University of Rhode Island change assessment scale (URICA).

Null Hypothesis ($H_0$4): When comparing video PSAs with different message foci (empathy, fear, information, and combination) there will be no difference in perceived effectiveness as measured by the PERS and stages of change as measured by the URICA.

Research Question 5 (RQ5). Does being in contemplation-stage of change effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a5): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-contemplation as measured by the URICA sub-score.

Null Hypothesis ($H_0$5): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-contemplation as measured by the URICA sub-score.

Research Question 6 (RQ6). Does being in action-stage of change effectively moderate the relationship between perceived effectiveness of video PSAs with different message foci (empathy, fear, information, and combination) and behavioral intention to engage in physical activity.

Alternative Hypothesis (H_a6): There is a significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-action as measured by the URICA sub-score.

Null Hypothesis ($H_0$6): There is no significant effect of video PSA foci (empathy, fear, information, and combination) on perceived effectiveness as measured by the PERS when controlling for the stage of change-action as measured by the URICA sub-score.

Using this quasi-experimental quantitative study, I was able to compare different video PSA message foci (fear, empathy, information, and combination) to determine perceived effectiveness in promoting physical activity. Because of this study's design, paired sample t-tests are being completed to measure change in perceived effectiveness of PSA message foci.

Analysis of variance is being completed to investigate if and how the perceived effectiveness was influenced by gender, amount of time participants currently engaged in physical activity, their current affect, and their current stage of change readiness.

Interpretation of Findings

Review of Findings

The premise for this study is that when informing the public about the importance of physical activity, if video public service announcement message focus resonates with viewers; developers and public health officials could predict an increase in physical activity. Four video public service announcements with difference message foci (fear, empathy, information and combination), had different results in perceived effectiveness of the message. There was a statistically significant difference between the perceived effectiveness scores; PSA Fear ($M = 2.93$, $SD = .464$, $p < .001$), PSA Empathy ($M = 2.97$, $SD = .413$, $p < .001$), PSA Information ($M = 2.85$, $SD = .466$,), and PSA Combination ($M = 2.92$, $SD = .395$, $p < .001$).

Kendall's W is being run to determine if there was agreement between 200 survey participant's judgement on the perceived effectiveness of each video message foci. The four message foci were rated according to the PERS. Overall the 200 participants moderately agreed in their assessments: $W = .419$, $p < .001$. Ranking order was empathy, information, fear, and combination.

A one-way analysis of covariance is being conducted to determine the moderating effects of the amount of physical activity participants currently engaged in. Participants perceived the PSA message foci differently, with the Fear PSA being perceived as the

most effective Fear (M = 1.37, p = .236), PSA Combination (M = 1.34, p = .248), PSA Empathy (M = 1.07, p = .376), and PSA Information (M = .935, p = .460).

Overall results indicated that 86% of participants did not meet the minimum physical activity requirements recommended by the WHO. Of those participants who currently exercised 150 minutes or more, perceived PSA Combination (M = 3.02, p = .396) was perceived as most effective, with empathy (M = 2.98, p = .409) and fear (M = 2.98, p = .353) close behind, and information (M = 2.85, p = .466) least effective.

For participants reporting no current amount of exercise, empathy (M = 2.88, p = .333) was perceived as most effective, fear (M = 2.83, p = .442) and combination (M = 2.80, p = .319) close behind, with information (M = 2.74, p = .395) least effective.

A one-way multivariate analysis of variance was conducted on the influence of readiness to change, as measure by the URICA and the perceived effectiveness of PSA message foci. PSA message foci-fear F(34, 199) = 5.604, $p < .005$, PSA message foci-empathy F(34, 199) = 4.426, $p < .005$, PSA message foci-information F(34, 199) = 5.296, $p < .005$, and for PSA message foci-combination F(34, 199) = 3.385, $p < .005$. There was no statistically significant difference in "readiness to change" score for each message foci, therefore, the null hypothesis was rejected.

Interpretations

The results of this study indicate differences in perceived effectiveness between the different message foci (fear, empathy, information, and combination). Overall, participants perceived the empathy video as more effective, followed by combination, with fear and information being perceived as least effective. These results are similar to

the Santa and Cochran (2008) study where empathy was perceived as most effective, followed by fear and information. The results indicate consistency in participant response, even with different foundational structure of PSAs and PSA message.

The results also correlate new research on public service announcements examining the relationship between message affective reactions and attitude. Through the results of this study, it is determined that if individuals perceived that the public service message was personally relevant, provided good information, and the sponsoring organization of the message was positive, that parents were more likely to encourage their children to have more physical activity in their children's lives (Crozier, Berry, & Faulkner, 2018). These findings support the results of this study, that media campaigns designed to elicit affective response can result in related attitudes.

Hogan, Mata, and Carstensen (2013) explored age differences in cognitive performance and affective experience after a single event of moderate exercise. The results demonstrated that a single event of exercise does have a positive effect on both affective experience and cognitive performance, regardless of participant age. Results from this study also indicated via the PANAS that 61% of participants had a positive affect while watching the four PSA videos. The latest research on promoting physical activity included predictors of intention, focusing on the conscious process of self-efficacy (St. Quinton, 2017). The results of this study, as well as other studies, indicate that perceived effectiveness can be measured and has aspects that promote intention.

A moderating effect in viewing the PSAs as effective was the current amount of physical activity engagement of the participant. Overall, the higher level of current

exercise engagement, the higher the perceived effectiveness of each PSA. For participants who currently meet WHO recommendations, the PSA fear was most effective, with fear being most effective for those participants right below that level, and empathy being most effective for all other levels.

In reviewing the results of this study for the impact of education on physical activity engagement, 99% of participants in this study had at least 2 years of college or more. This was not a surprise due to my use of an online survey. Survey Monkey Audience reported that Internet users may skew the participant pool toward those people that have access to Internet and computers, who are more highly educated, have higher incomes, and are younger, than the overall general population (Survey Monkey, 2018).

What was significant was that 26% of the participants had an income level of $25,000 or less. This could be a result of our population, which had 42% in the 25 – 34-year-old range. This would make sense as younger people tend to be in the lower income brackets, being new in their career fields or having less work experience, however, they may still try to be physically activity.

The results of this research study indicated that 27% of participants' household income was greater than $50,000. This is not significant because again it was expected that participants who use an online survey would have a higher income based on prior research. Shuval, Li, Gabriel, and Tchernis (2017) found in their study that participants in the higher income levels were 1.6% and 1.9% more likely to meet physical activity guidelines.

The CDC's Division of Nutrition, Physical Activity, and Obesity continues to monitor the health of Americans with a goal of improving the public's health (CDC, 2017). The reason for the continued monitoring of Americans is the rise in obesity, which has been reported to cost the U.S. health care system $147 billion annually (CDC, 2017). Secondary to obesity is the continued rise in preventable conditions or diseases, such as high blood pressure, high cholesterol, type 2 diabetes, heart disease, and certain cancers, that also increase the burden on the U.S. health care system. Thus, it is vital that the public be made aware of factors related to inactivity and be persuaded to take action.

PSAs have been found to be effective at communicating information, and research has confirmed that their effectiveness can be measured (Bigsby, Cappella, & Seitz, 2013). PSAs are currently used to promote topics such as smoking cessation, abstaining from drugs, and educating people to not drink and drive. Research has been able to measure PE, which is the ability of a person to become aware of something and make based on that new information, when information is through PSAs.

A recent study of physical activity variables resulted in new information that could help in the development of PSAs. Downs (2016) found that environmental variables can impede physical activity engagement, even for people who are highly engaged in physical activity. This may suggest that PSAs should not only take an empathetic approach but promote environmental factors that also promote (or at least do not decrease) physical activity engagement and work-life balance.

Stage of change results indicate over 28% of participants were in pre-contemplation (unaware that a change is needed), with 13% having no thoughts regarding

exercise. Only 11% of participants were in the Action, Stage of Change. This was a presentation of the findings from data collected during this study. Additional research also focused on precontemplation, recognizing that analysis of precontemplation can benefit from refinement, because current assessment of people in precontemplation could still meet WHO guidelines.

The newer concise model of stages of changes has been found to measure precontemplation to better predict people who know their behavior is unhealthy, but are apathetic to it (Lacey, & Street, 2017). This is important because participants tested under the traditional model of stages of change could meet WHO recommendations even in the precontemplation stage. Continued understanding in stages of change, especially precontemplation can help promoters of public health information tailor information dissemination in a way that is more effective.

Zhang and Yen (2015) found that physical activity overall reduces depressive symptoms for both men and women. A more specific look showed depressive symptoms effected men differently than women. It was found that physical activity ameliorates moderate depressive symptoms in men, while it ameliorates mild, moderate, and moderately severe depressive symptoms in women. This supports existing research that regular moderate physical activity can benefit both men and women's overall mental health.

Bhui and Fletcher (2000) reviewed general mood and anxiety states between men and women when physical activity was a moderating factor. It was found that while men have more of a benefit to longer periods of daily activity, both genders do benefit from

low-intensity exercise for long periods of time with a reduction in morbidity rate. It was noted that while women did have lower response rates, they also had high prevalence of anxiety and depressive states which could reflect a hormonal or physiological factor.

The results of this study confirm minimal difference in results from female to male, this is significant because PSAs can be designed based on message and not gender. In previous research Santa and Cochran (2008) found that females had a higher response to PSAs that effect the greater social good, rather than individualism. The results of this study resulted in both men and woman being more influenced by the empathy PSA, with woman having a slightly higher response, showing consistency with prior research. Another recent study found no significant change in physical activity measures when comparing men and women and age groups (Gorzelitz, Peppard, Malecki, Gennuso, Nieto, & Cadmus-Bertram, 2018) strengthening the age and gender in physical activity discussions, noting that other differentiating factors may need to be studied.

Limitations of the Study

A number of limitations should be considered when interpreting the findings presented in this study. These limitations include; single sample design, convenience sample, data collection process, age, ethnicity and socioeconomic make-up, use of self-report questionnaires, and length of the study. Many of these limitations are a product of the constraints present when conducting research in the field of psychology or in applied settings.

All measures were self-reports and therefore suffer from the common research problems such as associated with response distortion (social desirability), response bias,

introspective ability, and understanding of the question (Allen, Magee, Vella, & Laborde, 2017). New research also shows that participant self-reported measures for physical activity may well under-estimate actual activity, especially based on education and marital status, but not based on obesity status (Gorzelitz, Peppard, Malecki, Gennuso, Nieto, & Cadmus-Bertram, 2018). Additionally, the use of rating scales can create problems as people interpret scales differently, leading to measurement bias (Austin, Gibson, Deary, McGregor, & Dent, 1998). All assessments used 5-point Likert-type scales ranging from strongly agree to strongly disagree.

This limitation is an important factor because researchers have been able to determine the link between perceived effectiveness (PE) and actual effectiveness (AE), with specific focus on emotional response (Bigsby et al., 2013). Research has found that exercise climate (the feelings people have related to comfort and feeling accepted) could affect motivation and how that can be applied to the creation of PSAs (Brown, Fry, & Little, 2013). This means that future research may benefit from fewer self-report measures to real-time measures or longitudinal measures to determine perceived effectiveness. This would benefit determinations of actual effectiveness.

The single sample design and use of a convenience sample for the study could have had a limiting influence. The sample used in the study was medium size (N = 200) with 42% of participants from the 25-34 age category. Participants resided in 37 out of the 50 states with VA (18.5%), FL (1%), and CA (.7%) being the top for participation. Years of education ranged from none at all to completed graduate school. 99% of participants were in the category of 2 years of college or higher, with 43% of participants

graduating college (4 year of college) and 16% completing graduate school. For household income 27% of participants fell into the $50k range, 26% of participants fell into the $25k range, and 19% of participants fell into the $0 range. The results may not generalize to any one population.

This limitation could be a factor in video PSA development throughout the United States if the PSAs are not able to generalize to large populations. Within the United States, the Centers for Disease Control and Prevention (CDC; 2018) reported that in 2015, only 15 states and the District of Columbia reported 50% of the adult populations who participated in their survey reported engaging in physical activity at the WHO standards. These States were primarily in the mid-west. Central United States and eastern U.S. states reported ranges from 35% - 55%. While the percentages of people reporting to be more physically active did increase over a two-year reporting period, the results from this study demonstrate that on average more than 50% of the U.S. population remains inactive. These results indicate there is still a need to improve public health communication methods in a way that can increase public understanding of the need for regular physical activity.

The length of the study may have also been a limitation for the results. This study involved taking 2 assessments, watching four videos, and then an additional assessment after each video, for a total of 139 question and a survey length of 17 minutes. Survey Monkey reports that participants may begin “sacrificing” or “speeding” through a long survey, sacrificing quality results (Survey Monkey, 2018). Future studies similar to this may result in more significant perceived effectiveness results of video PSAs if they test

videos separately, keeping survey length to 50 questions, and survey time to less than 15 minutes, per Survey Monkey (2018).

Video PSAs have been found to be effective at communicating information, and research has confirmed that their effectiveness can be measured (Bigsby et al., 2013). Research has shown that video PSAs are an effective communication platform because they are typically less than a minute in duration, they are aimed at real audiences, and they can reach persons of many educational levels (Selfe & Selfe, 2008). To realize PSAs' communicative potential, it is essential that PSA developers understand the role message development, including the message's focus and delivery, plays in viewer response (Epton et al., 2015). Because this study included four PSAs and over 100 questions, the survey itself may have been contradictory to good effectiveness levels based on prior research.

Implications for Social Change

This research may be significant in its benefit to those who develop PSAs that disseminate public health information and, in turn, to the public who view the PSAs. Past research on the effects of inactivity on health (e.g., Hogan et al., 2013; Koeneman et al., 2011; Schutte et al., 2014), as discussed in the problem statement, have underlined the significance of this research study in aiding health communicators to improve the effectiveness of PSAs in promoting health behavioral change as it relates to physical activity. The overall results of this study, with prior PSA research support the need for PSAs to be developed in a way that resonates with views, in order to facilitate a behavioral change.

Additionally, the results from using the model of goal directed behavior as the framework for the four PSAs will extend research knowledge in behavioral change understanding. The inclusion of desire in this behavior change theory incorporates people's wish to do something rather than just their feelings of obligation to do it (Esposito et al., 2016). New research also supports the significant role of desire in a person's decision-making process that ultimately influences behavioral intention (Park, Lee, & Peters, 2017). The results of this study, combined with prior research, offers itself as an empirically supported behavioral change processes and the essential element of desire when trying to implement or influence a behavior change.

Although previous literature has elucidated the role physical activity plays in a person's health, for the research data to extend to change in society, effective dissemination of the data is significant—public health information is important, but it is not beneficial if it does not lead to behavior change. The finding in this study revealed that 86% of participants did not meet the minimum physical activity requirements recommended by the WHO, signifying current public health communication may not be effective. Providing empirical evidence to PSA developer that promote health behavioral change will be a significant benefit to society.

Recommendations for Further Study

This study is particularly important due to its design, which considered both PSA development and behavioral change process. Repeating this formula to confirm its effectiveness would benefit future PSA development. Additionally, future research would be beneficial if a longitudinal study was completed. While Bigsby et al. (2013) has

already provide empirical results to confirm perceived effectiveness can lead to actual effectiveness, updated testing with this new research could benefit researchers and PSA developers.

Additionally, confirming the impact of PSAs that promote physical activity by age, culture and population would also be beneficial. The goal of PSAs is to promote a public health concern and the message is only beneficial if it resonates with the audience. This study evaluated the different household demographic of overall household income and households with children under 18. 72% of the participants made $75,000 or less and 66% had no children under 18.

This suggests that overall income and responsibilities and cost associated with children may not be a factor in a person's desire to engage in physical activity. If this is the case, then it is important to continue to promote physical activity based on fact rather than life situation, again, this information is beneficial to PSA development.

Future research on physical activity could also benefit from an in-depth view into the role of income and age. While it was not significant that 99% of participants in this study had at least two years of college or more, due to the online survey platform, it was significant that the results still showed that 86% of participants did not meet the WHO recommendations. A future question may be, do we need to confirm that income may not be a factor in a person's desire to be physically activity. While it does aid in giving people options, in many areas if there are enough free areas to engage in physical activity, then what is preventing people from action.

What was significant in our study was that 26% of our participants had a lower income level of $25,000 or less. This could be a result of our population, which had 42% in the 25 – 34-year-old range. This would make sense as younger adults tend to make less money as they are just getting out in the work force. A future research area may include looking into the best motivation age to start promoting physical activity. Many studies show that getting children engaged in physical activity early age has a significant effect on executive function, attention, and academic performance (de Greeff, Visscher, Hartman, Bosker, & Oosterlaan, n.d). Additionally, starting children early in regular physical activity engagement may motivate them for a lifetime.

The results of this research study found that 27% of participants' household income was greater than $50,000. This is not significant because again it was expected that participants who use an online survey would have a higher income based on prior research. Shuval, Li, Gabriel, and Tchernis (2017) found in their study that participants in the higher income levels were 1.6 and 1.9 percent more likely to meet physical activity guidelines.

Conclusion

I investigated the perceived effectiveness of different message foci (fear, empathy, information, and combination) in video public service announcements development to promote physical activity. The model of goal directed behavior was used as the PSA development format. A sample of 200 adults (100 female, 100 male) around the United States were collected. Overall results indicated the video PSA with message

focus of "empathy" was viewed as most effective, while the video PSA with message focus "information" was viewed as least effective.

With overall results indicating that 86% of participants did not meet the minimum physical activity requirements recommended by the WHO, results from this study support the continued need for public health information to be presented in a way that resonates with viewers. Results from stage of change scores indicate over 28% of participants where in pre-contemplation (unaware that a change is needed), with 13% having no thoughts regarding exercise, again indicating a potential need to change how public health information regarding the need for physical activity is disseminated.

The results of this study confirm minimal difference in results from female to male, this is significant because PSAs can be designed based on message and not gender. It is recommended that future research into video PSA development to promote physical activity continue in order to promote increases in physical activity.

As a practicing licensed profession counselor, I know the importance of physical activity as part of a person's lifestyle that supports both overall physical and mental health. I believe the results of this study will be of interest to others in my field, and public service announcement developers, as such, I would like to submit an article based on this dissertation for publication and to consult with the Ad Counsel for potential production of the empathy video. Furthermore, I would like to present these findings at the American Psychological Association at the Convention August 2019. I will also submit an article based on this dissertation to The Journal of Health Promotion as I

believe it will add to the literature pertaining to communitywide efforts in promoting healthy living initiatives.

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Appendix A: Story Board and Dialogue for video PSAs

Setting – Same for all four PSAs

Main character Matt, getting ready to ride bicycle and bumps into two friends for discussion.

Dialogue 1 - Empathy

MAN and WOMAN walk along the park's trail. The two are talking indistinctly as they come up on a bike rack, where MATT is unlocking his bicycle.

WOMAN

Oh hey, Matt. I didn't know you biked.

MATT

Yeah, these days, I like to get some exercise every day.

MAN

Why? You trying to lose a few?

MATT

(somber)

Well, my dad passed away last year. He had gotten pretty overweight and developed diabetes. His doctors always said he need to be more active and lose some weight but he didn't take it seriously. I feel like, if he had just listened and committed to more physical

activity, he could still be here today. I think about that a lot. So, I decided I don't want my mom to lose me, too. And when I have children, I want to be there for them for a long time. It's just sad to think: if he had wanted to make a change, we could be riding bikes together.

FADES OUT.

Dialogue 2 - Fear

MAN and WOMAN walk along the park's trail. The two are talking indistinctly as they come up on a bike rack, where MATT is unlocking his bicycle. MAN is finishing up a hot dog from a food cart.

WOMAN

Oh hey, Matt. I didn't know you biked.

MATT stands.

MATT

I normally don't.

MAN chimes in.

MAN

(sarcastically)

Then why start now? Did your girlfriend talk you into it?

WOMAN jokingly hits MAN.

MATT

Nothing like that. I just had a physical yesterday and it turns out I have high cholesterol, high blood pressure, and I'm pre-diabetic. I figured I was too young to have anything like that... My doctor told me I need to make some serious lifestyle changes or I'll develop some serious illnesses later.

WOMAN

Later?! What you just said sounded pretty serious.

MATT

I know! Apparently, there are even worse things I could develop. It's scary. The doctor told me if I get on the right track, I can still reverse a lot of the problems. So, I want to

start getting physically active. I'm way too young to die, you know? You guys should think about getting active, too. Or else *you* might be in my shoes one day…

FADES OUT.

Dialogue 3 - Information

MAN and WOMAN walk along the park's trail. The two are talking indistinctly as they come up on a bike rack, where MATT is unlocking his bicycle.

WOMAN

Oh hey, Matt. I didn't know you biked.

MATT

Oh, I don't always. Sometimes I go running, or I'll lift weights at the gym. I also started hiking on the weekends, too.

MAN

You must like to exercise, huh?

MATT

It's more than liking exercise, I want to be physically active for my health. I learned a couple years ago that physical activity is one of the primary ways to maintain a healthy body and is recommended at all ages. In fact, physical activity is a great way to reduce the risk of injury and the development of non-communicable diseases, such as cardiovascular disease, ischemic stroke, Type-2 diabetes, a variety of cancers, and weight-related issues. And physical activity has been found to reduce depression and anxiety, as well.

WOMAN

Wow, I didn't know all that.

Turns to MAN.

WOMAN

I think it's time we get active, too!

FADES OUT.

Dialogue 4 - Combination

MAN and WOMAN walk along the park's trail. The two are talking indistinctly as they come up on a bike rack, where MATT is unlocking his bicycle.

WOMAN

Oh hey, Matt. I didn't know you biked.

MATT

Yeah, I like to get some exercise every day.

MAN

But you're already in shape, why worry about it?

MATT

Well, I didn't always. But my dad was diagnosed with diabetes. Turns out, my family has a long history of diabetes *and* heart disease.

WOMAN

But you don't have any problems, right?

MATT

Not yet. I talked to my doctor, and he mentioned that I could develop these problems too because they can be hereditary.

MAN

Oh yeah, my uncle died of heart failure, and I remember the doctors said my dad and I were at risk of high blood pressure just like him. So, what can we do?

MATT

Well luckily, my doctor also said that if I were to maintain a healthy level of physical activity, I could greatly reduce my risk. So here I am!

MAN

Maybe we could bike with you sometime.

MATT

Yeah man, sounds good.

FADES OUT.

Appendix B: Human Research Participant Certification

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Jennifer Erickson** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 01/30/2018.

Certification Number: 2627370.

Appendix C: Demographic Questionnaire

The information contained in this questionnaire will remain confidential. All published reports will not include any identifying information of the participants in this study.

Demographic Questions:

1. What is your age?

18 to 24; 25 to 34; 35 to 44; 45 to 54; 55 to 64; 65 to 74; 75 or older

2. What state do you reside in? (all 50 States and the District of Columbia will be listed).

3. What is the highest level of education you have completed?

4. What is your approximate average household income?

$0-$24,999; $25,000-$49,999; $50,000-$74,999; $75,000-$99,999; $100,000-$124,999; $125,000-$149,999; $150,000-$174,999; $175,000-$199,999; $200,000 and up

5. What is your gender?

Female; Male

6. Do you have any children under 18?

Yes; No

7. On average, how many minutes of physical activity have you engaged in each week, over the past two weeks?

1 min - 30 min; 31 min - 60 min; 61 min to 90 min; 91 min to 120 min; 121 min to 150 min; More than 150 min

Appendix D: University of Rhode Island Change Assessment Scale

EXERCISE: STAGES OF CHANGE (CONTINUOUS MEASURE)

PLEASE USE THE FOLLOWING DEFINITION OF EXERCISE WHEN ANSWERING THESE QUESTIONS:

Please enter the number in the right hand column that indicates how strongly you agree or disagree with the following statements.

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

Regular Exercise is any planned physical activity (e.g. brisk walking, aerobics, jogging, bicycling, swimming rowing, etc.) performed to increase physical fitness. Such activity should be performed 3 to 5 times per w for 20–60 minutes per session. Exercise does not ha to be painful to be effective but should be done at a level that increases your breathing rate and causes y to break a sweat.

1.	As far as I'm concerned, I don't need to exercise regularly.	
2.	I have been exercising regularly for a long time and I plan to continue.	
3.	I don't exercise and right now I don't care.	
4.	I am finally exercising regularly.	
5.	I have been successful at exercising regularly and I plan to continue.	
6.	I am satisfied with being a sedentary person.	
7.	I have been thinking that I might want to start exercising regularly.	
8.	I have started exercising regularly within the last 6 months.	

9.	I could exercise regularly, but I don't plan to.	
10.	Recently, I have started to exercise regularly.	
11.	I don't have the time or energy to exercise regularly right now.	
12.	I have started to exercise regularly, and I plan to continue.	
13.	I have been thinking about whether I will be able to exercise regularly.	
14.	I have set up a day and a time to start exercising regularly within the next few weeks.	
15.	I have managed to keep exercising regularly through the last 6 months.	
16.	I have been thinking that I may want to begin exercising regularly.	
17.	I have lined up with a friend to start exercising regularly within the next few weeks.	
18.	I have completed 6 months of regular exercise.	
19.	I know that regular exercise is worthwhile, but I don't have time for it in the near future.	
20.	I have been calling friends to find someone to start exercising with in the next few weeks.	
21.	I think regular exercise is good, but I can't figure it into my schedule right now.	
22.	I really think I should work on getting started with a regular exercise program in the next 6 months.	
23.	I am preparing to start a regular exercise group in the next few weeks.	
24.	I am aware of the importance of regular exercise but I can't do it right now.	

Scoring

Precontemplation (non-believers in exercise) items: 1, 3, 6, 9
Precontemplation (believers in exercise) items: 11, 19, 21, 24
Contemplation items: 7, 13, 16, 22
Preparation items: 14, 17, 20, 23
Action items: 4, 8, 10, 12
Maintenance items: 2, 5, 15, 18

MEASURES

HERE YOU CAN FIND THE PSYCHOLOGICAL MEASURES THAT HAVE BEEN DEVELOPED AT THE CPRC. ALL MEASURES ARE COPYRIGHT CANCER PREVENTION RESEARCH CENTER, 1991. DR. JAMES O. PROCHASKA, DIRECTOR OF THE CPRC, IS PLEASED TO EXTEND HIS PERMISSION FOR YOU TO USE THE TRANSTHEORETICAL MODEL-BASED MEASURES AVAILABLE ON THIS WEBSITE FOR RESEARCH PURPOSES ONLY, PROVIDED THAT THE APPROPRIATE CITATION IS REFERENCED.

Please Note: All assessment inventories are available for research purposes only and are not for clinical use.

Appendix E: Attention Questions

These questions are to confirm that the participant watched each PSA. These questions will be specific to each PSA to confirm attention.

PSA 1

1. Matt was concerned that his mother would lose him to an illness
2. The female friend was wearing a "xxxx" shirt

PSA 2

1. The male friend was xxxx
2. Matt was xxxx

PSA 3

1. The male friend was xxxx
2. Matt was xxxx

PSA 4

1. The male friend was xxxx
2. Matt was xxxx

Appendix F: Perceived Effectiveness Rating Scale

There are five possible responses to each of the items that follow:
1=Strongly Disagree 2=Disagree 3=Undecided 4=Agree 5=Strongly Agree

1. I have seen this advertisement before today.
2. I have seen an advertisement similar to this one before today.
3. I think that this message will be effective in persuading me to be more physically active.
4. I think that this message will be effective in persuading other people to be more physically active.
5. I think that this message is realistic.
6. My friends would be influenced by this advertisement.
7. This advertisement makes me want to be physically active.
8. This advertisement was of high quality.
9. This advertisement was not persuasive.
10. This advertisement cannot be trusted.
11. This advertisement was realistic.
12. This advertisement could help to promote an active lifestyle in my community.
13. This advertisement was appealing.
14. This advertisement was memorable
15. I learned something from this advertisement.
16. This advertisement was farfetched.
17. This advertisement was poorly made.
18. This advertisement was confusing.

Appendix G: Positive and Negative Affect Schedule

Positive and Negative Affect Schedule
PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent [INSERT APPROPRIATE TIME INSTRUCTIONS HERE]. Use the following scale to record your answers.

1 =	2 =	3 =	4 =	5 =
very slightly or not at all	a little	moderately	quite a bit	extremely

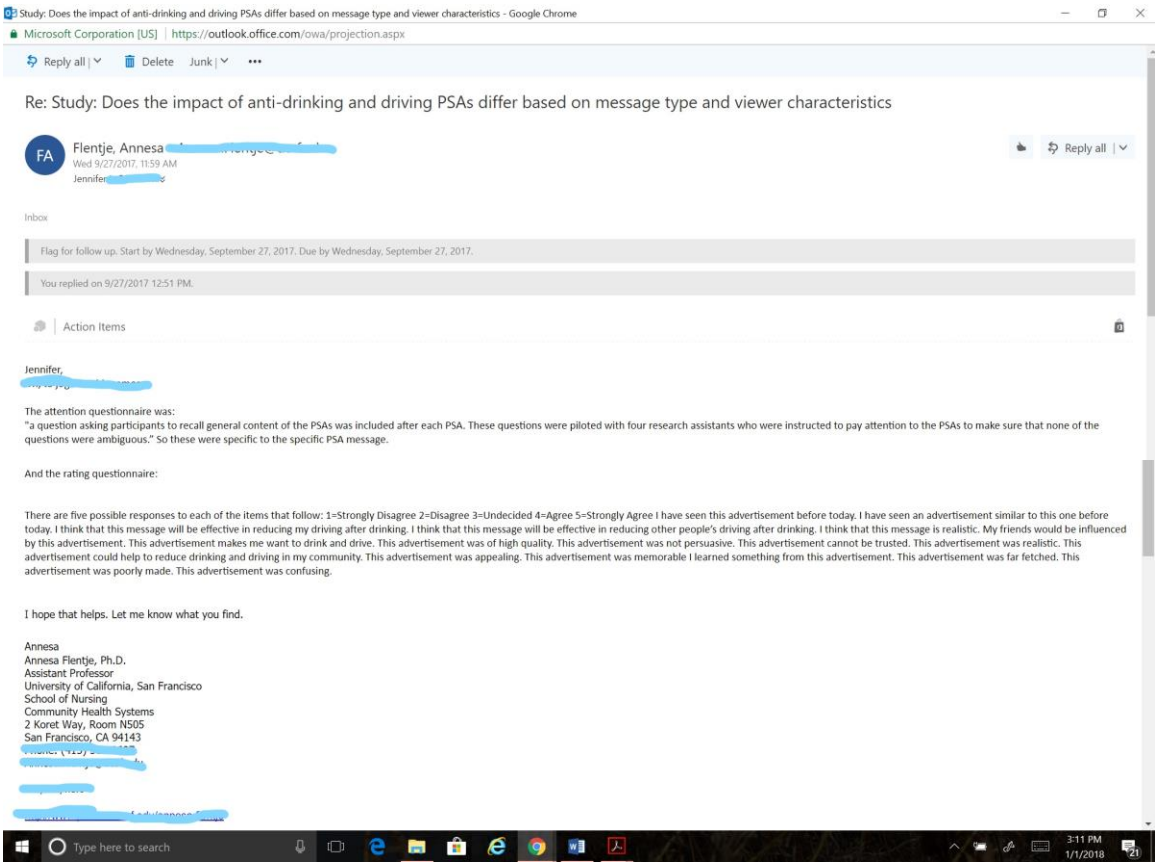
_____ interested	_____ irritable
_____ distressed	_____ alert
_____ excited	_____ ashamed
_____ upset	_____ inspired
_____ strong	_____ nervous
_____ guilty	_____ determined
_____ scared	_____ attentive
_____ hostile	_____ jittery
_____ enthusiastic	_____ active
_____ proud	_____ afraid

We have used PANAS with the following time instructions:

Moment	(you feel this way right now, that is, at the present moment)
Today	(you have felt this way today)
Past few days	(you have felt this way during the past few days)
Week	(you have felt this way during the past week)
Past few weeks	(you have felt this way during the past few weeks)
Year	(you have felt this way during the past year)
General	(you genally feel this way, that is, how you feel on the average)

Appendix H: PERS Permission

The attention question format and the rating questions (labeled the Perceived Effectiveness Rating Scale) were provided by Dr. Annesa Flentje, Ph.D. (formerly Annesa Santa from the study by Santa and Cochran, 2008).



Study: Does the impact of anti-drinking and driving PSAs differ based on message type and viewer characteristics - Google Chrome

Microsoft Corporation [US] | https://outlook.office.com/owa/projection.aspx

Reply all | Delete Junk | •••

Re: Study: Does the impact of anti-drinking and driving PSAs differ based on message type and viewer characteristics

FA Flentje, Annesa [redacted] Reply all

Wed 9/27/2017, 11:59 AM

Jennifer [redacted]

Inbox

Flag for follow up. Start by Wednesday, September 27, 2017. Due by Wednesday, September 27, 2017.

You replied on 9/27/2017 12:51 PM.

Action Items

Jennifer,

[redacted]

The attention questionnaire was:
"a question asking participants to recall general content of the PSAs was included after each PSA. These questions were piloted with four research assistants who were instructed to pay attention to the PSAs to make sure that none of the questions were ambiguous." So these were specific to the specific PSA message.

And the rating questionnaire:

There are five possible responses to each of the items that follow: 1=Strongly Disagree 2=Disagree 3=Undecided 4=Agree 5=Strongly Agree I have seen this advertisement before today. I have seen an advertisement similar to this one before today. I think that this message will be effective in reducing my driving after drinking. I think that this message will be effective in reducing other people's driving after drinking. I think that this message is realistic. My friends would be influenced by this advertisement. This advertisement makes me want to drink and drive. This advertisement was of high quality. This advertisement was not persuasive. This advertisement cannot be trusted. This advertisement was realistic. This advertisement could help to reduce drinking and driving in my community. This advertisement was appealing. This advertisement was memorable I learned something from this advertisement. This advertisement was far fetched. This advertisement was poorly made. This advertisement was confusing.

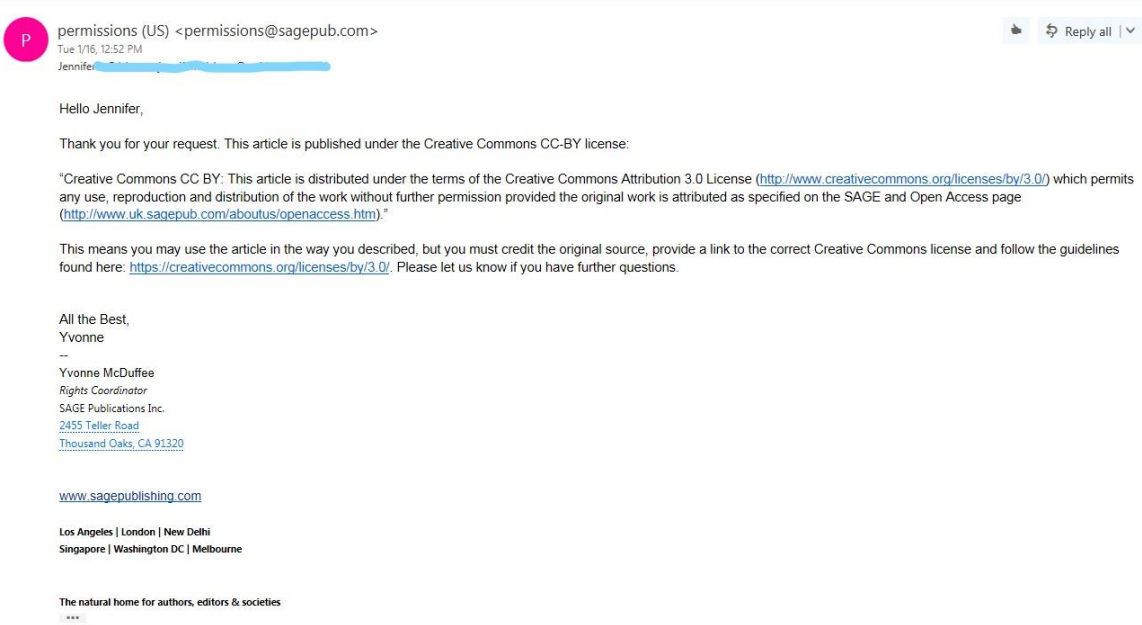
I hope that helps. Let me know what you find.

Annesa
Annesa Flentje, Ph.D.
Assistant Professor
University of California, San Francisco
School of Nursing
Community Health Systems
2 Koret Way, Room N505
San Francisco, CA 94143
[redacted]

Type here to search 3:11 PM 1/1/2018

Appendix I: Permission

This is email permission to use the figure 1 on page 5.



P

permissions (US) <permissions@sagepub.com>

Tue 1/16, 12:52 PM

Jennifer [redacted]

Reply all

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All the Best,
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