

EFFECTS OF A PHYSICAL ACTIVITY-THEMED
REALITY SHOW CONCEPT ON PHYSICAL ACTIVITY
BEHAVIORAL INTENTIONS AMONG POTENTIAL VIEWERS

by

Mary Elizabeth Gillis

Dissertation Committee:

Professor Carol Ewing Garber, Sponsor
Professor John Allegrante

Approved by the Committee on
the Degree of Doctor of Education

Date 16 May 2018

Submitted in partial fulfillment of the
requirements for the Degree of Doctor of Education in
Teachers College, Columbia University

2018

ABSTRACT

EFFECTS OF A PHYSICAL ACTIVITY-THEMED REALITY SHOW CONCEPT ON PHYSICAL ACTIVITY BEHAVIORAL INTENTIONS AMONG POTENTIAL VIEWERS

Mary Elizabeth Gillis

Physical inactivity is an important public health concern. Strong evidence exists linking insufficient physical activity (PA) with an increased risk of many adverse health conditions, including major non-communicable diseases such as coronary heart disease, type 2 diabetes, and breast and colon cancers—all of which can drastically reduce one's life expectancy.

The media holds great potential to encourage positive health behaviors among the broader community. However, evidence to support traditional mass media campaign approaches to PA promotion remains inconclusive, with most television-based campaigns falling short of achieving the PA changes they were designed to promote. Researching alternative methods of delivering PA messages could improve the efficacy of television-based health promotion efforts. Reality television presents one such alternative.

This dissertation consists of a systematic literature and two separate, but related, studies. The first study examined the associations between individual characteristics, health-related behaviors, impressions of a PA-themed reality television show concept, and intentions to engage in active transportation (AT) using a randomized two-group (independent) post-test pre-experimental design. Results showed that age, race, and education were significantly associated with impressions. Mild and moderate intensity

exercise was significantly associated with behavioral intentions, while impressions of the show explained 19% of the variance in behavioral intentions. There was a statistically significant difference between TV show conditions with those exposed to the AT concept reporting higher AT behavioral intentions.

The second study assessed the show concept in formative research and—in addition—examined the associations between individual characteristics, health-related behaviors, impressions of a PA-themed reality television show concept, and intentions to engage in active transportation (AT) using a non-randomized two-group (independent) post-test pre-experimental design as well as in-person, semi-structured interviews. Those exposed to the AT show concept showed higher behavioral intentions for AT, and there was a significant positive correlation between impressions and behavioral intentions in the AT show group. Semi-structured interview data indicated that a majority of research participants had positive impressions toward the PA-themed reality show concept and the show's characters. However, the visual and design components as well as clarity of the show concept need improvement. These two studies demonstrate the acceptability of the potential effectiveness of a PA-themed reality show concept for conveying active transportation-related messages to viewers. Both studies showed that a PA-themed reality show concept positively influenced PA behavioral intentions specific to AT among those who watched it and impressions of the show as a correlate to behavioral intentions, thus confirming that innovative reality programming can be used to entertain viewers and potentially inspire positive health behaviors.

© Copyright Mary Elizabeth Gillis 2018

All Rights Reserved

DEDICATION

This dissertation is dedicated to ... you, of course!

ACKNOWLEDGMENTS

I would like to take this opportunity to express my sincerest thanks to four very special individuals—my dissertation committee. You truly are my “dream team,” and I am eternally grateful for all of your support, encouragement, and invaluable contributions to this work. To Dr. Nathan Holbert: Thank you for taking the time to selflessly serve on my committee and for your willingness to engage in a thoughtful discussion of my work. To Dr. Laura Azzarito: You’ve broadened my perspective on what it means to be a quality researcher and the way I see the world. I appreciate this more than you know. To Dr. John Allegrante: You are a brilliant scholar and a kind man. Words cannot express how fortunate I’ve felt to have you in my corner all of these years. To Dr. Carol Garber: Strong, intelligent, independent, a sense of humor, and a good heart. Thank you for supporting this line of research from the very beginning. But most of all, thank you for being my mentor.

To all of my friends and family who’ve supported me through this journey of scholarship and self-discovery: You’re the reason my heart beats, and I love each and every one of you.

And finally to O.N. Thank you. For saving me.

M. E. G.

TABLE OF CONTENTS

	Page
Chapter I—INTRODUCTION	1
Significance.....	4
Overview.....	8
Dissertation Organization	10
References.....	11
 Chapter II—MEDIA-BASED PHYSICAL ACTIVITY INTERVENTIONS IN ADULTS AND CHILDREN: A SYSTEMATIC LITERATURE REVIEW OF RANDOMIZED AND NON-RANDOMIZED TRIALS	14
Abstract.....	14
Introduction.....	15
Methods.....	17
Study Selection	18
Data Extraction	19
Results.....	46
Immediate/Proximal Impacts: Awareness, Understanding, and Saliency.....	47
Intermediate Impacts: Attitudes, Beliefs, Intentions, etc.....	49
Distal Impacts: Physical Activity Behavior.....	52
Total dose.....	52
Moving from insufficiently active to sufficiently active	55
Other attitudinal and/or behavioral measures	55
Discussion.....	56
Recommendations for Research	57
Conclusions.....	64
References.....	66
 Chapter III—EXAMINATION OF A PHYSICAL ACTIVITY-THEMED REALITY TV SHOW CONCEPT USING AN ONLINE INTERNET SURVEY IN A SAMPLE OF URBAN ADULTS.....	70
Abstract.....	70
Introduction.....	71
Background/Literature Review	71
Methods.....	74
Participant Recruitment	74
Study Design.....	74
Explanation of AT and Home Design Comparison Videos.....	75
Measures	76
Conceptual Framework.....	77
Individual Characteristics	77
Physical Activity Behaviors.....	77
Active Transportation Habits.....	78

Perceived Entertainment Value of the Videos	78
Behavioral Intentions	79
Statistical Analysis	79
Results	81
Discussion	85
Conclusion	91
References	93

Chapter IV—FORMATIVE EVALUATION OF A PHYSICAL ACTIVITY- THEMED REALITY SHOW CONCEPT VIA IN-PERSON INTERVIEWS AMONG A COMMUNITY SAMPLE OF ADULTS	97
Abstract	97
Introduction	98
Methods	103
Participant Recruitment	104
Group Assignment	104
Explanation of AT and Home Design Video Concepts	104
Experimental Conditions	106
Experimental Design and Measures	106
Qualitative component	106
Quantitative component	107
Conceptual Framework	107
Individual characteristics	108
Health-related behaviors	108
Perceived entertainment	109
Behavioral intentions	109
Behaviors	110
Measures	110
Individual characteristics	110
Impressions of the show concept	110
Health-related behaviors	110
Behavioral intentions	111
Statistical Analysis	112
Results	113
Quantitative Results	114
Aim 1	114
Aim 2	115
Aim 3	115
Sub-aim 1	116
Qualitative Results	117
Comments Regarding Impressions of the PA-themed Show Trailer	118
Comments Regarding Characters	119
Comments Regarding Design and Visuals	120
Comments Regarding Clarity of the Show Concept	120
Discussion	121

Conclusion	126
References.....	127

APPENDICES

Appendix A—Review of Literature: Mass Media Campaign Interventions Designed to Encourage Physical Activity.....	132
Appendix B—Definitions and Abbreviations.....	152
Appendix C—Study I – Approved Teachers College IRB Materials.....	153
Appendix D—Study II – Approved Teachers College IRB Materials	158
Appendix E—Questionnaires and Forms	163

LIST OF TABLES

Table		Page
2.1	Databases Searched and Their Respective Terms	17
2.2	Campaign Characteristics: Study Design, Sampling, Participant Characteristics, etc.....	21
2.3	Campaign Characteristics: Formative Research, Theoretical Frameworks, Results, etc.....	30
3.1	Respondent Characteristics.....	83
3.2	Multiple Regression Analysis Evaluating Associations Between Impressions of a PA-themed Reality Television Show Concept and Participant Characteristics.....	84
3.3	Multiple Regression Analysis Evaluating Correlates of Behavioral Intentions (Walking Instead of Taking the Bus) by Participant PA Behaviors	84
4.1	Respondent Characteristics.....	114
4.2	Multiple Regression Analysis Evaluating Associations Between Impressions of a PA-themed Reality Television Show Concept and Participant Characteristics.....	115
4.3	Open Response Codes (Nodes) Related to the PA-themed Reality TV Show Trailer and Number of Cases	117

LIST OF FIGURES

Figure		Page
2.1	Flowchart of study selection process	20
3.1	Conceptual framework used to guide the development of the current research.....	75
3.2	Study flow and participant response rate throughout the recruitment and experimental process	81
3.3	Differences in behavioral intentions between AT concept and Home Design comparison concept by reality television conditions.....	86
4.1	Conceptual framework used to guide the development of the current research.....	108
4.2	Differences in behavioral intentions between PA-themed reality show concept (walking) versus Home Design comparison conditions (room redecorating).....	116
4.3	Frequencies of cited references for each of the 12 codes (nodes) impressions, characters, visuals and design, and clarity of concepts or the PA-themed reality TV show concept.....	118

Chapter I

INTRODUCTION

Physical inactivity is an important public health concern. According to the 2013 Behavioral Risk Factor Surveillance Survey (BRFSS), nearly 50% of adults in the United States fail to meet recommended levels of daily aerobic activity. This number is disturbing, as the benefits of physical activity (PA) have been clearly demonstrated. A substantive body of research has established the protective effects of physical activity with regard to chronic diseases such as cardiovascular disease, hypertension, type 2 diabetes, and certain cancers (Garber et al., 2011). Inadequate levels of physical activity are associated with increased rates of morbidity and mortality, with an estimated 3.2 million preventable deaths per year attributed to lack of regular physical activity (World Health Organization [WHO], 2017), while physical inactivity is estimated to result in over \$131 billion per year in direct healthcare costs in the United States alone (Carlson, Fulton, Pratt, Yang, & Adams, 2015). The percentage of preventable deaths linked to inactivity is likely to increase substantially in the coming years (Mokdad, Marks, Stroup, & Gerberding, 2004).

Determinants of physical activity participation are varied and complex. A variety of psychosocial factors influence a person's participation in physical activity, including lifestyle behaviors and personal attributes, as well as social and physical environmental conditions (Troost, Owen, Bauman, Sallis, & Brown, 2002). These psychosocial factors are complex—both individually and collectively—which has made it difficult for

researchers to determine an optimal way to promote physical activity levels in the numerous sociodemographic groups that would benefit from increasing their current levels (Lewis, Marcus, Pate, & Dunn, 2002).

One example of a relatively simple, nondiscriminatory means of fostering physical activity comes in the form of active transportation (AT). Participation in transportation-related physical activity is highly feasible for most individuals living in a variety of communities. National data indicate that 27% of all trips are within walking distance, while nearly 65% of trips are within biking distance. Even in the most automobile-oriented regions of the United States (such as Atlanta, GA), 40% of all trips—to work, to school, for shopping or entertainment purposes—are within walking or biking distance (Sallis, Frank, Saelens, & Kraft, 2003). Individuals who walk, bike, or use other non-motorized vehicles, such as scooters, for transport accumulate more than one hour of physical activity per day (New York City Department of Health and Mental Hygiene, 2011). What's more, those who participate in active transportation—regardless of mode—are more likely to adhere to physical activity recommendations (Berrigan, Troiano, McNeel, DiSogra, & Ballard-Barbash, 2006). Clearly, encouraging active transportation as a way to increase physical activity levels among the broader community offers a unique approach to health promotion.

Public health officials typically enlist mass media campaign interventions to promote physical activity on the broadest scale. Evidence suggests that mass media campaigns influence public opinion in favor of health-promoting public policies, thus acting as a bridge toward community acceptance of government health initiatives (Lewis et al., 2002). Since the year 2000, several campaigns designed to promote physical activity participation—through leisure or non-leisure activities—have been launched at the local, state, national, and international level. In 2002, the Centers for Disease Control and Prevention (CDC) introduced the *VERB* campaign—a national effort to inspire children ages 9-13 to “find their verb” (i.e., action or movement) (Huhman et al., 2005).

The 30-second advertising segments aired on child-specific cable networks, including Nickelodeon and the Disney Channel. On the heels of *VERB* came *Get Up and Do Something*, Delaware's statewide mass media campaign to provide young adults ages 18-30 with reasons to be more physically active (Peterson, Abraham, & Waterfield, 2005). And in 2008, the mass media campaign *Health U* aired on local cable channels in western Canada to encourage senior citizens to increase their daily activity levels (Berry et al., 2009).

Unfortunately, most television-based mass media campaigns do not connect with viewers to the degree necessary to elicit the physical activity behavior changes they were designed to promote. Even though studies have shown that campaigns such as *VERB* and *Get Up and Do Something* facilitated changes in knowledge and attitudes toward physical activity, they had little impact on influencing actual physical activity participation. There are two possible reasons for this: (1) the brevity of the campaigns, and (2) the quality and entertainment value of their content (Noar, 2006).

Most mass media campaigns appear onscreen for just 15 to 60 seconds—that is, if they aren't skipped over by DVRs, TiVo, or similar technologies. Even if the campaign aired three times over the course of a one-hour program, this equates to just 5% of the total airtime within that one hour, which is hardly enough time for viewers to internalize and embrace a message. Additionally, the content of most mass media campaigns is unsuccessful at capturing the attention of audience members to a sufficient degree necessary to impact behavior. In fact, studies examining *Health U* revealed that viewers found the campaign to be distasteful—an indication that those who viewed it would not in any way be motivated to change their behavior as a result of seeing the campaign (Berry et al., 2009).

Pervasive physical inactivity among adults in the United States is a public health crisis, and it is clear that public and private health agencies have not yet tapped the unique potential television holds to influence physical activity behaviors among viewers.

Alternative ways to use this powerful medium must be explored. The following research studies attempt to do just that—to explore an alternative way to utilize popular media to encourage people to alter their physical activity levels. Additionally, the research targets a clear, modifiable behavior—increasing transportation-related physical activity—a highly feasible lifestyle behavior for nearly all individuals living in both urban and rural areas regardless of demographic, physical activity status, or other characteristics.

Significance

This research is significant for the following reasons: (1) it utilizes reality television, a highly popular form of entertainment, to convey its health-related message; (2) the benefits of the behavior being targeted—active transportation—also influence economic, social, and environmental aspects of a community; (3) it enlists a completely original and highly marketable physical activity-themed reality show concept; and (4) the health promotion strategy was informed and supported by a conceptual framework specifically used to guide the development of this research.

This research project utilizes reality television, a popular form of entertainment, to convey its health-related message. In 2006, four of the top ten primetime broadcast TV shows in the U.S. were reality-based programs, all of which outperformed traditional scripted shows such as *CSI*, *Desperate Housewives*, and *Law and Order* (Zappia, 2006). The genre's impact on those who watch it is considerable (Barton, 2009). When compared to other genres, reality TV has a greater influence on viewers for two reasons: (1) viewers perceive reality TV as being more authentic, and (2) characters and contestants on reality shows are considered “people like me,” thus rendering their experiences more relevant to the viewer (Rose & Wood, 2005). These two factors—perceived authenticity and a heightened sense of connection—increase the likelihood that

viewers' knowledge, attitudes, values, and behaviors will be influenced by exposure to a reality show over and above other types of programming (Christenson & Ivancin, 2006).

Additionally, reality television is a cost-effective form of media. The U.S. government spent nearly \$125 million for the research, production, and airtime of *VERB* in the campaign's first year alone (Wong et al., 2008). However, after a one-year follow-up, data showed the campaign had little effect on children's active leisure time and virtually no impact on their time spent in organized physical activity (Huhman et al., 2005). Unscripted television, on the other hand, can cost as little as \$100,000 per half-hour episode—a mere fraction of the budget associated with the *VERB* campaign (Joyner, 2010). Moreover, reality television eliminates one of the most fundamental barriers that can hinder mass media campaigns: the need to purchase “gross ratings points” or GRP. Essentially, GRP are cable airtime or network airtime slots. The more GRP a production company or advertising firm is able to purchase, the more often a campaign will appear on television. Conversely, the less time they buy, the less frequently the spots will air. Given that most budgets for mass media campaigns are so high to begin with, there are rarely enough funds left over to buy the amount of commercial exposure necessary to ensure the content is reaching viewers. An unscripted television program that has physical activity integrated into the storyline, however, eliminates the need to purchase GRP altogether, thus providing a financially superior model for the widespread promotion of physical activity messages compared to mass media campaigns.

The benefits of the behavior being targeted—active transportation—also influence economic, social, and environmental aspects of a community. Habitual integration of active transportation into one's daily routine is a way to increase physical activity (Saelens, Sallis, & Frank, 2003). This is important when the link between physical inactivity and chronic disease has been clearly demonstrated (WHO, 2017). Interestingly, active transportation is beneficial in several other ways unrelated to physical health. From an economic perspective, increased active transportation leads to higher pedestrian and

cycling traffic flows throughout cities and towns. A higher sidewalk density is associated with increased levels of consumerism within a community (New York City Department of Health and Mental Hygiene, 2011). Additionally, pedestrian- and cycle-friendly neighborhoods help facilitate incidental contact between neighbors and increase social capital in the form of social networks, trust, and increased feelings of protection among residents (Leyden, 2003). Finally, active transportation is advantageous from an environmental perspective, as it reduces the use of—and dependency on—fossil fuel. Fossil fuel is a major concern because of its impact on greenhouse gas emissions and the effect these emissions have on global warming (Satterthwaite, 2008).

The physical activity-themed reality show concept, *Beat The Bus*, is completely original and highly marketable. The following paragraph provides a brief overview of the show. It contains proprietary information, and the author of this manuscript requests that it not be released to persons outside the government except for purposes of review and evaluation:

Every day on *Beat The Bus*, someone races a New York City bus all the way across town. The folks who race the bus are regular New Yorkers heading to work or to school who get roped into the show by the show's host. And neither the bus driver nor the bus passengers have any idea what's going on. This is Pedestrian vs. Bus and may the fastest one win. There are a few simple rules for every race:

- (1) Players have to wear whatever they are wearing and carry whatever they are carrying. And if they happen to be walking their dog, the dog must go with them.
- (2) On every block there is a challenge for the player to complete. Give someone directions. Help an old lady cross the street. Dodge a flock of pigeons.
- (3) The player may never look backwards at any time, so the player will never know exactly how far ahead of the bus he or she might be.

- (4) The player must also abide by all traffic laws and be considerate of other pedestrians on the sidewalk. (Other shows such as Bravo TV's *Around the World in 80 Plates*, Discovery Channel's *Cash Cab* as well as CBS's Emmy-awarding winning series *Amazing Race* all have similar policies of putting safety first when dealing with public places or modes of transportation.)

At the end of the bus route is the finish line where viewers will see the host of the show waiting to greet the winner. If the player wins, he or she will get a cash prize. If the bus wins, the host of the show surprises the bus passengers with prepaid Metro Cards (or similar fare cards) entitling them to a month of free bus rides. The driver of the bus also gets the cash prize originally intended for the player.

The author enlisted a professional production team to produce a sizzle reel—a stylized two-minute video that conveys an overview of the show. The sizzle reel had a production budget of \$10,000 and serves as the intervention in the following two research studies. Comparison groups viewed a parallel media message—a sizzle reel for a show called *Inside Job With Lisa Quinn*. *Inside Job With Lisa Quinn* follows home renovation expert Lisa Quinn and her interior design team as they sneak into homes of unsuspecting homeowners, surprising them with quick and inexpensive room makeovers.

Both sizzle reels were “host-driven” and comparable in every way possible (length, production quality) except for the specific topic addressed. Home renovation shows have previously been used in reality television research, specifically with regard to studies examining the influence of media messages about cosmetic surgery on one's interest in altering their own appearance. These studies provided the rationale for selecting it as an appropriate comparison condition for this research (Markey & Markey, 2010; Mazzeo, Trace, Mitchell, & Gow, 2006).

Finally, the health promotion strategy is informed and supported by a conceptual framework that was used to guide the development of this research. A theoretical underpinning is an integral component of mass media delivered interventions as it fosters

an understanding of, makes predictions about, and describes relationships among variables (Simons-Morton, McLeroy, & Wendel, 2012). The conceptual framework combines several common constructs specific to advertising literature and was developed specifically for this research. While oftentimes theories are stated in terms in such a way as to be testable, it is important to note that this conceptual model was solely used to guide the development of the research—it was not empirically tested.

Most previous attempts to bring positive physical activity messages to the broader community—in the form of mass media campaign interventions—have fallen short of achieving the physical activity changes they were designed to promote. This research assesses the exposure of health-promoting messages by making use of a theoretically derived, completely original show concept using a novel method of delivery: reality television. This method of delivery promises to be highly cost-effective. Not only does this approach have the potential to increase the airtime of physical activity messages, it also has the potential to drastically reduce the production and marketing costs associated with health promotion through the media. Moreover, reality TV evokes a heightened sense of culturally relevant authenticity and connectedness, both of which are critical to influencing audience behavior. If properly implemented and researched, this novel approach to using reality TV could lead to an entirely new genre of television that will entertain viewers while, at the same time, helping them better understand a wide array of health issues.

Overview

This dissertation includes a comprehensive literature review evaluating the current evidence base regarding physical activity-themed mass media campaign interventions. It also includes two separate but related studies assessing the effects of a reality television show concept on physical activity behavioral intentions among potential viewers. The

first study examines the associations between individual characteristics, health-related behaviors, impressions of a PA-themed reality show concept, and intentions to engage in active transportation using a randomized two group (independent) post-test pre-experimental design. The second study assesses the show concept in formative research and—in addition—examines the associations between individual characteristics, health-related behaviors, impressions of a PA themed reality show concept, and intentions to engage in active transportation using a non-randomized two-group (independent) post-test pre-experimental design and in-person, semi-structured interviews. The specific aims of this dissertation are:

1. To comprehensively evaluate the current status of literature regarding physical activity-themed mass media campaign interventions via a systematic review following the PRISMA guidelines.
2. To assess, in formative research, the concept of an original reality television show that integrates physical activity—in the form of active transportation—into its storyline.
3. To examine the associations between individual characteristics and impressions of a physical activity-themed reality television show concept.
4. To examine individual physical activity behaviors and active transportation habits as they relate to impressions of a physical activity-themed reality television show concept and intentions to engage in active transportation.
5. To examine viewers' impressions of a reality show concept featuring active transportation as a possible correlate of their interest in engaging in active transportation-related behavior.
6. To compare intentions to engage in the featured behavior between individuals exposed to the physical activity-themed reality television show versus a comparison condition.

Dissertation Organization

Chapter II is a systematic literature review assessing randomized and non-randomized physical activity-themed mass media campaign interventions in adults and children. Chapters III and IV are two distinct studies investigating impressions of a reality show concept and its effect on physical activity behavioral intentions among potential viewers. Each chapter is written in the format of a journal article and includes its own abstract, introduction, methods, results, discussion, conclusion, and tables and figures, followed by references. Appendix A includes a qualitative review of the current status of literature. Appendix B presents all definitions and abbreviations. Appendices C and D include approved Institutional Review Board documents from Teachers College, Columbia University, while Appendix E includes all forms and questionnaires pertaining to both studies.

References

- Barton, K. M. (2009). Reality television programming and diverging gratifications: The influence of content on gratifications obtained. *Journal of Broadcasting and Electronic Media*, 53(3), 460-476.
- Berrigan, D., Troiano, R. P., McNeel, T., DiSogra, C., & Ballard-Barbash, R. (2006). Active transportation increases adherence to activity recommendations. *American Journal of Preventive Medicine*, 31(3), 210-216.
- Berry, T. R., Spence, J. C., Plotnikoff, R. C., Bauman, A., McCargar, L., Witcher, C., ... & Stolp, S. (2009). A mixed methods evaluation of televised health promotion advertisements targeted at older adults. *Evaluation and Program Planning*, 32(3), 278-288.
- Carlson, S. A., Fulton, J. E., Pratt, M., Yang, Z., & Adams, E. K. (2015). Inadequate physical activity and health care expenditures in the United States. *Progress in Cardiovascular Diseases*, 57(4), 315-323.
- Christenson, P., & Ivancin, M. (2006). *The "reality" of health: Reality television and the public health*. Menlo Park, CA: Henry J. Kaiser Family Foundation.
- Garber, C. E., Blissmer, B., Deschenes, M. R., Franklin, B. A., Lamonte, M. J., Lee, I. M., ... & Swain, D. P. (2011). American College of Sports Medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medicine and Science in Sports and Exercise*, 43(7), 1334-1359.
- Huhman, M., Potter, L. D., Wong, F. L., Banspach, S. W., Duke, J. C., & Heitzler, C. D. (2005). Effects of a mass media campaign to increase physical activity among children: Year-1 results of the VERB campaign. *Pediatrics*, 116(2), e277-e284.
- Joyner, S. (2010, 30 April). Why networks love reality TV. *Investopedia*. Retrieved October 2, 2017 from <http://www.investopedia.com/financialedge/0410/why-networks-love-reality-tv.aspx>
- Lewis, B. A., Marcus, B. H., Pate, R. R., & Dunn, A. L. (2002). Psychosocial mediators of physical activity behavior among adults and children. *American Journal of Preventive Medicine*, 23(2), 26-35.
- Leyden, K. M. (2003). Social capital and the built environment: The importance of walkable neighborhoods. *American Journal of Public Health*, 93(9), 1546-1551.
- Markey, C. N., & Markey, P. M. (2010). A correlational and experimental examination of reality television viewing and interest in cosmetic surgery. *Body Image*, 7(2), 165-171.

- Mazzeo, S. E., Trace, S. E., Mitchell, K. S., & Gow, R. W. (2007). Effects of reality TV cosmetic surgery makeover program on eating disordered attitudes and behaviors. *Eating Behaviors, 8*, 390–397.
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *JAMA, 291*(10), 1238-1245.
- New York City Department of Health and Mental Hygiene. (2011). Health benefits of active transportation in New York City. *NYC Vital Signs Special Report, 10*(3), 1-4.
- Noar, S. M. (2006). A 10-year retrospective of research in health mass media campaigns: Where do we go from here? *Journal of Health Communication, 11*(1), 21-42.
- Peterson, M., Abraham, A., & Waterfield, A. (2005). Marketing physical activity: Lessons learned from a statewide media campaign. *Health Promotion Practice, 6*(4), 437-446.
- Rose, R. L., & Wood, S. L. (2005). Paradox and the consumption of authenticity through reality television. *Journal of Consumer Research, 32*(2), 284-296.
- Saelens, B. E., Sallis, J. F., & Frank, L. D. (2003). Environmental correlates of walking and cycling: Findings from the transportation, urban design, and planning literatures. *Annals of Behavioral Medicine, 25*(2), 80-91.
- Sallis, J. F., Frank, L. D., Saelens, B. E., & Kraft, M. K. (2004). Active transportation and physical activity: Opportunities for collaboration on transportation and public health research. *Transportation Research Part A: Policy and Practice, 38*(4), 249-268.
- Satterthwaite, D. (2008). Cities' contribution to global warming: notes on the allocation of greenhouse gas emissions. *Environment and Urbanization, 20*(2), 539-549.
- Trost, S. G., Owen, N., Bauman, A. E., Sallis, J. F., & Brown, W. (2002). Correlates of adults' participation in physical activity: Review and update. *Medicine and Science in Sports and Exercise, 34*(12), 1996-2001.
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (n.d.). *Behavioral Risk Factor Surveillance System (BRFSS): Turning information into health*. Retrieved from <http://cdc.gov/brfss>
- World Health Organization. (2017). *Diabetes* (Health Topics: Physical Activity). Retrieved from http://www.who.int/topics/physical_activity/en/
- Wong, F. L., Greenwell, M., Gates, S., & Berkowitz, J. M. (2008). It's what you do!: Reflections on the VERB™ Campaign. *American Journal of Preventive Medicine, 34*(6), S175-S182.

Zappia, C. (2006, 20 December). What's the most popular show of 2006? *The Village Voice*. Retrieved November 18, 2016 from http://www.villagevoice.com/blogs/television/archives/2006/12/what_wewatched.php

Chapter II

MEDIA-BASED PHYSICAL ACTIVITY INTERVENTIONS IN
ADULTS AND CHILDREN: A SYSTEMATIC REVIEW OF
RANDOMIZED AND NON-RANDOMIZED TRIALS

Abstract

Mass media-delivered campaign interventions are considered a cost-effective way to promote physical activity (PA) across socially, culturally, and economically diverse audiences on the broadest level, but their effectiveness is unknown. A systematic review of media-based interventions designed to facilitate PA behavior change was conducted using the PRISMA guidelines. Interventions delivered via television intended for a variety of populations that assessed attitudinal and behavioral PA outcomes were evaluated. Success was defined by the campaign's influence on: (1) immediate impacts including awareness, understanding, and saliency of PA messages; (2) intermediate impacts such as attitudes, beliefs, and intentions to become more physically active; and/or (3) distal impacts or the degree to which they influenced actual PA behavior among target groups. The majority of studies showed that short-term effects associated with television-based, mass media campaign interventions are mostly positive, yet evidence of long-term benefits are virtually non-existent. The author concludes that limited effectiveness is attributed to five common themes found throughout the literature: (1) mass media campaigns require formative research and pre-testing throughout each stage of development in order to maximize their effectiveness; (2) acceptability of PA messages

relies heavily on production content, quality, and appeal among audiences; (3) media messages are more likely to be effective if they are guided by an appropriate health-behavior theory; (4) campaigns should point to a specific and identifiable physical activity behavior that audiences can readily adopt; and (5) sustained campaign activity is needed to impact behavior in the long term.

Introduction

Habitual physical activity (PA) is essential for physical and mental health. Physical activity prevents weight gain, leads to higher levels of physical fitness, and helps to preserve physical function—all of which reduce one’s risk for premature chronic health conditions such as cardiovascular disease, type 2 diabetes, and certain cancers (Garber et al., 2011). Still, in spite of extensive public health efforts, nearly 50% of adults in the United States do not achieve adequate levels of aerobic activity (Centers for Disease Control and Prevention [CDC], 2013).

Public and private agencies have enlisted mass media campaign interventions in an effort to increase PA levels among socially, culturally, and economically diverse populations (Wakefield, Loken, & Hornik, 2010). Health-related mass media campaigns are organized, purposeful efforts to communicate, persuade, and influence a population to consider, adopt, or change to more health-enhancing practices (Atkins & Wallack, 1990). In the last half-century, campaigns designed to promote PA participation were launched at the local, state, national, and international level employing television as the primary mechanism of message delivery. For example, in 2002, the Centers for Disease Control and Prevention (CDC) introduced the *VERB* campaign—a national effort to encourage children ages 9-13 years old to “find their verb” (i.e., action or movement) (Huhman et al., 2005). On the heels of *VERB* came *Get Up and Do Something*, Delaware’s statewide mass media to provide young adults ages 18-30 years old with reasons to be

more physically active. And in 2008, *Healthy U* aired across local cable channels in western Canada to encourage senior citizens to increase daily activity levels (Berry et al., 2009; Peterson, Abraham & Waterfield, 2005).

The Community Preventive Services Task Force reports that there is insufficient evidence to determine the effectiveness of mass media to increase PA at the population level in all its forms (print, radio, billboards, television, etc.), while a majority of mass media campaign interventions specific to television fall short of achieving the PA changes they were designed to promote (Brown et al., 2012; Noar, 2006). Still, empirical evidence indicates that television remains the broadest and most culturally relevant means of disseminating health information, specifically because television, in particular, has been shown to be more accessible than other media to less educated groups (Koolstra, Bos, & Vermeulen, 2006). Therefore, utilizing this medium could potentially lessen the socioeconomic bias that is typically found in mass media health education and provide a promising mechanism to reach populations most in need of health education messages (Wardle, Rapoport, Miles, Afuape, & Duman, 2001).

If researchers, practitioners, and public health advocates are to continue to implement television-based PA interventions as a public health initiative, then a comprehensive review is necessary to determine what works versus what does not. Therefore, the purpose of this paper is to review the scientific evidence published regarding the effectiveness of television-based mass media PA interventions that took place in the United States and internationally from inception to 2016 inclusive. Integrated campaign approaches that included but were not limited to television are also discussed. Understanding the strengths and limitations of message dissemination across this medium is necessary to improve the efficacy of television as a tool for physical activity promotion.

Methods

The author conducted an extensive review of published literature in the English language using combinations of the following key terms: physical activity, mass media, intervention, campaign, and television, among others. The following seven databases were searched: Academic Search Premier, CINAHL, Embase, ERIC, Medline (through PubMed), ProQuest, and ScienceDirect. Table 2.1 shows each database with their respective search terms.

Table 2.1. Databases Searched and Their Respective Terms

Database	Terms Searched
Medline (PubMed)	physical activity AND media AND intervention; physical activity AND mass media campaign; physical activity AND reality television; reality television AND weight; exercise AND reality TV; physical activity AND mobile devices AND intervention; physical activity AND smart phones AND interventions; physical activity AND websites AND intervention; physical activity AND Internet AND intervention
ERIC	physical activity AND media AND intervention; physical activity AND mass media campaign; physical activity AND reality television; reality television AND weight; exercise AND reality TV
Academic Search Premier	mass media campaign AND physical activity
EMBASE	mass media, physical activity, campaign, intervention, television
ScienceDirect	mass media, physical activity, campaign, intervention, television

Additional studies were identified through review articles, Google Scholar, and reference lists of previously published work. In the context of this review, *media-based* is defined by the author as interventions using television or video content viewed across the broadcast, cable, or digital (Internet) space. *Physical activity* is defined as any bodily movement that results in a substantial increase in caloric requirements over resting and

includes both organized and non-organized activities (Caspersen, Powell, & Christenson, 1985; Corbin, Pangrazi, & Franks, 2000).

Research designs, measurement approaches, populations studied, theoretical frameworks, variables tested, and PA outcomes assessed are varied and diverse across mass media campaign intervention studies. Because of the complexity of this material, a meta-analysis was not feasible, and a narrative approach to the review was employed.

Interventions designed for healthy populations of children, teens, and adults that assessed immediate, intermediate, and distal outcomes were reviewed. Articles pertaining to interventions that focused on special healthcare needs (cardiovascular disease, type II diabetes, etc.) within a clinical or residential treatment setting were excluded. For campaigns targeting both PA and nutrition, only the PA findings are discussed. Integrated campaign approaches that incorporated television-based media as a chief component of the intervention are included. The author determined campaign success by its influence on improving: (1) immediate impacts such as awareness, understanding, and saliency of PA messages; (2) intermediate impacts such as attitudes, beliefs, and intentions to become more physically active; and/or (3) distal impacts such as the degree to which it influenced actual PA behavior among the target audience. All short-term, intermediate, and distal outcomes (if applicable) as a result of the campaign are reported.

Study Selection

A total of 1,224 articles were identified. After duplicates were removed and non-relevant studies eliminated, a total of 68 full texts were screened and subject to further scrutiny. Twenty-one articles fit the following inclusion/exclusion criteria: (1) assessed the impact of a mass media campaign using television as the primary medium of delivery; (2) assessed campaigns intended for a variety of sedentary yet otherwise healthy populations; (3) excluded interventions focused on special healthcare needs, such as cardiovascular disease or type II diabetes; (4) assessed attitudinal and/or behavioral PA

outcomes; (5) took place in the United States and internationally at either the local, state, or national level from inception to 2016; and (6) were published in the English language. This review did not discriminate against research papers based on study design. The results of the search are represented in Figure 2.1.

Data Extraction

The following information was extracted from each article and is reported in Table 2.2.

- Reference
- Campaign Name
- Country
- Study Design
- Sampling and Recruitment
- Participant Characteristics
- Intervention
- Campaign Length
- Sample Size and Response Rate

The following information was extracted from each article and is reported in Table 2.3.

- Reference
- Campaign Name
- Theoretical Framework
- Formative Research
- Results: Immediate Impacts
- Results: Intermediate Impacts
- Results: Distal Impacts

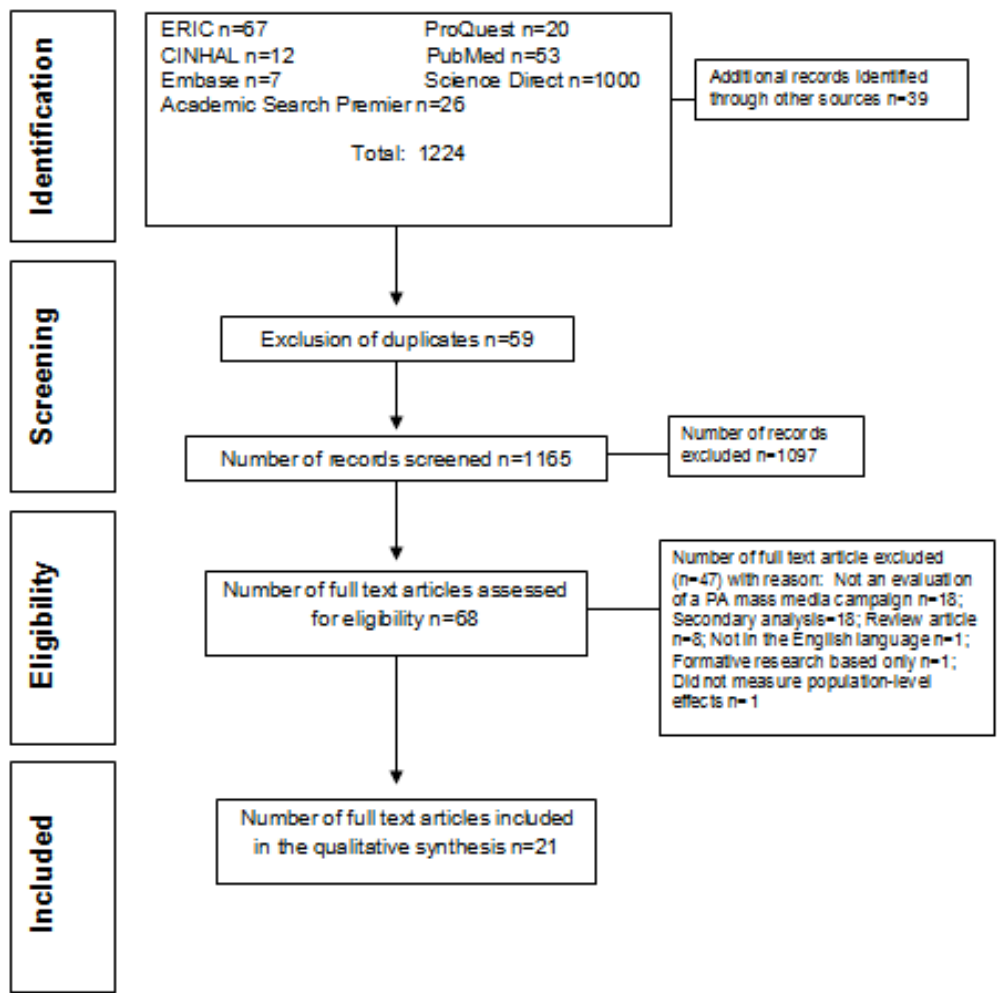


Figure 2.1. Flowchart of study selection process

Table 2.2. Campaign Characteristics: Study Design, Sampling, Participant Characteristics, etc.

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Morley et al., 2016	LiveLighter	Australia	Multiple Cross-sectional (baseline and 2 follow-ups) with comparison group; 2 media waves	Random digit dialing and drew from a sample frame of private household telephone landline numbers	Adults ages 25 to 49 years old Sub-sample: Overweight adults (BMI >25) and parents of at least 1 child <18 years old	Integrated campaign: Paid TV ads (15 and 30 seconds), cinema, radio, print and online advertising	~ 3 months	Intervention: Baseline N = 1003 Wave 1 N =1002 Wave 2 N =1001 Control: Baseline N = 1009 Wave 1 N = 1003 Wave 2 N = 1008 Response rate ranged between 35% and 44%
Peterson et al., 2005	Get Up and Do Something	United States	Cross-sectional	Cluster and convenient sampling	Adults ages 18 to 30 years old	Integrated campaign: Paid TV ads (30 seconds), billboards and bus wraps	~ 13 weeks	N = 363 90% Response rate

Table 2.2 (continued)

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Reger-Nash et al., 2005	Wheeling Walks	United States	Cohort (baseline and 3 follow-ups) with comparison group; 2 media waves	Random digit dialing of households	Sedentary and irregularly active adults ages 50 to 65 years old	Integrated campaign: Paid TV ads (30 seconds), newspaper, radio, media relations and community activities	~ 12 weeks	Intervention: Baseline N = 719 Follow-up 1 N = 519 Follow-up 2 N = 425 Follow-up 3 N = 373 Control: Baseline N = 753 Follow-up 1 N = 572 Follow-up 2 N = 442 Follow-up 3 N = 357 Response rate ranged between 50% and 74%
Reger-Nash et al., 2008	West Virginia Walks	United States	Pretest-Posttest; Cohort (baseline and 1 follow-up) with comparison group	Random digit dialing of households	Insufficiently active adults ages 40 to 65 years old	Integrated campaign: Paid TV ads (30 seconds), newspaper, radio, media relations and community activities	~ 8 weeks	Intervention: Baseline N = 1223 Follow-up N = 887 Control: Baseline N = 611 Follow-up N = 426 Response rate ranged between 70% and 73%

Table 2.2 (continued)

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Arikan et al., 2014	Fighting Obesity Campaign	Turkey	Cross-sectional	Multi-staged stratified sampling method; Randomly selected provinces stratified by urban or rural territory and clustered by neighborhoods where households were selected from each cluster	Individuals ages >15 years old	Integrated campaign: Paid TV ads, radio, newspapers, billboards and Internet	~ 3 months	N = 2038 87% Response rate
Craig et al., 2009	ParticipACTION	Canada	Cross-sectional	Participants randomly selected from an existing database	Adults ages >18 years old Sub-sample: Parents of children between 7 and 12 years old	Television only: Paid TV ads	Not indicated	N = 1500 100% Response rate

Table 2.2 (continued)

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Reger et al., 2002	Wheeling Walks	United States	Pretest-Posttest; Cohort (baseline and 1 follow-up) with comparison group; Direct observation	Random digit dialing of households	Sedentary and irregularly active adults ages 50 to 65 years old	Integrated campaign: Paid TV ads (30 seconds), radio, newspaper, Internet, public relations and community activities	~ 8 weeks	Intervention: Baseline N = 305 Follow-up N = 211 5 Community sites Control: Baseline N = 341 Follow-up N = 252 5 Community sites Response rate ranged between 69% and 74%
Miles et al., 2001	Fighting Fat, Fighting Fit	United Kingdom	Pretest-Posttest; Cohort (baseline and 1 follow-up)	Randomly selected sample of people who registered for the FFFF campaign	Adults ages >18 years old	Integrated campaign: Paid TV ads, TV programs, radio, Internet, books, video and print materials	~ 7 weeks	Baseline N = 3661 Follow-up N = 2112 58% Response rate
Wardle et al., 2001	Fighting Fat, Fighting Fit	United Kingdom	Pretest-Posttest; Cohort (baseline and 1 follow-up)	Stratified probability sample by random sampling of addresses of private households	Adults ages >16 years old	Integrated campaign: Paid TV ads, TV programs, radio, Internet, books, video and print materials	~ 7 weeks	Baseline N = 3661 Follow-up N = 2112 58% Response rate

Table 2.2 (continued)

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Hillsdon et al., 2001	ACTIVE for LIFE	United Kingdom	Cohort (baseline and 2 follow-ups); 2 media waves	Multi-stage cluster random probability design to identify a sample of home addresses	Adults ages 16 to 74 years old Sub-sample: Women ages 16 to 24 years old Sub-sample: Men ages 45 to 55 years old Sub-sample: Men and women > 50 years old	Integrated campaign: Paid TV ads (40 seconds), Internet, posters, newspapers, magazines, print materials, workplace promotion, public relations and community events	~ 36 months	Baseline N = 6711 Follow-up 1 N = 4268 Follow-up 2 N = 3189 Response rate ranged between 48% and 64%
Huhman et al., 2007	VERB	United States	Cohort (baseline and 2 follow-ups)	Random digit dialing of households	Parent/child dyads with children ages 9 to 13 years old (Year 1) and 11 to 15 years old (Year 2)	Integrated campaign: Paid TV ads, radio, print materials, Internet, school promotions and community events	~ 24 months	Baseline N = Not reported N = 2729 (Year 1) N = 2257 (Year 2) 83% Response rate
Berkowitz et al., 2008	VERB	United States	Cohort (baseline and 2 follow-ups) with comparison	Random digit dialing of households	Parent/child dyads with children ages 9 to 13 years old (Year 1) and 11 to 15 years old (Year 2)	Integrated campaign: Paid TV ads, radio, print materials, Internet, school promotions and community events	~ 24 months	Intervention: Baseline N = Not reported Year 1 N = 2771 Year 2 N = 1344 Control: Baseline N = Not reported Year 1 N = 2088 Year 2 N = 1069

Table 2.2 (continued)

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Leavy et al., 2012	Find Thirty Every Day	Australia	Multiple Cross-sectional (baseline and 2 follow ups); 7 media waves	Randomly selected from a telephone directory of residential phone numbers	Adults ages 20 to 54 years old	Integrated campaign: Paid TV ads (30 and 15 seconds), radio, print advertising, billboards, Internet, community activities and worksite activities	~ 22 months	Baseline N = 972 Follow-up 1 N = 938 Follow-up 2 N = 937 Response rate ranged from 77% to 89%
Beaudoin et al., 2007	Steps to a Healthier New Orleans	United States	Multiple Cross-sectional (baseline and 1 follow up)	Random digit dialing of households	Adults ages >18 years old	Integrated campaign: Paid TV ads, bus signage and streetcar signage	~ 7 months	Baseline N = 3137 Follow-up N = 1500 Response rate ranged between 20% and 27%
King et al., 2013	Measure Up	Australia	Multiple Cross-sectional (baseline and 1 follow-up); 2 media waves	Random digit dialing and drew from a sample of households with landline telephones	Adults 18 to 65 years old Sub-sample: Adults 25 to 50 years old with children Sub-sample: Adults 40 to 60 years old	Integrated campaign: Paid TV ads (30 and 60 seconds), radio, magazines, Internet, outdoor media, public relations and community activities	~ 7 months	N = 1006 Response rate ranged between 28% and 35%

Table 2.2 (continued)

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Berry et al., 2009	Healthy U	Canada	Mixed methods design; Cross-sectional and focus group interviews	Random digit dialing of households	Adults ages 18 to >55 years old Sub-sample: Adults ages 55 to 70 years old	Integrated campaign: Paid TV advertisements, news coverage, and billboards	~ 8 weeks	N = 1600 46% Response rate N = 29 (focus groups)
Booth et al., 1992	National Heart Foundation of Australia	Australia	Multiple Cross-sectional (baseline and 1 follow up)	Random sampling of households	Adults and children >14 years old	Integrated campaign: Paid TV ads, radio, magazines, print materials, public relations activities, community activities and scripted content within two national broadcast television shows	~ 4 weeks	Baseline N = 2426 Follow-up N = 2474 60% Response rate

Table 2.2 (continued)

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Renger et al., 2002	Yuma on the Move	United States	Multiple Cross-sectional (baseline and 1 follow-up); Pretest-Posttest; Cohort (baseline and 1 follow-up)	Random digit dialing of households	Adults 18 to > 65 years old Sub-sample: Adults 30 to 64 years old in the first 2 stages of change	Integrated campaign: Paid TV ads (30 seconds), comic strips and worksite posters	~ 24 months	Telephone interview: Baseline N = 500 Follow-up N = 500 Written survey: Baseline N = 703 Follow-up N = 644 Written survey (Sub-sample between- subject design): Baseline N = 84 Follow-up N = 75 Written survey (Sub-sample within-subject design): Baseline N = 33 Follow-up N = 33

Table 2.2 (continued)

Reference	Campaign	Country	Study Design	Sampling & Recruitment	Participant Characteristics	Intervention	Campaign Length	Sample Size and Response Rate
Wimbush et al., 1998	Health Education Board of Scotland	Scotland	Cohort (baseline and 2 follow-ups)	Multi-stage cluster random probability sampling; Random sample of those who actively responded to the campaign by contacting a free telephone helpline for further information	Adults and children ages 10 to 74 years old Sub-sample: Adults ages 30 to 55 years old who do not exercise on a regular basis	Integrated campaign: Paid TV ads (40 seconds), radio, booklets and a telephone line	~ 12 months	Baseline N = 700 Follow-up 1 N = 490 Follow-up 2 N = 283 Response rate ranged between 58% and 70%
Bauman et al., 2001	Active Australia	Australia	Pretest-Posttest; Cohort (baseline and 1 follow-up) with comparison group; Multiple Cross-sectional; 2 media waves	Random digit dialing of household telephones	Adults ages 25 to 60 years old motivated, but insufficiently active	Integrated campaign: Paid TV ads (15 seconds), print media, magazines, newspapers, physician mail outs and community activities	~ 5 months	Intervention: Baseline N = 2009 Follow-up N = 1700 Control: Baseline N = 3006 Follow-up N = 2253 Cohort: Baseline N = 1350 Follow-up N = 1185 Response rate ranged between 60% and 87%

Table 2.3. Campaign Characteristics: Formative Research, Theoretical Frameworks, Results, etc.

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Morley et al., 2016	LiveLighter	Not reported	Yes	<p>Awareness: 54% (W1) and 50% (W2); Higher among overweight individuals with 58% aware at W1 and 53% aware at W2</p> <p>Campaign recall (unprompted): A significant increase from 36% at baseline to 55% (W1) and 46% (W2) in intervention community of any weight related advertising compared to comparison community which remained stable from baseline (29%) to W1 (29%) and W2 (26%); Greater among overweight adults (35%) compared to rest of population (27%) at W1; Greater among parents (35%) compared to rest of population (26%) at W2; Around 1 in 3 adults recalled any LL ad</p> <p>Self-referent thoughts (Saliency): An increase in intervention who reported thinking about the harms to their health of being or becoming overweight 51% (baseline) to 58% (W1); Same pattern was seen in overweight sample from baseline (63%) to W2 (71%)</p>	<p>Attitudes/Beliefs: No change</p> <p>Intentions: Intervention sample who intended to do 30 minutes of moderate PA in next 7 days was significant from baseline (74%) to W2 (84%)</p>	Behavior: No change

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Peterson et al., 2005	Get Up and Do Something	Theory of reasoned action and theory of planned behavior	Yes	Awareness: 39% reported they had seen the TV ad	Intention: Of the 39% aware of the TV ad, 31% said they intended to be more physically active as a result of seeing the ad	NA
Reger-Nash et al., 2005	Wheeling Walks	Theory of planned behavior and transtheoretical model	Yes	Awareness: 77% reported seeing the TV ads at 3 months (W2) and 93% reported seeing them at 12 months (W4)	NA	Behavior: A higher proportion of sufficiently active walkers was seen among the most sedentary individuals (Group A) in the intervention compared to control at W2 (31% compared to 17%) and W4 (32% compared to 18%); The same pattern emerged for the moderately active individuals (Group B) in the intervention versus the control at W2 (60% compared to 44%); Group A (intervention) were 1.93 and 1.72 times more likely to increase daily walking time in minutes at W2 and W4, respectively; Group A (intervention) were 1.97 times more likely to make a positive change by > 30 minutes of daily walking as well as 2.13 and 1.94 times more likely to achieve significantly active walking status at W2 and W4, respectively; Group A (intervention) increased their walking days per week by 2 days at W2 and their walking time in minutes per day by 20 at W2 and 20 at W4; Group A (intervention) increased walking time in minutes per week by 75, 50 and 80 at W2, W3, and W4.

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Reger-Nash et al., 2008	West Virginia Walks	Theory of planned behavior and transtheoretical model	Yes	Awareness: 87% in the intervention community reported that they had heard of the campaign; 65% reported that they had seen the TV ads	NA	Behavior: Baseline insufficiently active respondents in the intervention group were 1.82 times more likely to become active walkers at follow-up compared to those in the comparison community; 27% were active walkers (intervention) versus 15% (control) at post-test
Arikan et al., 2014	Fighting Obesity Campaign	Not reported	Not reported	Awareness: 88% of respondents remembered the campaign; 85% learned about the campaign through television	NA	Behavior: Of the 88% aware, 29% reported a desired behavior change (increased PA, calculated his/her BMI, decreased meal portions); Females and those ages 20-39 were 1.56 and 1.28 times more likely to report behavior changes; Overweight and obese respondents were 2.29 and 3.11 times more likely; Those living in urban areas, who liked the campaign public spots and had higher levels of knowledge and awareness of obesity were 1.61, 2.42 and 2.17 times more likely to show behavioral changes

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Craig et al., 2009	ParticipACTION	Hierarchy of effects model	Not reported	<p>Awareness: 22% recalled the campaign without prompting and 57% recalled the campaign with prompting; Unprompted recall was more likely among women with a tertiary level of education; Prompted recall was more likely among women and among parents of highly active children</p> <p>Understanding/Knowledge: 59% agreed that “physical inactivity is associated with a higher risk of chronic health problems” and 12% agreed that “today’s children have a lower life expectancy than their parents”</p> <p>Saliency: 24% had moderate saliency scores and 28% had high saliency scores</p>	NA	Behavior: 27% reported doing more PA as a result of seeing the campaign

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Reger et al., 2002	Wheeling Walks	Theory of planned behavior, transtheoretical model, elaboration likelihood model, and advertising literature	Yes	Awareness: 90% of intervention community was aware of the campaign; 76% reported seeing the TV ads	<p>Attitudes: No change Social norms: No change</p> <p>Perceived control: Increased in intervention community from 3.35 (pre) to 3.5 (post)</p> <p>Intention: Increased in intervention community from 2.83 (pre) to 3.15 (post)</p> <p>Stage of change: 62% moved to a higher stage of change in the intervention community compared to 50% in the control community</p>	Behavior: 23% increase in walking in intervention community versus a 6% decrease in control community (direct observation); 32% reached sufficient walking status in intervention versus 18% in the control community; Intervention community increased moderate-intensity walking minutes per week by 123 minutes compared to the 88 minute increase in the control community

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Miles et al., 2001	Fighting Fat, Fighting Fit	Social learning theory and the health belief model	Yes	NA	NA	Behavior: 74% of participants reported an increase in activity levels; Total number of minutes per week of activity increased by 181 minutes; Those classified as sedentary decreased from 35% (pre) to 17% (post); Those classified as irregularly moderately active decreased from 36% (pre) to 22% (post); Those classified as being regularly moderately active increased from 29% (pre) to 60% (post); Those classified as doing vigorous activity increased from 2% (pre) to 9% (post); 36% shifted from being 'inactive' to 'active'; Increased exercise was more likely among men and those with a continued involvement in the campaign
Wardle et al., 2001	Fighting Fat, Fighting Fit	Social learning theory and the health belief model were used to guide the campaign	Yes	Awareness: 57% were aware of the campaign; 29% recalled watching one of the TV programs; 19% recalled 'being more active' as a campaign message; 16% recalled 'weight loss' as a campaign message; Awareness was higher among younger, female, white, highly educated, and those who reported watching one of the FFFF TV programs; 87% reported they heard of the campaign from TV	NA	NA

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Hillsdon et al., 2001	ACTIVE for LIFE	Social marketing theory	Yes	<p>Awareness: 38% were aware of the campaign; awareness was higher among those who were younger, males, those with children, from a lower social class, a higher readiness to change and who were vigorously active</p> <p>Knowledge: Those knowledgeable about PA recommendations increased by 3.7% from baseline to W3; Knowledge was higher in women, older age groups and those in lower social grades</p>	NA	Behavior: Those reporting vigorous activity decreased from 12% (baseline) to 3% (W3); Time spent in sedentary behavior increased from 24% (baseline) to 31% (W3)
Huhman et al., 2007	VERB	Theory of planned behavior and social cognitive theory	Yes	<p>Awareness: 81% reported being aware of the campaign</p> <p>Exposure: 19% reported no exposure of VERB, 16% reported exposure of < 1 per week, 22% reported exposure about once per week, 25% reported exposure several times per week and 17% reported exposure every day</p> <p>Understanding: Of the 81% aware of the campaign, 96% understood at least one key campaign message</p>	<p>Outcome expectations: Children aware of VERB scored a 10.07 on the outcome expectations scale compared to those unaware who scored 9.71</p> <p>Self-efficacy: No effect; Social influences: No effect</p>	Behavior: 61% of children aware of VERB engaged in PA the previous day compared to 46% unaware of VERB; Children aware of VERB engaged in 3.9 weekly sessions of free-time PA compared to the 3.0 sessions of those unaware

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Berkowitz et al., 2008	VERB	Theory of planned behavior and social cognitive theory	Yes	<p>Awareness: 84% of high- dose communities were aware of VERB compared to 76% of national-dose comparison after Year 1; 88% of high-dose communities were aware of VERB compared to 85% of national-dose comparison after Year 2</p> <p>Understanding: 77% of high-dose communities understood VERB message compared to 68% of national-dose comparison; 86% of high-dose communities understood VERB compared to 82% of national-dose comparison</p>	<p>Social influences: High- dose communities scored a 10.06 on the scale which was significantly higher than the 9.98 score of the national-dose comparison at Year 1</p> <p>Self-efficacy: high-dose communities score a 10.06 on the scale which was significantly higher than the 9.94 score of the national-dose comparison at Year 2</p>	Behavior: 61% in the high-dose community reported doing PA the day before the interview compared to 55% of the national-dose comparison at Year 2; High-dose community reported 4.06 median sessions of PA per week compared to 3.48 in the national-dose comparison at Year 2

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Leavy et al., 2012	Find Thirty Every Day	Social cognitive theory	Yes	<p>Awareness (prompted recall and prompted recognition): Total awareness increased from 30% (baseline) to 45% (Follow-up 1) to 49% (Follow-up 2); Awareness was significantly different across all subgroups from baseline to Follow-up 2; Prompted recall increased from 7% (baseline) to 19% (Follow-up 1) to 21% (Follow-up 2); Prompted recognition increase from 36% (baseline) to 40% (Follow-up 1); Total awareness was higher in women, those who were already sufficiently active and those from a lower SES; Awareness was 1.95 and 2.22 times more likely at Follow-up 1 and Follow-up 2 respectively; Awareness was 1.30 times more likely in women and 1.27 times more likely among those sufficiently active</p>	<p>Intention: Intention increased from 10% (baseline) to 18% (Follow-up 1) to 21% (Follow-up 2); Intention was significantly different across all subgroups from baseline to Follow-up 2 except among those who had achieved a university education; Intention was 2.09 and 2.40 times more likely at Follow-up 1 and Follow-up 2, respectively; Intention was 1.72 times more likely in women and 1.54 times more likely among those overweight/obese</p>	<p>Behavior: Walking in median minutes increased from 90 (baseline) to 120 (Follow-up 1); Total vigorous PA in median minutes increased from 0 (baseline) to 20 (Follow-up 1); Total PA in median minutes increased from 190 (baseline) to 240 (Follow-up 1); Subgroup analysis showed significant increases for vigorous PA and total PA for women; Subgroup analysis showed significant increases walking only for men; Total PA also increased in people living in the metropolitan area, aged 35 to 45 years old, among university educated respondents and those classified as normal/underweight BMI; There was an increase in PA at Follow-up 2 compared to baseline (1.22); PA was 32% less likely among females, 1.28 times more likely among those with a diploma and 1.85 times more likely among those with a university degree; PA was 26% less likely among overweight and obese; PA was 1.46 times more likely among those aware of the campaign</p>

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Beaudoin et al., 2007	Steps to a Healthier New Orleans	Not reported	Yes	<p>Campaign recall: Brand recall increased from 4% at baseline to 36% in the total sample; Recollection of walking message increased from 47% at baseline to 52% in the total sample; African Americans had higher levels of brand awareness and walking message recall (4% to 44%, 57% to 62%); The others subsample increased in brand awareness from 35% at baseline to 38% and in recall of walking messages from 3% to 23%</p> <p>Perceived importance (Saliency): Those who considered walking to be very important increased from 73% at baseline to 76% in the total sample; It increased in the African American women aged 18 to 49 subsample from 75% at baseline to 78% and in the others subsample from 72% at baseline to 76%</p>	NA	<p>Behavior: Those who participate in leisure walking during a usual week increased from 64% at baseline to 67% and 68% to 70% in the African American women aged 18 to 49 subsample and 63% to 66% in the others subsample; Those who participate in utilitarian walking in a usual week decreased from 51% at baseline to 50% in the total sample and decreased from 58% to 55% among African American women aged 18 to 49 subsample and remained the same at 49% in the others subsample</p>

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
King et al., 2013	Measure Up	Not reported	Yes	<p>Awareness (prompted and unprompted): Unprompted awareness increased from 1.1% pre-campaign to 38% post-campaign; Prompted recall was at 90% post-campaign; Unprompted recall was 45% less likely among aged 45 to 65 year olds, 2.4 times more likely among those with a high school degree or higher, 30% less likely among those employed, yet 1.63 and 1.53 times more likely among those making \$50,000 to \$100,000 and >\$100,000</p> <p>Knowledge: knowledge items that significantly increased pre to post included “recommended minutes of PA per day” (50% to 57%), “WC associated with increased risk of chronic disease form men and women (0% to 8% and 6% to 25%); knowledge of correct waist measurement was 5.72 times more likely among women</p> <p>Saliency: No change</p>	<p>Attitudes: Attitude items that significantly increased pre to post included “WC is strongly related to risk of developing chronic disease” (76% to 83%), “importance of maintaining a WC of <80cm/94cm to prevent chronic disease” (7.6 to 7.9), and “importance of prevention of chronic disease” (33.0 to 33.4)</p>	<p>Behavior: Proportion of those who measure their own waist in the past 6 months increase from 31% pre-campaign to 37% post-campaign; Proportion of those who gave a measure of their own waist increased from 21% pre-campaign to 27% post-campaign; Those who measured their waist in the last 6 months were more likely to have a high school degree or higher (AOR = 1.94), although they were 24% less likely to be employed</p>

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Berry et al., 2009	Healthy U	Hierarchy of evaluation framework	Not reported	Campaign recall (prompted and unprompted): Unprompted recall was low at .5% and prompted recall was 17%; those >55 years old were 1.46 times more likely to recall (prompted) the PA ads	Beliefs: No change Intentions: No change	Behavior: No change
Booth et al., 1992	National Heart Foundation of Australia	Social learning theory and social marketing theory	Not reported	Campaign recall: Increased from 46% pre-campaign to 71% post-campaign; A greater proportion of females recalled campaign message than males (80% vs. 73%)	Beliefs: No change in the belief item that exercise “helped a lot” in the prevention of heart disease from pre-campaign to post-campaign	Behavior: Walking for exercise in the previous 2 weeks increased pre-campaign (70%) to post-campaign (74%); Those ages 50 to 59 years old were 1.82 times more likely to walk and those >60 years old were 1.94 times more likely to walk; Those in the least educated group showed the greatest increase in walking pre-campaign (66%) to post-campaign (73%); Mean number of walking sessions increased pre to post from 7.9 to 8.4; Time spent sedentary decreased in the >60 year old group from 22% to 15% and in the least education group from 22% to 17%

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Renger et al., 2002	Yuma on the Move	Transtheoretical model	Yes	Knowledge: No change in the between-subject analysis (written surveys); No change in the within- subject analysis (written surveys)	Self-efficacy: Increased significantly from 13.12 pre-campaign to 16.42 post-campaign in the between subject analysis (written surveys) Decisional balance: No change in the between-subject analysis (written surveys); No change in the within-subject analysis (written surveys)	Behavior: No change in the between-subject analysis (written surveys); Significant increases in self-reported physical activity levels in the within-subject analysis pre-campaign (3.28) to post-campaign (4.34); Percentage of those who indicated that they did not participate in any leisure-time physical activity decreased from 30% to 26% (telephone survey); the percentage of those in the sub-sample who indicated they did no leisure-time physical activity decreased pre-campaign (36%) to post-campaign (23%)

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Wimbush et al., 1998	Health Education Board of Scotland	Not reported	Yes	<p>Awareness: 70% of all adults were aware of the campaign after W1 and 69% were aware after W2; 67% of the target group were aware after W1 and 69% were aware after W2</p> <p>Knowledge: The knowledge item “walking a mile uses up the same energy as running a mile” increased from 20% to 56% in the entire adult population and from 20% to 58% in the target population after W2; it increased from 57% to 65% after W2 among Fitline callers</p>	<p>Beliefs: Those who strongly agree with the belief item that “walking is a good form of exercise” increased from 38% at baseline to 57% post-campaign</p> <p>Intention: Intention item who reported “would like to be more physically” active increased from 60% at baseline to 82% post-campaign among Fitline callers</p> <p>Stage of change: Fitline callers shifted a mean .5 stages in the positive direction</p>	Behavior: 50% of all adults claimed to be more physically active after W1 and 48% claimed to be more physically active at the 1-year follow-up

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Bauman et al., 2001	Active Australia	Not reported	Yes	<p>Campaign recall (prompted and unprompted): Unprompted recall increased from 3% to 23% in the cohort and from 2% to 21% in the independent sample; prompted recall increased from 14% to 59% in the cohort and from 13% to 51% in the independent sample; In analysis confined to target group of NSW cohort unprompted recall increased by 20% and prompted recall increased from 16% pre to 59% post</p> <p>Knowledge: Knowledge items regarding moderate PA became stronger in the cohort for “generally more active for health” (2.06 pre to 1.83 post), “half an hour of activity daily necessary” (1.87 pre to 1.73 post), and “10-minute block of activity ok” (2.33 pre to 2.19 post; these knowledge items also became stronger in the independent sample (2.09 pre to 1.96 post; 1.90 pre to 1.82 post; 2.36 pre to 2.23 post); In analysis confined to target group of NSW knowledge items “generally more active for health” and “half an hour daily is necessary” became stronger (2.01 pre to 1.82 post and 1.82 pre to 1.69 post)</p>	<p>Intention: No change in cohort or independent sample</p> <p>Self-efficacy: increased significantly from 7.07 pre to 7.49 post in independent sample</p>	<p>Behavior: total hours per week decreased from 4.37 pre-campaign to 3.81 post-campaign in cohort; In analysis confined to NSW cohort 27% went from insufficiently active to achieving 5 sessions and 150 minutes per week post-campaign and total hours per week increased significantly from 1.37 to 2.44; Factors associated with an increase in total activity of >1 hour in the NSW sample included: Being aware of the campaign and in the target group (AOR = 2.08), An increased self-efficacy score (AOR = 1.64), An increased in knowledge item that half hour daily needed (AOR = 1.34); Those who believed more strongly that three times a week of 20 minutes of vigorous activity was necessary for health were 27% less likely to increase their total PA</p>

Table 2.3 (continued)

Reference	Campaign	Theoretical Framework	Formative Research	Results: Immediate Impacts	Results: Intermediate Impacts	Results: Distal Impacts
Owen et al., 1995	National Heart Foundation of Australia	Social learning theory and social marketing theory		Campaign recall: Increased from 46% to 77% in 1990 and from 63% to 74% in 1991	Intentions: The “no exercise, no intention to start” category decreased by 2.8% pre-campaign to post-campaign in 1990; There was no statistically significant change across intention categories for pre to post-campaign in 1991	Behavior: Likelihood of walking post-campaign was significant among those respondents aged 40 to 49 (1.57), 50 to 59 (1.79), and >60 years old (1.92) after the 1990 campaign; Pre-campaign and post-campaign differences in physical inactivity were not significant for either year

Results

Of the 68 potential articles assessed from the literature search, 21 eligible studies met the review criteria. Eight articles evaluated physical activity mass media campaigns from the United States, 6 from Australia, 3 from the United Kingdom, 2 from Canada, 1 from Turkey, and 1 from Scotland. The characteristics among these campaigns show much heterogeneity in terms of research design, measurement approaches, populations studied, theoretical frameworks, variables tested, and PA outcomes assessed. All campaigns were led by television, but 20 out of the 21 also incorporated a variety of other media channels, including radio advertisements, newspapers, magazines (among other print materials), billboards, bus wraps, and public relations activities as well as community and worksite events. Campaign duration ranged from: as little as 4 to 8 weeks ($n=6$); approximately 3 months ($n=4$); between 5 and 12 months ($n=4$); and several phases between 22 and 36 months ($n=6$). For one study, the duration of the campaign was not clear.

The evaluation designs for the campaigns included: experimental ($n=5$), quasi-experimental ($n=8$), non-experimental ($n=7$), and a mixed methods design ($n=1$). Five of the quasi-experimental design studies collected baseline and follow-up measures from a cohort and a comparison group. Four of the non-experimental studies were cross-sectional designs. Nearly all of the campaigns used random population sampling ($n=20$). Sample sizes ranged from 305 to 6,711, and response rates varied widely from 20% to 90%. Theoretical and conceptual framework underpinnings were reported in 15 of the 21 studies, with several citing that a combination of theories was used. The theories and frameworks reported include: theory of planned behavior ($n=6$), transtheoretical model ($n=4$), social learning theory ($n=4$), social cognitive theory ($n=3$), social marketing theory ($n=3$), health belief model ($n=2$), theory of reasoned action ($n=1$), elaboration likelihood

model ($n=1$), hierarchy of effects model ($n=1$), and hierarchy of evaluation framework ($n=1$). Sixteen of the studies reported some sort of formative research testing, and measurement of campaign exposure varied greatly, with 7 studies reporting Gross Ratings Points (GRPs), 7 reporting Target Audiences Ratings Points (TARPs), 2 reporting TV Audience Ratings Points (TVRs), 1 reporting Nielsen Ratings, while the remainder described exposure simply in terms of TV “spots” or failed to include a measure altogether. Campaign budgets were seldom reported—only 7 studies included a value, which ranged from a mere \$150,000 to upwards of \$194 million.

Immediate/Proximal Impacts: Awareness, Understanding, and Saliency

The most immediate measurable outcome of physical activity-themed mass media campaigns—and arguably the most important—is increased awareness of the campaign message (Cavill & Bauman, 2004). Awareness is defined in terms of whether the target population had seen the campaign elements. It is typically assessed through unprompted recall (where respondents are asked if they have heard of any campaign promoting physical activity throughout the duration of the research) and prompted recall (where respondents are given the campaign name, tagline, or shown materials related to the campaign and asked if they recognize them), but can also be a stand-alone measure. Nearly all of the 21 studies assessed campaign awareness, unprompted recall, or prompted recall ($n=19$), while a number of them measured a combination of the three. Ten of the 19 studies reported outcomes in terms of just awareness; 4 unprompted and prompted together; 3 unprompted alone; 1 measured solely prompted; while 1 measured both awareness and prompted recall.

Overall, the evaluations reported high levels of awareness, with estimates ranging from 38% to 93% with a median of 77%. Specifically, Hillsdon, Cavill, Nanchahal, Diamond, & White (2001) assessed the impact of the United Kingdom’s national campaign, *ACTIVE for LIFE*, on awareness (among other variables) over 36 months in

adults ages 16 to 74 years old. The research evaluated outcomes within a national cohort sample and a comparison group at baseline and two follow-ups. The integrated campaign enlisted 40-second paid TV advertisements, Internet, posters, newspapers, magazines, print materials, and workplace promotion initiatives, as well as public relations and community events. However, just 38% of sample respondents reported being aware of the advertising messages six to eight months after the television spots aired. Evidence suggests that levels of campaign awareness are directly dependent on post-campaign timing of the assessment. Since measures were taken several months after the campaign, it is likely that respondent recall dwindled over this timeframe, resulting in an underestimation (Cavill & Bauman, 2004).

Wheeling Walks achieved the highest level of awareness. The West Virginia-based integrated campaign enlisted 30-second paid TV advertisements, newspaper, radio, media relations, and community activities and assessed the effectiveness of these materials over 12 weeks. Awareness, among other outcome variables, was assessed at baseline and three follow-ups within a cohort and comparison group. Results showed that 93% of the sample ($n=373$) reported seeing the TV advertisements after the first follow-up, evidence in favor of television as a promising media channel for health promotion. Such high levels of awareness were likely due to a number of strengths related to the campaign: (1) it targeted a specific and identifiable PA behavior, walking, which is the most preferred form of PA for all age groups and activity levels; (2) it relied on formative research to inform and support the development of the campaign, which specifically targeted sedentary and irregularly active 50- to 65-year-old adults; and (3) theory of planned behavior and transtheoretical model constructs were used to guide campaign development and assessment (Reger-Nash et al., 2005).

The next level of campaign proximal impact after awareness is understanding and/or knowledge about physical activity. Eight out of the 21 studies reported such measures. Of these, 7 found significant increases in knowledge- and/or understanding-

related items, including: an understanding that “physical inactivity is associated with a higher risk of chronic health problems” and that “today’s children have a lower life expectancy than their parents” (Craig, Bauman, Gauvin, Robertson, & Murumets, 2009); improved knowledge among those who understood that “walking a mile uses up the same energy as running a mile” (Wimbush, MacGregor, & Fraser, 1998); and increased knowledge of appropriate physical activity recommendations such that individuals should be “generally more active for health,” “a half an hour of daily activity is necessary,” and that “10-minute blocks of activity are ok” (Bauman, Bellew, Owen, & Vita, 2001).

The final immediate measure of impact is saliency. Saliency pertains to perceived importance of physical activity messages and self-referent thoughts about the risks of physical inactivity. Yet, this outcome was infrequently assessed with just 3 of the 21 studies reporting on saliency. Morley et al. (2016) showed an increase in the intervention group who reported thinking about the harms to their health of being or becoming overweight from 51% at baseline to 58% at wave 1 as a result of the *LiveLighter* campaign. Interestingly, this pattern was also seen in the overweight sub-sample (from 63% at baseline to 71% at wave 1). In contrast, saliency scores were rather low in the assessment of Canada’s *ParticipACTION* campaign. Craig et al. (2009) reported 24% and 28% of respondents as having moderate and high saliency scores, respectively. Similar modest saliency outcomes came as a result of the *Step to a Healthier New Orleans* campaign, with those who considered walking to be very important increasing just 3% from 73% at baseline to 76% at follow-up in the total sample with an equally modest increase in the target population sub-sample—African American women ages 18 to 49—from 75% at baseline to 78% at follow-up (Beaudoin, Fernandez, Wall, & Farley 2007).

Intermediate Impacts: Attitudes, Beliefs, Intentions, etc.

According to Bauman, Smith, Maibach, and Reger-Nash’s (2006) theoretical hierarchy of variables influenced through physical activity mass media campaigns, there

are nine different outcomes designed to assess intermediate impacts: attitudes/beliefs, self-efficacy, social support, decisional balance, stage of change, perceived social norms/social influence, perceived barriers, personal control/mastery over physical activity behavior, and physical activity behavioral intentions. Thirteen out of the 21 studies evaluated 7 out of the 9 aforementioned measures: physical activity behavioral intentions ($n=8$), attitudes/beliefs ($n=6$), self-efficacy ($n=4$), perceived social norms/social influence ($n=3$), stage of change ($n=2$), decisional balance ($n=1$), and personal control/mastery over physical activity behavior ($n=1$). No studies measured perceived barriers or social support.

Physical activity behavioral intentions were significant in 5 out of the 8 studies assessed. Morley et al. (2016) showed that those exposed to the *LiveLighter* campaign who intended to do 30 minutes of moderate PA in the next 7 days were significant from baseline (74%) to follow-up (84%), while 31% of respondents who were aware of the *Get Up and Do Something* TV spots reported they intended to be more physically active as a result of seeing the ad (Peterson, Abraham, & Waterfield, 2005). Behavioral intention also increased significantly from pre to post in the intervention group exposed to the *Wheeling Walks* campaign (Reger et al., 2002). Furthermore, intention increased from 10% at baseline to 18% at follow-up 1 to 21% at follow-up 2 among those aware of Australia's *Find Thirty Everyday* campaign (Leavy et al., 2012). Interestingly, intention was 1.72 times more likely in women and 1.54 times more likely among those overweight/obese. Intention among those who engaged in the campaign initiative by the Health Education Board of Scotland (HEBS) showed that those who reported they "would like to be more physically active" increased from 60% at baseline to 82% post-campaign (Wimbush et al., 1998).

Just two studies out of the six that evaluated attitudes/beliefs showed significant changes. Attitude items increased pre to post as a result of Australia's *Measure Up* campaign and Scotland's HEBS initiative and included beliefs related to: waist

circumference as a positive risk factor to developing chronic disease, the importance of maintaining an appropriate waist circumference in order to prevent chronic disease, attitudes related to the importance of chronic disease prevention, and the belief item that walking is a good form of exercise (King, Grunseit, O'Hara, & Bauman, 2013; Wimbush et al., 1998).

Significant findings related to self-efficacy were found as a result of the *VERB* campaign, *Yuma on the Move*, and *Active Australia*. Specifically, *Active Australia* showed a considerable impact among insufficiently active adults ages 25 to 60 years old, with self-efficacy scores significantly increasing over the course of the five-month campaign from 7.07 to 7.49 (Bauman et al., 2001). Similarly, Berkowitz, Huhman, and Nolin (2008) assessed whether the communities that received a higher dose of advertising and promotional activities associated with *VERB* resulted in greater outcome measures compared to those exposed to the national average. High-dose communities scored a 10.06 on the self-efficacy scale, which was significantly higher than the 9.94 score of the national-dose comparison after year two of the campaign. *VERB* was also the only campaign to show significant increases in perceived social norms/social influence out of the three campaigns that assessed the outcome.

Both studies that measured stages of changes showed significantly positive shifts in stage. Respondents moved half a stage in the positive direction as a result of the physical activity-themed campaign initiative by HEBS, while 62% of the sample ($n=211$) moved to a higher stage of change in the intervention community (compared to just 50% in the control community) in the assessment of *Wheeling Walks* (Reger et al., 2002; Wimbush et al., 1998). *Wheeling Walks* was also the only campaign that evaluated perceived control/personal mastery over physical activity showing a significant increase in the intervention community from baseline to 8 weeks. The single campaign that evaluated decisional balance, *Yuma on the Move*, however, showed no changes in the intermediate measure (Renger et al., 2002).

Distal Impacts: Physical Activity Behavior

The most distal impact measure is the assessment of actual physical activity behavior change among target audiences. This is typically the most difficult to assess, as objective measures are seldom employed. In fact, all 19 out of the 21 studies that evaluated physical activity behavior change used self-report measures. While many made certain to use validated instruments, such as questions derived from the Behavioral Risk Factor Surveillance System (or the country's equivalent), several researchers designed questions specifically for the purposes of their own investigation making any findings—significant or not—questionable. Nonetheless, evaluation of self-report physical activity behavior typically includes one or more the following measures: total dose, total weekly sessions of physical activity, increase in quantum (i.e., increasing physical activity by ≥ 60 min/week), decreased sedentary time and/or moving from “insufficiently” active to “sufficiently” active (Bauman et al., 2006). Fifteen of the 19 studies that evaluated behavior change showed significant positive changes in self-reported physical activity.

Total dose. Five of the 15 studies reported an unspecified “total dose” of increased physical activity behavior change as a result of the campaigns. Beaudoin et al. (2007) found that those who participated in leisure walking during a usual week increased marginally from 64% at baseline to 67% among those exposed to *Steps to a Healthier New Orleans*. This same pattern was seen among the target population—African American women—whose leisure walking increased from 68% pre-campaign to 70% post-campaign (Beaudoin et al., 2007). Wimbush et al. (1998) reported an equally vague measure of physical activity behavior change in reporting that 50% of adults claimed to be more physically active after wave 1 of Scotland's HEBS initiative while 48% claimed to be more physically active after a one-year follow-up. Twenty-seven percent of those exposed to *ParticipACTION* reported being more physically active as a result of seeing the campaign (Craig et al., 2009), while likelihood of “increased walking” was significant among respondents aged 40 to 49 years old and those >60 in the assessment of the

National Heart Foundation of Australia (Owen, Bauman, Booth, Oldenburg, & Magnus, 1995). Additionally, Arian et al. (2014) showed that of the 88% aware of the *Fighting Obesity Campaign*, 29% reported a desired behavior change, with females and those ages 20 to 39 years 1.56 and 1.28 times more likely to report an increase in physical activity. Overweight and obese respondents were also 2.29 and 3.11 times more likely to show behavioral changes as were those living in urban areas, those who liked the campaign public spots, and those who had higher levels of knowledge and awareness of obesity.

Total weekly sessions of physical activity. Three studies out of the 15 reported behavior change in terms of total weekly sessions of physical activity. Two of the 3 studies were related to the *VERB* campaign. Huhman et al. (2007) reported that 61% of children aware of *VERB* engaged in physical activity the previous day compared to 46% unaware of the campaign. Those children aware of *VERB* engaged in 3.9 weekly sessions of free-time physical activity compared to the 3.0 number of weekly sessions of those unaware. Similarly, Berkowitz et al. (2008) showed that 61% in the higher-dose community reported doing physical activity the day before the interview compared to 55% of the national-dose comparison at Year 2, with the higher-dose community reporting 4.06 median sessions of weekly physical activity compared to the 3.48 in the national dose-comparison. Both studies enlisted the Youth Media Campaign Longitudinal Survey (YMCLS)—adding credence to the positive findings.

Increase in quantum. An increase in quantum of physical activity positions physical activity behavior change in terms of a specified amount such as an increase in minutes per day or minutes per week. In addition to showing that a higher proportion of sufficiently active walkers were seen among the most sedentary individuals in the intervention compared to control at wave 2 (31% compared to 17%) and wave 4 (32% compared to 18%) of the *Wheeling Walks* campaign, these same sedentary individuals were also more likely to increase daily walking time in minutes at wave 2 and wave 4 of the campaign. Specifically, the most sedentary individuals made a positive change by

>30 minutes of daily walking, increased their walking time in minutes per day by 20 minutes, and increased their walking time in minutes per week by 75, 50, and 80 minutes at wave 2, wave 3, and wave 4, respectively (Reger-Nash et al., 2005). Furthermore, in a separate study assessing *Wheeling Walks*, those exposed to the campaign reported a significant increase in moderate-intensity walking minutes per week by 123 minutes compared to the 88-minute increase in the control community (Reger et al., 2002). Similarly, Miles et al. (2001) reported that 74% of respondents reported an increase in activity levels, with the total number of minutes per week of activity increasing by 181 minutes among those exposed to the *Fighting Fat, Fighting Fit* campaign. But it was Leavy et al. (2012) that reported the most thorough and significant changes in quantum measures of physical activity as a result of the *Find Thirty Every Day* campaign. Walking in median minutes increased from 90 (baseline) to 120 (follow-up 1), while total vigorous physical activity in median minutes increased from 0 (baseline) to 20 (follow-up 1) and total physical activity in median minutes increased from 190 (baseline) to 240 (follow-up 1). A subgroup analysis showed significant increases for vigorous physical activity and total physical activity among women, while only increased walking was significant among men. Total physical activity also increased in people living in the metropolitan area, those ages 35 to 45 years old, university-educated respondents, and those classified as normal/underweight BMI. There was also an increase in physical activity at follow-up 2 compared to baseline, with changes 32% less likely among females, 1.28 times more likely among those with a diploma, 1.85 times more likely among those with a university degree, and 1.46 times more likely among those aware of the campaign.

Decrease in sedentary time. Changes in sedentary activity were infrequently assessed, with just two studies reporting a significant decrease in the measure. Specifically, Miles et al. (2001) showed that those classified as sedentary decreased from pre-campaign (35%) to post-campaign (17%) and those classified as irregularly

moderately active decreased from 36% (pre) to 22% (post) after implementation of the *Fighting Fat, Fighting Fit* campaign. Booth, Bauman, Oldenburg, Owen, and Magnus (1992) reported that time spent sedentary decreased among those >60 years old from 22% to 15% and in the least educated group from 22% to 17% post-campaign in the evaluation of the *National Heart Foundation of Australia* campaign.

Moving from insufficiently active to sufficiently active. Three campaigns assessed population shifts from “insufficiently active” to “sufficiently active”: *Wheeling Walks*, *West Virginia Walks*, and *Active Australia*. In addition to a 23% increase in walking among the intervention community (versus a 6% decrease in the control community), 32% of those exposed to *Wheeling Walks* reached sufficient walking status versus just 18% in the control (Reger et al., 2002). Baseline insufficiently active respondents exposed to *West Virginia Walks* were 1.82 times more likely to become active walkers at follow-up compared to those in the comparison community, with 27% reporting they were active walkers in the intervention compared to 15% in the control post-campaign (Reger-Nash et al., 2008). Twenty-seven percent of *Active Australia* respondents also went from insufficiently active to achieving 5 sessions and 150 minutes of physical activity post-campaign (Bauman et al., 2001).

Other attitudinal and/or behavioral measures. Eight of the 21 campaigns measured other attitudinal and/or behavioral outcomes unrelated to Bauman’s theoretical hierarchy of variables. For example, the *ParticipACTION* campaign assessed whether respondents looked for information about physical activity, visited the campaign website, talked to their children about being more physically active, talked to their spouse or partner about encouraging their children to be more physically active, made stricter rules about sedentary activities, or enrolled their child in an organized PA or sport as a result of seeing the campaign (Craig et al., 2009). Morley et al. (2016) evaluated the *LiveLighter* campaign’s perceived message effectiveness and found that it was perceived by almost all adults as “believable” and “made a strong argument for reducing weight,” with

approximately half of the respondents citing it as “relevant to me.” Interestingly, overweight adults were more likely to agree the ads were “relevant to me” and “made me stop and think.” *Get Up and Do Something* assessed whether respondents talked to someone about the TV ad. Of the 39% aware of the campaign, 26% said they had talked to someone about it (Peterson et al., 2005). Out of the 21 campaigns, only 2 measured impressions. Berry et al. (2009) assessed *Healthy U* qualitatively, finding mostly negative impressions among focus group participants, whereas *Wheeling Walks* showed that the TV ad achieved positive ratings, averaging 4.2 on a 5-point scale (Reger et al., 2002). Just one campaign measured weight loss outcomes. Miles et al. (2001) found that 78% of participants lost weight, with an average weight loss of 4.2 kg as a result of the *Fighting Fat, Fighting Fit* campaign. Weight loss was more likely among males, those who were overweight or obese, and those who were continually involved in the campaign. The percent classified as obese decreased by 11%, and those satisfied with their weight increased by 14% post-campaign (Miles et al., 2001).

Discussion

These studies show that physical activity-themed mass media interventions are likely to demonstrate high levels of awareness through prompted or unprompted recall of campaign name and/or tagline. This is important, as the literature cites awareness as the most critical precursor to attitudinal and behavioral changes, followed by knowledge and/or understanding of campaign messages (Flay & Burton, 1990; Hovland, Janis, & Kelley, 1953). However, knowledge and/or understanding were assessed in just 8 studies. The final immediate impact, saliency (perceived importance of physical activity messages and self-referent thoughts about the risks of physical inactivity), was evaluated in only 3 out of the 21 studies.

Health behavior communication theories support leveraging changes in cognition and affect as a way to effect change in health protective behaviors, including physical activity (Morley et al. 2016). Thirteen of these studies evaluated intermediate, emotion-provoking outcomes, and the results of these intermediate outcomes were mostly positive. But while 15 out of the 19 studies that assessed physical activity behavior change also saw positive changes, there are several limitations to consider. First, all results were based on self-report and may be subject to error due to memory/recall bias, reverse causality, and/or a risk of socially desirable responses. Second, several campaigns did not enlist a control community, and therefore no firm inferences about causality can be made. Although non-experimental and quasi-experimental designs are common in mass media evaluations, controlled designs provide stronger causal evidence in the evaluation of these campaigns. Third, no published validity or reliability studies have been reported in regard to the questionnaires used in the majority of the campaigns. These questions may not have had adequate sensitivity to detect changes in physical activity behavior. Thus, inherent threats to validity and potential for unreliability are very possible.

Recommendations for Research

Mass media campaigns designed to promote physical activity require much stronger research and development. The following recommendations are made as a result of this systematic review: (1) mass media campaigns require formative research and pre-testing testing throughout each stage of development in order to maximize their effectiveness across target groups; (2) acceptability of PA messages relies heavily on production content quality and appeal among audiences; (3) media messages are more likely to be effective if they are guided by an appropriate health-behavior theory; (4) campaigns should point to a specific and identifiable physical activity behavior that

audiences can readily adopt; and (5) sustained campaign activity is needed to impact behavior in the long term.

Mass media campaigns require formative research and pre-testing throughout each stage of development in order to maximize their effectiveness across target groups. Sixteen of the 21 studies reported some sort of formative research and/or pre-testing of materials, but the details of the formative research testing ranged from a simple statement such as “advertisements were extensively pre-tested with formative, qualitative research” to entire paragraphs devoted to explanation of pre-testing procedures. Nevertheless, resultant feedback can be used to define population groups as well as facilitate comprehension of and personal relevance toward campaign messages among target audiences (Bauman et al., 2006). For example, the *Get Up and Do Something* campaign was based on extensive formative research via an associate group analysis (AGA) procedure. Audience feedback on images and storyboards helped to shape the 30-second commercials prior to production of the television ad. Focus group data indicated that it was better to associate physical activity with things the target audience enjoyed—such as friends, socializing, and looking good—while simultaneously conveying a negative association with sedentary activities, yet in a “non-threatening, non-authoritative” manner. This resulted in a motivational campaign ad that better connected with the 18- to 30-year-old target audience (Peterson et al., 2005). *Active Australia* is another example where focus group testing provided valuable insight. The target group, sedentary yet otherwise healthy 25- to 60-year-olds, preferred humor and light-heartedness represented through incidental, everyday activities as opposed to “fear arousing messages that invoked the dire health consequences” of being sedentary. Positive changes in awareness, knowledge/understanding, self-efficacy, and physical activity behavior were most prominent among the pre-defined campaign target group—a group that was defined through extensive formative research testing (Bauman et al., 2001).

When time and resources allow, it is recommended to conduct formative evaluation throughout all phases of campaign development—from exploratory research, to concept development, message pre-testing, to market testing. This approach allows for the development of demographic-specific persuasive campaign materials that will reach and affect the broad and diverse audiences they are intended for (Bauman et al., 2006).

Acceptability of physical activity messages relies heavily on production content quality and appeal among audiences, though this is seldom assessed. *Wheeling Walks* showed that the TV ads achieved positive ratings averaging 4.2 on a 5-point scale. Favorable impressions toward the campaign may explain why 90% in the intervention community were aware of it, with 76% reporting they had seen the ads on TV. Campaign appeal might also explain the high levels of responsiveness. Positive changes as a result of *Wheeling Walks* were found in several outcomes, including perceived control, stage of change, and physical activity behavioral intention, as well as actual physical activity behavior, with the intervention community increasing moderate-intensity walking minutes per week by 123 minutes compared to the 88 minute increase in the control community (Reger et al., 2002). Scotland's HEBS initiative advertisement also attained high levels of awareness (70%), which researchers attribute to its popular appeal, while Turkey's *Fighting Obesity Campaign* showed that those who indicated they liked the campaign public spots were 2.42 times more likely to show physical activity behavioral changes (Arikan et al., 2014; Wimbush et al., 1998). Anecdotally, the *Get Up and Do Something* campaign used a “glitzier and stylish commercial marketing approach to the TV ads instead of an overly theoretical public-service-announcement approach” to better influence target audiences. Similarly, *Yuma on the Move* filmed TV spots “using area residents” in “familiar locations that have meaning and applicability” that researchers suggest are more effective than “national programs with prescribed protocols and national spokespersons” (Peterson et al., 2005; Renger et al., 2002).

It is clear that audience favorability toward campaign messages should be considered when designing and developing physical activity mass media interventions. In fact, advertising literature indicates that audiences' attitudes toward a television or web-based media advertisement is directly dependent on perceived levels of entertainment. If impressions are favorable, this might elicit a more proactive consumer response toward what is being advertised (Ducoffe, 1995; Fernandez, 1995). It would be beneficial for future physical activity mass media campaign interventions to test this empirically.

Media messages are more likely to be effective if they are guided by an appropriate health-behavior theory. Theory serves as "a conceptual foundation for a campaign and can suggest important determinants upon which campaign messages might focus" (Noar, 2006). Fifteen out of the 21 studies evaluated reported using health behavior theory to guide campaign development and evaluation, with the most popular theory being the theory of planned behavior ($n=6$). However, among the majority of these studies, it is unclear just *how* the theory was applied. It was common among these campaigns to state simply that "theoretical constructs were used to guide the campaign."

Still, other campaigns better explained how theoretical frameworks were implemented in either campaign development and/or evaluation. For example, *Fighting Fat, Fighting Fit* materials were based on social learning theory, and researchers elaborated on how characters featured in the campaign elements modeled the "desired physical activity behaviors," showed them to be effective in "achieving the desired results," and presented the campaign as "pertinent to 'real-life' situations" (Miles et al., 2001). Reger et al. (2002) detailed how the theory of planned behavior was used in the *Wheeling Walks* campaign to identify relevant response variables such as attitudes and social norms and how the elaboration likelihood model was used to construct messages designed to increase perceived control. The *VERB* campaign also demonstrated strong theoretical underpinnings and specifically designed TV ads to target social cognitive theory and theory of planned behavior constructs. Constructs included outcome

expectations, self-efficacy, and social influences. These psychosocial dimensions were then evaluated using scales from the Youth Media Campaign Longitudinal Survey (Huhman et al., 2007).

The results of this systematic review show that just 6 out of the 21 studies lacked theoretical underpinnings—evidence to support that health behavior theory has become increasingly more important in the development and assessment of physical activity-themed mass media campaigns (Noar, 2006). As a public health strategy, mass media campaigns are pragmatic efforts more concerned with the application of theory rather than comprehensively testing a single theoretical model. A detailed description of exactly how the theory was applied, however, is far less common. It is recommended that future manuscripts not overlook this important element and make efforts to better explain how theory-derived campaign messages guided individuals through the process of attitudinal and/or behavior change.

Campaigns should point to a specific and identifiable physical activity behavior that audiences can readily adopt. Research supports the efficacy of using one simple focused message as opposed to complex multi-messages, which tend to be costly and have had limited long-term effects (Reger-Nash et al., 2005). Mass media campaigns that effectively encourage walking are a possible solution. Evidence suggests that walking is the most preferred form of exercise among all age groups—irrespective of physical activity status—for several reasons: (1) walking is convenient in most communities; (2) it is affordable as no equipment is needed; and (3) walking can be easily incorporated into one's daily life. For these reasons, walking has fewer barriers than most other forms of physical activity (Reger-Nash et al., 2005). *Wheeling Walks* was designed to encourage 30 minutes or more of moderate to brisk walking among target groups on the grounds of the aforementioned reasons. Results were positive, with significant sustained population-wide improvements in walking among the most sedentary group at 3 and 6 months post-campaign. The impact was even sustained at 12 months (Reger-Nash et al., 2005). *West*

Virginia Walks replicated the *Wheeling Walks* community-wide campaign methodology and also identified walking as the target activity. Baseline insufficiently active respondents in the intervention group were 1.82 times more likely to become active walkers at follow-up compared to those in the unexposed comparison community (Reger-Nash et al., 2008). Scotland's HEBS initiative also focused solely on walking. Fifty percent of all adults claimed to be more physically active after wave 1, and 48% claimed to be more physically active at the 1-year follow-up (Wimbush et al., 1998).

Yet, walking alone wasn't the only simple and identifiable behavior assessed. The *Measure Up* campaign promoted knowledge of waist circumference as an indicator of chronic disease risk with promising results. The proportion of those who measured their own waist increased from 31% pre-campaign to 37% post-campaign, while the proportion of those who were capable of providing a measure of their own waist circumference increased from 21% pre-campaign to 27% post-campaign (King et al., 2013).

In contrast, the *Get Up and Do Something* campaign slogan deliberately encouraged "freedom of choice" by displaying myriad activities in their promotional TV ads—from playing frisbee to dancing in an outdoor park. But while audiences appreciated this freedom of choice, most individuals found that the advertisement left them directionless. One important question remained: Get up and do *what?* (Peterson et al., 2005). The same could be said for the *VERB* campaign. Promotional elements encouraged equally vague lifestyle changes, such as "playing more" and "trying new verbs" (Huhman et al., 2007). It is possible that the over-saturated, complex, multi-message approach was lost among tween audiences, making the intervention—although mostly successful—less effective than it could have been.

Physical activity-themed mass media campaigns should provide clear behavioral targets that confer physiological and epidemiologic benefits. Walking is credible, easy to understand, and has come to be the most socially normative way of increasing physical

activity among varied and diverse populations. The results of this systematic review show that mass media campaigns that focused on increasing moderate to brisk walking resonated with audiences and provided a successful stimulus toward behavior change among those exposed to the campaigns that promoted it.

Sustained campaign activity is needed to impact behavior in the long term. Systematic strategies need to be developed over longer periods of time—strategies that differ from those enlisted with short-term, episodic campaigns. Morley et al. (2016) showed that campaign awareness was significant after wave 1 of the *LiveLighter* campaign, while physical activity behavioral intention increased significantly, but only after wave 2. This evidence supports proximal variables as necessary precursors to actual physical activity behavior change. But the campaign lasted just 3 months, which was not nearly enough time to show significant positive changes in physical activity (Morley et al., 2016). *ACTIVE for LIFE* was also unsuccessful in promoting behavior change. In fact, those reporting vigorous activity *decreased* from 12% at baseline to 3% at follow-up, and time spent in sedentary behavior *increased* from 24% at baseline to 31% at follow-up. One explanation may have been the low levels of campaign exposure, which resulted in a lack of message penetration among the intervention community (Hillsdon et al., 2001).

Pre-campaign and post-campaign differences in physical inactivity were not significant for either of the two years following the National Heart Foundation of Australia's mass media campaign. The authors urge that future campaign exposure be more extensive and implemented over longer periods of time to fully assess behavioral impacts—a strategy the authors were not able to pursue (Owen et al., 1995). And while Miles et al. (2001) report positive evidence to support the *Measure Up* mass media campaign, results were only assessed in the short term. The authors insist that future campaigns should attempt to broadcast campaign messages over years rather than just

weeks or months to increase the likelihood of sustained positive change (Contento et al., 1995; Miles et al., 2001).

Hornik (2002) contends that per capita exposure is the most important determinant of the success of a health communication campaign. The more times a person hears a message, the more likely behavior change will occur, since message repetition works to prime an individual's decision-making (Cappella, Fishbein, Hornik, Ahern, & Sayeed, 2001). By contrast, physical activity-themed mass media campaigns that scatter their intervention messages or are sustained for just weeks or months at a time are inadequate and thus less likely to achieve the necessary intensity needed for proper market penetration among the target community (Marcus, Owen, Forsyth, Cavill, & Fridinger, 1998). The results of this systematic review support and add to the existing body of literature suggesting that long-term sustained campaign activity is required to achieve measurable physical activity behavioral impact.

Conclusion

Overall, these studies show that physical activity-themed mass media interventions are likely to demonstrate high levels of awareness through prompted or unprompted recall of campaign name and/or tagline. However, other immediate impacts, such as knowledge, understanding, and saliency, were far less assessed. A moderate number of studies evaluated intermediate, emotion-provoking outcomes, and the results of these intermediate outcomes were mostly positive. But even though nearly two-thirds of the studies evaluated physical activity behavioral outcomes, there are several methodological limitations that could have resulted in an overestimation of the positive findings. Recommendations for future research to further enhance the knowledge base regarding mass media campaigns designed to promote physical activity include: (1) implementing formative research and pre-testing testing throughout each stage of development; (2) a

more concerted attempt to create materials that appeal to target audiences; (3) ensuring that interventions are guided by an appropriate health-behavior theory; (4) promotion of a specific and identifiable physical activity behavior that audiences can readily adopt; and (5) sustained campaign activity, which is needed to impact behavior in the long term.

References

- Arikan, I., Karakaya, K., Erata, M., Tüzün, H., Baran, E., Göçmen, L., & Yesil, H. K. (2014). Fighting Obesity Campaign in Turkey: Evaluation of media campaign efficacy. *Central European Journal of Public Health, 22*(3), 170.
- Atkins, C., & Wallack, L. (1990). Mass communication and public health: Complexities and conflicts. *Mass Communication and Public Health. Complexities and Conflicts*.
- Bauman, A. E., Bellew, B., Owen, N., & Vita, P. (2001). Impact of an Australian mass media campaign targeting physical activity in 1998. *American Journal of Preventive Medicine, 21*(1), 41-47.
- Bauman, A. E., Smith, B. J., Maibach, E. W., & Reger-Nash, B. (2006). Evaluation of mass media campaigns for physical activity. *Evaluation and Program Planning, 29*(3), 312-322.
- Beaudoin, C. E., Fernandez, C., Wall, J. L., & Farley, T. A. (2007). Promoting healthy eating and physical activity: Short-term effects of a mass media campaign. *American Journal of Preventive Medicine, 32*(3), 217-223.
- Berkowitz, J. M., Huhman, M., & Nolin, M. J. (2008). Did augmenting the VERB™ campaign advertising in select communities have an effect on awareness, attitudes, and physical activity? *American Journal of Preventive Medicine, 34*(6), S257-S266.
- Berry, T. R., Spence, J. C., Plotnikoff, R. C., Bauman, A., McCargar, L., Witcher, C., ... & Stolp, S. (2009). A mixed methods evaluation of televised health promotion advertisements targeted at older adults. *Evaluation and Program Planning, 32*(3), 278-288.
- Booth, M., Bauman, A., Oldenburg, B., Owen, N., & Magnus, P. (1992). Effects of a national mass-media campaign on physical activity participation. *Health Promotion International, 7*(4), 241-247.
- Brown, D. R., Soares, J., Epping, J. M., Lankford, T. J., Wallace, J. S., Hopkins, D., ... & Community Preventive Services Task Force. (2012). Stand-alone mass media campaigns to increase physical activity: A community guide updated review. *American Journal of Preventive Medicine, 43*(5), 551-561.
- Cappella, J. N., Fishbein, M., Hornik, R., Ahern, R. K., & Sayeed, S. (2001). Using theory to select messages in antidrug media campaigns. *Public Communication Campaigns, 3*, 214-230.

- Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public Health Reports, 100*(2), 126.
- Cavill, N., & Bauman, A. (2004). Changing the way people think about health enhancing physical activity: do mass media campaigns have a role? *Journal of Sports Sciences, 22*(8), 771-790.
- Centers for Disease Control and Prevention. (n.s.). *Behavioral Risk Factor Surveillance System (BRFSS): Turning information into health*. Retrieved from <http://cdc.gov/brfss>
- Contento, I., Balch, G. I., Bronner, Y. L., Lytle, L. A., Maloney, S. K., Olson, C. M., & Swadener, S. S. (1995). The effectiveness of nutrition education and implications for nutrition education policy, programs, and research: A review of research. *Journal of Nutrition Education (USA)*.
- Corbin, C., Pangrazi, R., & Frank, D. (2000). Definitions: Health, fitness and physical activity. *President's Council on Physical Fitness and Sports Research Digest, 3*. Retrieved March 28, 2010, from http://fitness.gov/Reading_Room/Digests/digests.html.
- Craig, C. L., Bauman, A., Gauvin, L., Robertson, J., & Murumets, K. (2009). ParticipACTION: A mass media campaign targeting parents of inactive children; knowledge, saliency, and trialing behaviours. *International Journal of Behavioral Nutrition and Physical Activity, 6*(1), 88.
- Ducoffe, R. H. (1995). How consumers assess the value of advertising. *Journal of Current Issues & Research in Advertising, 17*(1), 1-18.
- Fernandez, K. V. (1995). *Information processing in directional media: The effectiveness of selected advertising executional cues in the Yellow Pages*. Unpublished dissertation, School of Business and Graduate School of the University of Kansas.
- Flay, B. R., & Burton, D. (1990). Effective mass media communication campaigns for public health. In C. Atkin & L. Wallack (Eds.), *Mass communication and public health*. (pp. 129-146). Newbury Park, CA: Sage.
- Garber, C. E., Blissmer, B., Deschenes, M. R., Franklin, B. A., Lamonte, M. J., Lee, I. M., Nieman, D. C., & Swain, D. P. (2011). American College of Sports Medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medicine and Science in Sports and Exercise, 43*(7), 1334-1359. doi: 10.1249/MSS.0b013e318213fefb

- Hillsdon, M., Cavill, N., Nanchahal, K., Diamond, A., & White, I. R. (2001). National level promotion of physical activity: results from England's ACTIVE for LIFE campaign. *Journal of Epidemiology & Community Health, 55*(10), 755-761.
- Hornik, R. (Ed.). (2002). *Public health communication: Evidence for behavior change*. Mahwah (NJ): Routledge.
- Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion; psychological studies of opinion change*. New Haven, CT, US: Yale University Press.
- Huhman, M. E., Potter, L. D., Duke, J. C., Judkins, D. R., Heitzler, C. D., & Wong, F. L. (2007). Evaluation of a national physical activity intervention for children: VERB™ campaign, 2002–2004. *American Journal of Preventive Medicine, 32*(1), 38-43.
- Huhman, M. E., Potter, L. D., Wong, F. L., Banspach, S. W., Duke, J. C., & Heitzler, C. D. (2005). Effects of a mass media campaign to increase physical activity among children: Year-1 results of the VERB campaign. *Pediatrics, 116*(2), e277-e284.
- King, E. L., Grunseit, A. C., O'Hara, B. J., & Bauman, A. E. (2013). Evaluating the effectiveness of an Australian obesity mass-media campaign: How did the 'Measure-Up' campaign measure up in New South Wales? *Health Education Research, 28*(6), 1029-1039.
- Koolstra, C. M., Bos, M. J., & Vermeulen, I. E. (2006). Through which medium should science information professionals communicate with the public: Television or the Internet? *Journal of Science Communication, 5*(3), 1-8.
- Leavy, J. E., Rosenberg, M., Bauman, A. E., Bull, F. C., Giles-Corti, B., Shilton, T., Maitland, C., & Barnes, R. (2012). Effects of Find Thirty every day cross-sectional findings from a Western Australian population-wide mass media campaign, 2008-2010. *Health Education & Behavior, 40*(4), 480-492.
- Marcus, B., Owen, N., Forsyth, L., Cavill, N., & Fridinger, F. (1998). Physical activity interventions using mass media, print media, and information technology. *American Journal of Preventive Medicine, 15*(4), 362-378.
- Miles, A., Rapoport, L., Wardle, J., Afuape, T., & Duman, M. (2001). Using the mass-media to target obesity: an analysis of the characteristics and reported behaviour change of participants in the BBC's Fighting Fat, Fighting Fit' campaign. *Health Education Research, 16*(3), 357-372.
- Morley, B., Niven, P., Dixon, H., Swanson, M., Szybiak, M., Shilton, T., ... & Wakefield, M. (2016). Population-based evaluation of the 'LiveLighter' healthy weight and lifestyle mass media campaign. *Health Education Research, 31*(2), 121-135.

- Noar, S. M. (2006). A 10-year retrospective of research in health mass media campaigns: Where do we go from here? *Journal of Health Communication, 11*(1), 21-42.
- Noar, S. M., Benac, C. N., & Harris, M.S. (2007). Does tailoring matter? Meta analytic review of tailored print health behavior change interventions. *Psychological Bulletin, 133*(4), 673-693. doi: 10.1037/00332909.133.4.673
- Owen, N., Bauman, A., Booth, M., Oldenburg, B., & Magnus, P. (1995). Serial mass-media campaigns to promote physical activity: Reinforcing or redundant? *American Journal of Public Health, 85*(2), 244-248.
- Peterson, M., Abraham, A., & Waterfield, A. (2005). Marketing physical activity: Lessons learned from a statewide media campaign. *Health Promotion Practice, 6*(4), 437-446.
- Reger, B., Cooper, L., Booth-Butterfield, S., Smith, H., Bauman, A., Wootan, M., ... & Greer, F. (2002). Wheeling Walks: A community campaign using paid media to encourage walking among sedentary older adults. *Preventive Medicine, 35*(3), 285-292.
- Reger-Nash, B., Bauman, A., Booth-Butterfield, S., Cooper, L., Smith, H., Chey, T., & Simon, K. J. (2005). Wheeling Walks: Evaluation of a media-based community intervention. *Family and Community Health, 28*(1), 64-78.
- Reger-Nash, B., Bauman, A., Cooper, L., Chey, T., Simon, K. J., Brann, M., & Leyden, K. M. (2008). WV Walks: Replication with expanded reach. *Journal of Physical Activity and Health, 5*(1), 19-27.
- Renger, R., Steinfeld, V., & Lazarus, S. (2002). Assessing the effectiveness of a community based media campaign targeting physical inactivity. *Family and Community Health, 25*(3), 18-30.
- Wakefield, M. A., Loken, B., & Hornik, R.C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet, 376*(9748), 1261-1271. doi: 0.1016/S01406736(10)60809-4
- Wardle, J., Rapoport, L., Miles, A., Afuape, T., & Duman, M. (2001). Mass education for obesity prevention: The penetration of the BBC's Fighting Fat, Fighting Fit campaign. *Health Education Research, 16*(3), 343-355.
- Wimbush, E., MacGregor, A., & Fraser, E. (1998). Impacts of a national mass media campaign on walking in Scotland. *Health Promotion International, 13*(1), 45-53.

Chapter III
EXAMINATION OF A PHYSICAL ACTIVITY-THEMED
REALITY TV SHOW CONCEPT USING AN ONLINE INTERNET
SURVEY IN A SAMPLE OF URBAN ADULTS

Abstract

Reality television (TV) is a popular form of media shown to be influential on those who watch it, yet little evidence exists regarding the associations between personal characteristics, health behaviors, and the genre's role in influencing health behaviors among audiences.

PURPOSE: To examine the associations between individual characteristics on the impressions of a physical activity (PA)-themed reality show concept and intentions to engage in active transportation (AT).

METHODS: Randomized two-group (independent) post-test pre-experimental design. Five hundred eighteen participants watched one of two 2-minute reality show concept videos (AT or Home Design), completed surveys assessing impressions of their respective show, and answered questions on sociodemographics, PA behaviors, and AT habits.

ANALYSIS: Means, frequencies, Spearman's rho (ρ), Chi square, multiple and bivariate regression, non-parametric *t*-tests.

RESULTS: Age, race, and education were significantly associated with impressions. Mild and moderate exercise were significantly associated with behavioral

intentions. Impressions of the show explained 19% of the variance in behavioral intentions for AT. There was a statistically significant difference between TV show conditions with those exposed to the AT show concept reporting higher AT behavioral intentions after watching the trailer.

CONCLUSION: This research suggests that a PA-themed reality show concept positively influenced AT behavioral intentions among viewers and that impressions of the show is a correlate to behavioral intentions.

Introduction

Reality television is a popular form of media shown to be influential on those who watch it, yet little evidence exists regarding the associations between personal characteristics, health-related behaviors, and the genre's role in positively influencing health behavioral intentions among audiences. Identifying and understanding the relationships between these factors is clearly of value, as it will help to tailor television interventions to more effectively influence health behavioral intentions, which could possibly engender health behavior change (Webb & Sheeran, 2006). An evaluation of an original reality TV show concept provides the backdrop of this investigation. Specifically, the purpose of this study is to examine the associations between individual characteristics and impressions of a physical activity (PA)-themed reality TV show concept and intentions to engage in active transportation (AT)-related behavior among potential viewers after watching the 2-minute show trailer.

Background/Literature Review

Physical activity is essential for physical and mental health (Garber et al., 2011), yet nearly 50% of adults in the United States do not achieve adequate levels of aerobic activity to achieve health and fitness benefits (BRFSS, 2013). Transportation-related PA

is a salient public health target because of its potential to enhance health by increasing PA, improve neighborhood safety, reduce the environmental impact of fossil fuels, and positively impact city economics (National Preventive Health Survey, 2009).

Mass media campaigns are organized, purposive efforts to communicate, persuade, and influence a population to consider, adopt, or change to more health enhancing practices (Atkins & Wallack, 1990). Because of the myriad communication channels, including public service announcements (PSAs), paid TV advertisements, TV news programs, documentaries, and entertainment programs, public and private health agencies often enlist mass media campaign interventions in an effort to encourage PA among large socially, racially, and economically diverse populations (Bauman, Smith, Maibach, & Reger-Nash, 2006; Wakefield, Loken, & Hornik, 2010). Reality television could be considered a mass media channel for delivering PA messages. The reality TV genre is characterized by the following: (1) those featured portray themselves (i.e., are not actors); (2) filming occurs in one's living or working environment rather than on a set; (3) filming occurs without a script; and (4) events are placed in a narrative context for the sole purpose of entertainment (Nabi, Biely, Morgan, & Stitt, 2003).

As a popular form of media, reality television has been shown to be influential on those who watch it for two reasons: (1) viewers perceive reality TV as being more authentic; and (2) characters on reality shows are considered "people like me," thus rendering their experiences more relevant to the viewer (Rose & Wood, 2005). For example, a significant number of traffic accidents related to aggressive driving occurred among West Virginia residents just days after NASCAR races aired on national TV. Research suggests that these incidents were directly related to professional racecar fans "acting out" NASCAR in their own driving on suburban streets (Vitaglione, 2012). A random telephone survey indicated that 93% of viewers who watched the show *Supernanny*—a reality TV series that features a parenting expert as she travels the globe helping parents deal with their unruly children—admitted to implementing better

household parenting techniques as a result of seeing the show, which then led to improvements in their children's behavior. These findings were most prevalent among women, parents between the ages of 20 and 30 years, parents with children under 12 years old, and those from single-parent households (Ganeshasundaram & Henley, 2009).

It is likely that individual characteristics, behaviors, and attitudes toward media influence the effectiveness of mass media campaigns (Noar, Benac, & Harris, 2007). Therefore, it is important to study the associations among these characteristics, behaviors, attitudes, and the media prior to launching a health-related mass media intervention. Thus, the overall objective of this research is to assess the concept of an original reality TV show that integrates PA—in the form of active transportation—into its storyline. The specific aims of this research are as follows: (1) to examine the associations between individual characteristics and impressions of a PA-themed reality show concept; (2) to examine individual PA behaviors and AT habits as they relate to impressions of a PA-themed reality show concept and intentions to engage in an AT; and (3) to examine viewers' impressions of a reality show featuring AT as a possible correlate of their interest in engaging in active-transportation-related behavior. A sub-aim of this research is to compare intentions to engage in the featured behavior between individuals exposed to the PA-themed reality show concept versus a Home Design comparison condition.

Little research has examined the extent to which television featuring PA can influence an individual's desire to be active. The research that is available is limited in its focus on *The Biggest Loser* franchise (a reality television series that chronicles the weight loss of obese individuals in a competitive context), mass media campaign interventions, or its non-experimental approach. The present study is unique because it builds upon past research examining the mass media's influence on behavior, predictors of PA participation, and PA behavioral intentions by examining the potential role that individual characteristics, health behaviors, and attitudes toward a reality show concept featuring

transportation-related PA may have on individuals' response toward this media and their desire to engage in AT.

Methods

Participant Recruitment

A total of 1,289 volunteer participants responded to this research. Participants were recruited from the urban community surrounding a northeastern university in the United States and primarily included students, faculty, staff, and neighboring residents. Recruitment was done via fliers, email blasts, word-of-mouth, and face-to-face solicitation as well as web-based bulletin board announcements. Inclusion criteria were as follows: (1) participants between 18 and 64 years old; (2) live or work in an urban environment; (3) capable of walking at least five city blocks without stopping and without severe discomfort; and (4) able to read and understand English. The Institutional Review Board (IRB) at Teachers College, Columbia University approved this study. All recruitment materials displayed the appropriate IRB protocol number, and all participants provided informed consent in accordance with Teachers College, Columbia University policies and procedures. Volunteers were entered into a raffle for a chance to win a \$100 gift card toward public transportation. Figure 3.1 depicts the study flow and participant response rate throughout the recruitment and experimental process.

Study Design

The study used a randomized two group (independent) post-test pre-experimental design. Respondents were randomly assigned to watch one of two 2-minute reality show concept videos (AT or Home Design)—also called a “sizzle reel” or a “trailer.” Approximately half were exposed to the reality show concept promoting AT, and the other half were exposed to a health behavior neutral media message, a Home Design

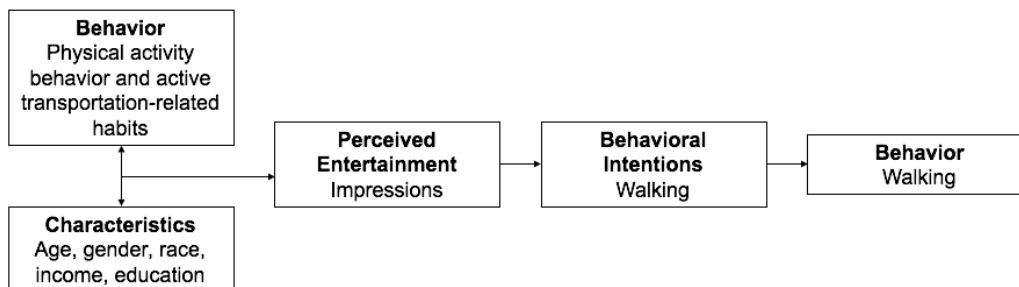


Figure 3.1. Conceptual framework used to guide the development of the current research

reality show concept, which acted as the comparison condition. Randomization was performed using a standard randomization Mersenne Twister algorithm and occurred immediately upon clicking the survey link. Participants were independently assigned to either the AT show concept or the Home Design concept. The post-test only design was employed due to the high likelihood of reactive effects of the pre-test on the reactions to the reality show concept trailer as well as measurement bias, due to the close proximity of the pre- and post-test assessments if a pre-test/post-test design was employed.

Explanation of AT and Home Design Comparison Videos

The physical activity themed concept, *Beat The Bus*, features ordinary people in a series of impromptu races while having fun and burning calories. The show is designed to encourage viewers to adopt, continue, or increase AT habits—specifically walking—within their own free-living environments. The following provides a brief synopsis of the show concept:

Whether it's taking the stairs instead of the escalator or walking to work instead of riding the train, *Beat The Bus* encourages viewers to take a fresh new look at how they get around through a series of impromptu races for the chance to win cash: A secretary races a New York City bus across town. A business traveler races a fellow traveler on a conveyor belt through a busy airport. A new mom jogs faster than a cruise ship moves down the Hudson River. Part competition and part workout, *Beat The Bus* is a series that focuses on the essential health principle, active transportation. Each episode is designed to inspire viewers to rethink their modes of transport while having fun and burning calories every step of the way!

The home design concept, *Inside Job With Lisa Quinn*, features an interior designer as she surprises unsuspecting homeowners with quick and inexpensive room makeovers. The show aims to encourage viewers to apply unique and functional interior design principles in their very own homes. The following paragraph provides a brief synopsis of the show concept:

Inside Job With Lisa Quinn is a home design program featuring TV personality and interior designer extraordinaire, Lisa Quinn, as she completely transforms a room on a shoe-string budget alongside her team of home improvement experts. In one episode, Lisa makes over a tiny bathroom for a first-year college student. In another episode, Lisa gives viewers a lesson in using color to brighten up one's living space. And in another episode, Lisa creates wall art by using items such as chalk and an overhead projector. Each episode is designed to give viewers tips on how to recreate their own home spaces using fresh and innovative ideas—in just a few simple steps and all without breaking the bank!

Both trailers were comparable in length (2 minutes) and production quality and differed only in the specific topic addressed. Home design shows have previously been employed as comparison conditions in reality television research on health, specifically with regard to studies examining the influence of media messages about cosmetic surgery on one's interest in altering their own appearance. These studies provided the rationale for selecting it as an appropriate comparison condition for this research (Markey & Markey, 2010; Mazzeo, Trace, Mitchell, & Gow, 2007).

Measures

After watching the assigned show concept, participants answered questions pertaining to their personal characteristics, PA behaviors, AT habits, and impressions of the show via the 37-item survey using the Qualtrics survey platform (version 2014-2015, Provo, UT).

Conceptual Framework

The conceptual framework combines several common constructs specific to advertising literature. It was solely used to guide the development of the evaluation components, and the study was not designed to empirically test the theory. Specifically, the conceptual framework provides a visual representation of constructs that informed the variables that were measured and the instruments employed to measure them (see Figure 3.1).

Individual Characteristics

Individual characteristics including gender, age, race, education, income, and BMI were queried. Age was collapsed into five categories to create a new variable Age.Group: 18 to 24 years old, 25 to 34 years old, 35 to 44 years old, 45 to 54 years old, and 55 to 64 years old. Gender was dichotomized into Gender.New (male versus non-male). BMI was dichotomized into BMI.New (BMI<25 versus BMI \geq 25). Race was dichotomized into Race.New (White versus non-White), Education into Education.New (<bachelors degree versus \geq bachelors degree), and Income was dichotomized into Income.New (<\$50,000 per year versus \geq \$50,000 per year).

Physical Activity Behaviors

The Godin Leisure-Time Exercise Questionnaire (GLTEQ) was used to measure participants' current PA behavior (MildGodinScore, ModerateGodinScore, VigorousGodinScore, HeartBeatsRapidly), and a Total Leisure Activity Score was calculated (TLAS) (Godin & Shephard, 1997). Additionally, participants were asked the following question: The World Health Organization (WHO) defines physical activity as "any bodily movement produced by skeletal muscles that requires energy expenditure." Based on this definition, how would you rate your current physical activity level? Participants answered on a Likert-type scale from 1 (very poor) to 6 (excellent) (World Health Organization [WHO], 2016).

Active Transportation Habits

The following questions were extracted from the RESIDEs Neighborhood Physical Activity Questionnaire (NPAQ) to gauge participants' current active transportation habits, specifically walking: (1) "Estimate the total time you spend walking as a means of transport *inside* your neighborhood in a USUAL WEEK" (AcTranIn); (2) "Estimate the total time you spend walking as a means of transport *outside* your neighborhood in a USUAL WEEK" (AcTranOut); (3) "In a USUAL WEEK, how many times do you walk as a means of transport *inside* your neighborhood?" (WalkInN); and (4) "In a USUAL WEEK, how many times do you walk as a means of transport *outside* your neighborhood?" (WalkOutN) (Giles-Corti et al., 2006). The questions extracted were consistent with the methodology employed in the study by Cerin et al. (2010). Portions of the RESIDEs NPAQ rather than the entire instrument were used to minimize participant burden without compromising a quality assessment of active transportation habits.

Perceived Entertainment of the Videos

Questions designed to assess content quality, appeal of each show concept, and reality television viewing habits—with word modifications tailored to the AT concept and the Home Design concept—included the following: (1) What are your impressions of the show concept? (Impressions); (2) Are the rules/tasks of the show entertaining/made clear to the viewer? (Tasks); (3) In terms of quality and appeal, how would you rate the visuals of the show? (Visuals); (4) Overall, I enjoyed watching the show trailer (Enjoyment); (5) If I saw it on television, I would watch this show (WatchOnTV); (6) If the host of the show approached you, how likely is it that you would participate in an episode of the show? (Participate); (7) Do you watch reality TV? (RealityTV); and (8) Have you ever tried something new as a result of seeing it on reality TV? (NewRealityTV). Participants answered the questions on a Likert-like scale, and scale items varied across questions ranging between 1 (No/Negative/Strongly Disagree) and 7 (Yes/Positive/Strongly Agree). Questions were tailored specifically for this research to

assess show content, quality, and appeal. These questions were adapted from marketing literature survey instruments assessing consumer attitudes toward television advertising (Mehta, 2000; Shavitt, Lowrey, & Haefner, 1998), using accepted procedures for designing optimal questions in social research by Fowler (2001).

Behavioral Intentions

The dependent variable behavioral intentions (Behavior) was defined by the following statement for those exposed to the PA-themed reality show concept: “After watching this show trailer, I am thinking about walking instead of taking the bus.” For the Home Design comparison condition, behavioral intention (Behavior) was defined as: “After watching this show trailer, I am thinking about redecorating my home.” Responses to the Likert-type scale ranged between 1 (Definitely No) and 7 (Definitely Yes).

Statistical Analysis

Descriptive statistics were determined using mean and standard deviations for scale variables for the AT concept and the Home Design comparison. Frequencies of ordinal variables for the AT concept and Home Design comparison were calculated.

Independent *t*-tests were used to test differences between the AT concept and Home Design comparison for scale variables (Age, BMI). Independent *t*-tests were used to test differences between the AT concept and Home Design comparison for PA behavior scale variables (MildGodinScore, ModerateGodinScore, VigorousGodinScore, TLAS) and AT habits scale variables (WalkInN, WalkOutN).

Non-parametric *t*-tests (Mann Whitney) were used to test for differences between the AT concept and Home Design comparison for ordinal data (Age.Group, BMI.Group, Education, Income). Non-parametric *t*-tests (Mann Whitney) were used to test for differences between the AT concept and Home Design comparison for PA behavior ordinal data (HeartBeatsRapidly, TLAS, WHO) and AT habits ordinal data (AcTranIn, AcTranOut).

Multi-dimensional chi-square tests were used to detect differences between the AT concept and Home Design comparison for nominal data (Gender.New and Race.New).

Non-parametric tests of correlation—Spearman's rho (ρ)—were used to determine if Gender, Age, Race, Education, Income, BMI, PA behavior variables (HeartBeatsRapidly, WHO), and AT habits variables (AcTranIn, AcTranOut) were associated with the dependent variables (Impressions and Behavior). Parametric tests of correlation—Pearson's r —were used to determine if PA behavior variables (MildGodinScore, ModerateGodinScore, VigorousGodinScore, TLAS) and AT habits variables (WalkInN, WalkOutN) were associated with the dependent variables (Impressions and Behavior). These variables were entered as correlates into the multiple regression models for the AT concept.

Spearman's rho (ρ) was used to measure the correlation between non-parametric variables (Impressions, Enjoyment, WatchOnTV, Behavior).

For aim 1, to examine the associations between individual characteristics and impressions of a PA-themed reality show concept, multiple regression analysis (forward procedure) was used to examine the associations between participant characteristics Age, Gender, Race, Education, Income, BMI, and the dependent variable Impressions of the PA-themed show.

Multiple regression analysis (stepwise procedure) was also used for aim 2 to determine the relationship between PA behavior variables (MildGodinScore, ModerateGodinScore, VigorousGodinScore, HeartBeatsRapidly, TLAS, WHO), AT habits (AcTranIn, AcTranOut, WalkInN, WalkOutN), and Impressions and Behavior.

For aim 3, to examine viewers' impressions (Impressions, Enjoyment, WatchOnTV) of a reality show concept featuring AT as a possible correlate of their interest in engaging in AT-related behavior, bivariate regression was used to determine the relationship between Impressions and Behavior, Enjoyment and Behavior, and WatchOnTV and Behavior.

For sub-aim 1, to compare intentions to engage in the featured behavior between individuals exposed to the PA-themed reality show concept versus a Home Design concept, comparisons between intentions to engage in the featured behavior of each show (walking versus room redecorating) were conducted using independent *t*-tests.

Results

Figure 3.2 shows the study flow and participant response rate throughout the recruitment and experimental process. A total of 1,289 initially responded to the survey. Of those, 518 volunteer respondents with a mean age of 31 ($SD \pm 10$) years old

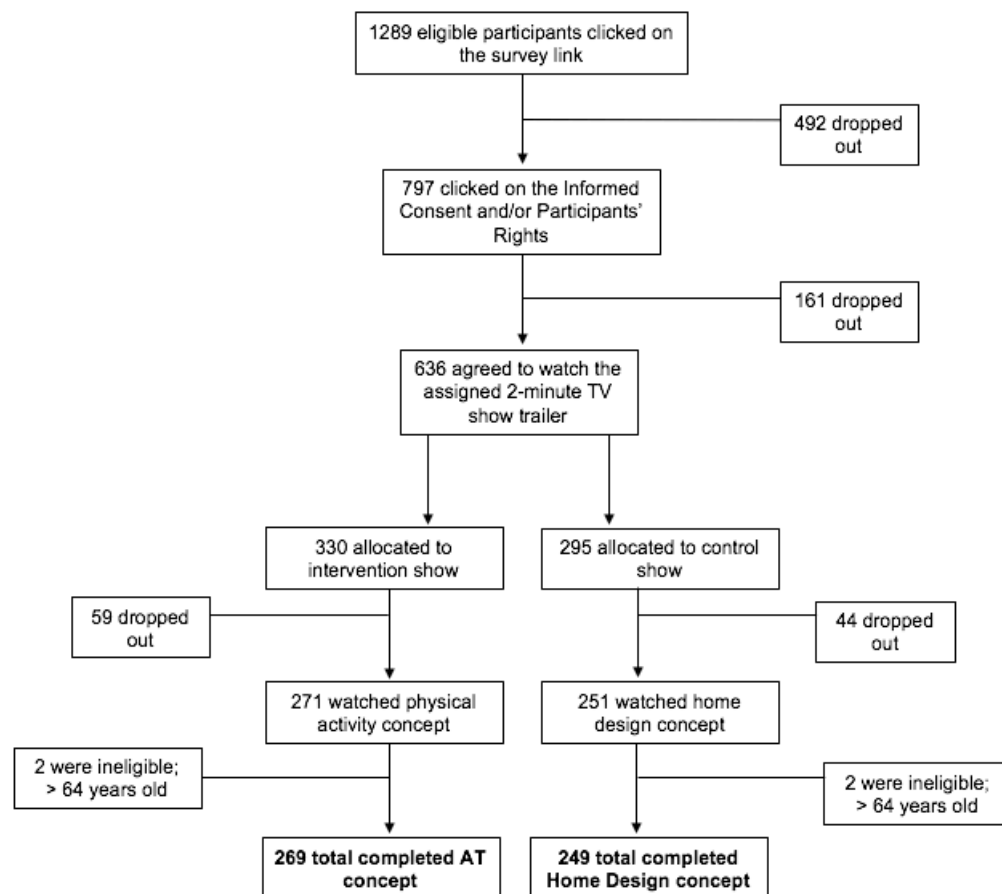


Figure 3.2. Study flow and participant response rate throughout the recruitment and experimental process

completed the questionnaire, for a 40% completion rate. Respondents represent a diverse group with regard to race and other demographic traits. A majority (46%) of the sample self-identified as White/Caucasian, 22% as Asian/Pacific Islander, 12% as Hispanic/Latino, 12% as African American, and 8% as Multi Ethnic or Other. Participant characteristics did not differ significantly between the AT concept and the Home Design comparison condition (see Table 3.1).

To examine the associations between individual characteristics and impressions of a PA-themed reality show concept, Table 3.2 shows the regression coefficients for the independent variables entered into the model. Age.Group, Race.New, and Education.New were significant correlates, with Age.Group showing a positive relationship with Impressions and Race.New (White versus non-White) and Education.New (<bachelors degree versus \geq bachelors degree) showing an inverse relationship. Gender, Income, and BMI were not significant correlates. The overall model was significant [$F(3, 237)=7.861$, $p<.001$], explaining 8% of the variance in Impressions of the show (see Table 3.2).

To examine individual PA behaviors and active transportation habits as they relate to impressions of a PA-themed reality show concept and intentions to engage in the featured behavior, the model examining PA behavior was significant [$F(2, 208)=5.326$, $p<.05$], explaining 4% of the variance in behavioral intentions. Current participation in mild exercise (MildGodinScore) showed an inverse relationship, while moderate exercise (ModerateGodinScore) showed a positive relationship. Participation in strenuous exercise (StrenuousGodinScore), any activity to work up a sweat (HeartBeatsRapidly), and TLAS were not significant correlates of Behavior. The model examining PA behavior defined by the GLTEQ categories strenuous (StrenuousGodinScore), moderate (ModerateGodinScore), mild exercise (MildGodinScore) how many times a week you work up a sweat so that your heart beats rapidly (HeartBeatsRapidly), and TLAS were not significant with Impressions. PA behavior as defined by asking respondents to rate

Table 3.1. Respondent Characteristics

Respondent characteristics	AT Concept	Percent of Total	Home Design	Percent of Total
Total	269	100%	249	100%
Gender				
Men	57	21.2%	48	20.5%
Women	191	76.7%	186	79.5%
Transgender	1	0.4%	0	0.0%
Age Group (in years)				
18 to 24	83	33.7%	83	35.9%
25 to 34	105	42.7%	94	40.7%
35 to 44	31	12.6%	29	12.6%
45 to 54	12	4.9%	15	6.5%
55 to 64	5	6.1%	10	4.3%
Race				
Asian/Pacific Islander	55	23.3%	45	19.6%
Black/African American	29	12.3%	25	10.9%
Hispanic/Latino	29	12.3%	29	12.6%
White/Caucasian	106	44.9%	110	47.8%
Multi-Racial	11	4.7%	16	7.0%
Other	6	2.5%	5	2.2%
Education				
Some high school or less	4	1.6%	3	1.3%
High school diploma	14	5.6%	13	5.6%
Some college	18	7.3%	20	8.7%
Associates degree	7	2.8%	4	1.7%
Bachelor's degree	51	20.6%	48	20.8%
Some graduate school	69	27.8%	69	29.0%
Masters degree or equivalent	70	28.2%	67	29.0%
Doctorate, law or medical degree	15	6.0%	7	3.0%
Income (in US dollars)				
<10,000	63	30.6%	43	23.2%
10,000-29,999	44	21.4%	46	24.9%
30,000-49,999	35	17.0%	33	17.8%
50,000-69,999	26	12.6%	26	14.1%
70,000-89,999	15	7.3%	14	7.6%
90,000-109,999	10	4.9%	8	4.3%
≥110,000	13	6.3%	15	8.1%
BMI Group				
Underweight	12	5.1%	15	6.8%
Normal	135	57.7%	136	61.8%
Overweight	51	21.8%	44	20.0%
Obese	36	15.4%	25	11.4%

Missing data: Gender (AT $n=20$; Home Design $n=15$), Age group (AT $n=23$; Home Design $n=18$), Race (AT $n=33$; Home Design $n=19$), Education (AT $n=21$; Home Design $n=18$), Income (AT $n=63$; Home Design $n=64$), BMI group (AT $n=35$; Home Design $n=29$)

Table 3.2. Multiple Regression Analysis Evaluating Associations Between Impressions of a PA-themed Reality Television Show Concept and Participant Characteristics (n=269)

Variable	B	SE	β	<i>p</i>
Constant	4.198	.341		.000
Race	-.451	.226	-.126	.047
Education	-.998	.294	-.215	.001
Age	.219	.101	.135	.031

Dependent variable = Impressions

their perceptions of their current physical activity level (WHO) on a 7-point Likert scale from 1 (Very Poor) to 7 (Excellent) was not significant with Impressions. The model examining AT habits as defined by the four questions extracted from the RESIDEs NPAQ (AcTranIn, AcTranOut, WalkInN, WalkOutN) failed to show any significant associations with Impressions and Behavior. Table 3.3 shows the regression coefficients for the predictor variables entered in the model examining PA behaviors on Behavior.

Table 3.3. Multiple Regression Analysis Evaluating Correlates of Behavioral Intentions (Walking Instead of Taking the Bus) by Participant PA Behaviors (n=269)

Variable	B	SE	β	<i>p</i>
Constant	3.778	.249		.000
Mild Godin Leisure Score	-.027	.012	-.167	.022
Moderate Godin Leisure Score	.029	.010	.217	.003

Dependent variable = Behavioral intentions

To examine viewers' impressions of a reality show featuring AT as a possible correlate of their interest in engaging in AT-related behavior (Behavior), results showed a significant positive correlation between Impressions of the TV show concept and Behavior ($\rho = .444$, $N = 251$, $p < .001$, two-tailed), so Impressions was entered into a bivariate regression model to assess the linear relationship between the two variables. The model showed a significant explanatory relationship: $F(1, 249) = 61.170$ $p < .001$, with Impressions explaining 19% of the variance in Behavior. The linear equation for this association is:

$$\text{Behavior} = 2.248 + .441(\text{Impressions})$$

For the sub-aim to compare intentions to engage in the featured behavior between individuals exposed to the AT concept versus the Home Design concept, an independent groups design was employed. The independent variable was television show concept (AT versus Home Design), and the dependent variable was Behavior operationalized by asking participants on a Likert-like scale how much they are thinking about engaging in the featured behavior after watching their respective show from 1 (Definitely No) to 7 (Definitely Yes). Results showed a statistically significant difference between TV show conditions in the degree to which participants were thinking about engaging in the respective featured behavior ($U = 24949.000$, $N1 = 242$, $N2 = 252$, $p < .001$, two-tailed), with means 3.8730 ($SD \pm 1.78$) and 3.3140 ($SD \pm 1.75$) for the AT concept and the Home Design concept, respectively. That is, those who watched the PA-themed reality show concept were more likely to engage in active transportation, whereas those exposed to the Home Design concept were less likely to engage in home redecorating (see Figure 3.3).

Discussion

This research study demonstrates the acceptability and supports the potential effectiveness of a PA-themed reality television show concept for conveying AT-related messages to viewers. The analysis showed that non-White individuals, individuals older than 35 years old, and those who reported having less than a bachelor's degree more often expressed positive impressions about the AT show concept compared to individuals identifying as Caucasian. This is important given that people who identify as minority are more frequently insufficiently active (Marquez, Neighbors, & Bustamante, 2010). Results also showed that time spent in mild exercise was negatively associated with AT behavioral intentions, while time spent in moderate exercise was positively associated with AT behavioral intentions. That is, those less active were less likely to want to

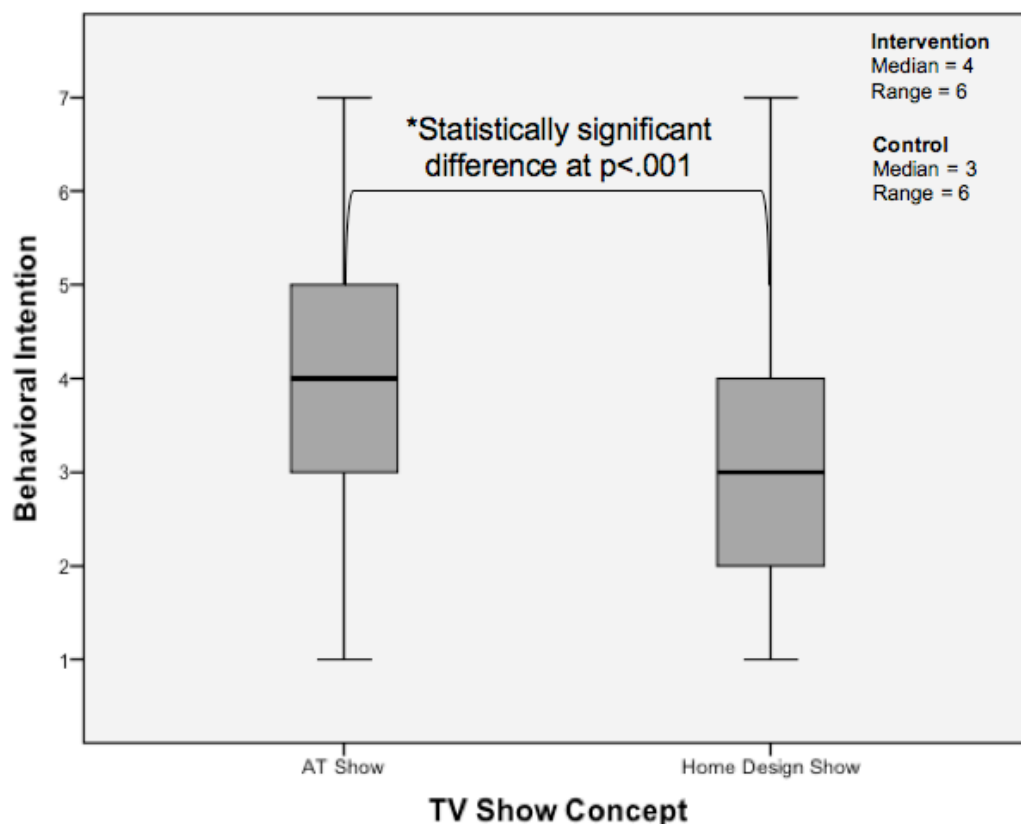


Figure 3.3. Differences in behavioral intentions between AT concept and Home Design comparison concept by reality television conditions

engage in active transportation. This suggests that individuals who engage in some physical activity may be more receptive to a message promoting active behavior than people who do not engage in activity of at least this intensity. Additionally, impressions of the show was positively associated with behavioral intentions, and those exposed to the AT show concept showed higher behavioral intentions for AT compared to the Home Design concept. Compared to the AT show concept, those assigned to the Home Design concept—and who had favorable impressions of the 2-minute show trailer—were less likely to want to make over a room in their home.

Interestingly, these findings are in direct contrast to previous research of media-delivered interventions, primarily using advertising campaigns. These studies indicate that mass media campaigns promoting physical activity tend to show higher favorability

among those who are younger, White, those who are female, and those with higher educational attainment, suggesting that the reality genre of television might be useful in reaching more ethnically diverse audiences (Miles, Rapoport, Wardle, Afuape, & Duman, 2001). On the other hand, research suggests that those who identify as Black/African American and/or Hispanic/Latino are more likely to use public transportation, which could explain why this sub-group embraced the AT show concept (Pew Research Center, 2016). Nonetheless, these findings still might support the show concept as a potentially effective strategy to influence physical activity.

Individuals who engaged in mild activity as defined by the GLTEQ were less likely to want to walk instead of take the bus, while individuals who reported participating in moderate activity, but not strenuous activity, were more likely to walk. Although some research has emphasized the need for mass media to target least active groups, other research suggests that mass media campaigns are more likely to be effective if they target those already intending to adopt moderate intensity PA (Booth, Bauman, Oldenburg, Owen, & Magnus, 1992; Hillsdon, Cavill, Nanchahal, Diamond, & White, 2001). The results of this study corroborate these findings.

Understanding and identifying relationships between personal characteristics and behaviors are clearly of value. These results support previous work that shows tailoring to personal characteristics and behaviors may improve the effectiveness of health-related mass media campaigns. Tailored health communication interventions tend to elicit greater attention and understanding among the targeted group as well as a higher likelihood of discussing contents of the health communication materials with peers. Additionally, tailoring helps to improve changes in cognitive-mediating variables, which increases the likelihood of behavior change (Noar, 2009).

Impressions of the show were a significant correlate to AT behavioral intentions, and those who viewed the show more favorably were more likely to have intentions for AT. Previous research looking at reality television and its effect on behavioral intentions

indicated that after viewing a show featuring cosmetic surgery, individuals who had a “positive impression of a reality television show were more likely to want to alter their bodies and faces using cosmetic surgery than individuals who do not enjoy these types of shows” (Markey & Markey, 2010, p. 170). However, there has been little research in this genre that promotes healthy behaviors, and this study is to our knowledge the first to do so.

In addition, advertising literature indicates that audiences’ attitudes toward a television or web-based media advertisement are directly dependent on perceived levels of entertainment. If impressions are favorable, this might elicit a more proactive consumer response toward what is being advertised (Ducoffe, 1996). The literature from these two areas—although different from the current research—suggests that impressions may be a potential determinant or mediator to physical activity mass media interventions. However, this would need to be empirically tested. Nonetheless, these preliminary research results suggest that this approach may be effective in some sub-populations.

Results from the study indicate that volunteers who were randomly assigned to watch a PA-themed reality show concept featuring AT were more likely to report a desire to participate in active transportation than participants assigned to the comparison condition not involving PA. This might be because the mass media intervention promoted a well-defined, achievable activity (walking) and cast ordinary people in the program—not actors—which helped achieve a real-life feel to the show. Other studies have suggested that mass media that seems more real may be more effective (King, Grunseit, O’Hara, & Bauman, 2013; Leavy et al., 2013). For example, researchers examining *Find Thirty Everyday* concluded that if the campaign presented 30 minutes of moderate activity as something that is achievable through accessible activities rather than aspirational, it may have been more successful (Leavy et al., 2013). Similarly, King and colleagues’ (2013) extensive formative research of the *Measure Up* campaign, a campaign designed to increase awareness, knowledge, and saliency of waist

circumference as a marker of health among New South Wales residents, suggests that the characters in the message were seen as credible and socially normative, an implication for personal relevance that audiences embraced. Awareness of the *Measure Up* campaign was markedly high at 90%.

Furthermore, some researchers found that viewers are more likely affected by media messages using area residents filmed in familiar locations that have meaning and applicability to their daily activities than by national programs with prescribed protocols and national spokespersons (Renger, Steinfeld, & Lazarus, 2002). TV ads that portray “achievable goals in an encouraging, friendly, conversational tone which helps to draw people in” were seen as superior to ads portraying expectations of health education advertising as “authoritarian, didactic, moralistic and expecting people to make drastic changes in lifestyle and give up enjoyable behavior” (Wimbush, MacGregor, & Fraser, 1998). Collectively, this research suggests that mass media featuring others in a community setting participating in a feasible and identifiable activity may motivate viewers to comply with the media message. This is exactly what the AT show concept, *Beat The Bus*, did. Shooting of the show took place in a familiar New York City neighborhood and featured diverse members of the neighboring community. Additionally, the 2-minute show trailer encouraged AT—a highly feasible and relevant form of PA for urban-dwelling adults—which was promoted by an unknown host rather than a known celebrity.

Another important component of this research is that it was guided by a conceptual framework with constructs related to advertising literature rather than health behavior. Although not tested, the conceptual framework provides a visual representation of constructs that informed the measurement of variables assessed.

Marketing research has shown that a certain congruity must exist between personal characteristics of a target audiences and what is being advertised (Ford & Smith, 1987). Personal attributes, including age, gender, social class, income, and education level,

directly influence how individuals buy into particular products or services. Numerous studies have demonstrated that consumers are influenced by advertisements that convey personal characteristics similar to their own. This, in turn, results in more favorable attitudes, opinions, and preferences toward what is being advertised. For this reason, the personal characteristics construct is included in the current conceptual framework (Eagly, Wood, & Chaiken, 1978).

Past behavior plays an important role in predicting future behavior (Ajzen, 1985). Advertising literature specifically has shown that past experiences and behaviors influence an individual's perceived value of advertising. Thus, the construct behaviors, specifically health-related behaviors, and its link to perceived entertainment is illustrated in the current conceptual model.

Marketing literature also suggests a strong association between perceived entertainment and consumer response toward an advertisement (Mehta, 2000) with audiences' attitudes toward a media advertisement being directly dependent on their perceived levels of entertainment. If perceived levels of entertainment of an advertisement are favorable, audiences are more likely to be persuaded by them. However, despite this link, the construct is seldom looked at when evaluating health-related mass media communication interventions. Thus, the construct perceived entertainment, derived from marketing literature, is included in the current study's theoretical framework (Donner, 2011; Mehta, 2000).

Lastly, a relationship exists between consumers' emotional responses induced by advertising, the perceived entertainment, and their behavioral intentions. This has implications with regard to the consumers' future advertising behavioral intention and behavior (Ajzen, 1985). Advertising literature also states that behavioral intention is the antecedent of consumer behavior—an implication for including the construct in the current conceptual framework (Manda, Farzadeh, & Askary, 2013).

Although this study is unique in its focus on impressions and the potential influence of a physical activity-themed reality show concept on active transportation-related behavioral intentions using a novel conceptual framework, there are a few limitations worth noting. First, researchers did not measure actual behavior—only the antecedent, behavioral intentions. Second, the participants completed surveys just once and immediately after exposure to their reality show concept, and therefore there is no way to know what the long-term results will be. Third, participants were not shown an entire episode of the reality television show. Rather they were shown a 2-minute video narrative explaining the concept of the show. But results of the study support the concept, which is encouraging and warrants further research in this area. Specifically, the AT show concept was positively received among non-White, less educated, older individuals, who indicated they participate in moderate activity. What's more, impressions were highly correlated with AT behavioral intentions. Respondents who had more favorable impressions were more likely to report intentions to engage in AT. Identifying and understanding the relationships between these factors are of utmost importance—especially since the show concept is currently in the development phase. The current findings will help to tailor future full-length episodes of the television series and segment the audience by targeting those who might be most responsive to its message based on personal characteristics and PA behaviors. This, in turn, will help to more effectively influence health behavioral intentions of viewers, which could possibly engender health behavior change (Webb & Sheeran, 2006).

Conclusion

The present study builds on past research examining mass media's influence on behavior, predictors of PA participation, and PA behavioral intention by examining the potential role that individual characteristics, behaviors, and attitudes toward a reality

show concept featuring transportation-related PA may have on individuals' response toward this media and their desire to engage in active transportation. Results suggest that a PA-themed reality show can positively influence active transportation intentions among viewers, and impressions is a correlate to behavioral intentions.

This show concept combined high quality entertainment with scientific underpinnings, and the specific vehicle, reality television, has not been previously examined as a physical activity public health promotion strategy. This research suggests that reality television may be an effective strategy to convey active transportation-related behaviors and promote positive physical activity behavior change among ethnically diverse audiences who need it most by reaching them where they are being influenced with other lifestyle messages—reality television.

The Community Preventive Services Task Force (2012) reports that there is insufficient evidence to determine the effectiveness of mass media to increase PA. This is largely due to the varied and diverse measurement approaches, variables tested, and PA outcomes assessed across mass media campaign intervention studies. Therefore, future research in this area could benefit from employing objective methods of measurement. Furthermore, a continued, long-term study assessing PA-themed reality television would shed light on its potential and allow for a better understanding of the medium's ability to affect population-level physical activity behavior change.

References

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior*. Heidelberg, Germany: Springer.
- Anderson, A. (2016). *Who relies on public transport in the U.S.* Pew Research Center. Retrieved October 2, 2017 from: <http://www.pewresearch.org/fact-tank/2016/04/07/who-relies-on-public-transit-in-the-u-s/>
- Atkins, C., & Wallack, L. (1990). *Mass communication and public health: Complexities and conflicts*. Newbury Park, CA: Sage.
- Bauman, A., Smith, B. J., Maibach, E. W., & Reger-Nash, B. (2006). Evaluation of mass media campaigns for physical activity. *Evaluation and Program Planning*, 29(3), 312-322.
- Booth, M., Bauman, A., Oldenburg, B., Owen, N., & Magnus, P. (1992). Effects of a national mass-media campaign on physical activity participation. *Health Promotion International*, 7(4), 241-247.
- Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013.
- Cerin, E., Barnett, A., Sit, C. P., Cheung, M. C., Lee, L. J., Ho, S. Y., & Chan, W. M. (2011). Measuring walking within and outside the neighborhood in Chinese elders: reliability and validity. *BMC Public Health*, 11(1), 851. doi: 10.1186/1471-2458-11-851.
- Community Preventive Services Task Force. (2012). Stand alone mass media campaigns to increase physical activity: Updated findings from the Community Preventive Services Task Force. *American Journal of Preventive Medicine*, 43(5), 562-564.
- Ducoffe, R. H. (1995). How consumers assess the value of advertising. *Journal of Current Issues and Research in Advertising*, 17(1), 1-18.
- Eagly, A. H., Wood, W., & Chaiken, W. (1978). Causal inferences about communicators and their effect on opinion change. *Journal of Personality and Social Psychology*, 36(4), 424-435.
- Ford, G. T., & Smith, R. A. (1987). Inferential beliefs in consumer evaluations: An assessment of alternative processing strategies. *Journal of Consumer Research*, 14, 363-371.
- Fowler, F. J. (2001) Designing questions to be good measures. In *Survey research methods* (3rd ed.). Thousand Oaks, CA: Sage.

- Ganeshasundaram, R. & Henley, N. (2009). Reality television (Supernanny): A social marketing “place” strategy. *Journal of Consumer Marketing*, 26(5), 311-319. doi: 10.1108/07363760976565
- Garber, C. E., Blissmer, B., Deschenes, M. R., Franklin, B. A., Lamonte, M. J., Lee, I. M., Nieman, D. C., & Swain, D. P. (2011). American college of sports medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medicine and Science in Sports and Exercise*, 43(7), 1334-1359. doi: 10.1249/MSS.0b013e318213fefb
- Giles-Corti, B., Timperio, A., Cutt, H., Pikora, T. J., Bull, F. C., Knuiman, M., Bulsara, M., Van Niel, K., & Shilton, T. (2006). Development of a reliable measure of walking within and outside the local neighborhood: RESIDE’s Neighborhood Physical Activity Questionnaire. *Preventive Medicine*, 42(6), 455-459.
- Godin, G., & Shephard, R. J. (1997). Godin leisure-time exercise questionnaire. *Medicine and Science in Sports and Exercise*, 29(6), 36-38.
- Hillsdon, M., Cavill, N., Nanchahal, K., Diamond, A., & White, I. R. (2001). National level promotion of physical activity: Results from England’s ACTIVE for LIFE campaign. *Journal of Epidemiology and Community Health*, 55(10), 755-761.
- King, E. L., Grunseit, A. C., O’Hara, B. J., & Bauman, A. E. (2013). Evaluating the effectiveness of an Australian obesity mass-media campaign: How did the ‘Measure-Up’ campaign measure up in New South Wales? *Health Education Research*, 28(6), 1029-1039.
- Leavy, J. E., Rosenberg, M., Bauman, A. E., Bull, F. C., Giles-Corti, B., Shilton, T., Maitland, C., & Barnes, R. (2013). Effects of Find Thirty Every Day cross-sectional findings from a Western Australian population-wide mass media campaign, 2008-2010. *Health Education & Behavior*, 40(4), 480-492.
- Manda, M. S., Farzadeh, H., & Askary, F. (2013). Investigating the impact of advertising on customers’ behavioral intentions: A case of agriculture bank. *Business and Economic Research*, 3(1).
- Markey, C. N., & Markey, P. M. (2010). A correlational and experimental examination of reality television viewing and interest in cosmetic surgery. *Body Image*, 7(2), 165-171.
- Marquez, D. X., Neighbors, C. J., & Bustamante, E. E. (2010). Leisure time and occupational physical activity among racial or ethnic minorities. *Medicine and Science in Exercise and Sport*, 42(6), 1086-1093.

- Mazzeo, S. E., Trace, S. E., Mitchell, K. S., & Gow, R. W. (2007). Effects of reality TV cosmetic surgery makeover program on eating disordered attitudes and behaviors. *Eating Behaviors, 8*, 390-397.
- Mehta, A. (2000). Advertising attitudes and advertising effectiveness. *Journal of Advertising Research, 40*(3), 67-72.
- Miles, A., Rapoport, L., Wardle, J., Afuape, T., & Duman, M. (2001). Using the mass-media to target obesity: An analysis of the characteristics and reported behaviour change of participants in the BBC's Fighting Fat, Fighting Fit campaign. *Health Education Research, 16*(3), 357-372.
- Nabi, R. L., Biely, E. N., Morgan, S. J., & Stitt, C. R. (2003). Reality-based television programming and the psychology of its appeal. *Media Psychology, 5*(4), 303-330.
- National Preventive Health Strategy. (2009). *Australia: The Healthiest Country by 2020*. Retrieved from <http://www.preventativehealth.org.au>
- Noar, S. M., Benac, C. N., & Harris, M. S. (2007). Does tailoring matter? Meta analytic review of tailored print health behavior change interventions. *Psychological Bulletin, 133*(4), 673-693. doi: 10.1037/00332909.133.4.673
- Pew Research Center. (2016). *Who relies on public transport in the U.S.* Retrieved from <http://www.pewresearch.org/fact-tank/2016/04/07/who-relies-on-public-transit-in-the-u-s/>
- Renger, R., Steinfeld, V., & Lazarus, S. (2002). Assessing the effectiveness of a community based media campaign targeting physical inactivity. *Family and Community Health, 25*(3), 18-30.
- Rose, R. L., & Wood, S. L. (2005). Paradox and the consumption of authenticity through reality television. *Journal of Consumer Research, 32*(2), 284-296. doi: 10.1207/S15324796ABM2502_03
- Shavitt, S., Lowrey, P. & Haefner, J. (1998). Public attitudes towards advertising: More favorable than you might think. *Journal of Advertising Research, 38*(4), 7-22.
- Vitaglione, G. D. (2012). Driving under the influence of (mass media): a four-year examination of NASCAR and West Virginia aggressive-driving accidents and injuries. *Journal of Applied Social Psychology, 42*(2), 488-505. doi: 10.1111/j.1559-1816.2011.00783.x
- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet, 376*(9748), 1261-1271. doi: 0.1016/S01406736(10)60809-4

Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, *132*(2), 249-268.

Wimbush, E., MacGregor, A., & Fraser, E. (1998). Impacts of a national mass media campaign on walking in Scotland. *Health Promotion International*, *13*(1), 45-53.

World Health Organization Health Topics (WHO). (2016). *Physical activity*. Retrieved February 24, 2016 from: http://www.who.int/topics/physical_activity/en/

Chapter IV
FORMATIVE EVALUATION OF A PHYSICAL ACTIVITY-THEMED
REALITY SHOW CONCEPT VIA IN-PERSON INTERVIEWS
AMONG A COMMUNITY SAMPLE OF ADULTS

Abstract

Reality television (TV) is a popular form of media shown to be influential on those who watch it, yet little evidence exists regarding the genre's role in influencing health behaviors among audiences.

PURPOSE: To examine in formative research the concept of a physical activity (PA)-themed reality TV show concept. To assess associations between individual characteristics, health-related behaviors and impressions of a PA-themed reality TV show concept and intentions to engage in active transportation (AT).

METHODS: Non-randomized two group (independent) post-test pre-experimental design, including in-person, semi-structured interviews. Forty-six participants watched one of two 2-minute reality TV show concept videos (AT or Home Design). The dependent variable was behavioral intentions operationalized by asking participants on a scale of 1 to 5 how much they are thinking about engaging in the featured behavior (AT or Home Design) after watching their respective show trailer.

ANALYSIS: Means, standard deviations, frequencies, one-tailed, non-parametric *t*-tests (Mann-Whitney), Spearman's rho.

RESULTS: There was a statistically significant difference in behavioral intentions between the AT and Home Design concept, with those exposed to the AT concept showing higher behavioral intentions for AT ($U=180.500$; $p<.05$). There was a significant positive correlation between impressions and behavioral intentions ($\rho=.373$; $p<.05$) in the AT show concept group. Qualitative themes that emerged from the semi-structured interviews included positive, negative, and neutral comments regarding impressions of the show trailer, characters, visual and design preferences, as well as clarity of the show concept.

CONCLUSION: The PA-themed reality TV show concept positively influenced PA intentions specific to AT among those who watched it. Impressions of the show is a correlate to behavioral intentions. Reactions to impressions of the show trailer and the characters were mostly positive. Yet, the visual and design components as well as clarity of the show concept need improvement.

Introduction

Physical inactivity is an important public health concern. Strong evidence exists linking insufficient physical activity (PA) with an increased risk of many adverse health conditions, including major non-communicable diseases such as coronary heart disease and type 2 diabetes, as well as breast and colon cancers—all of which drastically reduce one's life expectancy (Lee et al., 2012). Approximately 3.2 million preventable deaths per year occur due to a lack of regular physical activity (World Health Organization [WHO], 2014) while physical inactivity is estimated to result in over \$131 billion per year in direct healthcare costs in the United States alone (Carlson, Fulton, Pratt, Yang, & Adams, 2015).

The media holds great potential to encourage positive health behaviors among the broader community (Snyder & Hamilton, 2002; Stead, Gordon, Angus, & McDermott,

2007; Wakefield, Loken, & Hornik, 2010). Traditional media channels for mass communication include billboards, print materials, radio, the Internet, mobile phones, and television-led campaigns. Television-led campaigns typically utilize paid messaging disseminated through major broadcast media outlets, or they can be aired via unpaid public service announcements (PSAs) (Bauman, Smith, Maibach, & Reger-Nash, 2006).

Evidence to support traditional mass media campaign approaches to physical activity promotion remains inconclusive, with most television-led campaigns falling short of achieving the physical activity changes they were designed to promote (Bauman et al., 2006). Two potential reasons for this include: (1) insufficient research during the formative stages of campaign development; and (2) the inherent limitations associated with television advertising. Such limitations are important when health-related, television-led mass media campaigns are not unlike traditional television advertisements.

Television advertisements typically range between 15 to 60 seconds in duration per ad and are geared toward selling products or services. Similarly, health promotion television advertising, also known as “public service advertising,” ranges from 15 to 60 seconds per ad. These public service announcements use similar marketing strategies to traditional television advertisements, but, instead of products or services, the goal is to sell positive health behaviors (Dorfman & Wallack, 1993). What’s more, like traditional television advertisements, television-led, health-related mass media campaigns exist within a distracting and unorganized media environment—an environment that often inhibits an audience’s ability to critically evaluate the messages being delivered (Wang & Zhang, 2005). Thus, it can be argued that traditional television advertising and television-led, health-related mass media campaigns can be considered nearly equivalent.

Noar (2006) highlights seven components necessary to ensure a successful health-related mass media campaign: (1) use of theory as a conceptual foundation; (2) segmentation of the audience into homogenous subgroups based on demographic variables, including gender, race, and age group, as well as behavioral characteristics;

(3) use of a targeted message that is specific, identifiable, and appropriate for the previously selected segmented audience; (4) preproduction research with the target audience; (5) access and utilization of wide distribution channels that have the potential to reach the target audience; (6) effective process evaluation; and (7) use of sensitive and specific outcome evaluation methods. Unfortunately, these components—specifically steps 1 through 4, which are typically conducted in the formative research phase—are largely underutilized. It has been suggested that the underutilization of these components has been a limitation to the success of health-related mass media campaign interventions to date (Atkins & Freimuth, 2001; Noar, Benac, & Harris, 2007).

Using theory as a conceptual framework drives the set of assumptions about factors that contribute most to a health problem and allows these assumptions to be tested with appropriate outcome measures (Simons-Morton, McLeroy, & Wendel, 2012). With testable assumptions, practitioners can assess and—if necessary—modify intervention components at each stage of formative development (Rimer & Glanz, 2005). Audience segmentation is important when attempting to reach individuals at the population level. Mass media messages in particular need to retain a sense of personal charm to be influential, but this is difficult to do on a broad scale. Dividing audiences into homogenous subgroups based on similar characteristics and behaviors allows researchers to strike a balance between a tailored messaging approach while maximizing the intervention's reach and effectiveness (Schmid, Rivers, Latimer, & Salovey, 2008). Use of a targeted message narrows the health behavior into one that is explicit, attainable, and measurable. This approach has been shown to minimize perceived barriers, thus increasing the likelihood a health behavior will be adopted (Reger-Nash et al., 2005). Preproduction research is used to gauge audience reactions to basic artistic components. Audio and visual factors (use of music, video, technical production quality, etc.), characters as well as the message being delivered, and the situation in which the desired behavior will occur should all be evaluated prior to the creation of materials to increase

effectiveness of the approach and avoid unnecessary future costs (Atkins & Freimuth, 2001).

Still, while proper implementation of formative research could improve health-related, television-based mass media campaign interventions, these phases (use of theory as a conceptual foundation, segmentation of the audience into homogenous subgroups, use of a targeted message and preproduction research with the target audience) continue to be ignored. This is due in part to the lack of a systematic approach based on appropriate research results with most mass media campaigns proceeding in the absence of a research-based foundation (Atkins & Freimuth, 2001).

What's more, television is a costly form of media advertising, and quality ads are expensive to produce. Adding to these costs are cable or network airtime slots (gross rating points, GRP), which must be purchased to ensure distribution. A GRP is a measure of estimated exposure to advertising. It is defined as the product of both "reach" and "frequency," where reach is defined as "the proportion of the target audience that has an opportunity to be exposed to the ad," and frequency is defined as "the number of times an average target audience member is estimated to have an opportunity to view the advertisement in a given period" (Wong et al., 2004, p. A10). GRPs cost upwards of \$400,000 per 30-second slot (Poggi, 2013).

Furthermore, while television remains the most important advertising medium for marketers, literature suggests that the intrusive tactics employed to capture consumers' attention can be "annoying" to audiences (Rettie, Robinson, & Jenner, 2001; Sandage & Leckenby, 1980). Thus, audiences are advertising averse and actively pursue ways to avoid ads altogether by channel surfing between programs or using technologies such as the V-chip or TiVo (O'Neill & Barrett, 2004). Wilbur (2008) developed a model to understand the relationship between viewer demand for programs and advertiser demand for audiences. The model predicts that when a highly-rated network decreases advertising by 10%, it can expect an audience gain of nearly 25%.

Proper implementation of formative research could improve the efficacy of television-based campaign interventions designed to encourage physical activity. Moreover, the inherent limitations associated with commercial advertising (high costs, intrusive nature) necessitate researching and understanding other methods of delivering physical activity messages through the media. Shifting away from television-led mass media campaigns that are likened to traditional advertising toward an alternative method of delivery may enhance the effectiveness of physical activity messages delivered on TV. One alternative method of delivery is reality television.

In 2006, four of the top ten prime-time broadcast TV shows in the U.S. were reality-based programs, all of which outperformed traditional scripted shows such as *CSI*, *Desperate Housewives*, and *Law & Order* (Zappia, 2006). The genre's impact on those who watch it is considerable (Barton, 2009). When compared to other genres, reality TV has a greater influence on viewers for two reasons: (1) viewers perceive reality TV as being more authentic; and (2) characters and contestants on reality shows are considered "people like me," thus rendering their experiences more relevant to the viewer (Rose & Wood, 2005). These two factors—perceived authenticity and a heightened sense of connection—increase the likelihood that viewers' knowledge, attitudes, and behaviors will be influenced by exposure to a reality show over and above other types of programming—an implication for using this genre to promote healthy behaviors (Christenson & Ivancin, 2006).

The purpose of this research is to evaluate a physical activity-themed reality television show concept promoting active transportation (AT). There is both a developmental component and an experimental component to this study. The primary objective of the developmental component is to integrate the four key formative research principles of successful mass media campaigns as described by Noar (2006) (use of theory as a conceptual foundation, segmentation of the audience into homogenous subgroups, use of a targeted message, and preproduction research with the target

audience) and apply them to a previously untested method of delivery—reality television. The specific aims of the experimental component are as follows: (1) to examine the associations between individual characteristics and impressions of a physical activity-themed reality TV show concept; (2) to examine individual physical activity behaviors and active transportation habits, collectively known as health-related behaviors, as they relate to impressions of a PA-themed reality show concept and intentions to engage in active transportation (AT); and (3) to examine viewers' impressions of a reality show featuring active transportation as a possible correlate of their interest in engaging in active transportation-related behavior. A sub-aim was to compare intentions to engage in the featured behavior between individuals exposed to the PA-themed reality show concept versus a Home Design comparison condition.

The current study builds upon existing evidence related to reality television's influence on viewers and applies it to physical activity behavior. These results are the first of a larger ongoing study designed to provide a sound empirical basis for developing new avenues for delivering physical activity messages through the media and support innovative reality television as a method to influence positive health.

Methods

The research followed a mixed-methods design employing both quantitative and qualitative research techniques. Volunteer respondents were assigned to watch one of two 2-minute reality show concept videos (AT or Home Design), also called a “sizzle reel” or a “trailer,” via purposive sampling. Approximately half of respondents were exposed to the reality show concept promoting active transportation, and the other half were exposed to a health behavior neutral media message, the Home Design reality show concept, which acted as the comparison condition.

Participant Recruitment

Participants were recruited from the community surrounding a university located in a major urban center in the United States and included students, faculty, staff, and neighboring residents. Inclusion criteria were as follows: (1) participants between 18 and 64 years old; (2) live or work in the metropolitan area; (3) capable of walking at least 5 city blocks without stopping and without severe discomfort; and (4) able to read and speak English. Recruitment was done via fliers, email blasts, word-of-mouth, and face-to-face solicitation, as well as web-based bulletin board announcements. The Institutional Review Board (IRB) at Teachers College, Columbia University approved this study. All recruitment materials displayed the appropriate IRB protocol number, and all participants provided informed consent in accordance with Teachers College, Columbia University policies and procedures.

Group Assignment

Group assignment was based on the subjective judgment of the primary researcher based on the availability of the research assistant because the primary researcher had a major role as the “host” in the AT show concept video. If respondents saw the primary researcher featured in the video and were then asked to answer questions in her presence, it is likely there would have been a reactive effect. Therefore, a trained research assistant conducted all semi-structured interviews and distributed questionnaires to those assigned to the AT concept, while the primary researcher conducted all semi-structured interviews and distributed questionnaires to those assigned to the Home Design concept.

Explanation of AT and Home Design Video Concepts

The 2-minute PA-themed concept video features ordinary people in a series of impromptu races while having fun and burning calories. The show aims to encourage viewers to adopt, continue, or increase active transportation habits—specifically

walking—within their own free-living environments. The following paragraphs describe the show concept in greater detail:

Everyday on *Beat The Bus*, someone races a New York City bus all the way across town. The folks who race the bus are regular New Yorkers heading to work or to school who get roped into the show by the show's host. And neither the bus driver nor the bus passengers have any idea what's going on. This is Pedestrian vs. Bus and may the fastest one win.

There are a few simple rules for every race:

(1) Players have to wear whatever they are wearing and carry whatever they are carrying. And if they happen to be walking their dog, the dog must go with them.

(2) On every block, there is a challenge for the player. Give someone directions. Help an old lady cross the street. Dodge a flock of pigeons.

(3) The player may never look backwards at any time so the player will never know exactly how far ahead of the bus he or she might be.

(4) The player must also abide by all traffic laws and be considerate of other pedestrians on the sidewalk. (Other shows such as Bravo TV's *Around the World in 80 Plates*, Discovery Channel's *Cash Cab*, as well as CBS's Emmy-awarding winning series, *Amazing Race* all have similar policies of putting safety first when dealing with public places or modes of transportation.)

At the end of the bus route is the finish line where viewers will see the host of the show waiting to greet the winner. If the player wins, he or she will get a cash prize. If the bus wins, the host of the show surprises the bus passengers with prepaid Metro Cards (or similar fare cards) entitling them to a month of free bus rides. The driver of the bus also gets the cash prize originally intended for the player.

The 2-minute Home Design concept video features an interior designer and her team of experts as they surprise unsuspecting homeowners with a quick and inexpensive room makeover. The show aims to encourage viewers to apply unique and functional interior design principles in their very own homes.

Both media messages were comparable in length, production quality, and differed only in the specific topic addressed. Home design shows have previously been employed as comparison conditions in reality television research on health, specifically with regard

to studies examining the influence of media messages about cosmetic surgery on one's interest in altering their own appearance. These studies provided the rationale for selecting it as an appropriate comparison condition for this research (Markey & Markey, 2010; Mazzeo, 2007).

Experimental Conditions

Participants watched their assigned show trailer on a large projector screen in a quiet room at Teachers College, Columbia University. A researcher was present during all screenings. After watching the assigned show concept (AT or Home Design), either the research assistant or the primary researcher conducted individual and group interviews during which participants were asked to share their opinions and answer questions based on what they saw using a semi-structured interview format. Groups were no larger than two individuals per group. Participants then completed a paper-and-pencil questionnaire with open-ended and fixed-response questions. Volunteers received \$10 for their participation and were entered into a raffle for a chance to win a \$100 gift card toward public transportation.

Experimental Design and Measures

Qualitative component. The formative research component utilized a qualitative approach and included open-ended, semi-structured interview questions designed specifically for this research. Semi-structured interviews were conducted using standard procedures as described elsewhere (Krueger & Casey, 2009; Rabiee, 2004) to explore a variety of themes, including impressions of the show trailer, characters, visual and design preferences, as well as clarity of the show concept. Questions—with word modifications tailored to the AT concept and the Home Design concept—included the following: (1) What are your impression of this show trailer? (2) How did you like/dislike the visuals? (3) How did you like/dislike the characters? and (4) Was the concept of the show made clear? These questions were derived from principles for designing optimal

questions in social research by Fowler (2001) and adopted from marketing literature survey instruments assessing consumer attitudes toward television advertising (Mehta, 2000; Shavitt, Lowrey, & Haefner, 1998).

The purpose of the semi-structured interviews was to examine responses to the physical activity-themed reality TV show concept in greater depth and to triangulate these results with the survey results and get a better understanding of the reasons the PA-themed sizzle reel was or was not successful at reaching potential audiences. While questions were asked about both show concepts (AT and Home Design), qualitative data were only assessed on the physical activity-themed TV show concept. Semi-structured interviews took between 10 and 15 minutes to complete.

All interviews were videotaped. Consent for research, taping, and later use of video and audio footage for research purposes was obtained from all participants. The audio and videotapes were transcribed verbatim and imported into and analyzed with NVivo software (Version 11). Data were coded, ordered, and analyzed for themes. The results of this formative testing will allow for revisions prior to shooting the physical activity-themed reality show series.

Quantitative component. The quantitative component enlisted questionnaires that consisted of both open-ended and fixed-response questions. These questions were designed to assess show content, quality, and appeal, as well as physical activity behaviors and active transportation habits.

Conceptual Framework

The conceptual framework used to develop the show trailer and to guide the evaluations employed several common constructs specific to advertising and marketing literature that have been shown to influence consumer behavior. These constructs included personal characteristics, health behaviors, perceived entertainment, behavioral intentions, and behavior (see Figure 4.1).

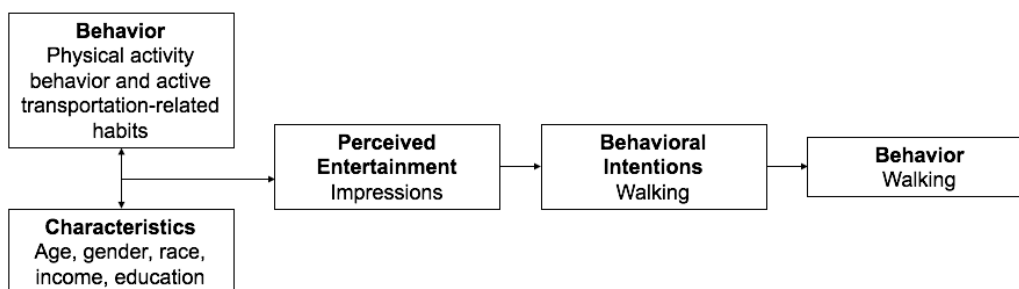


Figure 4.1. Conceptual framework used to guide the development of the current research

Individual characteristics. Advertising literature indicates that demographic variables including educational attainment and gender, among other characteristics, have been shown to affect consumers' impressions toward advertising. Specifically, previous research has demonstrated the predictive power of demographic variables toward advertising value and attitudes toward ads (Brackett & Carr, 2001). Numerous studies have demonstrated that consumers are influenced by advertisements that convey personal characteristics similar to their own (Eagly, Wood, & Chaiken, 1978; Kelley, 1967; Simons, Berkowitz, & Moyer, 1970). Therefore, to examine the associations between individual characteristics and impressions of a PA-themed reality show concept (Aim 1), sociodemographic variables including age, gender, race, income, and educational attainment were queried.

Health-related behaviors. To examine individual PA behaviors and AT habits as they relate to impressions of a PA-themed reality show concept and intentions to engage in the featured behavior (Aim 2), current PA behaviors and AT habits were measured. Current and past behavior plays an important role in predicting future behavior, and literature specifically has shown that past experiences and behaviors influence an individual's perceived value and attitudes toward advertising (Ajzen, 1985). Thus, the construct health-related behaviors, specific to PA status and AT habits, are measured,

while their link to perceived entertainment is illustrated in the current theoretical framework.

Perceived entertainment. Advertising literature suggests a relationship between perceived entertainment and consumers' response toward an advertisement (Mehta, 2000) with audiences' attitudes toward a media advertisement being directly dependent on their perceived levels of entertainment. If perceived levels of entertainment of an advertisement are favorable, audiences are more likely to be persuaded by them. Therefore, the construct perceived entertainment, derived from marketing literature, is included in the current study's theoretical framework (Mehta, 1998). Questions designed to assess content, quality, and appeal of each show concept, with word modifications tailored to the AT concept and Home Design concept, included the following: (1) This is a creative idea for a reality show (Creativity); (2) The concept of the show is made clear to the viewer (Concept); (3) The rules of the show are made clear to the viewer (Rules); (4) The host of the show is a likeable character (Host); (5) I would participate in an episode of this show (Participate); (6) I enjoyed watching this 2-minute video concept (Enjoyment); and (7) If I saw an episode of this show, I would watch it on TV (WatchOnTV). Although not validated, the questions were derived from principles for designing optimal questions in social research by Fowler (2001) and adopted from marketing literature survey instruments assessing consumer attitudes toward television advertising (Mehta, 2000; Shavitt et al., 1998).

Behavioral intentions. A strong association exists between consumers' perceived entertainment and behavioral intentions. This has implications with regard to the consumers' future advertising behavioral intention and behavior. If impressions are favorable, this might elicit a more proactive consumer response toward what is being advertised (Ducoffe, 1995). Advertising literature also states that behavioral intention is the antecedent of consumer behavior—an implication for including the construct in the current conceptual model (Mandan, Hossein, & Furuzandeh, 2013). While a validated

question does not exist for behavioral intention, health promotion research indicates that the more specific a question or declarative statement is phrased, the more sufficient it will be to assess behavioral intentions (Simons-Morton, McLeroy, & Wendel, 2012).

Behavior. Although actual physical activity behavior was not measured, it is important to note that a behavioral intention-behavior relationship exists in social and health psychology with intentions as a key predictor of behavior (Ajzen, 1985).

Measures

Individual characteristics. To examine the associations between individual characteristics and impressions of the 2-minute physical activity-themed reality show concept, sociodemographics such as age, sex, race, educational attainment, and income were collected (Aim 1).

Impressions of the show concept. Individuals' impressions of the show concept were assessed using three separate variables: Creativity, Enjoyment, and "Would you watch this show on TV?" (WatchOnTV). Creativity was assessed by asking the participants to respond to a declarative statement, "This is a creative idea for a reality show," where respondents indicated a response on a Likert-type scale. Items ranged from 1 (Strongly Disagree) to 5 (Strongly Agree). Using the same Likert-type scale, Enjoyment was ascertained in response to another declarative statement: "I enjoyed watching this 2-minute video concept." Similarly, WatchOnTV was determined in response to statement, "If I saw an episode of this show, I would watch it on TV." Similarly, respondents indicated a response between 1 (Strongly Disagree) and 5 (Strongly Agree).

Health-related behaviors. To examine individual physical activity behaviors and active transportation habits as they relate to impressions of a PA-themed reality show concept and intentions to engage in the featured behavior (Aim 2), two questions were extracted from the Fantastic Lifestyle Checklist, which assesses current physical activity

status (Wilson, Nielsen, & Ciliska, 1984): (1) I am moderately active for at least 30 minutes per day (gardening, climbing stairs, housework, etc.) (ModeratePA); and (2) I am vigorously active for at least 30 minutes per day (running, cycling, etc.) (VigorousPA). Participants answered the questions on a Likert-type scale, and scale items varied across statements ranging between less than once per week (1) to 5 or more times per week (5) (Wilson et al., 1984).

To measure active transportation habits, the following four questions were taken from the RESIDEs Neighborhood Physical Activity Questionnaire (Giles Corti et al., 2006): (1) “Estimate the total time you spend walking as a means of transport *inside* your neighborhood in a USUAL WEEK” (WalkInN); (2) “Estimate the total time you spend walking as a means of transport *outside* your neighborhood in a USUAL WEEK” (WalkOutN); (3) “In a USUAL WEEK, how many times do you walk as a means of transport inside your neighborhood” (AcTranIn); and (4) “In a USUAL WEEK, how many times do you walk as a means of transport *outside* your neighborhood” (AcTranOut) (pp. 1-5). Questions 1 and 2 were measured as continuous variables as the number of times per week in minutes. Question 3 and 4 were measured on a 6-point scale ranging between 1 (0 times per week) and 6 (>20 times per week). These four questions were validated independently of the entire RESIDEs NPAQ and assessed against the International Physical Activity Questionnaire (IPAQ). Measures showed acceptable kappa values for how many times a week participants had walked as a means of transport within ($k=0.84$) and outside ($k=0.73$) their neighborhood. Similarly, duration of transport walking within the neighborhood in minutes was considered excellent ($ICC \geq .82$), as was the duration of transport-related walking outside the neighborhood ($ICC \geq .84$) (Giles-Corti et al., 2006). A composite score was not created, and the four questions were analyzed separately.

Behavioral intentions. The dependent variable, behavioral intentions (Behavior), was measured as a response to a statement presented to those exposed to the PA-themed

reality TV show concept: “After watching this show trailer, I am thinking about walking instead of taking the bus.” For the Home Design comparison condition, behavioral intentions (Behavior) was defined as: “After watching this show trailer, I am thinking about redecorating my home.” Responses to the Likert-type scale ranged between 1 (Strongly Disagree) and 5 (Strongly Agree). To examine viewers’ impressions of a reality show featuring active transportation as a possible correlate of their interest in engaging in active transportation-related behavior (Aim 3), the variables Impressions and Behavior were defined as mentioned above. The entire survey required approximately 5 to 10 minutes to complete.

Statistical Analysis

Descriptive statistics were calculated using means and standard deviations for continuous variables in AT group and Home Design comparison. The variable Age was then collapsed into the following four categories to create Age.Group: 18 to 24 years old, 25 to 34 years old, 35 to 44 years old, and 45 to 54 years old.

Frequencies of sociodemographic characteristics including Age Group, Sex, Race, Education, and Income for the AT and Home Design groups were obtained. Race and Income were then dichotomized (White versus non-White, <\$50,000 versus \geq \$50,000), and Education was trichotomized (associates degree or less, bachelors degree, some masters or greater).

Non-parametric *t*-tests (Mann Whitney U test) were used to test for differences between AT and Home Design groups for sociodemographic ordinal data (Age.Group, Education, Income).

Multi-dimensional chi-square analysis (McNemar’s) was used to test for differences between nominal variables (Sex, Race).

Non-parametric *t*-tests were used to test for differences between groups for PA status ordinal data (ModeratePA, VigorousPA) and AT habits ordinal data (AcTranIN,

ActTranOUT). Independent *t*-tests were used to determine differences for sociodemographic scale data (Age) and each AT scale variable (WalkInN, WalkOutN).

To examine the associations between individual characteristics and impressions of a PA-themed reality show concept, multiple regression analysis (enter procedure) was used to examine the associations between characteristics Sex, Age.Group, Race, Education, and Income and the dependent variable Impressions (Creative, Enjoyment, WatchOnTV).

Multiple regression analysis (enter procedure) was also used to determine the relationship between PA status (ModeratePA, VigorousPA), AT habits (WalkInN, WalkOutN, AcTranIn, AcTranOut), and Impressions and Behavior (Aim 2).

To examine viewers' impressions of a reality show concept featuring AT as a possible correlate of their interest in engaging in AT-related behavior, Spearman's rho (ρ) was used to measure the correlation between nonparametric variables Impressions and Behavior (Aim 3).

For the sub-aim, to compare intentions to engage in the featured behavior between individuals exposed to the PA-themed reality show versus a control condition, comparisons between intentions to engage in the featured behavior of each show (walking versus room redecorating) were conducted using independent *t*-tests.

Results

A total of 45 out of 46 volunteer respondents between the ages of 21 and 49 years old completed all parts of the research and were included in the results of this study. One respondent was dismissed from the study after watching the Home Design concept because she was unable to speak fluently enough to answer the questions. The sample represents a diverse group with regard to race. Over one-third (35%) identified as White/Caucasian, 24% Asian/Pacific Islander, 15% Black/African American, 13%

Hispanic/Latino, and 9% as Multi-Racial or Other. Approximately 75% of respondents were women. Participant characteristics were similar in the AT and Home Design conditions (see Table 4.1).

Table 4.1. Respondent Characteristics

Respondent characteristics	Intervention	Percent of Total	Control	Percent of Total
Total	22	100%	23	100%
Sex				
Male	4	18.2%	7	34.8%
Female	18	81.8%	16	65.2%
Not Reported	0	0.0%	0	0.0%
Age (in years)				
18 to 24	2	9.1%	0	0.0%
25 to 34	16	72.7%	20	87.0%
35 to 44	1	4.5%	2	8.7%
45 to 54	1	4.5%	1	4.3%
Not Reported	2	9.1%	0	0.0%
Race				
White	6	27.3%	10	56.5%
Non-White	15	68.2%	13	43.5%
Not Reported	1	4.5%	0	0.0%
Education				
Associates degree or less	2	9.1%	0	0.0%
Bachelors degree	5	22.7%	10	43.5%
Graduate school or above	15	68.2%	13	56.5%
Not Reported	0	0.0%	0	0.0%
Income (in US dollars)				
<\$50,000	10	45.5%	14	60.9%
≥\$50,000	8	36.4%	5	21.7%
Not Reported	4	18.1%	4	17.3%

Frequencies and percent of total values for respondent characteristics for the AT concept and Home Design concept groups including sex, age, race, education and income.

Quantitative Results

Aim 1. Table 4.2 shows the regression coefficients for the independent variables entered into the model in order to examine the associations between individual

characteristics and Impressions (WatchOnTV) of a PA-themed reality show concept. Education, Sex, Age Group, Race, and Income were not significant correlates. The overall model was not significant.

Table 4.2. Multiple Regression Analysis Evaluating Associations Between Impressions of a PA-themed Reality Television Show Concept and Participant Characteristics (n=22)

Variable	B	SE	β	t	p
Constant	2.761	1.178		2.343	.034
Sex	.483	.725	.201	.665	.517
Age.Group	.975	.605	1.611	.129	.129
Race	.264	.333	.213	.794	.440
Education	-1.097	.523	-.805	-2.097	.055
Income	-.140	.257	-.134	-.546	.539

Dependent variable = Impressions (WatchOnTV)

Aim 2. Multiple regression analysis (enter procedure) was also used to determine the relationship between PA status (ModeratePA, VigorousPA) and AT habits (WalkInN, WalkOutN, AcTranIn, AcTranOut) and Impressions and behavioral intentions (Behavior). None of the variables were significant correlates to Impressions (Creative, Enjoyment, WatchOnTV), or Behavior. Neither model was significant.

Aim 3. To examine viewers' impressions of a reality show featuring active transportation as a possible correlate of their interest in engaging in active transportation-related behavior, the results showed a significant (modest) positive correlation between Impressions (WatchOnTV) and Behavior ($\rho=.373$; $N=22$, $p<.05$, one-tailed) in the AT group. Thus, those who liked the show concept also expressed more interest in engaging in active transportation, specifically walking. Similarly, there was a significant (modest) correlation between Impressions (WatchOnTV) and Behavior ($\rho=.535$; $N=23$, $p<.05$, one-tailed) in the Home Design group. Thus, those who liked the show concept also expressed more interested in wanting to redecorate a room in their home.

Sub-aim 1. To compare intentions to engage in the featured behavior between individuals exposed to the PA-themed reality show versus a comparison condition, an independent groups design was employed. Results showed a statistically significant difference between TV show conditions and the degree to which participants were thinking about engaging in the respective featured behavior, with the AT group showing significant behavioral intentions for active transportation ($U=180.500$, $N_1=24$, $N_2=22$, $p<.05$, one-tailed). That is, those who watched the PA-themed reality show concept were more likely to engage in active transportation, whereas those exposed to the Home Design concept were less likely to engage in home redecorating (see Figure 4.2).

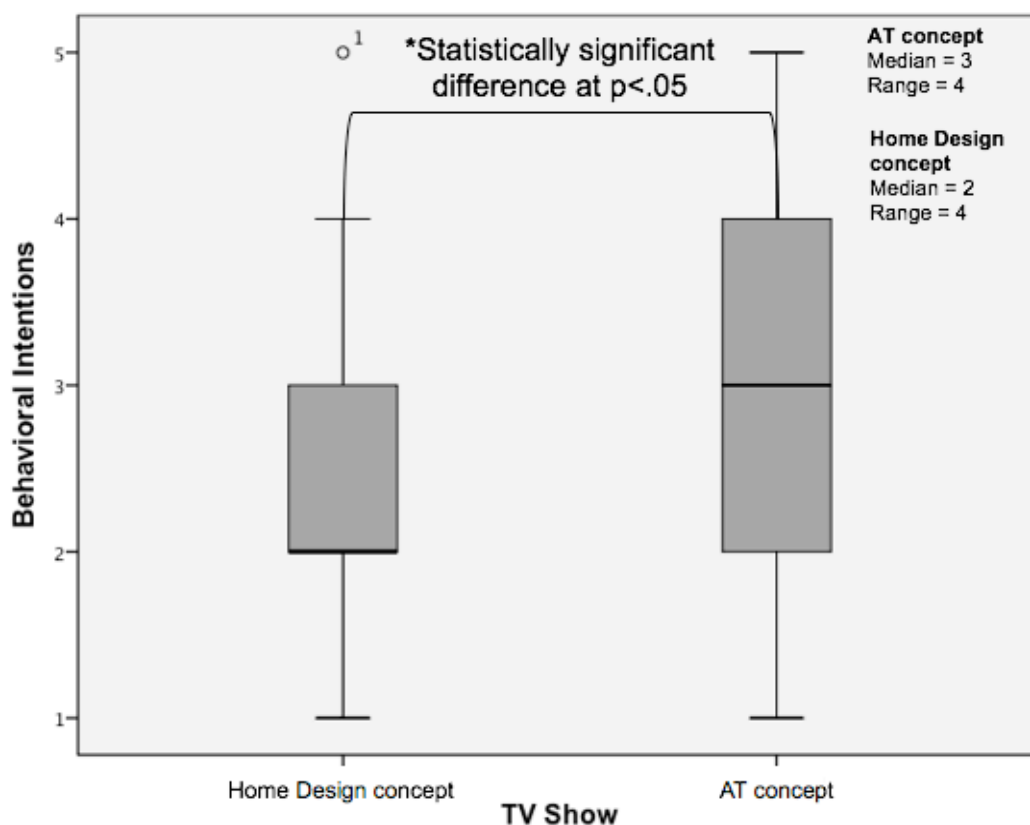


Figure 4.2. Differences in behavioral intentions between PA-themed reality show concept (walking) versus Home Design comparison conditions (room redecorating)

Qualitative Results

Themes emerged under the general categories regarding impressions of the show trailer, characters, visual and design preferences, as well as clarity of the show concept. Under all four categories, positive, negative, and neutral comments were made. Table 4.3 shows the 12 codes (nodes) and the number of cases in group. Figure 4.3 shows the frequencies of cited references for each of the 12 codes (nodes).

Table 4.3. Open Response Codes (Nodes) Related to the PA-themed Reality TV Show Trailer and Number of Cases ($n=22$)

Codes	<i>n</i>	Percent of Total
Impressions – Positive	20	91%
Impressions – Negative	13	59%
Impressions – Neutral	3	14%
Characters – Positive	21	95%
Characters – Negative	10	45%
Characters – Neutral	4	18%
Visuals & Design – Positive	13	59%
Visuals & Design – Negative	11	50%
Visuals & Design – Neutral	2	9%
Clarity of Concept – Positive	14	64%
Clarity of Concept – Negative	11	50%
Clarity of Concept – Neutral	0	0%

Number and percentage of open response codes (nodes) related to the PA-themed reality TV show by participant

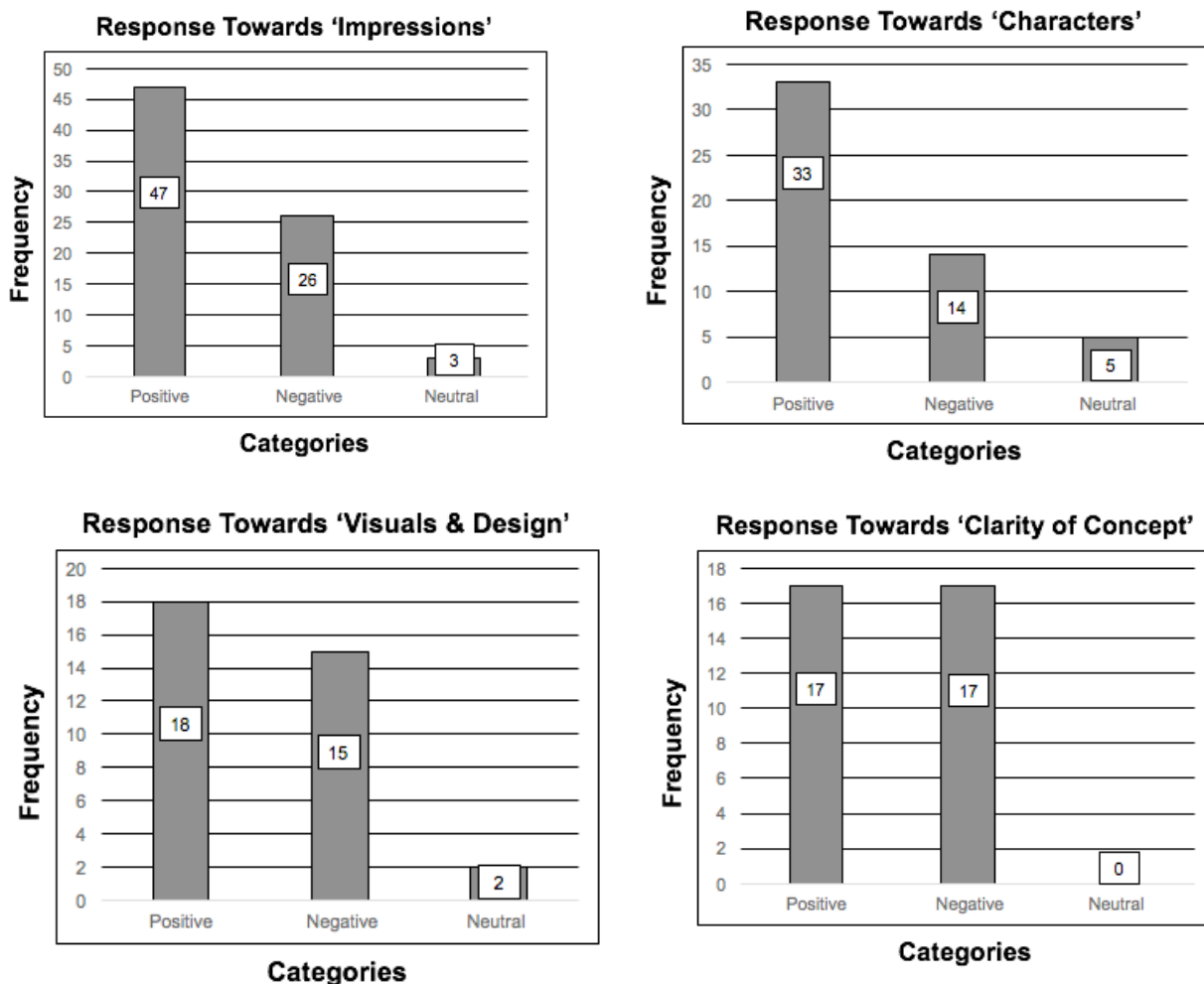


Figure 4.3. Frequencies of cited references for each of the 12 codes (nodes) impressions, characters, visuals and design, and clarity of concepts for the PA-themed reality TV show concept

Comments Regarding Impressions of the PA-themed Show Trailer

The majority of comments about impressions of the show were positive, and the comments classified as positive were mostly about the originality of the concept. These ideas were exemplified by one participant who said, “If I’m flipping through the channels ... and I encounter this then I might stay and watch this ... to see what it’s about. Because it’s completely different. I’ve never heard of such a thing ... of that before.” Another participant said, “I think it’s a cool concept ... yeah, it’s really interesting.” Several participants also commented positively about the humor, saying, “I thought it was

amusing.... It was funny. It's a good premise," and "I will say it might not be a bad idea... I mean it sounds ... it sounds humorous." Additionally, many participants found that it was relatable in that "It's really ... like a New Yorker's daily life," and "I enjoyed watching that because I know ... like ... the life of New Yorkers and everything."

However, there were also several comments about the show trailer that were negative. For example, several participants felt that the concept was "a little vague" in that there were "some details missing," Some even suggested that the entire thing didn't "make sense." There were also some contradictory comments regarding the humor aspect: "I wasn't sure if it was humorous to the point where I'm being tricked. You know where I'm ... like ... on one of those prank shows ... like you were pranking me." Others raised an important issue related to cultural relevance by saying, "I don't think ... like ... anyone else from another culture would enjoy watching that." Other negative comments include: "It just doesn't seem appealing.... It just seems like it would be boring."

Comments Regarding Characters

The show concept is a "host-drive" show that features other characters, yet only in supporting roles. As such, most of the positive comments were related to the host. Specifically, participants appreciated the host's approach to explaining the show concept. "She seemed like she was very good on camera and ... like ... good for introducing the show," and "The character who was explaining everything ... she was very thorough and ... umm ... she ... umm ... yeah, she explained everything really well." Other viewers simply used adjectives such as "funny," "energetic," and "definitely likeable." The supporting characters were described as "very realistic ... like ... being a New Yorker in the city and everything...," and that the "people represent ... different situations." However, there were also several negative comments regarding the host and supporting characters. One participant insisted that the host "sometimes spoke a little too fast...," while another claimed that she "has a different sense of humor than me ... and it sort of

turned me off.” Participants felt that the supporting characters were “obviously actors” and “A little stiff in some parts ... a little bit of acting came out as well. It wasn’t as real or genuine.” Some participants were impartial and said things like “Uhh ... neutral” or “I don’t have any strong preference,” while the host’s role was simply as “a background narrating person.”

Comments Regarding Design and Visuals

Positive comments related to the visual and design were not as descriptive. Despite probing, most participants described them as simply, “The visuals were good. I liked them” or “I thought the visuals were great.” Other participants appreciated the stylized “stop motion” effect, and several commented on how natural the clip seemed. “Umm ... and how it’s just kind of ... like ... normal and not really ... like overly produced or anything,” and “I think it’s ... like ... something very familiar with ... like ... everyday in the street.” Yet, many participants also had strong negative reactions to the visual and design components related to the “stop motion” effect and the colors. “Hmm ... I just got disturbed ... like ... there was this black and white fractured-like scene.... I just didn’t like that part,” and “I’m not sure how you can make the colors a little bit more vibrant.” Furthermore, while the budget for the production was comparable to most reality TV show sizzle reels, many commented that it seemed “cheaply made.” “Umm ... I guess it could have been a little more ... high quality ... umm ... it seemed low-budget-y.” “It didn’t look like a professional production.”

Comments Regarding Clarity of the Show Concept

Comments regarding the clarity of the show concept were also less descriptive, yet nearly equally divided among participants. Fourteen of the 22 participants cited, “I think it’s clear,” while 11 of the 22 participants said it was too “vague” or “There was information missing” and “I didn’t get how you win.” Most of the negative comments were associated with the rules of the game and left many wondering: “I was just like kind

of confused ... like ... are they just running ... just running? Like ... they can't use ... like ... a bike or anything like that,” and “What kind of tasks ... umm ... do I need to accomplish ... what is considered a successful completion of a task?” as well as:

I'm trying to figure out now ... because I know it said you have to figure out how to out run the bus until ... until when? Like, what point would be the end? That wasn't clear. I was trying to figure out ... like, who are you going to get to run the entire route of a bus? Is there a cut-off point? Do you run five blocks? Or, whatever ... umm ... other than that ... yeah, yeah ... I thought that part was unclear.

Discussion

This formative research study assessed a physical activity-themed reality television show concept conveying active transportation-related messages to viewers using a mixed-methods design. Both a pre-experimental (quantitative analysis) and a formative developmental component (qualitative analysis) were employed. Results of the quantitative analysis showed that Impressions (WatchOnTV) proved to be a significant correlate to behavioral intentions (Behavior) and those exposed to the intervention show concept showed significant behavioral intentions for AT. The qualitative analysis showed that reactions toward impressions of the physical activity-themed reality show as well as reactions toward the characters were mostly positive. However, participants thought that the visual and design components need improvement and the show concept needs to be better clarified.

Impressions (WatchOnTV) of the show was a significant correlate to AT behavioral intentions (Behavior). Previous research examining audiences' impressions toward reality television indicates that lifestyle programs that present “personal lifestyle transformations” (such as those storylines associated with *Supernanny* and *Undercover Boss*) have the ability to produce strong feelings of elevation, understanding, and compassion. Viewers who perceive these shows as positive, moving, or thought-

provoking were more likely to demonstrate motivations for altruism and behavioral intentions associated with helping others (Tsay-Vogel & Krakowiak, 2016).

Results from this study also reveal that individuals who were assigned to watch a PA-themed reality show concept featuring active transportation were more likely to report a desire to participate in the featured behavior than those in the Home Design comparison condition. That is, those exposed to the PA-themed reality were more likely to report a desire to participate in AT, whereas those exposed to the Home Design concept were less likely to engage in home redecorating.

Prior research evaluating reality television and its effect on behavioral intention showed that those exposed to a reality television show featuring cosmetic surgery had an increased desire for two cosmetic procedures that were highlighted in the program—teeth bleaching and laser hair removal (Nabi, 2009). Furthermore, in a posttest-only experimental design, participants exposed to a 10-minute segment of a reality television cooking show consumed significantly more calories in the form of chocolate compared to those exposed to the control condition (Bodenlos & Wormuth, 2013). These two studies, although different from the current study, suggest that reality television can encourage audiences to adopt views and even model the behaviors depicted—an implication for positive intervention efforts that utilize reality television as a way to influence behavior.

Analysis of the semi-structured interviews showed that impressions of the physical activity-themed reality show as well as reactions toward the characters were mostly positive. In particular, participants commented about the humor and the relatability of the concept. Participants also appreciated the main character's (the host) narrative approach to explaining the show. The supporting characters were also well received and described as very realistic. The situation in which these characters were featured also represented familiar situations that respondents were able to relate to—another aspect that respondents reacted favorably toward.

Previous research supports filming physical activity-themed mass media campaign TV ads that portray achievable activities in a positive way and using community residents. This is in direct contrast to most health-related campaigns that promote prescribed physical activity protocols requiring drastic changes while using celebrities or national spokespersons to promote such messages. Literature also supports filming health-related campaigns in familiar locations that have meaning and applicability to the target audiences' daily activities (Renger, Steinfelt, & Lazarus, 2002).

The visual and design components of the PA-themed reality TV show trailer, however, need improvement, while the concept of the show requires further clarification. Many participants had strong negative reaction to the “stop motion” effect. The colors were also described as gray and dreary. Participants also commented that it seemed cheaply made, low-budget-y, and that it didn't seem like a professional production. Comments regarding the clarity of the show concept were also mostly negative. Most of the negative comments were associated with the rules of the game, specifically the tasks the players were required to complete—an indication that this feature should be eliminated from the show concept altogether.

This study was unique in its focus in that it evaluated in formative research the concept of a physical activity-themed reality TV show concept and the show concept's potential influence on active transportation-related behavioral intentions among those who watched it. There are several methodological strengths to this study. First, it enlisted a mixed methods design—an approach that has not been employed to any substantial degree in the health promotion field. This approach can offset the limitations associated with both quantitative and qualitative research. It would have been impossible to capture the rich descriptions from a strictly quantitative approach. Yet, employing a qualitative-only approach would have limited the generalizability of the research findings (Johnson & Onwuegbuzie, 2004).

Second, the study evaluated an original reality TV show concept. Little research has examined the extent to which reality television featuring PA can influence an individual's desire to be active, and the research that is available is limited in its focus on *The Biggest Loser* franchise. Berry, McLeod, Pankratow, and Walker (2013) examined the effects of a single seven-and-a-half minute clip of the *Biggest Loser* on viewers' attitudes toward exercise. The posttest-only design showed that those exposed to the *Biggest Loser* had more negative attitudes toward exercise than those in the control group, suggesting that—although the show features physical activity storylines and information—viewing it may undermine one's motivation for exercise. Thus, there is a need to examine different approaches to exercise depiction in the media and the possible influence these different depictions may have on audiences (Berry et al., 2013).

Third, the health promotion intervention was informed and supported by a conceptual framework that was specifically used to guide the development of this research. A theoretical underpinning is an integral component of media-delivered interventions as it fosters an understanding of, makes predictions about and describes relationships among variables (Simons-Morton et al., 2012). While oftentimes theories are stated in terms in such a way as to be testable, it is important to note that this conceptual model was solely used to guide the development of the research. Personal characteristics, health-related behaviors, and perceived entertainment constructs were all measured and hypothesized to affect impressions of the PA-themed show trailer and behavioral intentions (Behaviors) toward active transportation based on evidence from the advertising field. To the primary researcher's knowledge, using constructs from advertising techniques has not been employed in physical activity mass media campaign research, even though physical activity-themed mass media campaigns are likened to traditional advertising.

Fourth, the physical activity-themed reality TV show concept had a targeted message that featured a clear and identifiable behavior that audiences can readily adopt—

walking. Evidence supports the efficacy of using one simple focused message as opposed to complex multi-messages, which tend to be costly, with limited long-term effects (Reger-Nash et al., 2005). For example, the slogan of Delaware's statewide physical activity-themed mass media campaign, *Get Up and Do Something*, deliberately encouraged freedom of choice by displaying myriad activities in their promotional TV ads—from playing frisbee to dancing in an outdoor park. But while audiences appreciated this freedom of choice, most individuals found that the advertisement left them directionless. One important question remained: Get up and do *what?* (Peterson, Abraham, & Waterfield, 2005).

Lastly, this research enlisted extensive formative research to assess audience reactions to the show concept with regard to impressions, characters, visual and design components, as well as overall clarity. The resultant feedback will likely help to avoid unnecessary future production costs and will be used to inform and support the development of the series. Researchers will continue to shoot episodes that promote active transportation as a highly feasible activity that can easily be incorporated into one's everyday life while using a non-celebrity host. The visuals and designs, specifically the colors, will be brightened, while the tasks-each-player-must-complete component will be eliminated from the show altogether.

Despite these strengths, there are also several limitations that should be noted. The post-test design affects whether conclusions about cause-and-effect relationships can be drawn from this research. The post-test design limits the ability to say there is causality because the variable behavioral intentions (Behavior) was not manipulated; it was simply measured. Furthermore, there was not random allocation of participants to condition, because it was just not possible. Group assignment was based on the availability of the research assistant because the primary researcher had a major role as the "host" in the AT show concept video. It is likely there would have been a reactive effect if respondents

saw the primary researcher in the video and were then asked to answer questions in her presence. Thus, the research relied on purposive sampling.

Finally, text descriptions were coded, ordered, and analyzed by just one researcher, and therefore the study lacks a measure of inter-rater reliability. The author does, however, have plans to complete an inter-rater check to establish the reliability of coding in the future.

Conclusion

It can be argued that the results of this study support this original physical activity-themed reality television show concept as a suitable public health strategy. Reality television has been shown to be influential on a variety of behaviors among viewing audiences—for better or for worse—and the status of literature calls for a better understanding on how physical activity depicted in reality television may affect exercise-related cognitions and behavior among those who watch this type of programming.

More importantly, the formative research component is a particular strength of this research. Proper implementation of formative research could improve health-related, television-based mass media campaign interventions by reducing future costs and uncovering aspects of the campaign that resonate most with target audiences, thus increasing the likelihood of engendering change. Still, lack of a systematic approach based on appropriate research results remains, with most health-related mass media campaigns being developed without a research-based foundation (Atkins & Freimuth, 2001). Formative, qualitative research has seldom been employed in the entertainment field as a whole despite evidence suggesting that qualitative strategies will widen the field's perspective and enable a better understanding of what the media *can* do as opposed to just what it *cannot* do (Finlay & Faulkner, 2005).

References

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior*. Heidelberg, Germany: Springer.
- Atkins, C. K., & Freimuth, V. S. (2001). Formative evaluation research in campaign design. *Public Communication Campaigns*, 3, 125-145.
- Barton, K. M. (2009). Reality television programming and diverging gratifications: The influence of content on gratifications obtained. *Journal of Broadcasting and Electronic Media*, 53(3), 460-476.
- Bauman, A., Smith, B. J., Maibach, E. W., & Reger-Nash, B. (2006). Evaluation of mass media campaigns for physical activity. *Evaluation and Program Planning*, 29(3), 312-322.
- Berry, T. R., McLeod, N. C., Pankratow, M., & Walker, J. (2013). Effects of biggest loser exercise depictions on exercise-related attitudes. *American Journal of Health Behavior*, 37(1), 96-103.
- Bodenlos, J. S., & Wormuth, B. M. (2013). Watching a food-related television show and caloric intake. A laboratory study. *Appetite*, 61, 8-12.
- Brackett, L. K., & Carr, B. N. (2001). Cyberspace advertising vs. other media: Consumer vs. mature student attitudes. *Journal of Advertising Research*, 41, 23-32.
- Burke, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 22(7), 14-26.
- Carlson, S. A., Fulton, J. E., Pratt, M., Yang, Z., & Adams, E. K. (2015). Inadequate physical activity and health care expenditures in the United States. *Progress in Cardiovascular Diseases*, 57(4), 315-323.
- Christenson, P., & Ivancin, M. (2006). *The "reality" of health: Reality television and the public health*. Menlo Park, CA: Henry J. Kaiser Family Foundation.
- Dorfman, L., & Wallack, L. (1993). Advertising health: The case for counter-ads. *Public Health Reports*, 108(6), 716-726.
- Ducoffe, R. H. (1995). How consumers assess the value of advertising. *Journal of Current Issues and Research in Advertising*, 17(1), 1-18.
- Eagly, A. H., Wood, W., & Chaiken, S. (1978). Causal inferences about communicators and their effects on opinion change. *Journal of Personality and Social Psychology*, 36, 424-435.

- Finlay, S. J., & Faulkner, G. (2005). Physical activity promotion through the mass media: Inception, production, transmission and consumption. *Preventive Medicine, 40*(2), 121-130.
- Fowler, F. J. (2001). Designing questions to be good measures. In *Survey research methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Giles-Corti, B., Timperio, A., Cutt, H., Pikora, T. J., Bull, F. C., Knuiman, M., Bulsara, M., Van Niel, K., & Shilton, T. (2006). Development of a reliable measure of walking within and outside the local neighborhood: RESIDE's Neighborhood Physical Activity Questionnaire. *Preventive Medicine, 42*(6), 455-459.
- Johnson, R.B. & Onwuegbuzie, A.J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.
- Kelley, H. H. (1967). *Attribution theory in social psychology*. Lincoln: University of Nebraska Press.
- Krueger, R. A., & Casey, M. A. (2009). *Focus groups: A practical guide for applied research*. Thousand Oaks, CA: Sage.
- Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T., & Lancet Physical Activity Series Working Group. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *The Lancet, 380*(9838), 219-229.
- Mandan, M., Hossein, S., & Furuzandeh, A. (2013). Investigating the impact of advertising on customers' behavioral intentions. *Business and Economic Research, 3*(1).
- Markey, C. N., & Markey, P. M. (2010). A correlational and experimental examination of reality television viewing and interest in cosmetic surgery. *Body Image, 7*(2), 165-171.
- Mazzeo, S. E., Trace, S. E., Mitchell, K. S., & Gow, R. W. (2007). Effects of reality TV cosmetic surgery makeover program on eating disordered attitudes and behaviors. *Eating Behaviors, 8*, 390-397.
- Mehta, A. (2000). Advertising attitudes and advertising effectiveness. *Journal of Advertising Research, 40*(3), 67-72.
- Miles, A., Rapoport, L., Wardle, J., Afuape, T., & Duman, M. (2001). Using the mass-media to target obesity: An analysis of the characteristics and reported behaviour change of participants in the BBC's Fighting Fat, Fighting Fit campaign. *Health Education Research, 16*(3), 357-372.

- Nabi, R. L. (2009). Cosmetic surgery makeover programs and intentions to undergo cosmetic enhancements: A consideration of three models of media effects. *Human Communication Research, 35*(1), 1-27.
- Noar, S. M. (2006). A 10-year retrospective of research in health mass media campaigns: Where do we go from here? *Journal of Health Communication, 11*(1), 21-42.
- Noar, S. M., Benac, C. N., & Harris, M. S. (2007). Does tailoring matter? Meta analytic review of tailored print health behavior change interventions. *Psychological Bulletin, 133*(4), 673.
- O'Neill, E., & Barrett, M. (2004, May). TiVo—The next big thing—DVRs and television advertising models. In *the World Media Economics Conference, HEC Montréal, Montréal, Canada*.
- Peterson, M., Abraham, A., & Waterfield, A. (2005). Marketing physical activity: Lessons learned from a statewide media campaign. *Health Promotion Practice, 6*(4), 437-446.
- Poggi, J. (2013, September 27). *The cost of "Breaking Bad": AMC asks for \$400,000 for finale*. Retrieved from <http://adage.com/article/media/costbreaking-bad-amc-asks-400-000finale/244442/>
- Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the Nutrition Society, 63*(4), 655-660.
- Reger-Nash, B., Bauman, A., Booth-Butterfield, S., Cooper, L., Smith, H., Chey, T., & Simon, K. J. (2005). Wheeling Walks: Evaluation of a media-based community intervention. *Family & Community Health, 28*(1), 64-78.
- Renger, R., Steinfeld, V., & Lazarus, S. (2002). Assessing the effectiveness of a community based media campaign targeting physical inactivity. *Family and Community Health, 25*(3), 18-30.
- Rettie, R., Robinson, H., & Jenner, B. (2001). *Does Internet advertising alienate users?* Paper presented at Academy of Marketing. Retrieved March 5, 2002 from http://www.kingston.ac.uk/~bs_s520/images/rettrob.pdf
- Rimer, B. K., & Glanz, K. (2005). *Theory at a glance: A guide for health promotion practice*. National Cancer Institute, U.S. Department of Health and Human Services.
- Rose, R. L., & Wood, S. L. (2005). Paradox and the consumption of authenticity through reality television. *Journal of Consumer Research, 32*(2), 284-296.
- Sandage, C. H., & Leckenby, J. D. (1980). Attitudes toward advertising: institution vs. instrument. *Journal of Advertising, 9*(2), 29-32.

- Schmid, K. L., Rivers, S. E., Latimer, A. E., & Salovey, P. (2008). Targeting or tailoring? Maximizing resources to create effective health communications. *Marketing Health Services, 28*(1), 32.
- Shavitt, S., Lowrey, P., & Haefner, J., (1998) Public attitudes towards advertising: More favorable than you might think. *Journal of Advertising Research, 38*(4), 7-22.
- Simons, H. W., Berkowitz, N. N., & Moyer, J. R. (1970). Similarity, credibility and attitude change: A review and a theory. *Psychological Bulletin, 73*, 1-16.
- Simons-Morton, B., McLeroy, K.R. & Wendel, M.L. (2012). *Behavior theory in health promotion practice and research*. Burlington, MA: Jones and Bartlett.
- Snyder, L. B., & Hamilton, M. A. (2002). A meta-analysis of US health campaign effects on behavior: Emphasize enforcement, exposure, and new information and beware the secular trend. *Public Health Communication: Evidence for Behavior Change, 357-383*.
- Stead, M., Gordon, R., Angus, K., & McDermott, L. (2007). A systematic review of social marketing effectiveness. *Health Education, 107*(2), 126-191.
- Tsay-Vogel, M., & Krakowiak, K. M. (2016). Inspirational reality TV: The prosocial effects of lifestyle transforming reality programs on elevation and altruism. *Journal of Broadcasting & Electronic Media, 60*(4), 567-586.
- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet, 376*(9748), 1261-1271.
- Wilbur, K. C. (2008). A two-sided, empirical model of television advertising and viewing markets. *Marketing Science, 27*(3), 356-378.
- Wilson, D. M., Nielsen, E., & Ciliska, D. (1984). Lifestyle assessment: testing the FANTASTIC instrument. *Canadian Family Physician, 30*, 1863.
- Wong, F., Huhman, M., Asbury, L., Bretthauer-Mueller, R., McCarthy, S., Londe, P., & Heitzler, C. (2004). VERB—A social marketing campaign to increase physical activity among youth. *Preventing Chronic Disease, 1*(3), A10.
- World Health Organization (WHO). (2014). Physical activity. *World Health Organization Topics*. Retrieved June 26, 2017 from http://www.who.int/topics/physical_activity/en/
- Zappia, C. (2006, 20 December). What's the most popular show of 2006? *The Village Voice*. Retrieved November 18, 2016, from http://www.villagevoice.com/blogs/television/archives/2006/12/what_watched.php

Zhang, P., & Wang, C. (2005). An empirical evaluation on consumer perceived advertising value and attitude. *Proceedings of the 6th Global Information Technology and Management (GITM) World Conference, Anchorage, Alaska, June 5-7, 2005*. Retrieved from <https://ssrn.com/abstract=2350579>

Appendix A

Review of Literature: Mass Media Campaign Interventions

Designed to Encourage Physical Activity

Introduction

Physical activity (PA) is essential for health. Habitual physical activity prevents weight gain, leads to higher levels of physical fitness, and helps to preserve physical function—all of which reduce one's risk for premature chronic health conditions such as cardiovascular disease, type 2 diabetes, and certain cancers (Garber et al., 2011). Still, in spite of extensive public health efforts, nearly 50% of adults in the United States do not achieve adequate levels of aerobic activity (BRFSS, 2013).

Health-related mass media campaigns employ defined mass media channels to inform, persuade, or motivate individuals on the broadest scale to modify their behavior. As such, public and private agencies have enlisted these interventions in an effort to increase physical activity among socially, culturally, and economically diverse populations (Bauman, Smith, Maibach, & Reger-Nash, 2006; Wakefield, Loken, & Hornik, 2010).

The purpose of this paper is to critically evaluate the most recent collection of primary studies regarding physical activity-themed mass media campaign interventions in the form of a narrative review. This approach allowed the author to address the complexities and diversities inherent to this comprehensive topic with the goal of comparing and contrasting each of the different studies.

Physical Activity-themed Mass Media Campaign Interventions

Atlantis, Salmon, and Bauman (2008) assessed the acute effects of an Australian government-sponsored TV advertisement, *Get Moving*, on children's choices, preferences, and ratings of liking for PA and sedentary behavior in a laboratory setting using a Solomon four-group design. Thirty-one public school children between the ages of 10 and 12 years old free of mental or physical limitations were randomized to one of two intervention groups or one of two control groups. All groups were assigned to watch a 30-minute animated children's television show including commercials; however, the INT groups were exposed to three 30-second *Get Moving* segments over and above the standard commercial advertisements. In addition to pre- and/or post-attitudinal measures (preferences, choices, and ratings of liking for PA and sedentary activities), researchers monitored PA and sedentary behaviors through direct observation immediately following exposure to the standard or additional commercial advertisements. Results showed no significant changes in any of the outcomes assessed, and the authors cite that the lack of effects could be attributable to the small sample size, non-balanced group, and the low statistical power. Furthermore, the reliability and validity of the activity preference measurement tool was questionable, and the PA direct observation piece only lasted 10 minutes. Interestingly, authors point to the quality and content of the *Get Moving* campaign itself as a possible limitation, citing that further research is needed to determine whether different content and/or higher doses of exposure to PA promotion are needed to influence children's PA choices (Atlantis et al., 2008).

In a mixed methods design employing a cross-sectional, population-based survey (n=1600) and focus group data, Berry et al. (2009) evaluated TV advertisements designed to encourage PA and fruit and vegetable consumption among seniors, aged 55 to 70 years old. The 30-second commercials, known as *Healthy U*, ran for eight weeks in Alberta, Canada. Specifically, the post-test only design assessed campaign awareness, perceived

credibility of the information source, and intentions to perform the health behaviors advertised. Results showed that unprompted and prompted recall—both indicators of campaign awareness—were low at just .5% and 18%, respectively, with no significant findings in behavioral intentions to perform the advertised activities. Logistic regression analysis with adjusted odds ratio (AOR) were calculated to determine the unique contributions of audience characteristics on campaign awareness, with individuals over the age of 55 years old being 1.46 times more likely than younger participants to recall the *Healthy U* advertisements. But authors suggest that the higher awareness among this group may have been because the campaign elicited such a negative response. The 30-second ads showed an animated ‘grim-reaper’ character who either slipped on a banana peel or was hit in the head with a baseball, implying that one can ward off death as it encroaches with age by eating right and being physically active. Focus group data were transcribed verbatim and yielded the following comments: “People our age know we’re going to die. We’ve all faced death already. What the accent should be on is enjoyment of the life that you have.” Comments pertaining to the government as the source of information included: “The advertisements were a waste of money on the government’s part” and “The government is not considered a reliable source.” There was also confusion about what the advertisement sought to have viewers adopt, as evidenced by statements such as: “A lot of the message was left to the audience...” and “It didn’t really come out and hit you in the eyes.” So, much similar to Australia’s *Get Moving* campaign, Canada’s *Healthy U* was not a highly recognizable brand, and authors attribute its lack of effectiveness to the content and quality of the ads. Still, authors maintain that television is an important medium to use in health promotion, as repeated exposure via the mass media channel can help shape norms within society and thus influence social expectations (Berry et al., 2009).

Researchers Renger, Steinfelt, and Lazarus (2002) evaluated the effectiveness of a community-based effort addressing physical inactivity among adults, aged 30 to 64 years

old, in Yuma, AZ. The integrated mass media campaign launched in 1997 and utilized 30-second public service announcements (PSAs) and print materials, including comic strips and worksite posters—all of which were research-tested before being launched to target adults in the first two stages of behavioral change, pre-contemplation, and contemplation. The research employed a cross-sectional design (pre- and post-measures) with a comparison group using random-digit dialing techniques plus written survey responses with data collected from both independent and repeated samples. Telephone interview PA questions comprised the following: (1) During the past month, did you participate in any physical activities or exercises, such as running, calisthenics, golf, gardening, or walking for exercise? (2) How many times per week or per month did you take part in this activity during the past month? and (3) When you took part in this activity, for how many minutes or hours did you usually keep at it? Pre and post written surveys were collected at community locations where volunteer respondents were asked a total of 11 questions pertaining to demographics, stage of behavioral change, current PA level, knowledge of benefits and barriers to PA, process data regarding any information obtained about PA, PA self-efficacy, and pros and cons regarding PA.

The between-subject analysis of telephone survey data showed a significant reduction in Yuma, AZ residents who did not engage in leisure time activity decreasing from 29.8% (pre-campaign) to 25.6% (post-campaign). When segmented by age, the 40- to 64-year-old group showed an even greater reduction, with 35.6% not engaging in leisure time PA pre-campaign decreasing to 23.1% post-launch. A between-subject analysis of the 11-item written surveys showed a significant increase in PA self-efficacy scores from 13.12 to 16.42, whereas the within-subject analysis self-efficacy scores increased from 11.86 to 15.74 while self-reported PA in minutes per day increased significantly from 3.28 to 4.34.

Strengths of the campaign include its transtheoretical model (TTM) underpinnings and implementation of formative research throughout all stages of campaign

development. And the researchers were able to employ a repeated measures design through strategic planning of the written survey data collection procedures. However, without a control group, the results of the study are limited. It is not clear whether the observed changes were a result of the media campaign alone. Still, some important findings include: (1) analysis of the print materials failed to reach statistical significance, suggesting that the comic strips and posters were not as effective as television is in conveying the PA messages to the target audience; (2) the authors' emphasis on the inherent limitation in using PSAs because of the lack of control over when they air; and (3) PSA ads featured area residents filmed in familiar locations, suggesting that viewers are more likely to be influenced by media content that is meaningful and applicable to the target audience's daily lives. This finding is in direct contrast to most PA-themed television-based campaigns that feature prescribed PA protocols and use celebrity spokespersons (Renger et al., 2002).

In a large cross-sectional study, Booth, Bauman, Oldenburg, Owen, and Magnus (1992) assessed the effects of a national mass media PA campaign among Australian residents using an existing national probability sample. Specifically, authors sought to determine campaign recall, assess changes in knowledge of the role of PA in the prevention of cardiovascular disease (CVD), the frequency of PA behavior (walking for exercise, moderate, and vigorous PA), and to determine if the effects of the campaign varied across socio-economic groups. The integrated campaign consisted of several elements: paid TV advertisements, pre-recorded radio PSAs, a professional published paper on the relationship between exercise and heart disease, posters, leaflets, and stickers, t-shirts, sweatshirts, publicity tours by PA experts, and two episodes of a nationally-broadcast television soap opera with PA messages embedded within the scripts. Data were collected from two nationally representative independent samples of adults, ages 14 to 60 years old, while collection took place two weeks before the campaign launch (n=2426) and four weeks after (n=2474). Survey respondents were

asked to recall any publicity over the previous month from the National Heart Foundation (NHF) of Australia regarding walking or getting regular exercise and asked about their belief about the role of exercise in the prevention of heart disease. These exercise questions to assess walking, moderate, and vigorous activity were modeled after questions used in the 1983 and 1989 Risk Factor Prevalence Surveys previously conducted by the NHF of Australia. Campaign recall increased from 46% to 71%, with a greater proportion in females than males recalling publicity over the previous month (80.3% compared to 72.8%). There was no significant change in the belief about benefits of exercise in reducing CVD, as the belief was high to begin with at 92.1% pre-campaign. Physical activity as measured by self-reported walking increased significantly from 70.1% to 73.9%, and this was greater for those 40 years and older and in the least-educated group (less than a secondary education). Men and women between 50 and 59 years old and over 60 were almost twice as likely to walk following the campaign (AOR = 1.82, 95% CI, 1.02-3.23; AOR = 1.94, 95% CI, 1.15-3.28). The proportion of those who were sedentary decreased from 22% to 15.4% in the over 60 group, while the least educated group showed a decrease in sedentary activity from pre- to post-campaign (21.6% versus 17.3%).

Owen, Bauman, Booth, Oldenburg, and Magnus (1995) took Booth et al.'s research a step further and examined the cumulative effects of this serial mass media campaign to promote walking in Australia, which launched in 1990 and then re-launched in 1991. The cross-sectional design with pre- and post-measures employed face-to-face home-based interviews among a random sampling of households. Data were collected from individuals aged 14 to >60 years old 2 weeks before and 3-4 weeks after the campaign launch to assess awareness (recall), PA intentions, PA behavior, and walking. Message recall increased significantly from 46% to 77% in 1990 and from 62.5% to 73.5% in 1991. Walking increased in 1990 and showed significant variations by age, with those between the ages of 40 to 49 and 50 to 59 more likely to report walking (AOR = 1.57,

95% CI 1.03, 2.39; AOR = 1.92, 95% CI 1.27, 2.90). However, there were no significant increases in walking across the population or among any subgroup in 1991, nor were there any changes in inactivity levels and physical activity intentions—an indication that campaign effectiveness reached its peak after just one year.

Strengths of this research include PA questions taken from the NHF Risk Factor Prevalence Studies, which is considered a valid and reliable source. Furthermore, groups were demographically similar in terms of age, sex, and education. But a controlled study would have provided stronger causal evidence compared to the cross-sectional design employed. Also, the positive effects may have been augmented by another health-related social advertising campaign, which aired concurrently.

Leavy et al. (2013) reported the effects of a more recent Australian PA-themed campaign, *Find Thirty Everyday*, which aired between 2008 and 2010. The integrated campaign employed 15-second and 30-second TV ads, which were supported by radio and print advertising on billboards, websites, and online resources. English-speaking adults between the ages of 20 and 54 years old free from disease or disability that would limit moderate PA were randomly selected from a 2006 electronic telephone directory. Each respondent from one of the three independent samples answered a 75-item survey at baseline in 2008 (pre-campaign; n=972), in 2009 (1st follow-up; n=938) and 2010 (2nd follow-up; n=937). Researchers assessed awareness through prompted recall and prompted recognition questions, which were used to calculate a score for total awareness followed by questions about PA saliency and behavioral intention. Physical activity behavior questions were derived from the Active Australia questionnaire, which was considered a valid and reliable source. Demographic data including gender, age, location (metropolitan or other), socio-economic status (SES), education, income, and BMI were collected to assess the associations between these independent variables with awareness and behavioral intention. Overall campaign awareness increased significantly from baseline to 2nd follow-up. Behavioral intentions increased significantly from baseline to

2nd follow-up. However, there was no significant increase in either outcome at 3rd follow-up. Awareness also significantly increased across all subgroups (gender, age, location, SES, income, BMI, self-reported activity) from baseline to 2nd follow-up, as did behavioral intention with the exception of those in the highest education category, who only saw an increase from baseline to 1st follow-up. Total walking, moderate PA, vigorous PA, and total PA in median minutes increased significantly from baseline to 1st follow-up. Logistic regression analysis showed that females and those who were already sufficiently active were more likely to be aware of the campaign (AOR = 1.30, 95% CI, 1.12-1.53; AOR = 1.27, 95% CI, 1.08 to 1.50), whereas those with a university degree were less likely to be aware of the campaign (AOR = .81 95% CI, .66 to .99). Females were more likely (AOR = 1.72, 95% CI, 1.40 to 2.12) to report PA behavioral intentions, as were overweight individuals (AOR = 1.54, 95% CI, 1.24 to 1.91). Interestingly, though, females reported 32% less actual activity compared to males (AOR = .68, 95% CI .56 to .77), while the overweight group reported 26% less activity than their normal weight counterparts (AOR = .74, 95% CI, .63 to .88).

Campaign success was likely due to the extensive, 10-stage formative research process used to inform campaign development messages, themes, and images for the TV ads. The pre-testing materials indicated that *Find Thirty Everyday* needed to be portrayed as achievable through everyday activities rather than as “aspirational” and that casting real people in the TV ads instead of actors would allow for audiences to better embrace the campaign message.

In the same year as *Find Thirty Everyday*, King, Grunseit, O’Hara, and Bauman (2013) published results evaluating the population level impact of *Measure Up*, an integrated mass media campaign designed to target obesity in New South Wales (NSW). *Measure Up* utilized television, press, radio, outdoor advertising, and community activities and had two target groups: (1) parents aged 25 to 50 years old, and (2) adults aged 45 to 50 years old diagnosed with a chronic disease. The campaign ran from

October 2008 through April 2009, and researchers employed a cross-sectional telephone survey with pre and post measures (n=1006) to assess its effects. Outcomes included self-reported PA and diet, campaign awareness, knowledge about one's own waist circumference (WC), personal relevance to the campaign message, perceived confidence to make lifestyle changes, and WC measuring behavior. Personal characteristics included age, gender, location (capital city vs. non-capital city), education, employment, status, income, language, self-reported risk factors, and BMI.

Awareness as measured by unprompted recall increased from 1.1% to 38.2% from pre-campaign to post-campaign, while prompted recall was markedly high post-launch at 89.4%. Audiences also retained campaign messages (a measure of knowledge), with 82.2% and 82.3% agreeing that increased WC heightens one's risk for CVD and 30 minutes or more of PA is necessary for health benefits. Waist circumference-measuring behavior increased significantly from 31.4% pre-campaign to 36.6% post-campaign. Factors associated with knowledge included both age and education, with older adults having half the odds of recalling the campaign and the higher educated group more likely to recall it. Women also displayed higher odds of knowing a healthy WC measure, and individuals with a grade 12 or higher education were more likely to have measured their own WC in the previous six months. But those employed were 24% less likely to have done the same self-assessment.

This campaign approach was innovative in that it used WC as an indicator of chronic disease risk rather than weight. But pre-testing research indicated that 90% of the target audience already knew about this relationship, which raises the question: Why was this campaign even necessary? Still, authors insist that continued long-term investment in campaigns such as *Measure Up*, supplemented with community-based health promotion, may contribute to population risk factor understanding and behavior change to reduce chronic disease. Moreover, this was also one of the only campaigns that measured a specific, distal outcome—WC measuring behavior—among audiences at a 6-month

follow-up. Additionally, the media message specifically used the risk of chronic disease as an “emotional hook” and used positive modeling to influence viewers. And personal relevance continues to be of utmost importance, as formative research findings suggested that the characters in the message were seen as credible and socially normative (“like me” or “it’s happening to me”) (King et al., 2013).

Using a quasi-experimental design that employed both a cohort and independent samples with a comparison group, Bauman, Bellew, Owen, and Vita (2001) evaluated the impact of a statewide PA campaign in NSW Australia designed to reach adults, ages 25 to 60 years old, who were motivated, yet insufficiently active. The campaign was supported by extensive formative research and hailed the tagline, “Exercise, you have to take it regularly not seriously.” Media components consisted of two 15-second advertisements supported by print media, a toll-free hotline, marketing of campaign merchandise, physical activity counseling kits, and community-based walking and PA events. The two aims of the research were: (1) to determine if the campaign resulted in increased awareness, improved knowledge, and changes in intention and PA behavior in NSW compared to the rest of Australia; and (2) to examine the effects of the campaign target group compared to all others. All data were derived from self-reported responses to a random telephone survey and resulted in several encouraging outcomes.

Awareness increased in the NSW cohort by 20% (unprompted recall) and 45% (prompted recall) post-launch. Three out of five knowledge items measuring the importance of moderate PA also increased significantly in both the NSW cohort and NSW independent sample—an increase not seen in the comparison group. Logistical regression analysis showed that being aware of the campaign and being in the target group were associated with a twofold increase in the likelihood of increasing actual PA behavior. Those with higher exercise self-efficacy were 64% more likely to increase their activity. What’s more, a 34% increase in activity was associated with an increased understanding that 30 minutes of PA is necessary for health benefits. Interestingly, those

who believed more strongly that PA needed to be vigorous to achieve health benefits were less likely to increase their total PA—thus highlighting the need for media-based interventions that emphasize that shorter, more moderate bouts of activity are sufficient to achieve health benefits.

The findings here are important because they suggest a positive impact as a result of the campaign in terms of awareness, knowledge, and the understanding of the moderate PA message. Both the NSW cohort and independent sample with comparison group corroborated these findings, which is an added strength to this research.

Wimbush, MacGregor, and Fraser (1998) assessed the impact of a national mass media campaign designed to promote walking in Scotland in 1995 using two population-based surveys and multi-stage cluster random probability sampling with a sub-sample. The integrated campaign incorporated 40-second TV advertising, a telephone line (*Fitline*), and print materials. The purpose of the campaign was to encourage walking among lower SES men and women between the ages of 30 and 55 years old. To assess campaign awareness, data were derived from a sample (n=800) using Scotland's Communication's Tracking Survey. In addition, data were derived pre- and post-campaign through placing five questions in System 3 Scotland's monthly omnibus survey to assess PA knowledge, beliefs, motivations, intentions, and behavior.

There were no significant changes in awareness across the population as a whole or within the target group from pre- to post-launch. But the knowledge/belief item "walking is a good form of exercise" increased across the population (36%), the target group (38%), and *Fitline* callers (10%). Exercise intentions, self-assessed change in PA level, and stage of change in exercise behavior also increased significantly across *Fitline* callers, but not in the population or target group.

Interestingly, one-third of those who telephone *Fitline* to obtain further information were regular exercisers and were not the ones being targeted by the campaign. Still, the authors insist that this mass media campaign was a success and encouraged the following

when moving forward with PA mass media campaigns: (1) TV advertising can help to achieve broad population coverage, but to be effective the messages conveyed must be simple; (2) TV ads must portray achievable goals in an encouraging, friendly, conversational tone that helps to draw people in; and (3) TV ads should adopt messages that are counter to the typical mass media campaigns that portray health education as authoritarian, didactic, moralistic, and expecting people to make drastic changes in lifestyle and give up enjoyable behavior (Wimbush et al., 1998). The *VERB* campaign was designed to do just this—reposition PA as cool, fun, and a chance to have a good time with friends.

Huhman et al. (2005) evaluated the effects of *VERB*, a nation-wide mass media campaign designed to increase physical activity levels in children, ages 9 through 13. The campaign, initiated by the Centers for Disease Control and Prevention (CDC), combined expertise from both public and private sectors and enlisted corporate advertising firms to develop and execute the campaign commercials. Researchers collected physical activity data via random-digit-dialing in the months prior to the campaign's launch, where 87% of parents and 81% of children in eligible households completed a baseline interview. Beginning in late 2002, a series of 30-second advertising segments aired on child-specific cable networks, including Nickelodeon and the Disney Channel, encouraging children to “find their verb” (i.e., activity or movement). One year following the launch, investigators contacted the same parent-child cohort (n=2729; RR 71%) and measured what effect—if any—the campaign had on their levels of physical activity. Positive behavioral effects were limited and found only in measured free-time PA in the previous week among girls aged 9 to 10 years old.

After *VERB*'s second year, the same outcome measures were assessed, including free-time PA in the past 7 days, organized PA in the past 7 days, and PA on the day before the interview, outcome expectations, self-efficacy, and social influences. Awareness and exposure were also assessed. Results showed a statistically significant

dose-response effect of exposure to *VERB* on the children reporting PA on the day before the interview and a statistically significant dose-response effect of exposure to *VERB* on children's median number of free-time PA sessions. An awareness effect was also detected. Sixty-one percent of those unaware of the campaign reported PA on the previous day in 2004 averaging 3.9 weekly sessions of PA per week. This was slightly higher than the 46% of those aware of the campaign that reported PA on the previous day in 2004 and averaged 3.0 weekly sessions of PA per week. There was also a statistically significant dose-response effect on outcome expectations with children aware of the *VERB* averaging an outcome expectations score of 10.07 compared with a score of 9.71 among children unaware of *VERB*.

During its second year, *VERB* upped its advertising time in select communities throughout the country. A total of six communities representing a broad geographic and demographic mix received a 50% higher dosage of on-air *VERB*-related promotional activity compared to the first year and national average, which remained the same. The augmented doses also integrated community outreach initiatives through what is known as a "street team" marketing approach. This technique situated *VERB* ambassadors, ages 16 to 21, at high-traffic, tween-friendly venues such as malls, theaters, state and country fairs, and sporting events to talk to the public about physical activity and distribute *VERB*-branded items such as wristbands and Frisbees. Researchers Berkowitz, Huhman, and Nolin (2008) examined the effects of the increased commercial advertising (combined with additional community outreach initiatives) on PA outcomes and compared the results to baseline. The methods reflected the same longitudinal design employed during the campaign's first-year research. Results showed that tweens in the higher dose communities demonstrated greater awareness of the *VERB* campaign and more positive attitudes toward physical activity among their peers. Yet, no changes occurred in any of the PA activity outcomes assessed.

The initial goal was to sustain *VERB*'s higher-dose advertising and community outreach initiatives for a total of two years, but after just one year, budget constraints necessitated a drop in the higher dose from six communities to four communities. The same team of researchers compared these four higher-dose communities to the baseline national-dose. Tweens that received two years of the higher dose showed greater awareness and understanding of the campaign as well as higher self-efficacy scores. Percentage of those physically active the day before the interview were higher (61% versus 55.3%) than the standard dose comparison, as were the median number of free-time PA sessions per week (4.06 vs. 3.48).

The *VERB* campaign used a commercial marketing approach to create a “brand” that target groups would identify with and included general and ethnic specific materials to broaden its appeal. Although the authors recognize that improving PA will require multiple approaches across many sectors, they insist that changing normative behaviors requires reaching children where they are being influenced by other lifestyle messages—through the mass media. But while behavioral outcomes were encouraging, reverse causality cannot be ruled out. It is possible that more active children happened to have noticed the campaign compared to non-active children. Furthermore, the Youth Media Campaign Longitudinal Survey (YMCLS) reliability and validity are considered only “acceptable” for measuring PA behavior.

On the heels of *VERB* came *Get Up and Do Something*—Delaware's statewide media campaign designed to encourage young adults to be more physically active. The campaign drew heavily from Corbett's (2001) research, which indicated that the most successful media campaigns are those that first identify the mindset of the target audience toward a specific behavior before designing the intervention. For instance, media campaigns that integrate levels of awareness, feelings, and perceived barriers toward physical activity of a specific group are more likely to yield positive behavioral outcomes within that group. *Get Up and Do Something* did just that. The campaign was based on

strong formative research testing, allowing the marketing firms responsible for its launch to better shape the campaign. Formative research indicated that most young adults, ages 18 to 30, within the state of Delaware—regardless of gender or ethnicity—held negative perceptions of physical activity and associated exercising with lackluster adjectives such as *painful*, *boring*, *not fun*, and *relegated to the indoors*. The marketing firm used these findings to create a campaign that portrayed exercise as the opposite: *engaging*, *social*, and *fun*. The end result was a 30-second television advertisement featuring an African American male encouraging a couple to get up and get moving outdoors. The campaign aired on cable network channels of E!, MTV, BET, FX, ESPN2, and Comedy Central—all of which cater to the 18- to 30-year-old demographic (Peterson, Abraham, & Waterfield, 2005).

In October 2005, Peterson et al. published data regarding the campaign's effectiveness. While no behavioral outcomes were assessed, viewers in Delaware described *Get Up and Do Something* as positive, upbeat, and energetic. What's more, 31% of respondents who recognized the campaign indicated they were inspired to be more physically active as a result of seeing it. Unfortunately, however, many focus group participants felt that the campaign left them directionless. While they appreciated the freedom of choice associated with the slogan, many felt they needed a message that was more specific. One critical unanswered question remained: Get up and do what?

Sharpe, Burroughs, and Granner (2010) evaluated *Step Up, Step Out!*, a year-long campaign and enlisted both a quasi-experimental and cohort study design to assess pre- and post-campaign differences in PA recall, knowledge, beliefs, motivational readiness, and behavior among women ages 35 to 54 years old who self-identified as irregularly active and inactive. The non-randomized design compared a 24-week behavioral intervention plus mass media exposure campaign to pre and post cross-sectional survey samples from a media-exposed-only county and a no-intervention county. Results showed that the 24-week behavioral intervention plus the mass media exposure showed

more favorable outcomes compared to both the mass media exposure and no intervention group, suggesting that mass media campaigns alone are, in fact, not sufficient to achieve PA behavioral change.

In 1995, England's national health promotion agency was tasked with creating a 3-year mass media campaign designed to encourage moderate PA among residents. Specifically, *ACTIVE* for LIFE was based on social marketing principles and aimed to increase knowledge and acceptability of the new PA recommendations that adults should aim to take part in at least five sessions of 30 minutes of moderate intensity of PA per week. The integrated campaign utilized 40-second TV advertisements along with print materials and online resources that were developed, pre-tested, and designed to appeal to a broad audience of adults, aged 16 to 74 years old. The first phase of TV ads aired over a six-week period in the spring of 1996 (wave 1), and follow-up data were collected in 1997 (wave 2) and 1998 (wave 3). Awareness (prompted and unprompted), knowledge, readiness to change, and behavior were assessed.

Thirty-eight percent of respondents were aware of the campaign, and awareness was higher among those who were younger, males, those with children, from a lower social class, those with a higher readiness to change, and those who were vigorously active. Yet, awareness was assessed 6 to 8 months after the campaign aired and likely produced an underestimate.

Those knowledgeable about PA recommendations increased by 3.7% from baseline to wave 3, and knowledge was higher in women, older age groups, and those in lower social grades. Readiness to change was more likely among women, younger participants, and participants who were aware of the campaign at wave 2; however, those reporting vigorous activity decreased from 12% (baseline) to 3% (wave 3), and time spent in sedentary behavior increased from 24% (baseline) to 31% (wave 3). While the study employed prospective longitudinal design using a national sample and enlisted face-to-face interviews, there was no control group that makes inferences about causality

difficult. Additionally, no published validity or reliability studies exist on the questionnaire used (Hillsdon, Cavill, Nanchahal, Diamond, & White, 2001).

Conclusion

Research designs, measurement approaches, populations studied, theoretical frameworks, variables tested, and PA outcomes assessed are varied and diverse across mass media campaign intervention studies, which makes them difficult to assess comprehensively. Still, the Community Preventive Services Task Force reports that there is insufficient evidence to determine the effectiveness of mass media to increase PA at the population level in all its forms (print, radio, billboards, television, etc.), while a majority of mass media campaign interventions specific to television fall short of achieving the PA changes they were designed to promote (Brown et al., 2012; Noar, 2006). However, empirical evidence indicates that television remains the broadest and most culturally relevant means of disseminating health information, specifically because television in particular has been shown to be more accessible than other media. Thus, television provides a promising mechanism to reach populations most in need of health education messages, but further research is warranted in order to fully understand how to use this powerful medium (Wardle, Rapoport, Miles, Afuape, & Duman, 2001).

References

- Atlantis, E., Salmon, J., & Bauman, A. (2008). Acute effects of advertisements on choices, preferences, and ratings of liking for physical activities and sedentary behaviors: A randomized controlled pilot study. *Journal of Science and Medicine in Sport, 11*, 553-557.
- Bauman, A. E., Bellew, B., Owen, N., & Vita, P. (2001). Impact of an Australian mass media campaign targeting physical activity in 1998. *American Journal of Preventive Medicine, 21*(1), 41-47.
- Bauman, A., Smith, B. J., Maibach, E. W., & Reger-Nash, B. (2006). Evaluation of mass media campaigns for physical activity. *Evaluation and Program Planning, 29*(3), 312-322.
- Berkowitz, J. M., Huhman, M., & Nolin, M. J. (2008). Did augmenting the VERB™ campaign advertising in select communities have an effect on awareness, attitudes, and physical activity? *American Journal of Preventive Medicine, 34*(6), S257-S266.
- Berry, T. R., Spence, J. C., Plotnikoff, R. C., Bauman, A., McCargar, L., Witcher, C., ... & Stolp, S. (2009). A mixed methods evaluation of televised health promotion advertisements targeted at older adults. *Evaluation and Program Planning, 32*(3), 278-288.
- Booth, M., Bauman, A., Oldenburg, B., Owen, N., & Magnus, P. (1992). Effects of a national mass-media campaign on physical activity participation. *Health Promotion International, 7*(4), 241-247.
- Brown, D. R., Soares, J., Epping, J. M., Lankford, T. J., Wallace, J. S., Hopkins, D., ... & Community Preventive Services Task Force. (2012). Stand-alone mass media campaigns to increase physical activity: A community guide updated review. *American Journal of Preventive Medicine, 43*(5), 551-561.
- Centers for Disease Control and Prevention. (2013). *Office of Surveillance, Epidemiology and Laboratory Services. Behavioral Risk Factor Surveillance System*. Retrieved from <http://apps.nccd.cdc.gov/brfss/display.asp?cat=PA&yr=2013&qkey=8291&state=US>
- Corbett, K. K. (2001). Susceptibility of youth to tobacco: A social ecological framework for prevention. *Respiratory Physiology, 128*(1), 103-118.

- Garber, C. E., Blissmer, B., Deschenes, M. R., Franklin, B. A., Lamonte, M. J., Lee, I. M., Nieman, D. C., & Swain, D. P. (2011). American College of Sports Medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medicine and Science in Sports and Exercise*, 43(7), 1334-1359. doi: 10.1249/MSS.0b013e318213febf
- Hillsdon, M., Cavill, N., Nanchahal, K., Diamond, A., & White, I. R. (2001). National level promotion of physical activity: results from England's ACTIVE for LIFE campaign. *Journal of Epidemiology and Community Health*, 55(10), 755-761.
- Huhman, M., Potter, L. D., Wong, F. L., Banspach, S. W., Duke, J. C., & Heitzler, C. D. (2005). Effects of a mass media campaign to increase physical activity among children: Year-1 results of the VERB campaign. *Pediatrics*, 116(2), e277-e284.
- King, E. L., Grunseit, A. C., O'Hara, B. J., & Bauman, A. E. (2013). Evaluating the effectiveness of an Australian obesity mass-media campaign: How did the "Measure-Up" campaign measure up in New South Wales? *Health Education Research*, 28(6), 1029-1039.
- Leavy, J. E., Rosenberg, M., Bauman, A. E., Bull, F. C., Giles-Corti, B., Shilton, T., Maitland, C. & Barnes, R. (2013). Effects of Find Thirty Every Day cross-sectional findings from a Western Australian population-wide mass media campaign, 2008-2010. *Health Education & Behavior*, 40(4), 480-492.
- Markey, C. N., & Markey, P. M. (2010). A correlational and experimental examination of reality television viewing and interest in cosmetic surgery. *Body Image*, 7(2), 165-171.
- Noar, S. M. (2006). A 10-year retrospective of research in health mass media campaigns: Where do we go from here?. *Journal of Health Communication*, 11(1), 21-42.
- Owen, N., Bauman, A., Booth, M., Oldenburg, B., & Magnus, P. (1995). Serial mass-media campaigns to promote physical activity: Reinforcing or redundant? *American Journal of Public Health*, 85(2), 244-248.
- Peterson, M., Abraham, A., & Waterfield, A. (2005). Marketing physical activity: Lessons learned from a statewide media campaign. *Health Promotion Practice*, 6(4), 437-446.
- Renger, R., Steinfeld, V., & Lazarus, S. (2002). Assessing the effectiveness of a community based media campaign targeting physical inactivity. *Family and Community Health*, 25(3), 18-30.
- Sharpe, P. A., Burroughs, E. L., & Granner, M. L. (2010). Impact of a community-based prevention marketing intervention to promote physical activity among middle-aged women. *Health Education and Behavior*, 37, 403-423.

- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet*, 376(9748), 1261-1271.
- Wardle, J., Rapoport, L., Miles, A., Afuape, T., & Duman, M. (2001). Mass education for obesity prevention: the penetration of the BBC's Fighting Fat, Fighting Fit campaign. *Health Education Research*, 16(3), 343-355.
- Wimbush, E., MacGregor, A., & Fraser, E. (1998). Impacts of a national mass media campaign on walking in Scotland. *Health Promotion International*, 13(1), 45-53.

Appendix B

Definitions and Abbreviations

Definitions

1. Mass media campaigns: organized, purposive efforts to communicate, persuade, and influence a population to consider, adopt, or change to more health enhancing practices
2. Physical activity: any bodily movement that results in a substantial increase in caloric requirements over resting and includes both organized and non-organized activities
3. Active transportation: any form of human-powered transportation such as walking or cycling

Abbreviations

1. PA: physical activity
2. AT: active transportation
3. TV: television

Appendix C

Study I – Approved Teachers College IRB Materials



Teachers College IRB

Exempt Study Approval

To: Mary Gillis
From: Curt Naser, TC IRB Administrator
Subject: IRB Approval: 17-302 Protocol
Date: 06/15/2017

Thank you for submitting your study entitled, "*Beat The Bus: Can "Reality" TV Facilitate Physical Activity Behavior Change?*;" the IRB has determined that your study is **Exempt** from committee review (Category 4: **Existing Data**) on 06/15/2017.

Please keep in mind that the IRB Committee must be contacted if there are any changes to your research protocol. The number assigned to your protocol is 17-302. Feel free to contact the IRB Office by using the "Messages" option in the electronic Mentor IRB system if you have any questions about this protocol.

You can retrieve a PDF copy of this approval letter from the Mentor site.

Best wishes for your research work.

Sincerely,
Curt Naser, Ph.D.
TC IRB Administrator
curtn@axiomeducation.com

INFORMED CONSENT
Teachers College, Columbia University
525 West 120th Street
New York, NY 10027
212.678.3000
www.tc.edu

INFORMED CONSENT: Online Survey

Principal Investigator (PI): Mary Gillis

Research Title: ***Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults***

DESCRIPTION OF THE RESEARCH: You are invited to participate in a research study entitled, *Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban- Dwelling Adults*. You have been invited because you are an urban-dwelling individual between the ages of 18 and 64 years old and are capable of walking at least 5 city blocks without stopping and without experiencing severe discomfort. Your participation in this research will provide insight and expertise to the development and production of an original reality television series, which will be evaluated as part of a larger, future study. The procedures for this research study are as follows: First, you will be randomly assigned to watch one of two reality television show trailers. Then you will watch the 2-minute trailer of the show you were assigned to watch. Afterwards, you will be asked to complete a brief online questionnaire based on what you just saw. There will also be questions pertaining to your individual characteristics including your age, race, ethnicity, physical activity and transportation-related habits among others.

RISKS AND BENEFITS: There are no formidable risks associated with participating in this study, however, the online survey will take approximately 5 to 10 minutes of your time to complete. And there are no direct benefits from participation, but there is a chance that afterwards you might reflect upon your physical activity habits and improve your current level. Your participation will also help to inform and support the writing of the PIs doctoral thesis. Finally, if you should decide that you do not want to participate in this study, simply select “No, I do not wish to participate in this study” from the choices below. You are also free to withdraw at anytime without consequence by exiting out of the internet browser.

PAYMENTS: You will receive \$10 for your participation in this study. Additionally, you will be entered into a raffle to receive a one-month, pre-paid Metro Card worth approximately \$100.

DATA STORAGE TO PROTECT CONFIDENTIALITY: The completed questionnaires will be stored within the password-protected software under the Qualtrics Survey Software platform. Data cannot be traced back to you and the information will be kept entirely confidential. Your commentary and insight is for the sole benefit of the PI and her faculty sponsor so that they can—if necessary—modify the content of the reality show, *Beat The Bus*, prior to production of the series. Six months after a thorough analysis of the data, all of these materials will be destroyed. Any presentations or reports that result from this research study will refer to you as Online Survey Participant #1, #2, #3, etc.

TIME INVOLVEMENT: Your participation will involve a single event lasting between 5 and 10 minutes.

HOW WILL RESULTS BE USED: The results of the study will be used to inform and support the production of the original reality series, *Beat The Bus*, as well as the writing of the PI's doctoral.

Please click "Yes" or "No" to indicate whether you have read the abovementioned information and agree to participate in this study.

Yes, I agree to participate in this study

No, I do not wish to participate in this study

For questions related to this research, please contact Mary Gillis at meg2162@tc.columbia.edu or 646-509-7133. For questions regarding your rights as a participant in this research, please contact the Institutional Review Board at Teachers College Columbia University at 212-678-4105. Or write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY, 10027, Box 151.

PARTICIPANT'S RIGHTS
Teachers College Columbia University
525 West 120th Street
New York NY 10027
212.678.3000
www.tc.edu

PARTICIPANT'S RIGHTS: Online Survey

Principal Investigator (PI): Mary Gillis

Research Title: ***Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults***

- I have read the Research Description and have had the opportunity to ask questions about the purposes and procedures regarding this study.
- My participation in research is voluntary. I may refuse to participate or withdraw from participation at any time without jeopardy to future medical care, employment, student status or other entitlements.
- The researcher may withdraw me from the research at his/her professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue to participate, the investigator will provide this information to me.
- Any information derived from the research project that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- If, at any time, I have any questions regarding the research or my participation, I can contact the investigator, who will answer my questions. The investigator's phone number and email are (646) 509-7133 and meg2162@tc.columbia.edu
- If, at any time, I have comments, or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the Teachers College Columbia University Institutional Review Board. The phone number for the IRB is (212) 678-4105. Or, I can write to the IRB at Teachers College Columbia University, 525 W. 120th Street, New York, NY, 10027, Box 151.
- By clicking "Yes" I agree to participate in this study.
- Yes, I agree to participate in this study
- No, I do not wish to participate in this study

Teachers College, Columbia University
525 West 120th Street
New York NY 10027
212 678 3000
www.tc.edu

INVESTIGATOR'S VERIFICATION OF EXPLANATION

Principal Investigator (PI): Mary Gillis

Research Title: ***Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban Dwelling Adults.***

I certify that I have carefully explained the purpose and nature of this research to _____ (participant's name) in age-appropriate language. He/She has had the opportunity to discuss it with me in detail. I have answered all his/her questions and he/she provided the affirmative agreement (i.e. assent) to participate in this research.

Investigator's Signature: _____

Date: _____

Appendix D

Study II – Approved Teachers College IRB Materials



Teachers College IRB

Exempt Study Approval

To: Mary Gillis
From: Curt Naser, TC IRB Administrator
Subject: IRB Approval: 17-302 Protocol
Date: 06/15/2017

Thank you for submitting your study entitled, "*Beat The Bus: Can "Reality" TV Facilitate Physical Activity Behavior Change?*;" the IRB has determined that your study is **Exempt** from committee review (Category 4: **Existing Data**) on 06/15/2017.

Please keep in mind that the IRB Committee must be contacted if there are any changes to your research protocol. The number assigned to your protocol is 17-302. Feel free to contact the IRB Office by using the "Messages" option in the electronic Mentor IRB system if you have any questions about this protocol.

You can retrieve a PDF copy of this approval letter from the Mentor site.

Best wishes for your research work.

Sincerely,
Curt Naser, Ph.D.
TC IRB Administrator
curtn@axiomeducation.com

INFORMED CONSENT
Teachers College, Columbia University
525 West 120th Street
New York, NY 10027
212.678.3000
www.tc.edu

INFORMED CONSENT: Focus Group Participants

Principal Investigator (PI): Mary Gillis

Research Title: ***Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults***

DESCRIPTION OF THE RESEARCH: You are invited to participate in a research study entitled, *Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults*. You have been invited because you are an urban-dwelling individual between the ages of 18 and 64 years old and are capable of walking at least 5 city blocks without stopping and without experiencing severe discomfort. Your verbal comments as well as your responses to a questionnaire will provide insight and expertise to the development and production of an original reality television series, which will be evaluated as part of a larger, future study. The procedures for this research study are as follows: You will be randomly assigned to watch one of two reality television show trailers. You will then listen to a brief, oral overview of the show concept. Then you will watch the 2-minute trailer of the show you were assigned to watch. Afterwards, you will be asked to participate in an open discussion and answer questions about what you just saw. The discussion will be deliberately conversational, minimally structured and you will be encouraged to speak freely and openly. The researcher will take hand-written notes throughout the discussion. Before the session ends, you will be asked to fill out a brief questionnaire. Questions will pertain to your individual characteristics including your age, race, ethnicity, physical activity and transportation-related habits among others. In addition, the session will be videotaped. In order to participate in this research, you must consent to being videotaped. Filming will enable the researcher to revisit the session and extract themes, reactions and/or responses not originally recorded by hand during the initial discussion. The videotapes will be used solely for research purposes. These videotapes will be stored in a locked file cabinet in the PIs office (room 956 Thorndike Hall) at Teachers College, Columbia University for six-months post analysis. After the six-month post-analysis period all videotapes will be destroyed.

RISKS AND BENEFITS: There are no formidable risks associated with participation in this study. However, there is an inherent risk in using focus groups since individuals might know each other and will be sharing personal opinions or information. Therefore, confidentiality cannot be guaranteed. There is also a chance that you will be bored during the 2-minute trailer and/or become uncomfortable sitting during the 45-minute session duration. To minimize these risks and discomforts, the screening and discussion session will take place in an extremely accommodating environment that provides a comfortable seating arrangement, proper air ventilation and plenty of space to stand up and walk around if you tire of sitting. To put it into perspective, the research has the same amount of risk one might encounter while participating in say, a "book club" discussion.

There are no direct benefits from participating in this study, however, there is a chance that after the session you might reflect upon your physical activity habits and improve your current levels. Your participation will also help to inform and support the writing of the PIs doctoral thesis. Finally, if you should decide that you do not want to participate in this study, you should inform the PI immediately as you are free to withdraw at any time without consequence.

PAYMENTS: There is no payment for your participation in this research study. However, you will be entered into a raffle to receive a one-month, pre-paid Metro Card worth approximately \$100.

DATA STORAGE TO PROTECT CONFIDENTIALITY: The hand-written notes, completed questionnaires and videotapes will be stored in a locked file cabinet in the PIs office (room 956 Thorndike Hall) at Teachers College, Columbia University. And although the data collected can be linked back to you, the information will be kept entirely confidential. Your commentary and insight is for the sole benefit of the PI and her faculty sponsor so that they can—if necessary—modify the content of the reality show, *Beat The Bus*, prior to production of the series. Six months after a thorough analysis of the data, all of these materials will be destroyed. Any presentations or reports that result from this research study will refer to you as Focus Group Member #1, #2, #3, etc.

TIME INVOLVEMENT: You will be asked to participate in ONE, 45-minute focus group session where you will watch a 2-minute trailer for a reality show, fill out a questionnaire, and answer open-ended questions.

HOW WILL RESULTS BE USED: The results of the study will be used to inform and support the production of the original reality series, *Beat The Bus*, as well as the writing of the PIs doctoral thesis.

Participant's signature: _____ Date: ____ / ____ / ____

Name: _____

For questions related to this research, please contact Mary Gillis at meg2162@tc.columbia.edu or 646-509-7133.

For questions regarding your rights as a participant in this research, please contact the Institutional Review Board at Teachers College Columbia University at 212-678-4105. Or write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY, 10027, Box 151.

Teachers College, Columbia University
 525 West 120th Street
 New York NY 10027
 212 678 3000
www.tc.edu

PARTICIPANT'S RIGHTS: Focus Group Participants

Principal Investigator (PI): Mary Gillis

Research Title: ***Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban Dwelling Adults***

- I have read and discussed the Research Description with the researcher. I have had the opportunity to ask questions about the purposes and procedures regarding this study.
- My participation in research is voluntary. I may refuse to participate or withdraw from participation at any time without jeopardy to future medical care, employment, student status or other entitlements.
- The researcher may withdraw me from the research at his/her professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue to participate, the investigator will provide this information to me.
- Any information derived from the research project that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- If, at any time, I have any questions regarding the research or my participation, I can contact the investigator, who will answer my questions. The investigator's phone number and email are (646) 509-7133 and meg2162@tc.columbia.edu
- If, at any time, I have comments, or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the Teachers College, Columbia University Institutional Review Board /IRB. The phone number for the IRB is (212) 678-4105. Or, I can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY, 10027, Box 151.
- I should receive a copy of the Research Description and this Participant's Rights document.
- If video and/or audio taping is part of this research, I () consent to be audio/video taped. I () do NOT consent to being video/audio taped. The written, video and/or audio taped materials will be viewed only by the principal investigator and members of the research team.
- Written, video and/or audio taped materials () may be viewed in an educational setting outside the research () may NOT be viewed in an educational setting outside the research.
- My signature means that I agree to participate in this study.

Participant's signature: _____ Date: ____/____/____

Name: _____

Teachers College, Columbia University
525 West 120th Street
New York NY 10027
212 678 3000
www.tc.edu

INVESTIGATOR'S VERIFICATION OF EXPLANATION

Principal Investigator (PI): Mary Gillis

Research Title: ***Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban Dwelling Adults.***

I certify that I have carefully explained the purpose and nature of this research to _____ (participant's name) in age-appropriate language. He/She has had the opportunity to discuss it with me in detail. I have answered all his/her questions and he/she provided the affirmative agreement (i.e. assent) to participate in this research.

Investigator's Signature: _____

Date: _____

Appendix E

Questionnaires and Forms

Reality TV Survey Final – BEAT THE BUS**1. INFORMED CONSENT: Online Survey**

Principal Investigator (PI): Mary Gillis

Research Title: Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults

IRB Protocol #: 12-275

DESCRIPTION OF THE RESEARCH: You are invited to participate in a research study entitled, Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults. You have been invited because you are an urban-dwelling individual between the ages of 18 and 64 years old and are capable of walking at least 5 city blocks without stopping and without experiencing severe discomfort. Your participation in this research will provide insight and expertise into the development and production of an original “Reality” television show, which will be evaluated as part of a larger, future study. The procedures for this research study are as follows: First, you will be randomly assigned to watch one of two “Reality” television show trailers. Then you will watch the 2-minute trailer of the show you were assigned to watch. Afterwards, you will be asked to complete a brief online questionnaire based on what you just saw. There will also be questions pertaining to your individual characteristics including your age, race, ethnicity, physical activity and transportation-related habits, among others.

RISKS AND BENEFITS: There are no formidable risks associated with participating in this study, however, the online survey will take approximately 5 to 10 minutes of your time to complete. And there are no direct benefits from participation, but there is a chance that afterwards you might reflect upon your physical activity habits and improve your current level. Your participation will also help to inform and support the writing of the PIs doctoral thesis. Finally, if you should decide that you do not want to participate in this study, simply select “No, I do not wish to participate in this study” from the choices below. You are also free to withdraw at anytime without consequence by exiting out of the Internet browser.

PAYMENTS: There is no payment for your participation in this research study. However, as a “thank you” for your time, you will be entered into a raffle to receive a one-month, pre-paid Metro Card worth approximately \$100 should you choose to include your email at the end of the survey.

DATA STORAGE TO PROTECT CONFIDENTIALITY: The completed questionnaires will be stored within the password-protected software under the Qualtrics Survey Software platform. Data cannot be traced back to you and the information will be kept entirely confidential. Your commentary and insight is for the sole benefit of the PI and her faculty sponsor so that they can—if necessary—modify the content of a “Reality” show prior to production of the pilot episode. Six months after a thorough analysis of the data, all of these materials will be destroyed. Any presentations or reports that result from this research study will refer to you as Online Survey Participant #1, #2, #3, etc.

TIME INVOLVEMENT: Your participation will involve a single event lasting between 5 and 10 minutes.

HOW WILL RESULTS BE USED: The results of the study will be used to inform and support the development of a “Reality” television show pilot and the writing of the PI’s doctoral thesis.

For questions related to this research, please contact Mary Gillis at meg2162@tc.columbia.edu or 646-509-7133.

For questions regarding your rights as a participant in this research, please contact the Institutional Review Board at Teachers College, Columbia University at 212-678-4105. Or write to the IRB at Teachers College, Columbia University, 525 West 120th Street, New York, NY, 10027, Box 151.

Please click “Yes” to indicate that you have read the abovementioned information and agree to participate in this study.

- Yes, I agree to participate in this study
- No, I do not wish to participate in this study

2. PARTICIPANT’S RIGHTS: Online Survey

Principal Investigator (PI): Mary Gillis

Research Title: Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults

IRB Protocol #: 12-275

- I have read the Research Description and have had the opportunity to ask questions about the purposes and procedures regarding this study.
- My participation in this research is voluntary. I may refuse to participate or withdraw from participation at any time without jeopardy to future medical care, employment, student status or other entitlements.
- The researcher may withdraw me from the research at his/her professional discretion.
- If during the course of the study, significant new information that has been developed becomes available, which may relate to my willingness to continue to participate, the investigator will provide this information to me.
- Any information derived from the research project that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- If at any time I have any questions regarding the research or my participation, I can contact the investigator, who will answer my questions. The investigator’s phone number and email are (646) 509-7133 and meg2162@tc.columbia.edu.

• If at any time I have comments, or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the Teachers College, Columbia University Institutional Review Board. The phone number for the IRB is (212) 678-4105. Or, I can write to the IRB at Teachers College, Columbia University, 525 West 120th Street, New York, NY, 10027, Box 151.

• By clicking “Yes” I agree to participate in this study.

- Yes, I agree to participate in this study
- No, I do not wish to participate in this study

3. Please watch the following 2-minute trailer of the “Reality” television show Beat The Bus. Then click “Yes” to continue.

- Yes
- No

4. Based on this trailer, what are your impressions of the “Reality” television show Beat The Bus?

- It’s an excellent idea for a show
- It’s a very good idea for a show
- It’s a good idea for a show
- It’s neither a good nor a bad idea for a show
- It’s a fair idea for a show
- It’s a poor idea for a show
- It’s a bad idea for a show
- Don’t Want To Answer

5. In your own words, how would you describe the concept of the show?

6. The tasks the player must complete in order to successfully beat the bus are made clear to the viewer.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Don’t Want To Answer

7. What did you like about the main character? What did you dislike about the main character?

8. In terms of quality and appeal, I would rate the visuals of the show as:

- Excellent
- Very Good
- Good
- Fair
- Poor
- Very Bad
- Don't Want To Answer

9. Overall, I enjoyed watching the trailer for Beat The Bus.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree
- Don't Want To Answer

10. If I saw it on television, I would watch the "Reality" TV show Beat The Bus.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Don't Want To Answer

11. If the host of the show approached you, how likely is it that you would participate in an episode of Beat The Bus?

- Absolutely!
- Very likely
- Likely
- Possibly
- Unlikely
- Highly unlikely
- Not a chance!
- Don't Want To Answer

12. After watching the trailer of Beat The Bus, I am thinking about walking instead of taking the bus.

- Definitely Yes
- Very Probably Yes
- Probably Yes
- Possibly
- Probably Not
- Very Probably Not
- Definitely Not
- Don't Want To Answer

13. "Reality" TV is a genre of programming that presents unscripted situations, documents actual events and usually features unknowns instead of professional actors. Hidden camera shows and talent competition shows are both examples of "Reality" television programming. Even documentaries, news programs, talk shows and game shows--depending on the specifics of the show--can be classified as "Reality" programming. Based on this definition, do you watch "Reality" TV?

- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never
- Don't Want To Answer

14. From cooking shows to home improvement shows and even parenting shows such as Supernanny, "Reality" television has been shown to be influential on those who watch it. Have you ever tried something new as a result of seeing it on "Reality" TV?

- Definitely Yes
- Very Probably Yes
- Probably Yes
- Possibly
- Probably Not
- Very Probably Not
- Definitely Not
- Don't Want To Answer

15. The World Health Organization defines physical activity as “any bodily movement produced by skeletal muscles that requires energy expenditure.” Based on this definition, how would you rate your current physical activity levels?

- Excellent
- Very Good
- Good
- Fair
- Poor
- Very Poor
- Don't Want To Answer

16. During a typical 7-Day period, how many times PER WEEK on the average do you do STRENUOUS EXERCISE (HEART BEATS RAPIDLY) for more than 15 minutes during your free time? (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

17. During a typical 7-Day period, how many times PER WEEK on the average do you do MODERATE EXERCISE (NOT EXHAUSTING) for more than 15 minutes during your free time? (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

18. During a typical 7-Day period, how many times PER WEEK on the average do you do MILD EXERCISE (MINIMAL EFFORT) for more than 15 minutes during your free time? (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snowmobiling, easy walking)

19. During a typical 7-Day period, in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (HEART BEATS RAPIDLY)?

- Often
- Sometimes
- Never/Rarely

20. Do you have any physical limitations that might prevent you from engaging in physical activity and/or exercise?

- Yes
- No

21. If you answered “Yes” to the above question, please describe in the space provided.

22. Please provide any additional comments you would like to share in the space below.

23. What is your date of birth? (MM/DD/YYYY)

24. What is your gender?

- Male
- Female
- Transgender
- Do not want to answer

25. Please indicate your height (inches) in the space provided:

26. Please indicate your weight (pounds) in the space provided:

27. What is your main ethnic or cultural group?

- Asian/Pacific Islander
- Black/African American
- Hispanic/Latino
- American Indian/Native American
- White/Caucasian
- Multi-Ethnic/Multi-Racial
- Other
- Don't Want To Answer

28. What is your current employment status? (You may select more than one answer)

- Employed Full-Time
- Employed Part-Time
- Unemployed
- A Homemaker
- Full-Time Student
- Part-Time Student
- Retired
- Disabled
- Other
- Don't Want To Answer

29. Approximately what is your household income per year?

- Less than \$10,000
- \$10,000 - 29,999
- \$30,000 - 49,999
- \$50,000 - 69,999
- \$70,000 - 89,999
- \$90,000 - 109,999
- Greater than \$110,000
- Don't Want To Answer

30. What is your educational level?

- Some high school or less
- High school diploma
- Some college
- Associate's degree
- Bachelor's degree
- Some graduate school
- Masters degree or equivalent
- Doctorate, law or medical degree
- Don't Want To Answer

31. In a usual week, how many times do you walk as a means of transportation, such as going to and from work, walking to the grocery store or walking to the bus/subway IN YOUR OWN NEIGHBORHOOD or local area?

- 0 - 1 times/week
- 2 - 3 times/week
- 4 - 5 times/week
- 6 - 7 times/week
- > 7 times/week
- Don't Want To Answer

32. In a usual week, please estimate the total time you spend walking as a means of transportation IN YOUR OWN NEIGHBORHOOD or local area.

33. In a usual week, how many times do you walk as a means of transportation, such as going to and from work, walking to the grocery store or walking to the bus/subway OUTSIDE YOUR NEIGHBORHOOD or local area?

- 0 - 1 times/week
- 2 - 3 times/week
- 4 - 5 times/week
- 6 - 7 time/week
- > 7 times/week
- Don't Want To Answer

34. In a usual week, please estimate the total time you spend walking as a means of transportation OUTSIDE YOUR NEIGHBORHOOD or local area.

35. In your commute to work, to school or elsewhere what are the modes of transportation that you use? (You may select more than one answer)

- Car
- Train
- Bus
- Walk
- Bike
- Subway
- Other
- Don't Want To Answer

36. If you selected "Other," please elaborate.

37. Thank you for taking the time to complete this survey. Please enter your email below for a chance to win a 1-month pre-paid Metro Card worth approximately \$100 (optional).

Reality TV Survey Final – INSIDE JOB WITH LISA QUINN

1. INFORMED CONSENT: Online Survey

Principal Investigator (PI): Mary Gillis

Research Title: Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults

IRB Protocol #: 12-275

DESCRIPTION OF THE RESEARCH: You are invited to participate in a research study entitled, Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults. You have been invited because you are an urban-dwelling individual between the ages of 18 and 64 years old and are capable of walking at least 5 city blocks without stopping and without experiencing severe discomfort. Your participation in this research will provide insight and expertise into the development and production of an original “Reality” television show, which will be evaluated as part of a larger, future study. The procedures for this research study are as follows: First, you will be randomly assigned to watch one of two “Reality” television show trailers. Then you will watch the 2-minute trailer of the show you were assigned to watch. Afterwards, you will be asked to complete a brief online questionnaire based on what you just saw. There will also be questions pertaining to your individual characteristics including your age, race, ethnicity, physical activity and transportation-related habits, among others.

RISKS AND BENEFITS: There are no formidable risks associated with participating in this study, however, the online survey will take approximately 5 to 10 minutes of your time to complete. And there are no direct benefits from participation, but there is a chance that afterwards you might reflect upon your physical activity habits and improve your current level. Your participation will also help to inform and support the writing of the PIs doctoral thesis. Finally, if you should decide that you do not want to participate in this study, simply select “No, I do not wish to participate in this study” from the choices below. You are also free to withdraw at anytime without consequence by exiting out of the Internet browser.

PAYMENTS: There is no payment for your participation in this research study. However, as a “thank you” for your time, you will be entered into a raffle to receive a one-month, pre-paid Metro Card worth approximately \$100 should you choose to include your email at the end of the survey.

DATA STORAGE TO PROTECT CONFIDENTIALITY: The completed questionnaires will be stored within the password-protected software under the Qualtrics Survey Software platform. Data cannot be traced back to you and the information will be kept entirely confidential. Your commentary and insight is for the sole benefit of the PI and her faculty sponsor so that they can—if necessary—modify the content of a “Reality” show prior to production of the pilot episode. Six months after a thorough analysis of the data, all of these materials will be destroyed. Any presentations or reports that result from this research study will refer to you as Online Survey Participant #1, #2, #3, etc.

TIME INVOLVEMENT: Your participation will involve a single event lasting between 5 and 10 minutes.

HOW WILL RESULTS BE USED: The results of the study will be used to inform and support the development of a “Reality” television show pilot and the writing of the PI’s doctoral thesis.

For questions related to this research, please contact Mary Gillis at meg2162@tc.columbia.edu or 646-509-7133.

For questions regarding your rights as a participant in this research, please contact the Institutional Review Board at Teachers College, Columbia University at 212-678-4105. Or write to the IRB at Teachers College, Columbia University, 525 West 120th Street, New York, NY, 10027, Box 151.

Please click “Yes” to indicate that you have read the abovementioned information and agree to participate in this study.

- Yes, I agree to participate in this study
- No, I do not wish to participate in this study

2. PARTICIPANT’S RIGHTS: Online Survey

Principal Investigator (PI): Mary Gillis

Research Title: Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults

IRB Protocol #: 12-275

- I have read the Research Description and have had the opportunity to ask questions about the purposes and procedures regarding this study.
- My participation in this research is voluntary. I may refuse to participate or withdraw from participation at any time without jeopardy to future medical care, employment, student status or other entitlements.
- The researcher may withdraw me from the research at his/her professional discretion.
- If during the course of the study, significant new information that has been developed becomes available, which may relate to my willingness to continue to participate, the investigator will provide this information to me.
- Any information derived from the research project that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- If at any time I have any questions regarding the research or my participation, I can contact the investigator, who will answer my questions. The investigator’s phone number and email are (646) 509-7133 and meg2162@tc.columbia.edu.
- If at any time I have comments, or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the Teachers College, Columbia University Institutional Review Board. The phone number for the IRB is (212) 678-4105. Or, I can write to the IRB at Teachers College, Columbia University, 525 West 120th Street, New York, NY, 10027, Box 151.

• By clicking “Yes” I agree to participate in this study.

- Yes, I agree to participate in this study
- No, I do not wish to participate in this study

3. Please watch the following 2-minute trailer of the “Reality” television show Inside Job With Lisa Quinn. Then click “Yes” to continue.

- Yes
- No

4. Based on this trailer, what are your impressions of the “Reality” television show Inside Job With Lisa Quinn?

- It’s an excellent idea for a show
- It’s a very good idea for a show
- It’s a good idea for a show
- It’s neither a good nor a bad idea for a show
- It’s a fair idea for a show
- It’s a poor idea for a show
- It’s a bad idea for a show
- Don’t Want To Answer

5. In your own words, how would you describe the concept of the show?

6. The rules that the design team must abide by in order for the renovation to be successful are entertaining.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Don’t Want To Answer

7. What did you like about the main character? What did you dislike about the main character?

8. In terms of quality and appeal, I would rate the visuals of the show as:

- Excellent
- Very Good
- Good
- Fair
- Poor
- Very Bad
- Don’t Want To Answer

9. Overall, I enjoyed watching the trailer for Inside Job With Lisa Quinn.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree
- Don't Want To Answer

10. If I saw it on television, I would watch the "Reality" TV show Inside Job With Lisa Quinn.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Don't Want To Answer

11. If the host of the show approached you, how likely is it that you would participate in an episode of Inside Job With Lisa Quinn?

- Absolutely!
- Very likely
- Likely
- Possibly
- Unlikely
- Highly unlikely
- Not a chance!
- Don't Want To Answer

12. After watching the trailer of Inside Job With Lisa Quinn, I am thinking about renovating a room in my home.

- Definitely Yes
- Very Probably Yes
- Probably Yes
- Possibly
- Probably Not
- Very Probably Not
- Definitely Not
- Don't Want To Answer

13. "Reality" TV is a genre of programming that presents unscripted situations, documents actual events and usually features unknowns instead of professional actors. Hidden camera shows and talent competition shows are both examples of "Reality" television programming. Even documentaries, news programs, talk shows and game shows--depending on the specifics of the show--can be classified as "Reality" programming. Based on this definition, do you watch "Reality" TV?

- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never
- Don't Want To Answer

14. From cooking shows to home improvement shows and even parenting shows such as Supernanny, "Reality" television has been shown to be influential on those who watch it. Have you ever tried something new as a result of seeing it on "Reality" TV?

- Definitely Yes
- Very Probably Yes
- Probably Yes
- Possibly
- Probably Not
- Very Probably Not
- Definitely Not
- Don't Want To Answer

15. The World Health Organization defines physical activity as "any bodily movement produced by skeletal muscles that requires energy expenditure." Based on this definition, how would you rate your current physical activity levels?

- Excellent
- Very Good
- Good
- Fair
- Poor
- Very Poor
- Don't Want To Answer

16. During a typical 7-Day period, how many times PER WEEK on the average do you do STRENUOUS EXERCISE (HEART BEATS RAPIDLY) for more than 15 minutes during your free time? (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

17. During a typical 7-Day period, how many times PER WEEK on the average do you do MODERATE EXERCISE (NOT EXHAUSTING) for more than 15 minutes during your free time? (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

18. During a typical 7-Day period, how many times PER WEEK on the average do you do MILD EXERCISE (MINIMAL EFFORT) for more than 15 minutes during your free time? (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snowmobiling, easy walking)

19. During a typical 7-Day period, in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (HEART BEATS RAPIDLY)?

- Often
- Sometimes
- Never/Rarely

20. Do you have any physical limitations that might prevent you from engaging in physical activity and/or exercise?

- Yes
- No

21. If you answered "Yes" to the above question, please describe in the space provided.

22. Please provide any additional comments you would like to share in the space below.

23. What is your date of birth? (MM/DD/YYYY)

24. What is your gender?

- Male
- Female
- Transgender
- Don't Want To Answer

25. Please indicate your height (inches) in the space provided:

26. Please indicate your weight (pounds) in the space provided:

27. What is your main ethnic or cultural group?

- Asian/Pacific Islander
- Black/African American
- Hispanic/Latino
- American Indian/Native American
- White/Caucasian
- Multi-Ethnic/Multi-Racial
- Other
- Don't Want To Answer

28. What is your current employment status? (You may select more than one answer)

- Employed Full-Time
- Employed Part-Time
- Unemployed
- A Homemaker
- Full-Time Student
- Part-Time Student
- Retired
- Disabled
- Other
- Don't Want To Answer

29. Approximately what is your household income per year?

- Less than \$10,000
- \$10,000 - 29,999
- \$30,000 - 49,999
- \$50,000 - 69,999
- \$70,000 - 89,999
- \$90,000 - 109,000
- Greater than \$110,000
- Don't Want To Answer

30. What is your educational level?

- Some high school or less
- High school diploma
- Some college
- Associate's degree
- Bachelor's degree
- Some graduate school
- Masters degree or equivalent
- Doctorate, law or medical degree
- Don't Want To Answer

31. In a usual week, how many times do you walk as a means of transportation, such as going to and from work, walking to the grocery store or walking to the bus/subway IN YOUR OWN NEIGHBORHOOD or local area?

- 0 - 1 times/week
- 2 - 3 times/week
- 4 - 5 times/week
- 6 - 7 times/week
- > 7 times/week
- Don't Want To Answer

32. In a usual week, please estimate the total time you spend walking as a means of transportation IN YOUR OWN NEIGHBORHOOD or local area.

33. In a usual week, how many times do you walk as a means of transportation, such as going to and from work, walking to the grocery store or walking to the bus/subway OUTSIDE YOUR NEIGHBORHOOD or local area?

- 0 - 1 times/week
- 2 - 3 times/week
- 4 - 5 times/week
- 5 - 6 times/week
- > 7 times/week
- Don't Want To Answer

34. In a usual week, please estimate the total time you spend walking as a means of transportation OUTSIDE YOUR NEIGHBORHOOD or local area.

35. In your commute to work, to school or elsewhere what are the modes of transportation that you use? (You may select more than one answer)

- Car
- Train
- Bus
- Walk
- Bike
- Subway
- Other
- Don't Want To Answer

36. If you selected "Other," please elaborate.

37. Thank you for taking the time to compete this survey. Please enter your email below for a chance to win a 1-month pre-paid Metro Card worth approximately \$100 (optional)

Principal Investigator: Mary Gillis
Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults (IRB 12-275)

*Remember that all of your answers will be kept completely confidential.

SUBJECT CHARACTERISTICS

1. What is your date of birth? (MM/DD/YYYY)

2. What is your gender? (Circle one) MALE FEMALE TRANSGENDER

3. What is your main ethnic or cultural group? (Circle one)

ASIAN OR PACIFIC ISLANDER
BLACK/AFRICAN AMERICAN
HISPANIC/LATINO
AMERICAN INDIAN/NATIVE AMERICAN
WHITE/CAUCASIAN
MULTI RACIAL
OTHER _____
DON'T KNOW
DON'T WANT TO ANSWER

4. What is your current employment status? (Circle one)

EMPLOYED FULL-TIME
EMPLOYED PART-TIME
UNEMPLOYED
A HOMEMAKER
FULL-TIME STUDENT
PART-TIME STUDENT
RETIRED
DISABLED
OTHER _____
DON'T KNOW
DON'T WANT TO ANSWER

5. Approximately what is your household income per year? (Circle one)

- <\$10,000 PER YEAR
- \$10,000 – 29,999 PER YEAR
- 30,000 – 49,999 PER YEAR
- \$50,000 – 69,999 PER YEAR
- \$70,000 – 89,999 PER YEAR
- \$90,000 – 109,999 PER YEAR
- ≥\$110,000 PER YEAR
- DON'T KNOW
- DON'T WANT TO ANSWER

6. What is your highest educational level achieved? (Circle one)

- SOME HIGH SCHOOL OR LESS
- HIGH SCHOOL DIPLOMA
- SOME COLLEGE
- ASSOCIATE'S DEGREE
- BACHELOR'S DEGREE
- SOME GRADUATE SCHOOL
- MASTERS DEGREE
- DOCTORATE, LAW OR MEDICAL DEGREE
- DON'T WANT TO ANSWER

ATTITUDES TOWARDS THE 2-MINUTE TRAILER OF *BEAT THE BUS*

Please answer the following questions by circling the option that best fits your response.

1. *Beat The Bus* is a creative idea for a reality show.

Strongly Disagree Disagree Neutral Agree Strongly Agree

2. The rules of the game *Beat the Bus* are made clear to the viewer.

Strongly Disagree Disagree Neutral Agree Strongly Agree

3. The challenges the player must complete in order to successfully *Beat The Bus* are entertaining.

Strongly Disagree Disagree Neutral Agree Strongly Agree

4. The host of the reality show *Beat The Bus* is a likable character.

Strongly Disagree Disagree Neutral Agree Strongly Agree

5. If the host of the show approached me on the street, I would participate in an episode of *Beat The Bus*.

Strongly Disagree Disagree Neutral Agree Strongly Agree

6. I enjoyed watching the episode of the reality show *Beat The Bus*.

Strongly Disagree Disagree Neutral Agree Strongly Agree

7. If I saw it on TV, I would watch the reality show *Beat The Bus*.

Strongly Disagree Disagree Neutral Agree Strongly Agree

8. After watching the trailer for *Beat The Bus*, I am thinking about walking instead of taking the bus.

Strongly Disagree Disagree Neutral Agree Strongly Agree

PARTICIPATION IN ACTIVE TRANSPORTATION

1. In a USUAL WEEK, how many times do you walk as a means of transportation, such as going to and from work, walking to the grocery store or walking to the bus/subway in your neighborhood or local area? (Please circle one)

0 1 – 5 6 – 10 11 – 15 16 – 20 >20

2. Please estimate the total time you spend walking as a means of transportation in your neighborhood or local area.

_____ Hours _____ Minutes

3. In a USUAL WEEK, how many times do you walk as a means of transportation, such as going to and from work, walking to the grocery store or walking to the bus/subway outside your neighborhood or local area? (Please circle one)

0 1 – 5 6 – 10 11 – 15 16 – 20 >20

4. Please estimate the total time you spend walking as a means of transportation outside of your neighborhood or local area.

_____ Hours _____ Minutes

5. In your commute to work, what are the modes of transportation that you use?

CAR
 SUBWAY
 TRAIN
 BUS
 WALK
 BIKE
 COMBINATION
 OTHER

6. If you selected "COMBINATION" or "OTHER" please elaborate:

-

PHYSICAL ACTIVITY ASSESSMENT

Please answer the following questions by circling the option that best fits your response.

1. I am moderately active for at least 30 minutes per day (gardening, climbing stairs, housework, etc.).

Less than once per week 1-2 times per week 3 times per week
 4 times per week 5 or more times per week

2. I am vigorously active for at least 30 minutes per day (running, cycling, etc.).

Less than once per week 1-2 times per week 3 times per week
 4 times per week 5 or more times per week

Principal Investigator: Mary Gillis
Beat The Bus: Transportation-Related Physical Activity Behaviors in Urban-Dwelling Adults (IRB 12-275)

*Remember that all of your answers will be kept completely confidential.

SUBJECT CHARACTERISTICS

1. What is your date of birth? (MM/DD/YYYY)

2. What is your gender? (Circle one) MALE FEMALE TRANSGENDER

3. What is your main ethnic or cultural group? (Circle one)

ASIAN OR PACIFIC ISLANDER
BLACK/AFRICAN AMERICAN
HISPANIC/LATINO
AMERICAN INDIAN/NATIVE AMERICAN
WHITE/CAUCASIAN
MULTI RACIAL
OTHER _____
DON'T KNOW
DON'T WANT TO ANSWER

4. What is your current employment status? (Circle one)

EMPLOYED FULL-TIME
EMPLOYED PART-TIME
UNEMPLOYED
A HOMEMAKER
FULL-TIME STUDENT
PART-TIME STUDENT
RETIRED
DISABLED
OTHER _____
DON'T KNOW
DON'T WANT TO ANSWER

5. Approximately what is your household income per year? (Circle one)

- <\$10,000 PER YEAR
- \$10,000 – 29,999 PER YEAR
- \$30,000 – 49,999 PER YEAR
- \$50,000 – 69,999 PER YEAR
- \$70,000 – 89,999 PER YEAR
- \$90,000 – 109,999 PER YEAR
- ≥\$110,000 PER YEAR
- DON'T KNOW
- DON'T WANT TO ANSWER

6. What is your highest educational level achieved? (Circle one)

- SOME HIGH SCHOOL OR LESS
- HIGH SCHOOL DIPLOMA
- SOME COLLEGE
- ASSOCIATE'S DEGREE
- BACHELOR'S DEGREE
- SOME GRADUATE SCHOOL
- MASTERS DEGREE
- DOCTORATE, LAW OR MEDICAL DEGREE
- DON'T WANT TO ANSWER

ATTITUDES TOWARDS THE 2-MINUTE TRAILER OF *INSIDE JOB WITH LISA QUINN*

Please answer the following questions by circling the option that best fits your response.

1. *Inside Job With Lisa Quinn* is a creative idea for a reality show.

Strongly Disagree Disagree Neutral Agree Strongly Agree

2. The concept of the show *Inside Job With Lisa Quinn* is made clear to the viewer.

Strongly Disagree Disagree Neutral Agree Strongly Agree

3. The rules that the design team must abide by in order for the renovation to be considered successful are entertaining.

Strongly Disagree Disagree Neutral Agree Strongly Agree

4. The host of the reality show *Inside Job With Lisa Quinn* is a likable character.

Strongly Disagree Disagree Neutral Agree Strongly Agree

5. If the host of the show approached me, I would participate in an episode of *Inside Job With Lisa Quinn*.

Strongly Disagree Disagree Neutral Agree Strongly Agree

6. I enjoyed watching the episode of the reality show *Inside Job With Lisa Quinn*.

Strongly Disagree Disagree Neutral Agree Strongly Agree

7. If I saw it on TV, I would watch the reality show *Inside Job With Lisa Quinn*.

Strongly Disagree Disagree Neutral Agree Strongly Agree

8. After watching the trailer for *Inside Job With Lisa Quinn*, I am thinking about renovating a room in my home.

Strongly Disagree Disagree Neutral Agree Strongly Agree

PARTICIPATION IN ACTIVE TRANSPORTATION

1. In a USUAL WEEK, how many times do you walk as a means of transportation, such as going to and from work, walking to the grocery store or walking to the bus/subway in your neighborhood or local area? (Please circle one)

0 1 – 5 6 – 10 11 – 15 16 – 20 >20

2. Please estimate the total time you spend walking as a means of transportation in your neighborhood or local area.

_____ Hours _____ Minutes

3. In a USUAL WEEK, how many times do you walk as a means of transportation, such as going to and from work, walking to the grocery store or walking to the bus/subway outside your neighborhood or local area? (Please circle one)

0 1 – 5 6 – 10 11 – 15 16 – 20 >20

4. Please estimate the total time you spend walking as a means of transportation outside of your neighborhood or local area.

_____ Hours _____ Minutes

5. In your commute to work, what are the modes of transportation that you use?

CAR
SUBWAY
TRAIN
BUS
WALK
BIKE
COMBINATION
OTHER

6. If you selected "COMBINATION" or "OTHER" please elaborate:

PHYSICAL ACTIVITY ASSESSMENT

Please answer the following questions by circling the option that best fits your response.

1. I am moderately active for at least 30 minutes per day (gardening, climbing stairs, housework, etc.).

Less than once per week 1-2 times per week 3 times per week
4 times per week 5 or more times per week

2. I am vigorously active for at least 30 minutes per day (running, cycling, etc.).

Less than once per week 1-2 times per week 3 times per week
4 times per week 5 or more times per week

FOCUS GROUP SESSIONS – Semi-structured Interview Questions

After viewing the trailer, focus group members will be asked to verbally answer the follow questions:

What are your impressions of *Beat The Bus*?
 How did you like/dislike the characters and visuals?
 Were the rules of the game clear?
 Overall, did you enjoy watching *Beat The Bus*?

Do you watch reality TV?
 Did you ever try something new as a result of seeing it on reality TV?

Would you consider yourself physically active?
 Approximately how many times a week are you moderately active for at least 30- minutes?
 Approximately how many times a week are you vigorously active for at least 30- minutes?
 Do you ever walk as a means of transportation?

If the host of the show approached you on the street, would you participate in an episode of *Beat The Bus*?

After viewing the trailer, focus group members will be asked to verbally answer the follow questions:

What are your impressions of *Inside Job With Lisa Quinn*?
 How did you like/dislike the characters and visuals?
 Was the concept of the show clear?
 Overall, did you enjoy watching *Inside Job With Lisa Quinn*?

Do you watch reality TV?
 Did you ever try something new as a result of seeing it on reality TV?

Would you consider yourself physically active?
 Approximately how many times a week are you moderately active for at least 30- minutes?
 Approximately how many times a week are you vigorously active for at least 30- minutes?
 Do you ever walk as a means of transportation?

If the host of the show approached you, would you participate in an episode of *Inside Job With Lisa Quinn*?