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DEVELOPMENT OF A PHYSICAL ACTIVITY INTERVENTION
TARGETED AT MIDDLE-AGED MALES: A MIXED METHODS RESEARCH STUDY

A Dissertation
presented in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in the Department of Health, Exercise Science, and Recreation Management
The University of Mississippi

by

SHERYL L. CHATFIELD

May 2014

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ABSTRACT

Objective: Inactivity levels are increasing throughout the world. Regular participation in physical activity (PA) has multiple physical and mental health benefits. Males are underrepresented in PA intervention research despite having lower life expectancies both at birth and at age 60. Males may be less likely to volunteer for intervention research because their preferences for PA program characteristics differ from those of females. This research project was planned to investigate males' preferences for health-promoting PA interventions through use of qualitative and quantitative approaches.

Methods: An interpretative phenomenological approach (IPA) was used to analyze interviews with three older adult males who initiated regular participation in physical activity at middle age. Findings from the interviews helped inform the details provided on a factorial survey (FS) instrument created through a process developed by the researcher using the open access software program R. Survey respondents, including male non-administrative and contract university staff, were asked to rate each of 8 potential PA intervention programs that contained random combinations of several characteristics and to respond to one open-response item. Statistical results were analyzed using hierarchical linear regression (HLM); the open-response item was analyzed using descriptive qualitative analysis.

Results: Findings from the IPA research included the need for control over one's schedule and the role of mentors in encouraging PA participation. Statistical analysis of the FS responses suggested that type of activity and size of group were the more influential intervention

characteristics. Findings from the open-response item emphasized a desire for appropriate goal-setting and motivational support.

Conclusions: The benefits of a mixed methods approach are supported by the results of this research in which qualitative aspects both informed and enhanced the quantitative portion. Factorial survey provides a cost effective means to investigate individuals' preferences for characteristics of an intervention, and R software can be used to efficiently create the instrument and data frame for statistical analysis. Further research is needed to clarify subjective definitions of health coaching. Taken as a whole, these results suggest that males may prefer that a peer or mentor figure provide coaching and motivation as opposed to an expert trainer or coach.

LIST OF ABBREVIATIONS AND SYMBOLS

ACC American College of Cardiology

AHA American Heart Association

CDC United States Centers for Disease Control and Prevention

CVD Cardiovascular disease

DF Degrees of freedom

FS Factorial Survey

ICC Intraclass correlation

HLM Hierarchical Linear Model

IPA Interpretative/interpretive Phenomenological Analysis

NICE National Institute for Health and Care Excellence

PA Physical activity

R^2 Measure of model fit for regression analysis

REML Restricted maximum likelihood estimation

WHO World Health Association

χ^2 Chi Square

ACKNOWLEDGEMENT

I thank all of the research participants for sharing time and information; without research participants, there would be no health behavior research. I thank the University of Mississippi Graduate School for their generous support via a dissertation fellowship this semester. The focus I was able to maintain as I wrote this document reflects the luxury of time this award provided for me. I especially thank Braxton Tullos of Aramark, and Andrea Jekabsons and Wendy Carmean of Human Resources at The University of Mississippi, for their essential assistance in getting surveys completed.

I thank my family, especially my mother, my brother, and my husband, for their support throughout this process. I also acknowledge the memory of my late father, whose ethical approach to his profession and dedicated approach to his physical activity greatly influenced the way I view both research and life. I thank my father-in-law for providing invaluable support, and I acknowledge the memory of my late mother-in-law who demonstrated an inspiring mix of passion for justice with an ever-present ability to find things to laugh about.

I thank my dissertation committee chairs, Drs. Garner and Hallam, and members Drs. Bentley, Dupper, Townsend, and Valliant for cooperation and guidance throughout this process. I am especially grateful for the support and encouragement provided over the course of the last four years by my committee co-chair and adviser Dr. Jeffrey Hallam.

I thank the graduate students who provided direct assistance with quality control components of this project: Alicia Cambron and Mary Amanda Haskins. I also thank T Davis for being an ongoing source of support and motivation.

I will forever be grateful to the professionalism and efficiency of the Institutional Review Board at the University of Mississippi; I would like to acknowledge Dr. Thomas Lombardo and express my sincere thanks for the exceptional work done by Jennifer Caldwell through the past few years on my behalf.

I thank the individuals who inspired and assisted me over the course of my first graduate studies at The University of Southern Mississippi, which I began after a 20-year gap from higher education. I also acknowledge the faculty of the qualitative research graduate certificate program at Nova Southeastern University: Drs. Ron Chenail, Robin Cooper, and Maureen Duffy, for their invaluable and ongoing contribution to my explorations with qualitative methods, for providing tremendously helpful feedback on my writing, for providing me with multiple opportunities to share my ideas, and for being a shining “North Star” during some of the darker segments of my doctoral experience.

Lastly, I credit some inspiring reading and English teachers who taught classes at J.C. Sommer Elementary School, Park Street Middle School, and Grove City High School, in Grove City, Ohio, during the 1960s and 70s. Several wonderful teachers taught me the pleasure of reading and the power of writing; very possibly I would not have made it through this process without those experiences.

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CHAPTER 1

INTRODUCTION

According to Booth, Gordon, Carlson, and Hamilton (2000), “physical inactivity” (p. 778) is the environmental cause most directly responsible for the increasing incidence of cardiovascular diseases, type 2 diabetes, and obesity-related conditions in the US. The US Centers for Disease Control and Prevention (CDC) estimated the cost of physical inactivity in the US at \$75 billion (CDC, 2011).

Not surprisingly, most adult Americans fail to meet the physical activity (PA) guidelines provided by the US Department of Health and Human Services. For adults under age 69, bouts of moderate to vigorous activity average only 6-10 minutes per day. Vigorous activity decreases steadily with increasing age to an amount that is not statistically significantly different from zero minutes per day after age 60 (Troiano et al., 2008).

Because activity levels decrease and risk of chronic disease increases with age, interventions to increase PA in adult or aging populations are warranted. Although males throughout the world have lower life expectancies both at birth and at age 60, (World Health Organization [WHO], 2013), most participants in PA intervention research are females (George et al., 2012; Waters, Galichet, Owen, and Eakin, 2011). Among male participants, Black males may be even more rare. Whitt-Glover and Kumanyika (2009) conducted a systematic review of activity interventions targeting Black Americans and determined that all studies reviewed but

one included primarily, if not exclusively, female participants. Although Rosnow and Rosenthal (1997) observed that women were more likely to volunteer to participate in research in general, George et al. suggested that differential motivations between males and females might in part explain why males are “under-represented” (p. 282) in PA interventions.

The purpose of this paper is to describe my use of multiple research methods in order to develop recommendations for PA interventions directed at middle-aged males. It is hoped that the recommendations formulated through this project will lead to improvements in the efficacy of interventions with the population of interest.

The specific aims addressed by this project include:

- **Specific Aim 1:** Description of a procedure for the process of creating a factorial survey instrument using R software.
- **Specific Aim 2:** Identification of commonalities within the descriptions of the lived experience of initiation of regular participation in physical activity in middle-aged males.
 - An interpretive phenomenological analysis approach was used to explore commonalities of the experience as articulated by the participants and interpreted by the researcher.
- **Specific Aim 3:** To report the results of a factorial survey instrument designed to assess the priorities of potential participants when considering participation in a PA intervention.

The remainder of this introduction contains a brief overview of literature relevant to the context of the project. Following this are the specific research questions applicable to the stated aims of the project.

According to George et al. (2012), males are more likely to be motivated by competitive goals, including those offered at times informally through participation in group settings. Males

are also more likely to rely on exercise to control weight, which supports the focus of this project on PA rather than other alternatives, such as nutritional or surgical interventions to improve health. The suggestion that there are differences in motivation based on sex is consistent with the findings of Murcia, Blanco, Galindo, Villodre, and Coll (2007) and Kilpatrick, Hebert, and Bartholomew (2005). Murcia et al. determined that males tended to generally demonstrate an ego involved orientation and preferred an environment that provided opportunities for ongoing competitive comparison. Kilpatrick et al. (2005) reported similar findings, describing the motivation of male as centered on “challenge, strength and endurance, competition, and social recognition when compared to women” (p. 93).

One quasi-experimental technique that has been minimally used in intervention planning (Hennessy, MacQueen, & Seals, 1995) is the factorial survey approach described by Rossi and Anderson (1982). This approach allows a researcher to explore how participants weigh multiple factors through their rating of several scenarios or *vignettes* that present random combinations of the factors or variables. These results should indicate which, among assessed design elements, participants view more or less influential when judging the desirability of a potential intervention. Use of the results of such a technique to inform design of an intervention has potential to improve the efficacy of an intervention through improvements in both recruitment and retention.

In a review of PA program adaption and adherence, Pavey et al. (2012) recommended future studies use combined qualitative and quantitative methods “to enhance our understanding of the variation,” (p. 737) in individual responses to programs. Pavey et al. suggested that gathering more detailed information about research participants, including their responses to behavioral counseling, might help researchers better understand differences between adherents and non-adherents. Patton (2002) and Teddlie and Tashakkori (2009) argued for mixed methods

due to the potential of qualitative and quantitative data to provide more complete information when considered collectively. Kaptein (2011) recommended the use of interpretative phenomenological analysis (IPA) in particular to help researchers or practitioners establish clearer connections with the perceptions and expectations of participants or clients, and to allow the knowledge gained to be applied toward development and improvement of interventions. In keeping with the recommendations of these authors, this study as a whole was planned to employ a sequential mixed or multiple methods approach in which initial qualitative IPA research was conducted and analyzed for use in informing the items included in the quantitative factorial survey portion.

This section provided background and justification for this research by reviewing how middle-aged males are an appropriate population for PA intervention research, both due to health risks and underrepresentation in research, briefly discussing the utility of the factorial survey approach as a tool to inform interventions, and providing some support for the qualitative and quantitative methodologies and methods proposed. The following research questions were developed based on the specific aims provided above:

- How do men who became regularly physically active during middle age describe their experiences?
- What combination of characteristics in a physical activity intervention is most attractive to currently inactive middle-aged men?

Following in Chapters 2, 3 and 4 are three resultant research articles, each of which contains unique background, methods, results, and discussion sections. Chapter 5 contains a review of the stated aims and considers how those aims were met by the research findings, as well as discussion of the results in total and implications for future research.

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CHAPTER 2

MANUSCRIPT I

Use of R software to create a randomised instrument for
factorial survey research applications

Significance for public health

Physical inactivity is associated with multiple chronic diseases, and rates of participation in physical activity are decreasing throughout the world. Well-developed interventions have potential to encourage physical activity participation in a variety of populations. Factorial survey, a type of systematic vignette research, can be applied to determine which elements of an intervention are more or less important to participants and this might lead to improvements in recruitment and retention. In this paper, I provide detailed directions and a simple example using a combination of free and commonly available software so other researchers can use this process to develop interventions that are potentially more attractive to participants.

Abstract

Background: Physical inactivity is associated with increases in chronic disease rates throughout the world. Physical activity interventions might be more effective if participants were given opportunities to provide input at the design phase. Factorial survey designs provide a viable means to assist with public health intervention planning but have not regularly been employed for this purpose. The time and perceived technological skills required to produce randomized survey instruments may be a deterrent that prevents greater use of this technique.

Design and methods: I chose to use a factorial survey approach to gather data from potential participants prior to implementing a physical activity intervention. The process is described in this paper and illustrated with a simplified example. The open access and open source programming language R was used in conjunction with functions of Microsoft® Excel and Word to efficiently create factorial survey instruments. The process used to create surveys also produces a dataset which can be used to conduct statistical analysis in R once scores from the completed surveys are input.

Expected impact: Through use of well-crafted factorial survey instruments, researchers can gain understanding of the relative importance or weight of various features of physical activity or other public health intervention programs in an efficient and cost effective way. In this paper, I describe this process in detail in the hope of encouraging further use and continuing assessment of the utility of the factorial survey approach for health behavior intervention planning.

Introduction

Physical inactivity is associated with chronic disease, disability, and even premature death [1] and has been described as “a neglected dimension of prevention and intervention worldwide [1p189]. There is increasing need for effective public health interventions to encourage greater participation in physical activity among people in developing as well as developed countries [2]. Researchers who design interventions frequently, and appropriately, focus on increasing physical activity participation in assessable ways, and so may be less inclined to request participant input during the design phase of interventions. However, use of an efficient and systematic method to gather information from participants may help researchers design more attractive interventions that enhance recruitment efforts and ideally decrease the number of dropouts.

Factorial Surveys

Factorial surveys are research instruments that contain a number of similar but not identical scenarios, referred to as vignettes. In experimental research terms, factorial surveys can be described as consisting of random combinations of various levels of multiple quantitative, categorical, or dichotomous predictor variables. Respondents’ scoring of several vignettes makes regression analysis possible, and the calculated coefficient values may be viewed as representing the relative weight of the predictor variables.

Initial applications of factorial survey or vignette research were designed to explore which characteristics or features of a setting or circumstance had more or less influence over individuals’ attitudes, judgments, and decision-making processes [3]. Researchers later expanded the uses of the factorial survey process by developing instruments designed to assess respondents’ intentions [4]. Factorial survey has been used in health contexts to assess clinical decision-

making [5,6] or to assess normative beliefs [7,8], although only two published studies in which factorial survey was used for the purposes of health behavior intervention planning were identified [9,10].

As suggested above, a factorial survey instrument generally contains several similar vignettes; therefore a useful instrument needs to be comprehensible and logical, and must accommodate variations among the predictors while retaining those attributes. While some authors have offered considerations for vignette designs [11, 12 <http://kops.ub.uni-konstanz.de/handle/urn:nbn:de:bsz:352-150806>], the process of creating an instrument is not generally detailed. Some older research studies refer to obsolete software. More recent authors have described use of currently available software [13,14] that tends to require substantial financial investment. There is a further limitation for some researchers in that many programs were developed for use only on the PC platform.

The process I describe in this paper was motivated by the following aims: to provide explicit directions for efficient production of a factorial survey instrument that could be followed by researchers with moderate technology skills (or with limited technology skills and willingness to improve those skills); to use open access and readily available software to provide a process that can be used by either Windows and Mac users; to encourage further use and assessment of the factorial survey process for public health intervention planning through provision of this process description.

Materials and Methods

Survey Creation

The process described here can be used to create a desired number of random vignettes with essentially as many dimensions and as many levels per dimension researchers want to

include. Because of the nature of participant contact in my research area of interest, I focused on creation of paper surveys. Motivated individuals are encouraged to explore ways to adapt this process for online use when that represents the most effective way to gather data from the target participants.

Required software to produce the randomized data frame includes the R base installation [15] and a single add on package: `dataframes2xls` [16]. To create the survey instrument, researchers must have access to the Microsoft® Office products Excel and Word. Use of Excel also facilitates organization of the data for analysis.

The required keyboarding to create a factorial survey instrument is relatively minimal. It is necessary to enter a series of lists containing each level of each dimension, and to enter some lines of R code to initiate the functions. It is also necessary to type in MS Word the wording that comprises the base survey instrument. The bulk of the data fields are written to an Excel spreadsheet, which is used to fill the survey form using the mail merge function in Word. After the researcher has retrieved completed surveys from respondents, he or she will need to manually enter scores for each item as well as information gathered that reflects any additional covariates.

To help researchers visualize this process, I will review the stages using a simplified example relating to design of a physical activity intervention. Based on existing literature and my own prior qualitative research, I have some idea of potential characteristics of exercise interventions, such as whether or not one has available activity companions, to what extent personalized training or coaching is offered, what type or types of activity are offered or encouraged, frequency of exercise, and time of day. Table 1 below contains potential levels for each of these dimensions.

Table 1 Sample survey items

Activity	Group	Frequency	Time	Coaching
Walking and jogging	Alone	3 times per week	In the Morning	None
Bicycling	With one Partner	4 times per week	At midday	Weekly
Walking and weight training on alternate days	In a group of 8-12	5 times per week	In the evening	Monthly
Playing tennis	In a group of 25		Varying times of the day	As desired

For the purpose of this example, I am going to assume that I want to survey both female and male participants so have chosen a neutral name. Vignettes are frequently worded to refer to someone who is like the respondent but is not the respondent. Each vignette will be worded to address each dimension, as in this example:

Jamie is being offered a chance to participate in an exercise program. Jamie will be walking and jogging with one exercise partner, 5 times per week. Jamie will be exercising in the evening. A health coach will help Jamie set weekly goals. How likely do you think Jamie will be to enroll in this exercise program?

Please assign a score between 0, with 0 meaning not likely, and 100, which means you think it is extremely likely that Jamie will enroll in this program.

The number of potential vignettes reflects the product of the number of levels, so in this instance, there are 4 (activity) x 4 (group size) x 3 (frequency) x 4 (time) x 4 (coaching, note that ‘none’ is an option) or 768 total potential vignettes. It is not considered reasonable for a single individual to score 768 vignettes; recommendations for appropriate number of vignettes vary although some researchers suggested that typical respondents were most attentive to the first eight vignettes [17]. Given n of 768 or greater, it is possible to score each combination at least once, although in many instances, the number of possible vignettes exceeds the potential participants.

When using a portion of the possible vignette combinations, researchers have recommended random or purposive selection; the discussion of the merits of each approach is beyond the scope of this paper; what I describe is a fully random process. Interested readers are referred to Jasso [18], Dulmer [19] and Azmuller [20] for informed and provocative discussions about alternatives and consequences. The process described in this paper can easily be altered to reflect a “quota design” [19p383] if preferred.

For this example, assume access to a sample of 50 respondents who will each receive 8 vignettes. Therefore, it is necessary to create a random sample of 400 vignettes and assign 8 to each of 50 respondents. Sample R code is contained in the Appendix; below I provide a brief explanation of each item. The ‘#’ symbol contained in some lines on the code document signify that R is to disregard the information on that line. It is possible to work directly in the R workspace or a separate code document although the latter may be preferred for organizational purposes. It should be noted that R commands should be written in the R workspace, an R document, or an appropriate text editor, as punctuation from word processing programs is problematic for R.

In order to begin this process, it is first necessary to visit <http://www.r-project.org/> and select the CRAN tab to install the R base package. It is also necessary to create or assign a working directory and create a path from R to the directory. The Manuals tab at the R website contains a variety of free alternatives that provide detailed directions to accomplish these tasks.

The first line of code in the appendix contains the directions to install the necessary additional package `dataframes2xls` [16]. After installation, it is necessary to reference any add on package at the beginning of each new R session using the library command. Savvy users get in the habit of including a list of library commands at the beginning of any saved code document.

R is an object-oriented program, a concept that may be best understood by the inexperienced user if he/she simply considers this as a need to name much of what he/she does in R. In the case of the dimensions or predictor variable, the user will assign a name to the object that contains the list of levels; data frames and statistical models are also named. The lines of code below #1 show creation of the groups from my example using the `c` (for concatenate) command. Since I am using textual items, or string variables, I need to enclose each in quotation marks.

The code beneath #2 directs R to repeatedly (400 times) draw a random single item (specified as length of 1) from each group, with replacement. The `set seed` command provides a starting point for the randomizing so allows the same random draw to be replicated. The last two items in this segment of code were included to facilitate organization of the survey instrument and the statistical analysis. *Participant* consists of a vector of the numbers 1 to 50 that repeats each number 8 times before going to the next. When the data are filled into a spreadsheet, this column groups vignettes by person. Program assigns numbers to each vignette, so participants will see surveys containing programs numbered 1 through 8. The inclusion of these items also

makes it easy to enter the scores from completed surveys and to reassemble any surveys in which pages become separated.

Segment #3 of the code directs R to create a data frame or table of the randomized dimensions and then write this table to an Excel spreadsheet. It is at this point that it is important for users to have a working directory set up because this is the default location for the new spreadsheet. Individuals running this sample code will hopefully be pleased to find a file titled *factorial survey* in the working directory folder.

There are a few steps remaining in the survey creation process. First, it is necessary to remove the quotation marks from the spreadsheet. This can be done with a single replace command by highlighting the active cells in the spreadsheet and directing that Excel replace all single quotation marks with a space. Next, it is necessary to consider any improbable combinations. Ideally these may be eliminated earlier in the process although it is not always possible to do so and still include the predictors of interest. In this example, playing tennis alone on a regular basis is, if not impossible, at least unexciting, so I will visually scan the spreadsheet for this combination. Note that there are multiple ways to identify problem combinations in Excel although none exceedingly easy. For a larger dataset that includes thousands rather than hundreds of rows, investigation of these alternatives is likely warranted.

In my example, I identified and highlighted 31 occurrences of the combination. My approach was to create a new random list of either activity or group or both without the item of concern. I can display this list of 31 in R or write it to another spreadsheet and substitute these items. In doing this some of the true randomization is lost but this may be less of a concern than providing respondents with confusing or illogical options, something researchers have cautioned against [12]. Note that I may need to again remove the quotation marks if I have pasted these

into the spreadsheet. The steps in R to create these modified random lists are shown as #4 and #5 in the Appendix.

Now that the data frame is available, the surveys can be created with minimal difficulty by using Word and the merge function to create a form letter. This data frame facilitates creation of a survey that includes participant number, program number and several sentences describing the program. Some of these items, such as the health coach statements, are complete. This was done because one of the options for this dimension is no coaching, so the blank cell will be inserted leaving just an extra space between lines on the survey. Other items require wording to make sense (e.g., “The activity is:”). Researchers are encouraged to create instruments that meet their utility, aesthetic, and assessment needs. It is most likely that researchers will want to place scoring or assessment information beneath each vignette so this information is included in the Word merge document. Variations among scoring choices abound; Wallender [4] provided an overview with examples.

Once the base survey document has been created, it is necessary to match a data source, in this instance the produced spreadsheet, with the document. Once this is accomplished, the various headings can be dragged into place on the form. It is possible to preview the results prior to completing the final merge. Merged surveys may then be saved or printed.

It is likely that researchers will need to attach additional information to the survey forms including a request for any covariates or demographic information, survey directions, and consent or other ethics or review board information. It is also possible, and in some instances practical, to describe the scenario on an opening page with directions and provide just details on the individual survey pages.

Pre-analysis Tasks

The bulk of data entry occurs once pencil and paper surveys have been retrieved and scores are available. Matching the scores up to the line of data on the spreadsheet is relatively simple by using the Participant and Program identifiers. It will be necessary at this time to create columns and enter other covariates, although the auto fill capabilities of Excel simplify this task to some extent. Once the data frame contains all data necessary for rating, the spreadsheet must be saved in a format, such as a tab delimited or comma separated values file that allows R to perform calculations.

Researchers have generally tended to recommend some type of regression analysis and frequently advise consideration of hierarchical linear models [21, 22], taking the view that vignettes are nested within individuals (the Participant variable), thus avoiding difficulties caused by violation of the assumption of independent errors in non-hierarchical linear regression models. There are several add on packages to create a multilevel analysis in R including *nlme* [23]. One further advantage of R software is that variables with text labels, such as the predictors used in this example, are presumed to represent levels of a categorical variable, so there is no need to recode the variables. The default in R is to make the first alphabetical entry in each list the reference cell. Additional discussion of statistical modeling including diagnostic tests and interpretation is beyond the scope of this paper. Potential sources are Kreft and de Leeuw [24] and Gellman and Hill [25]; the latter authors provide a great deal of R code.

Discussion

Ideally the results of a factorial survey will provide researchers with insight about characteristics that may be of more or less importance in physical activity or other public health intervention planning. This knowledge may in turn improve attractiveness, recruitment,

adherence and eventual success of intervention efforts. As with any survey research, limitations apply including issues relating to sample size and respondent characteristics. It is both reasonable and worth noting that researchers are advised to avoid fully random sampling for participant selection and to instead target respondents who are members of the population of interest [24].

Unique complications in designing factorial surveys relate to unexpected or unwanted interactions among predictors; researchers are advised to strive for selection of orthogonal variables [3]. Although selection of predictors that are supported by prior research is generally practical, it is also recommended that researchers include items based on “extra-theoretical reasonings and conventional wisdom” [18p342]. A combination of wise choices and pilot testing may improve the quality of the process.

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APPENDIX

Appendix

```
#SAMPLE R CODE TO PRODUCE VIGNETTES
#installing the add on to write the data to Excel
install.packages("dataframes2xls")
library(dataframes2xls)

#1 creating the groups

activity<-c("walking and jogging", "bicycling", "walking and weight training on
  alternate days", "playing tennis")
group<-c("alone", "with one exercise partner", "in a group of 8 to 12", "in a group of
  25")
frequency<-c("three times per week", "four times per week", "5 times per week")
time<-c("in the morning", "at midday", "in the evening", "at varying times of the
  day")
coach<-c("The health coach will help Jamie set weekly goals", " The health coach will
  help Jamie set monthly goals", "The health coach will help Jamie set goals whenever
  Jamie wants to contact the coach" , "")

#2 drawing the samples from the first group

Participant<-rep(1:50, each = 8)
Program<-rep(1:8, 50)
set.seed(1984)
fsActivity<-replicate(400, sample(activity, length(1), replace = T))
fsGroup<-replicate(400, sample(group, length(1), replace = T))
fsFrequency<-replicate(400, sample(frequency, length(1), replace = T))
fsTime<-replicate(400, sample(time, length(1), replace = T))
fsCoach<-replicate(400, sample(coach, length(1), replace = T))

#3 putting the random items together in a data frame and create an #Excel workbook in
  the working directory

fsFrame<-data.frame(Participant, Program, fsActivity, fsGroup, fsFrequency, fsTime,
  fsCoach)

write.xls(fsFrame, "factorialSurvey.xls")

#4 make a new random list to substitute for the illogical combination

revActivity<-c("walking and jogging", "bicycling", "walking and weight training on
  alternate days")
revGroup<-c("with one exercise partner", "in a group of 8 to 12", "in a group of 25")

#5 draw 31 random selections and show these in the R console

ranRevActivity<-replicate(31, sample(revActivity, length(1),replace = T))
ranRevGroup<-replicate (31, sample(revGroup, length(2), replace = T))

ranRevActivity
ranRevGrou
```

CHAPTER 3

MANUSCRIPT II

Flipping the On Switch: Men Who Became Regularly Physically Active During Middle Age

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Acknowledgments

I thank Alicia Cambron for invaluable support for this research project, and the three exceptional individuals who participated in this research.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship and/or publication of this article.

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Abstract

One method to increase physical activity in aging adults is through use of intervention research. A means to inform designs of physical activity interventions is to examine the practices of those who are successful in adhering to activity. As authors of recent review articles have suggested, males are underrepresented in intervention research studies. Consequently, I designed this study to use the interpretative phenomenological analysis (IPA) approach to explore the motivators and practices of three older active males who independently initiated regular physical activity participation during middle age. Participants discussed the role of mentors and other influences, and their awareness of effort or intensity during activity. My analysis of the data further suggested that these men assertively managed their environments and used internal restraints in order to regulate their physical activity participation, consistent with some elements of Bandura's social cognitive theory. Activity researchers might consider counseling participants in effective use of the indicated strategies.

Keywords

exercise / physical activity, older people; men's health; research, qualitative; interviews; interpretative phenomenological analysis

Researchers have suggested that humans evolved to have efficient metabolic processes while engaging in regular activity, which implies that chronic inactivity is a less natural state (Booth et al., 2008). Unfortunately, technological improvements that impact many individuals' occupational and personal lives are frequently associated with decreases in physical activity.

Throughout the world, rates of physical activity (PA) among adults decrease with age. According to World Health Organization (WHO) data, more than 40% of adults in the Americas aged 45 to 59 are physically inactive; the rate increases to more than 60% in adults over age 60. For European countries, inactivity rates are lower although still nearly 50% of adults aged 60 or over are classified as inactive. Researchers have not offered detailed reasons for these declines although Troiano et al. (2008) suggested that some of the decrease might be accounted for by perceived decline in ability with age.

Undesirable consequences of inactivity include cardiovascular disease, type II diabetes and other chronic conditions (Booth, Gordon, Carlson & Hamilton, 2000). Potential positive results from PA participation include prevention or reduction of risk for these physical conditions and improvements in mental health as well (United Kingdom Department of Health, 2004).

Intervention research (e.g., Freene, Waddington, Chesworth, Davey, & Cochrane, 2014; Purath, Keller, McPherson, & Ainsworth, 2013) is one method used to encourage initiation of PA in inactive middle-aged or older individuals. Although there are some exceptions (e.g., Duncan et al., 2012; Gray et al., 2013), most participants in PA intervention research are female (George et al., 2012; Waters, Galichet, Owen, & Eakin, 2011). This may be because females are more likely to volunteer to participate in research in general (Rosnow & Rosenthal, 1997); an alternative or additional explanation is that factors that motivate men to participate in PA are not

necessarily incorporated into designs of interventions (George et al.). If the latter is true, then beneficial information might be obtained through exploration of the habits of currently active men, in particular those who initiated regular participation in PA during middle age.

According to Pearce (2009), researchers using qualitative approaches to PA for health promotion may be uniquely situated to contribute to “more in-depth understanding of behaviors related to physical activity, or lack thereof” (p. 880). In understanding PA practices, Pearce further noted that the role of “behavior factors...and cultural and environmental situations that support or hinder physical activity and exercise are also critical” (p. 880).

Among qualitative approaches, interpretative phenomenological analysis (IPA; Smith, Larkin & Flowers, 2009) in particular facilitates an in depth exploration. IPA can be described as an attempt “to get as close as possible” (Smith et al. p. 37) to the experiences of a generally small number of individuals, while acknowledging the role of the researcher in seeking the essence of the experience. IPA differs from other phenomenological approaches to research in that the concern is “personal meaning and sense making” rather than the “common structure . . . of experience” (Smith et al., p. 45).

Three distinguishing features of IPA include that it is “phenomenological, hermeneutic and idiographic” (Smith, 2011, p. 17). For the purposes of IPA, phenomenology, which has its roots in philosophy, refers to the researcher’s desire to understand how participants understand and assign meaning to their experiences. Since phenomenological research is inductive in nature, participants’ experiences are necessarily viewed as context dependent. The hermeneutic nature of IPA refers to the interpretative character of the approach. The “hermeneutic circle” (Smith et al., 2009, p. 27) describes the fact that interpretation tends to be a cyclic rather than linear process. IPA is sometimes described as relying on a “double hermeneutic,” or a process in which the

researcher “is trying to make sense of the participant trying to make sense of what is happening to them” (Smith et al., p. 3). The idiographic nature of IPA refers to the focus on the individual or particular event or action, which suggests in depth analysis of a single or small number of participants, and again reiterates the inductive and context dependent nature of the IPA approach.

Although a steadily increasing number of authors have published articles that describe use of IPA in research, Smith (2011) observed that there is a dearth of publications in which authors have used this approach to conduct “preventative health behavior and health promotion” (p. 25) research. Smith asserted that IPA has great utility for exploration of “attitude behavior relationships or triggers and obstacles to beneficial health behavioural changes” (p. 25).

The purpose of this paper is to add to the published health behavior research reports guided by IPA. My goals for this research project were to explore how participants described their PA practices, and to identify potential triggers that might have inspired these previously inactive or irregularly active individuals to routinize their PA behavior.

Background

Consistent with Smith’s (2011) observation cited above, I was unable to identify more than a few articles exploring participants’ exercise behaviors in which the authors specified that IPA informed study design, data analysis, or both. Authors of two examples explored fitness center or gym exercisers. Sebire, Standage, Gillison, and Vansteenkiste (2013) conducted interviews with participants who they classified as either intrinsically or extrinsically motivated in order to further assess the utility of “goal-content theory” (p. 308), a derivative of Deci and Ryan’s self determination theory. Sebire et al. reported particular differences between the groups in how each used social comparisons and performance goals as motivators.

Pridgeon and Grogan (2012) compared the exercise experiences of adherents and dropouts among members of a fitness facility. Like Sebire et al. (2013), Pridgeon and Grogan identified the importance of social comparisons in exercise behaviors. Both adherents and dropouts in this research noted the role of habit in maintenance of exercise behavior. One theme unique to the exercise dropouts was the importance of social support provided as exercise companionship. Adherents, on the other hand, noted the role of “physiological addictions” (p. 392) as a facilitator of regular exercise behavior.

Several authors of published IPA research articles used disease or illness as a context to explore PA behaviors. Borkoles, Nicholls, Bell, Butterly, and Polman (2008) interviewed participants who experienced exercise limitations due to symptoms of multiple sclerosis (MS), while Turner, Barlow, and Ilbery (2002) interviewed former professional UK football players whose functional limitations resulted from osteoarthritis. In both articles, researchers described how physical limitations complicated and sometime deterred participants’ ongoing exercise participation. However, Turner et al. reported that former football players often took solace in their prior accomplishments and tended to consider osteoarthritis a natural consequence of sport participation, whereas Borkoles et al. found participants with MS were often insecure and ashamed of exhibiting visible symptoms of disability.

McDonough, Sabiston, and Ullrich-French (2011) examined participants who initiated PA behaviors following cancer recovery in a research study designed in part to assess the fit of Tedeschi and Calhoun’s theory of posttraumatic growth. These authors found that benefits of participating on a competitive ‘dragon boating’ squad depended on each individual’s orientation and characteristics of other team members. Many participants reported that they benefited from both giving and receiving social support. Some participants thrived on the competitive element

of the activity, while others described personality conflicts they experienced due to the group nature of the activity.

Authors of two other published IPA articles examined alternative types of PA participation. Participants in research described by Hefferon and Ollis (2006) were professional dancers. These authors explored the manifestation of Csikszentmihalyi's "[f]low experience" (p. 141) during dance rehearsal and performance, and reported that intrinsic motivation was a predominant theme. Darker, Larkin, and French (2007) used IPA to explore participants' perceptions of walking. Participants reported walking primarily for transportation purposes; most indicated that they did not view walking as an exercise behavior due to lack of intensity.

The articles reviewed above represent approaches to a variety of exercise behaviors, although only the article by McDonough et al. (2011) described initiation of new exercise behaviors. However, participants were recruited into the activity as well as the research as a result of their disease history. No prior published research articles in which authors described use of IPA to explore individually initiated exercise were identified, which suggests that this study represents a unique use of IPA.

Methods

Design

According to Smith et al. (2009), IPA research requires elicitation of "a rich, detailed, first-person account of [participants'] experiences" (p. 56). Given this, interviews represent an appropriate method of data collection.

Participants

I used "opportunit[y]" sampling (Smith et al., 2009, p. 49) to recruit individuals I knew who had initiated regular PA participation during middle age. The participants consisted of three men who

were between 60 and 65 years of age and had routinized their exercise participation at some point between ages 38 and 50. I had originally encountered each individual in an activity setting so had a casual acquaintance prior to this research for time periods ranging from one to eight years. According to Smith et al., due to the in depth nature of data analysis that characterizes IPA, small sample sizes are not unusual; Smith et al. argued that even individual cases may comprise an appropriate sample for IPA research.

Interviews

Several of the articles reviewed in the previous section incorporated elements of theory into design. According to Smith et al. (2009), theory testing is most appropriately incorporated as a “secondary” (p. 48) question that is considered during analysis so that researchers do not limit or attempt to steer what should be an “open” and “inductive” (p. 46) process. Keeping this direction in mind, I modified a sample interview guide provided by Smith et al. for use in this research rather than seeking covariates or constructs from existing literature. The questions included in the interview guide are exploratory in nature and focus on how the participant views the role and experience of physical activity. The interview guide is contained in the Appendix.

Data processing and quality control

Prior to initiating recruitment or data collection, I obtained approval for this research from the university’s institutional review board. After agreeing to participate, each participant was given a consent form in advance of the scheduled interview. I conducted all interviews in person at each participant’s preferred location. I audio recorded and transcribed each interview, using the “simple” (p. 16) conventions described by Dresing, Pehl, and Schmieder (2012), which are appropriate for analysis that will be informed by the “surface semantic content of a conversation” (p. 17) as opposed to paralinguistic or discourse elements. I assigned each participant a code

number that I used both to name the file and to identify responses in the typed transcript. I substituted a generic term for any potentially identifying information (e.g., TOWN for a particular town; RUNNER for a fellow exerciser). A graduate student who had previously completed university ethics training verified accuracy of my transcripts, and after this, I provided each participant with an electronic copy of his transcript for further corrections or comments. I retained copies of the text of participant responses and attachments but deleted all emails from the web-based system. I retained all data as electronic files in secured portable storage, which I kept in a locked office. I used a password-protected computer to access all files.

Analysis

I modeled my analysis on the explicit analysis guidelines provided by Smith et al. (2009) although I incorporated some modifications for my personal technology preferences. Although Smith et al. recommend that analysts create columns in order to handwrite or typed comments; I instead made the prescribed descriptive, linguistic, and conceptual comments on each transcript using the commenting function of MS Word. I temporarily altered the user information in order to produce a different label (e.g., “Conceptual”) and color of bubble for each type of comment. I followed the same steps for each transcript: first, assessed the comments for themes, next, typed the themes in order of appearance on another document, and, finally grouped themes into higher level or “super-ordinate” themes (Smith et al., p. 96). Through this process I continued to focus on my stated research goal and discarded irrelevant material.

After I completed development of super-ordinate themes for each transcript, I combined all of the super-ordinate themes on a single document, and then created a master table listing super-ordinate and sub themes. For each of the sub themes, I inserted representative segments of the data for each individual, referenced by line number. According to Smith (2011) a reasonable

guideline to establish support for a super-ordinate theme is to provide data from at minimum three participants, or in the instance of research with three or fewer participants, to provide data from all participants. Therefore, I discarded any super-ordinate theme that did not meet this guideline. Subthemes, on the other hand, described variations among participants, a key factor given the idiographic nature of IPA, so each did not apply to all three participants. I was able to use the superordinate themes to identify “patterns across cases” (Smith et al., 2009, p. 101). The information from the master table provided the basis for my interpretative analysis.

Findings

The superordinate themes that ran through all three interviews included: *influential others*; *what I get from activity*; *looking toward the future*; and *in or out of control*. In this section, I discuss each theme and some sub themes of interest and provide support through excerpts from the interview transcripts.

Before reviewing the themes, I provide a brief description of each participant with a focus on the factor or factors each identified as a trigger for the initiation of regular PA participation. In order to protect participants’ privacy, I will identify to them through the remainder of this paper by the letters A, B, and C.

Description of Participants

Participant A primarily engaged in swimming and hiking and had a seasonal approach to activity, swimming through the fall and winter months, and hiking and backpacking during an annual year-end vacation and during the summer months. He had been irregularly active until he started to plan his swimming during early morning hours at a pool near his workplace. He noted that prior efforts with a midday swimming schedule had been unsuccessful because he never had the “self-discipline or control of my schedule” to adhere. Another influential factor was that he was,

by his own description, “in terrible shape” during his first hiking and backpacking efforts, so was inspired to improve his fitness during the time between trips. Although he had a family history of chronic health concerns, A did not emphasize this as an incentive for his PA participation. At the time of the interview, he had been swimming 1800 yards, or just over one mile, most weekday mornings between August and May for more than 10 years. He had also hiked annually during the same time period although number, although duration and distances of hikes varied from one year to the next. Participant A was also an occasional recreational cyclist.

Participant B began running during middle age as a response to fears his health would deteriorate and he was not performing at his potential professionally because he was “out too much, drinking too much.” He was inspired by an experience during his university years when he had likewise initiated regular PA practices, which he felt helped him “[excel] at school like I knew I should have been.” He had been regularly physically active in running, bicycling and swimming for roughly 25 years at the time of the interview. Participant B was a regular and accomplished participant in recreationally competitive running and triathlon events.

Participant C abandoned recreational tennis after finishing university study because he found “everybody started wanting to play doubles, and you’re not getting any exercise playing doubles.” His inactivity eventually led to noticeable weight gain and he found this both “frustrating” and unacceptable. He began to swim on a regular basis because an available pool was conveniently located, it represented an activity he could do all year, and prior efforts with running had been physically uncomfortable. Unlike A, who emphasized the utility aspect of swimming to benefit his time spent hiking, participant C was highly motivated to increase distance and particularly swimming pace. He was able to describe to me the evolution of his early swimming pace and distance in explicit detail. Participant C had competed in triathlon

paces regularly in the past and was preparing, after some years of focusing on PA primarily for fitness and enjoyment, to compete again in the season following this interview. At the time of the interview, participant C had been regularly active for just over 25 years.

Themes

Influential others. Family members, exercise companions, and mentors comprised the external others who participants described as having encouraged or influenced PA participation. All three participants mentioned the influence of their father, either as a positive or cautionary role model. Participant C told about his father's physically active lifestyle after retiring from his occupation at age 62.

He was active until six months before he died . . . And I think that's one of the primary reasons he lived so long. And had a really good quality of life except for that last six months. And as a result of seeing that . . . that's the factor I think that will keep me going and continuing to bicycle and swim.

For participant B, his father's "drinking problems" were a parallel with his own and allowed him to understand that "you tend to fall back," and to appreciate that "once you have control of your life and you're not drinking. . . how much more focused you can be." Participant A described a history of diabetes in his late father and an older brother, but noted that his own doctor recognized that he was "basically dealing with diabetes through diet and exercise."

Although all three participants described current PA as a result of an individually initiated change in lifestyle, mentors had sometimes influenced specific activity practices. Participants A and C were encouraged to expand a focus on one or two disciplines to the multi-sport discipline of triathlon by other triathletes. According to B:

We had hired a guy who did triathlons, and so I would go to the gym, and I'd run and I'd swim a little bit, and I was telling him what I was doing, and he said, "Well, you need to get a bike." So I bought a bike for \$60 or something like that, and started hanging out with these guys and found how much fun it was. And really all that did was kept

reinforcing the fact that . . . I wouldn't go out at night time. . . . and, so before I knew it 10 years had passed and I had quit drinking and all of the sudden I had a new lifestyle.

Participant C's swimming ability came to the notice a friend who was a recreationally active triathlete. Despite C's protests that running was physically uncomfortable, his friend insisted, "You need to try [triathlons]. You just need to get some good shoes and learn to stretch." C found to his surprised that he "ran three miles the first day." He ended up participating in several races a year during the following decade.

Participant A viewed part of his role as a regular swimmer as being a mentor to others. It was his general practice to make a point of introducing himself to strangers and to help new swimmers "feel a part of the sort of group."

What I get from activity. When participants described the experience of being in activity, each described awareness of signs of effort during activity, including elevated heart rate and expectation of fatigue. Participant A described the feelings that occur as he starts a long workout:

I know that the first lap, or the first 200 yards, or whatever it happens to be are going to remind me of my age and how sore my muscles are . . . but fundamentally, I know that I'm going to be able to keep going . . . I know that, that first instance when I lift my 40 pound pack on my back and know that we're hiking 17 miles that particular day that I'm going to be tired at the end of the day. And that pack sure is heavy first thing in the morning, and five minutes down the trail, it feels like I'm swimming again . . . it's part of that regular rhythm, and the problem has kind of gone away.

For participant B, bicycle riding is planned to incorporate an element of performance improvement:

What I do now is . . . hill repeats, and do it on my own, and wear a heart monitor. And I know if I'm up in the 160, 150 beats per minute, I'm pushing myself . . . it's structured – I do 10 of them, I'm three miles from my car. (And, after a ride) you've just got this little fatigue feeling, and can't wait to go home and eat and take a shower, and maybe take a 20-minute nap. It's fun."

Participant C has likewise focused on bicycling in recent years. He chose his current home in part due to proximity to what he viewed as good riding routes. He described the effort he experiences on a bicycle:

And even when you run – I mean, I can run an hour, and that’s really taking everything I’ve got in my legs . . . I can keep my heart rate up for the same amount for three hours on a bicycle. So you can get so much more long term aerobic, to do the things that help you, on a bicycle.

And what that effort is like in a group setting:

When we ride in groups . . . when we hit the hills and everybody takes off, and I’m doing my best to hang with the young guys that are in their 30s and 40s, and some of them I can stay pretty close to . . . the people that are stronger can do more pulling and so everybody can stay (together) . . . you can have the little spurts where you can sprint or do some hills and then you get back together.

The experience of being in activity also tended to have a cleansing effect on mental stress.

According to Participant A:

Usually, if there was something that was bugging me at the beginning of the swim, by the end of it, I’ve usually forgotten what it was . . . that’s the value of doing a mile, is it gives you time to forget all of that stuff you were fretting about.

A viewed the stress relief not just in a reactive but also in a preventive way. He was anticipating an increase in his work load, and:

There aren’t pressures like that all of the time, but when they happen . . . I’m pretty sure that I’m probably going to be spending maybe 5 or 10 more minutes in the pool, just because I can schedule-wise, but because I know it’s probably going to make the difference.

Participant B noted:

I do think about work and things, while I’m out riding, but a lot of times I think about things and I get a different perspective on what problems I have. I’ll say I don’t come up with necessarily solutions, but I do notice I do look at things a little differently, as you’re out, you’re not really focused on it – you’re really focused on where you’re going – it’s just kind of in the back of your mind. But it’s still very relaxing because you tend to usually just think about the ride and the weather and those types of things.

Looking toward the future. Participants all anticipated changes in activity with age. All three also mentioned a (different) specific older individual who was viewed as an inspiration. Participant A was aware of an 80-year-old completing a long Grand Canyon hike, and could see himself hiking in his 70s, as long as he wasn't "in that position of really needing assistance to hike in and out of the Canyon." He projected swimming for as long as he "could swim more [lengths of the pool] than he was old," which would put him at age 72. Yet, he was also determined to be "the grandpa that can actually" hike with his grandchildren, and given that none of his young adult children had at the time of the interview had their own children, this suggests a relatively flexible outlook on future activity.

As mentioned above, participant C had made specific plans for focused training and racing during the season following the interview. He also cited an 80-year-old, in this instance a regional recreational runner, who competed regularly in distance road races, and expressed his admiration for someone who was "still running at that age." C did not place any timelines on his own activity and, in fact noted that:

the cycling will still be there . . . I plan on doing it – not quite as aggressively at some point, but I still plan on doing it. And keep getting enough to get the heart rate up and keep going for a long time.

Of the three participants, B was most looking forward to aging because his impending retirement offered "lots of time to be able to go biking, and go do races that I probably hadn't done before." He further noted: "I see it [activity] as being central to whatever I do for retirement." B mentioned being both inspired and impressed by a regional cyclist who had recently had some success in multisport pursuits, and was just one year older but performing at a very high level.

In or out of control. Perhaps the most prevalent among the super-ordinate themes was control. I describe this theme as prevalent because it recurred throughout each interview, both in a macro sense, i.e., having control over the ability to be active, having control over how one's life was structured, as well as in the micro sense, i.e., having control over a given workout session, or priorities on a given day.

In discussing control or lack of control, participants frequently used metaphor or other expressive language. Participant A had, some months prior to our interview, found himself needing to make several unplanned regional trips over the course of several weeks. This had a disruptive impact on his physical activity and he described his sense that he was on a “downward spiral” until he was able to deal with the circumstances and “corrected that trajectory.” He described his success in altering his schedule to accommodate weekday morning swims as “put[ting] a lock on that time frame.” The pool in which A swims had for several years morning hours only on Mondays through Thursdays; it was essentially A's desire to have a fifth morning swim that led him on an aggressive campaign to convince pool management to add Friday morning hours. In this sense, A was able to expand his sense of control over his environment; he could not swim 5 mornings a week instead of 4.

Participant B expressed how control over his exercise equated to control over the rest of his life:

At one point, I decided that I had to get control of my life . . . and, as part of that decision, I started running again. Because it had helped me in the past to get focused . . . so, when I decided that I needed to get a little more control of my life, I started running again.

B described the alternative: “either you changed it (your lifestyle), or you were heading down, heading toward big trouble.” When he did find the sense of control, B felt it spilled over into his professional life:

So I kept on running and racing, and eventually, I had the opportunity to (get a new job) . . . and so all of the sudden . . . my focus was there, but my success started; I became much more successful at my job. And I still attribute it to the fact that I'm not distracted by (the local bar scene) . . . so they kind of reinforced each other – being in control of my life and also maintaining a lifestyle and . . . wanting to improve in your active lifestyle.

Participant C attributed his success at remaining active to advice he was given describing how to stay in control:

Now the thing that made the difference that allowed me to stick this time was a conversation that I had (with a medical professional) . . . I went to him one day and I said . . . “I'm swimming and I'm really getting into shape, and I think this is something I'm going to be able to stick with.” And he said: “The problem is, when you go on vacation, or you get sick, and you have to stop for a while, if you don't force yourself to immediately . . . go back and do it and get right back in that habit, or you'll lose it, just like you have everything else you've tried.” And having that knowledge, and realizing that that was important, I made sure . . . and so that's how I got rolling, and how I managed to keep it up.

C also enforced his own controlling influence over his workouts. Because he continues to experience some discomfort associated with the act of running, and has found it difficult to moderate his pace, his solution is to:

Do 12 or 18 miles on (a mountain bike trail) and then throw [the bike] in the back of the car and then run 3 or 4 miles. Because then I'm running, I'm getting the long term endurance with it . . .but I'm not running very fast, because I've already used so much energy. So that's easier on my legs . . . simply because I can't make myself run slower when I'm fresh.

Discussion

Although the factors that inspired each of these individuals to initiate and maintain regular PA participation varied, there were similarities in activity practices, especially relating to control. Participants described instances in which they felt in control as well as circumstances in which they found ways to gain control.

Bandura's (1986) social cognitive theory is applied regularly among the various theoretical approaches that researchers have used to guide PA investigations and interventions (e.g., Annesi & Unruh, 2004; Hallam & Petosa, 2004). The primary assertion of the social cognitive theory is that individuals' behaviors result from an interaction among three elements: the behavior, unique individual factors, and the environment, actual or perceived, in which the behavior takes place. Both self-regulation (self-monitoring) and self-efficacy, or confidence in one's ability to complete an activity to achieve a desired outcome (Bandura), have been cited as influential over regular exercise behaviors (e.g., Anderson, Wojcik, Winnett & Williams, 2006; McAuley & Blissmer, 2000), but the findings from this research, especially regarding issues of control, suggested parallels with some other elements of the theory.

According to Bandura, "people create environments and set them in motion" (p. 22). This is consistent with A's description of "putting a lock on" the morning swimming time frame by purposely scheduling his work day to begin after available morning pool hours. Although not discussed in the findings above, C also noted that he managed his late afternoon work schedule to accommodate twice-weekly warm weather group bicycle rides. B, on the other hand suggested that he had ample flexibility by virtue of his seniority in his job to "sneak out" for exercise on occasion when the weather was attractive.

However, B was more conscious of control during his bouts of activity. He described reluctance to participate in group bicycle rides due to the unpredictability of group behaviors regarding pace and distance as well as his determination to follow his predetermined work out plan. B communicated this ("I want to ride my route") in explaining why he did not follow a group ride he had recently encountered. Both this and C's strategy of running only after he bicycled, described above, can be viewed as expressions of what Bandura (1986) labeled as

“internal restraints” (p. 262). According to Bandura, it is development of these “internal standards of behavior which serve as guides and deterrents” (p. 262) that allows individuals to independently limit behaviors without the need for external influences such as punishments. Both B and C described imagined negative consequences (going further/faster than you were prepared to ride; having an activity-limiting injury from running too fast) consistent with this practice that also demonstrate what Bandura termed the “forethought” (p. 18) capability of humans. It is also worth noting that both B and C routinized exercise behaviors to help restrain the less desirable behaviors of alcohol use and weight gain, although participant A differed in having a more distinct health promoting/fitness improvement inspiration.

These findings suggest that the ability of individuals to both monitor and, in some instances, restrain behaviors, or to exercise control over activity patterns by managing their environments may be key to adherence to PA participation. However, while many people can strive to improve self-regulatory or self-management skills, either to increase desirable or decrease unwanted behaviors, not as many individuals can manage or control their environments, in particular work environments.

The participants in this study represented three secondarily educated, financially comfortable White males. While it can be argued that this is not a representative sample of the population, authors of some published longitudinal research articles (Lunn, 2010; Scheerder, Vanreusel & Taks, 2006) have found these characteristics may define a representative sample of individuals who remain adherent to PA.

The fact that these participants chose individual activities when initiating regular PA behaviors might be meaningful in intervention planning. Based on prior research (Chatfield, 2014), I suggested that regular activity participation that begins in early adulthood is frequently

initiated in a group setting; as a result, I speculated that group settings might be attractive to new exercisers of any age. The practices of these participants do not support that speculation. However, participants in my prior research initiated adult participation in PA during the 1960s and 1970s, whereas these participants initiated regular PA participation between the late 1980s and the early 2000s, so differences in choices of group participation may reflect changes over time in availability of type and number of activity groups. Whatever the explanation, developers of PA interventions may want to focus on encouraging participants new to activity to develop sufficient skills to engage in individual endurance activities such as running, walking, swimming, or cycling so that these are available as an alternative if not a primary activity.

Both employment and family responsibilities may reduce available discretionary time for exercise. The fact that these research participants initiated regular activity during middle age suggests this time of life may offer improved opportunities for PA participation, as people become more stable in employment and family dynamics change. In fact, participant A suggested that both increased job security and grown children had a positive impact on his activity practices. Therefore, activity researchers may wish to increase focus on middle-aged participants while being aware of the need to consider how to counsel participants to find potential areas of control over the workday such as identifying any potential flexibility in work schedules.

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APPENDIX: IPA INTERVIEW GUIDE

IPA Interview guide

1. Can you verify that you are at least 18 years of age?
2. Please tell me what place exercise/PA/specific activity (e.g., 'running') has in your life right now?
Potential Prompts (PP): What is it like when you exercise? How do you feel when you are exercising?
3. Can you tell me about one of the recent times you exercised?
PP: What was it like? How did you feel?
4. Can you describe how participating in regular exercise impacts your relationships with other people?
PP: Partner, family members, exercise group members, co-workers
5. Can you tell me why you decided to begin to exercise regularly?
PP: Can you describe how you felt about exercise before that time?
6. What type of exercise or activity did you begin with? Did you add to or change the type of activity/ies you do as time went on?
PP: Who do you regularly exercise with? What groups have you worked with? What exercise/activity classes have you taken? Describe any work you have done with a coach or trainer.
7. Has the role of exercise changed in your life over time?
PP: In what ways?
8. What for you has been a positive development resulting from exercise?
PP: How did that make you feel? How did things change for you?
9. How would you describe yourself in relation to your exercise?
PP: How do you feel about yourself as an exerciser/active person? Does your job/profession impact your exercise?
10. How do you think other people see you in relation to your exercise?
PP: Partner, family members, co-workers
11. How do you see your exercise behavior in the future?

CHAPTER 4
MANUSCRIPT III

Men's preferences for physical activity interventions:

A factorial survey research study

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Abstract

Objective: Increased participation in physical activity (PA) provides a viable approach to decrease the consequences of cardiovascular disease. Prior researchers have not comprehensively addressed men's preferences for features of PA interventions, which may in part explain why men are underrepresented in intervention research. The factorial survey method provides a cost effective means to assess potential interventions.

Methods: A factorial survey instrument was developed to assess men's preferences for multiple characteristics of physical activity intervention programs. Dimensions in the survey included: type of activity, exercise group size, time of day, flexible work hours, goal-setting assistance, and absence or presence of current health concerns. Participants included male staff at a large US public university and employees of a contracted food service provider. The survey also included one open-response item.

Results: The results of hierarchical linear regression suggested that the most important factors among those assessed were group and type of activity although these items did not account for much of the variability within and between individuals. Findings from qualitative analysis of the open-response item suggested that coaching or supportive direction was also deemed important although the parameter estimate for this variable did not reach statistical significance in the regression model.

Conclusions: The open response item enhanced the survey results. Additional dimensions or interactions should be explored in future research. Individual interpretations or definitions of health coaching should be explored through further qualitative research to help better represent this item in future surveys.

Keywords: *Physical activity, factorial survey, males*

Introduction

Both the National Institute for Health and Care Excellence (NICE) in the UK and the American College of Cardiology/American Heart Association (ACC/AHA) recently provided revised guidelines for use of statins as a protective measure against incidence of cardiovascular disease (CVD). The former recommended that “that the threshold be halved,” (Statins, 2014, p. 669), and now encompasses those identified as being at 10% or greater risk for CVD in the next 10 years. The US recommendations are slightly more aggressive, encompassing those “with at least a 7.5% ten-year risk . . . and consideration of statins for those with 10 year risks of between 5% and 7.5%” (p. 669).

An alternative approach to prevention of CVD is suggested by the results of a recently published metaepidemiological study (Naci and Ioannidis, 2013). According to the authors, when assessing mortality from CVD, “there were not statistically detectable differences among any of the exercise and drug interventions” (p. 4) which led the authors to conclude: “exercise interventions should therefore be considered as a viable alternative to, or alongside, drug therapy” (p. 5).

This recommendation, while attractive to health behavior practitioners, is not without difficulties. Despite repeated investigations, researchers do not have clear understanding of the factors that have causal rather than associative relationships with ongoing physical activity participation (Bauman et al., 2012). Additionally, roughly half of all individuals initiating regular participation in physical activity will abandon it within six months (Annesi & Unruh, 2007).

The research project described in this paper reflects a unique approach to physical activity intervention research. Few researchers have solicited participants’ input on design of exercise interventions, and those who have tended to focus on a single dimension, such as

preference for group versus individual activities (e.g., Beauchamp, Carron, McCutcheon & Harper, 2007), preferred delivery method for intervention information (e.g., Vandelanotte et al., 2013), or specific activity preferences (e.g., Nies, Troutman-Jordan, Branche, Moore-Harrison, & Hohensee, 2013). Of these, specific activity preference may be most important; according to Iso-Ahola and St. Clair (2000), those who remain adherents to physical activity participation have tended to engage in activities that provide them with a “sense of control and competence” (p. 136). Yet the results of much research suggest that additional mediators, facilitators, or constraints impact physical activity participation (Bauman et al., 2012); therefore, while identification of activity preferences may be helpful or necessary, it is not likely sufficient to ensure success of an intervention.

The factorial survey approach provides a means to simultaneously and systematically assesses multiple factors or characteristics of a situation through use of a series of descriptive passages known as *vignettes*. Details in the vignettes, referred to as *dimensions*, represent predictor variables that may influence judgments or decision-making, and, according to Lauder (2002), may be “more accurate representations of real life than are the type of generalized questions usually asked in surveys” (p. 37-38). Dimensions contain *levels*, which represent categories within predictors. Rossi and Anderson (1982) described the factorial survey process as a means of “combin[ing] ideas from balanced multivariate experimental designs with sample survey procedures” (p. 15). Participants’ scores or rankings can be used as outcome variables in a regression equation to calculate coefficient values that can be considered proxies for weight or relative importance of the predictors.

Researchers have used factorial surveys to explore judgments, beliefs, and intentions (Wallender, 2009). However, the method has only infrequently been used for intervention or

program planning purposes (e.g., Hennessy, MacQueen, & Seals, 1995; Hennessy, Williams, Mercier, & Malotte, 2002), despite the fact that it reflects a relatively cost effective method of gathering information (Lauder, 2002).

This project was designed to use factorial surveys to systematically solicit input from participants regarding physical activity intervention preferences with the hope that incorporation of this information into intervention designs will improve both recruitment and retention. According to the World Health Association (WHO; 2013), males throughout the world have lower life expectancy at birth and at age 60; however, it is believed that men are consistently underrepresented in physical activity intervention research (George et al., 2012; Waters, Galichet, Owen, & Eakin, 2011). Because physical activity levels decrease with age (Troiano et al., 2008), while risk for CVD increases, the target participants for this research study are adult males, in particular those near or at middle age.

Methods

Instrument Development

Creation of a factorial survey instrument requires that a researcher make decisions about the following: number of vignettes each participant should view; order of dimensions within vignettes; identification of dimension; how participants score, rate, or rank the vignettes.

Researchers have assessed and provided guidance to address some of these elements. Sauer, Auspurg, Hinz, and Liebig (2010) concluded that eight vignettes was the optimal number to prevent fatigue. Auspurg and Jäckle (2012) concluded that order is only likely to impact results when vignettes and dimensions are complex; these authors defined a complex vignette as one with more than eight dimensions.

The dimensions typically reflect items identified by a review of literature. For the research described in this paper, these items were augmented with items the author identified during analysis of data from a prior qualitative interview study (Chatfield, 2014) with men who initiated regular participation in physical activity at middle age. Jasso (2006) also encouraged use of items of particular researcher interest. With this in mind, one dimension, preexisting health condition, was included because it was of interest to both the researcher and the participants' employer. Table 1 shows the dimensions, a sample level for each dimension, number of levels per dimension, and source for each item. Identified dimensions were intended to be orthogonal to eliminate interactions and therefore simplify data analysis.

Although variations are found in vignette scoring or rating scales (Wallender, 2009), the scoring for this instrument was modeled on the factorial survey intervention research conducted by Hennessey et al. (1995), and worded as a probability item (e.g., *how likely is it that James would begin to exercise if this was the option*). Participants were provided with a 0 to 100 scale of identical length for each vignette, with marks in increments of 5 and labeled at three points: a definitive refusal at 0; a positive acceptance at 100 and a neutral response at 50. Participant responses that did not fall on one of the lines were measured and a score was assigned. Scores were rounded to increments of .5 point (e.g., 67.5, 82.5, etc.).

Consistent with practices from prior factorial survey research (e.g., Caro et al., 2011), the base vignette did not request that participants identify their personal preferences; rather it described a generic middle-aged male called James. The directions specify that participants are to use their knowledge and expertise to assess how James would respond.

Table 1

Dimensions with Sources

Dimension	Example of level	Number of levels	Source
Type of activity	Basketball	6	Generally available activities in the community
Group	In a group of 8 to 12	5	George et al. (2012); Oka, King, & Young (1995); Spink & Carron (1993)
Group (add'l level)	With a group weekly; alone the rest of the time	Incl in above	Prior interview research
Goal setting support	Weekly meetings with health coach	4	Conn et al., 2011; Annesi, 2002; Annesi & Unruh, 2007
Time of day	Morning	3	Prior interview research
Flexible work hours	Available flexibility in work hours to accommodate physical activity	2	Prior interview research
Prior health condition	Family history of heart disease	5	Of interest to participant employer

Producing Randomized Surveys

The number of potential vignettes is the product of the number of levels of dimensions, so designs in which every participant rates every combination are only possible when the potential number of vignettes is small. In this instance, there are 3,600 potential vignettes.

Researchers have used designs in which respondents are provided with either a random or chosen sample of vignettes; this research represents the former approach. According to Wallender (2009), when vignettes are constructed from random combinations of dimensions, and “each

dimension level is equally likely to appear in the vignettes,” a researcher might “estimate the unbiased net effect of each . . . [level] on [respondents’] assessments” (p. 50).

The author created factorial survey instruments that each contained eight variations of the physical activity intervention program through use of the open source program R (R Core Team, 2013) in combination with Microsoft ® Office products Excel and Word. Through use of R, it was possible to create the necessary groups consisting of the levels of each dimension, and to randomly select a single item from each group multiple times in order to create the series of vignettes. Because R recognizes string variables, the dimensions were entered as words and not code numbers. This facilitated simple creation of the survey instrument by writing a data frame of dimensions to an Excel spreadsheet that was used as the data source for the form letter merge process in Word and later provided the data frame for statistical analysis. The process of creating the randomized instrument, including sample code, is detailed elsewhere (i.e., Chatfield, 2014).

Of 800 vignettes produced, 46 included the illogical combinations of either *tennis* or *basketball* as the activity and *alone* as the level of the group dimension. Although alteration of these 46 items interferes with the pure random nature of the surveys, according to Auspurg, Hinz, and Liebig (2009), participants receiving a survey with an illogical item are likely to overlook that dimension in scoring, thus impacting the weighing of the other predictors. For this study, the illogical combinations were replaced through a second, random process in which random draws were made of groups consisting of the remaining dimensions minus the items in question. For roughly half of the illogical combinations, the activity level was replaced; group was replaced in the remaining surveys.

Following the work of Ganong, Coleman, Kusgen McDaniel, and Killian (1998), and Ganong and Coleman (2005; 2006), this instrument also incorporated a free response or

qualitative item. In the directions for this item, respondents were asked to provide their ideal physical activity program for James.

Prior to production of the final surveys, Institutional Review Board approval was obtained and a pilot version was tested with participants who had the characteristics of interest. The only changes made as a result of the pilot involved further clarification of the directions for the qualitative item and expanding room for response to that item. The Institutional Review Board also approved the amended instrument.

Participants

Heise (2010) argued for purposive, rather than random sampling of factorial survey participants, noting that use of participants who are not involved in the issue of concern “wastes resources and contaminates data with errors of judgment” (p. 85). There is not clear consensus regarding number of groups, number of participants, and applicability of sample size calculations for factorial survey approaches. Based on general guidelines provided by Hox (2010), the researcher selected a target number of 100 participants in order to produce 800 observations. Target participants consisted of male university non-administrative staff and male employees of a food service contracting organization. Surveys were produced in pencil and paper format in consideration of the fact that members of the target group did not typically use computers during their working hours.

In accordance with Institutional Review Board procedures, each participant was provided with a consent letter that described the study and provided contact information. Although this research was designed in response to particular concern in middle-aged males, any male over 18 was deemed eligible to complete a survey so the researcher could provide detailed reports to participants’ employers, which were promised in return for their cooperation in disseminating the

surveys. Demographic items requested included age in 10-year bands, self-identified race or ethnicity, and a basic estimate of how regularly respondents participated in physical activity.

Analysis

Statistical analysis. Respondents returned 57 of the distributed surveys. A demographic summary is provided in Table 2. Four respondents failed to verify age over 18 so those data were not included in analysis in keeping with Institutional Review Board protocol. One respondent failed to score the last program in his survey packet; final analysis was based on 53 surveys comprising 423 observations. The author entered respondent scores and demographic item categories. A graduate student checked data entry on a randomly selected sample of 13% of the surveys; no data entry errors were identified in the sample.

All statistical analyses were conducted using R. The dependent variable, score, was assessed for normality via descriptive statistics and creation of a histogram. The mean value for score was 49.37 and the median was 50. The distribution was slightly platykurtic in appearance (kurtosis = 2.28) and skew was approximately symmetric (skew = 0.09).

According to Hox, Kreft, & Hermkins (1991), data from a factorial survey design in which each respondents assesses more than one vignette generally form a nested or hierarchical structure because data are likely to violate the assumption of independence for linear regression models. In this research, vignettes comprise the first level of analysis with respondents comprising the second level or grouping factor. The calculated intraclass correlation (ICC), suggested that 24% of the variability in scores was due to differences between respondents and provided excellent support for a multilevel approach. Unique features of multilevel models when compared to other linear models are that no provision needs to be made for missing data

points, and the intercept as well as slopes for predictor variables can be allowed to vary randomly.

Table 2

Respondent Demographics

Age	
18-29	15
30-39	17
40-49	12
50-59	8
60-69	1
Race/ethnicity	
Black	17
Hispanic	1
White	34
Other	1
Reported current exercise	
5 or more days per week; most weeks	8
3-4 days/week; most weeks	11
1-2 days/week; most weeks	14
No regular exercise; last 1-2 months	5
No regular exercise; last 3-4 months	1
No regular exercise; last 6 months	14

The R package *lme4* (Pinheiro, Bates, DebRoy, Sarkar, 2013) was used to assess the multilevel models. Following direction provided by Hox (2010) and Bliese (2013), the researcher tested models with increasing complexity to assess the contribution of each predictor. The first two models assessed contained the intercept alone in order to compare the effect of allowing the intercept to vary randomly among group members. A Chi Square difference test between the -2 log likelihood of the fixed and random intercepts models had a statistically significant result ($\chi^2 = 45.98$; $df = 1$; $p < 0.001$) indicating that the random intercepts model had better fit. In the next step, all predictor variables (Activity, Group, Time of Day, Flexible Work Hours, Health Coach, and Health Status), were entered as fixed effects. Chi Square difference test of the fixed effect model suggested that prediction was significantly improved by inclusion of the predictors ($\chi^2 = 46.99$; $df = 21$; $p < 0.001$). Following, each variable in turn was allowed to vary randomly and model fit compared to the fixed effects model. All models other than the initial intercept-only comparison were run using restricted maximum likelihood estimation (REML). The default optimizer in R was changed to “optim” to encourage convergence.

Results

Quantitative Results

Statistically significant predictors included levels of Activity and Group. Model fit was improved over the fixed effects model ($\chi^2 = 28$; $df = 14$; $p = 0.014$) by allowing the slope for Group to vary randomly. One level of Time of Day (morning) was also statistically significant in the final model. According to Kreft and de Leeuw (2007), hypothesis testing of individual parameters, in particular for social science researchers, is far less helpful than a focus on overall fit of the model. Therefore, all parameters were left in the final model. Table 3 shows parameter estimates with standard errors, confidence intervals, and p values.

Table 3

Parameter Estimates

<i>Parameter</i>	<i>Level</i>	<i>Estimate (SE)</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>P value</i>
Intercept		55.78 (5.21)	45.53	66.03	< 0.001
Activity (reference cell: <i>Basketball</i>)					
	Bicycling	-1.60 (3.69)	-8.87	5.66	0.67
	Jogging	-10.07 (3.49)	-16.94	-3.21	0.004
	Swimming	-6.94 (3.45)	-13.73	-0.16	0.04
	Tennis	-12.88 (3.82)	-20.38	-5.37	< 0.001
	Weight/jogging	-12.30 (3.44)	-19.08	-5.53	< 0.001
Group (reference cell: <i>Alone</i>)					
	Group of 25	5.5 (4.03)	-2.43	13.44	0.173
	Group of 8-12	5.36 (3.77)	-2.06	12.77	0.156
	With a group once per week; alone otherwise	-0.5 (3.77)	-7.92	6.92	0.90
	With one partner	11.1 (4.21)	2.79	19.38	< 0.001
Time (reference cell: <i>in the evening</i>)					
	In the middle of the day	-2.0 (2.41)	-6.73	2.74	0.41
	In the morning	-5.23 (2.35)	-9.86	-0.61	0.03

<i>Parameter</i>	<i>Level</i>	<i>Estimate (SE)</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>P value</i>
Work (ref cell: <i>blank</i>)					
	Can work flexible hours to fit in exercise	1.57 (1.95)	-2.27	5.41	0.42
Coach (ref cell: <i>blank</i>)					
	Coach helps set goals once a week	1.97 (2.75)	-3.44	7.37	0.47
	Coach helps set goals once a month	-0.6 (2.99)	-6.48	5.29	0.84
	Coach helps when contacted	-0.12 (2.69)	-5.41	5.17	0.96
Health (reference cell: <i>family history of heart disease</i>)					
	High blood pressure	-0.86 (3.23)	-7.21	5.49	0.80
	No current health concerns	1.67 (2.93)	-4.10	7.44	0.57
	Joint pain or arthritis	-6.06 (3.11)	-12.18	0.05	0.05
	Overweight	-5.4 (3.11)	-11.52	0.73	0.08

According to Hox (2010), changes in variance estimates can serve as a proxy for R^2 to assess model fit for multilevel regression models. Changes in variance were calculated using the formula provided by Hox. Adding all predictors accounted for an additional 4% of the between group (difference between respondents) variance, and 6.4% of the within group variance when compared to the intercept-only model. The variance change attributable to the addition of the random slope initially returned an illogical negative result, which, according to Hox, is not

entirely unusual. The calculation was adjusted using a formula provided by Hox and attributed to Snijders and Bosker. The adjusted result suggested that 44.86% of the within group variance was accounted for by incorporating a random slope for the predictor variable Group.

Qualitative Analysis and Findings

The researcher typed the handwritten qualitative items onto a word processing document to facilitate coding. Coding was conducted via the comment/track changes functions of the Microsoft Office ® software program Word. The researcher used descriptive and in vivo coding methods as defined by Saldaña (2013). Codes were organized and combined into six categories, and the researcher developed three broader themes based on the categories. According to Saldaña, a theme is a result of coding or categorization that is more implicit and represents more departure or abstraction from the original data than a code. Due to the brief and directed nature of participant responses, the themes presented demonstrate the researcher's descriptive rather than interpretive approach to the data, although some data transformation is reflected.

Identified themes included: *easing into it; choice and changes; pressure versus persuasion*. The theme *easing into it* included examples provided by several respondents to encourage James, the individual described in the surveys, to approach his increase in PA involvement incrementally. According to one respondent, it is necessary to “take it easy with someone then work your way up.” Another described the need for James to increase “speed and exercise time steadily as he goes.” Another respondent expressed some concern that any of the described programs might be overwhelming for James as a new exerciser and he might instead need to begin with slow walking.

The survey contained only one activity alternative that could be described as cross training (weight training 2 days per week and jogging 3 days per week) but several respondents

described ideal plans that incorporated 2 or more activities per week. These recommendations comprised the theme *choice and changes*. Respondents provided plans that included alternative types of exercise (e.g., “stretching and cardio,” “weights and cardio on alternating days”) or suggested alternating similar types of exercises (e.g., “jogging and bicycling,” “bike, swim, and play basketball”). Respondents in some instances provided health-related reasons for activity alternatives (e.g., “light weights to help with weight loss”) although one of the primary reasons given for variation in activities was “so he [James] won’t get bored.”

Coaching was mentioned frequently in the open response item. The theme including these items was titled *pressure versus persuasion* because the responses reflected opposing approaches. Some respondents felt that it was the place of the coach to “push” or to be in “constant contact” with James so someone would be “holding [him] accountable.” One participant mentioned that James would be likely to succeed in a program that was “similar to what is done in the military.” However, another respondent cautioned that the role of the coach is to “help him set goals” but specifically directed “don’t push.” The role of James’s coach, according to another respondent, would be to “help him set goals and help him achieve goals.”

Other respondents combined the role of a workout partner with some of the functions of a coach. One participant noted that the best work out partners can “motivate you.” Another noted “involving other people makes you exercise.”

One other item of note from the open response question relates to how respondents described workout group size. The most frequently mentioned numbers described very small groups (e.g., 1, 2, or 5 other people). Group sizes represented on the survey instrument included a single partner although the next size level was a group of 8 to 12, which was selected by the researcher to represent a small group when compared to a large group of 25 or more. That

respondents had preference for a group size larger than a single partner but smaller than the small group option provided on the survey suggests that this item might be better represented in future surveys by allowing participants free choice to select optimal workout group size. This would have the additional benefit of preventing the need to modify the randomized items through correction of the illogical combinations.

Conclusion

Analysis of the survey data, while providing some guidance for PA interventions, also suggests that more comprehensive results might be obtained given minor adjustments to the survey instrument, notably to the Group item as discussed above. Additionally, responses to the Health Coach item suggest that this is a complex and subjectively defined concept and should be explored further, ideally through follow up qualitative research.

Group and Health Coach were intended to be distinct variables, and in the statistical analysis, it was presumed that they were treated as such by respondents. However, the number of open response items in which participants mentioned coaching and workout partners as sources of support suggests that these items might be viewed as interchangeable in some circumstances. Health Coach was included in the survey for as a mechanism to deliver goal setting support as reported in research by Annesi (2002) and Annesi and Unruh (2007) although some respondents expanded the interpretation of this item in their qualitative responses.

Also, as was reported in the qualitative findings, even when the role of the coach appeared to be defined consistently, respondents expressed very different opinions regarding the way the actual coaching should be delivered. The fact that the parameter estimates for this item did not reach statistical significance may be a reflection of the ambiguity in the concept

combined with various beliefs about how coaching should be provided, rather than an indication of lower priority given to this item.

Multiple responses suggesting variation in activity offerings suggest that the limited alternatives provided on the survey did not constitute an adequate universe of choices. As for Group, it might be preferable to represent activity types via an item that allows more flexibility of choices, or perhaps by developing additional levels of the Activity dimension that represent combinations rather than single items. The trade-off with some of these decisions is that by increasing the number of choices, an increasingly complex survey emerges, and there is greater need to consider interactions or other alternatives in the analysis. To account for this, larger sample sizes should be obtained, ideally of such a size to divide between analysis and testing samples.

Limitations of this research include that respondents' expressed preference is not necessarily a proxy for choice or adherence to a program. However, it can be reasonably assumed that respondent's choices were more likely to reflect preferences and less likely to reflect disinterest or dislike. Given the rating mechanism, it was possible to assign a 0 score to all programs and no participant did so.

Another limitation relates to comments made regarding the length and readability of the sample. The programs themselves were stated by a row of simple short descriptive sentences (e.g., "The activity is bicycling") but the Institutional Review Board consent information comprised nearly an entire page. The survey directions and base scenario description were shorter and contained several extra spaces but still had the appearance of containing more than half a page of content, so the instrument began with what looked like two rather lengthy pages of text. Despite efforts to make the consent information simple, required words such as "research"

may be conceptually difficult or may conjure up uncomfortable associations for participants. Although it was not possible in every instance for the researcher to have direct contact with participants, this practice is preferable, especially in a group setting as it allows the consent and directions to be delivered verbally.

The findings considered in total suggest that factorial survey provides a viable and cost effective alternative to gather information from targeted participants to inform designs of intervention research. One finding of particular importance is that inclusion of a single open response item both added to and clarified the results of statistical analysis. Absent the open item, the Health Coach term might easily have been deemphasized based merely on lack of statistical significance of the parameter estimate. Given the results of this research, further assessment and reporting of factorial survey administration and analysis, as well as evaluation of interventions developed as a result of factorial survey research is warranted.

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CHAPTER 5

DISCUSSION

The first thing I consider in this closing segment is how well this research study addressed the stated aims. Below I restate the aims as described in the introduction to this document along with the assessment plans, which were described in the project prospectus.

- **Specific Aim 1:** To develop and describe a procedure for the process of a factorial survey research design using R software. *Assessment plan for Aim 1.* Successful implementation of the factorial survey process indicates successful completion of this aim. A further measure will be development of a written protocol that will provide direction for others wishing to use this procedure. This protocol may be incorporated in one of the written reports resulting from this research or may comprise an additional report.

Information contained in the first and third manuscripts addressed the first aim and assessment plan. The first manuscript described the development process while the third demonstrated implementation of the process. It is my conclusion that this aim was appropriately addressed by this project.

- **Specific Aim 2:** To identify potential commonalities within the descriptions of the lived experience of initiation of regular participation in physical activity among middle-aged males. *Assessment plan for Aim 2.* The provision of data that informs one or more dimensions on the factorial survey suggests that Aim 2 has been satisfactorily addressed.

Information contained in the second and third manuscripts addressed the second aim and assessment plan. The first manuscript contains a description of the commonalities of the participants' lived experiences and the theme table contained in Appendix B provides some additional detail derived directly from the data. Table 1 in the third manuscript provides a

description of the three items from this data that were incorporated into the factorial survey. It is my conclusion that this aim was appropriately addressed by the findings from this project.

- **Specific Aim 3:** To develop, administer, and analyze the results of a factorial survey instrument designed to assess the priorities of potential participants when considering participation in a PA intervention. *Assessment plan for Aim 3.* Upon completion of the analysis of the factorial survey, the PI will create recommendations for PA interventions for the population of interest. The statement of these recommendations will indicate satisfactory completion of Aim 2.

The third manuscript addressed the items contained in the third specific aim. I have formulated some recommendations for intervention planning but I also formulated some recommendations for refinement of the survey instrument as a result of both qualitative and quantitative findings. It is my belief that the results of this survey could be applied toward intervention planning but that results from an improved survey might inform a better intervention. Given this, it is my conclusion that the third aim was partially addressed by the findings from this project.

The research prospectus predicted potential contributions of this research that also merit revisiting at this time. The first of these related to the cost effectiveness of the factorial survey process when used for intervention planning. I did not identify an explicit basis for comparison in the prospectus, but pilot or actual participant intervention studies are implied. While a direct comparison is not reasonable, it is difficult to imagine any actual intervention that would assess levels of multiple variables including activity, group, time, and coaching preferences and incur less expense than this process which required, in addition to human labor, relatively minimal equipment and supplies (paper, pencils, toner, staples, and four expandable folders). A related condition of this contribution stated was encouragement of wider use and assessment of this process, which I hope to accomplish through future dissemination of the description in presentations and publications.

The other identified potential contribution was use of the findings to create recommendations to improve recruitment and retention of PA intervention programs directed at males. As described in the response to Aim 3 above, I believe that this project provides some direction for both pilot intervention research and further refinement of the factorial survey instrument; I will list these later in this section.

The results of these two research studies can be further assessed both in terms of methodology and implications. From a methodological standpoint, this study could be viewed either as a *mixed methods* single study or two separate but related research studies, which might be considered a *multiple methods* approach. Using the latter criteria, the qualitative interview study provided both unique findings and some basis to inform the following survey portion of the factorial survey research. The inclusion of the single qualitative item might or might not lead the factorial survey research to be categorized as a mixed methods study, depending on how the scope of that portion of the data is defined as well as the criteria used. However, it is clear that this research contained elements of both qualitative and quantitative data collection and analysis.

I chose the specific types of methods within the qualitative and quantitative methodologies because I felt they best addressed the respective research aims. Gorard (2010) has suggested that it is both natural and appropriate to gather or access as much available data of any type as is beneficial toward addressing a research question. According to Gorard, researchers have ultimate responsibility to (direct or indirect) funders, or to those likely to benefit from the research findings, as opposed to researchers' own preferences or prejudices.

One clear illustration of the value of mixed methods comes from an assessment of the factorial survey study. Given sole reliance on the statistical analysis, the parameters reflecting health coaching did not receive statistical significance, yet, references to coaching,

encouragement, and goal setting support as provided by others were frequent in the qualitative piece. Either piece absent the other paints an incomplete picture, although even taken in combination these results suggest a need to further explore this concept and how individuals subjectively define the term coach. The concept of coaching becomes of greater interest when the findings from the IPA interview project related to the role of mentors are considered. It may be that the ideal coaching is not provided by a coach or personal trainer, but rather an individual of the type described by the interview research participants, i.e., someone who has slightly more experience and can provide the type of context dependent information (e.g., which running shoes to buy; how to register to compete in a triathlon) that is not always readily available for a novice. An analogy might be found in the use of peer supporters by some substance abuse or other mental health organizations. Individuals may prefer to have advice come from a person who is similar; they may be more motivated by a successful individual whose accomplishments seem to be more realistic and achievable. These tendencies are supported by elements of Bandura's (1986) social cognitive theory as well as the social comparison theory originally described by Festinger (1954) and updated by Wood (1989). Bandura further noted the importance of sharing or communicating goals with others for increasing commitment to goals.

The ultimate purposes of any research study usually include contributing to the body of knowledge and often include providing direction for further research. I believe that this research has accomplished both of these goals. The interview research provides an in depth examination of a relatively unique group of individuals that also serves as an encouraging demonstration of individuals at middle age who initiated and adhered to regular participation in physical activity for many years, at a level that has provided and continues to provide both physical and mental health promoting benefits. If a small number of individuals can make this self-directed behavior

change, this provides promise that a larger number of individuals can make lasting lifestyle changes given proper levels of support. The results of both the qualitative and quantitative portions of the factorial survey contribute to the description of what constitutes proper levels of support. Taken in combination, these results provide several potential directions, listed below, for further qualitative, quantitative, or mixed methods research:

- Further exploration, as noted above, of how individuals define the term coaching or the type of support, such as goal setting assistance, provided by coaches. This might appropriately be followed up with a revised factorial survey instrument that defines or describes this support differently or more clearly distinguishes among companionship, encouragement, and goal setting.
- Consideration of further or flexible levels of the group factor in a future instrument. In the open response item, several individuals identified small groups consisting of 3-5 individuals. This size of group was not specified on the instrument so might have led to a circumstance in which the preferred alternative was not made available.
- Pilot PA intervention research designed to match participants with a mentor figure who has some prior success with PA adherence but does not represent a personal trainer or other authority figure and instead is more of a ‘buddy.’ Part of the goal of this pilot research should be to explore the structure and depth of this relationship. Results from such pilot intervention research can be used to inform not only larger scale intervention research but also future factorial survey instruments.
- Larger scale administration of a revised factorial survey instrument with a priority on reaching middle aged (35 +) minority participants to further explore preferences of this underrepresented group.

- In depth interviews with male adult non-exercisers or non-adherents to explore other factors that might help further enlighten understanding of the failure of intervention research to connect with this population.

In conclusion, it is my hope that the presentation of these findings will encourage students or researchers to consider mixed methods approaches to health behavior research. I also hope this information encourages further use and assessment of the factorial survey method for intervention planning.

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LIST OF APPENDICES

APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVALS



Sheryl Chatfield

<slchatfi@go.olemiss.edu>

IRB Approval of 14x-028

1 message

Ole Miss IRB <irb@olemiss.edu>

Th

u, Sep 12, 2013 at 9:07 AM To: SHERYL CHATFIELD <slchatfi@go.olemiss.edu>, jntownse <jntownse@olemiss.edu>
Cc: JOHN GARNER

Ms.Chatfield:

This is to inform you that your application to conduct research with human participants, "The experiences of men who became physically active during middle age" (Protocol #14x-028), has been approved as Exempt under 45 CFR 46.101(b)(#2).

Please remember that all of The University of Mississippi's human participant research activities, regardless of whether the research is subject to federal regulations, must be guided by the ethical principles in The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research.

It is especially important for you to keep these points in mind:

- You must protect the rights and welfare of human research participants.
- Any changes to your approved protocol must be reviewed and approved before initiating those changes.
- You must report promptly to the IRB any injuries or other unanticipated problems involving risks to participants or others

If you have any questions, please feel free to contact the IRB at irb@olemiss.edu.

Jennifer Caldwell, PhD

Senior Research Compliance Specialist, Research Integrity and Compliance

The University of Mississippi

212 Barr



IRB Approval of 14x-133

4 messages

Ole Miss IRB <irb@olemiss.edu>

ue, Dec 3, 2013 at 1:59 PM To: SHERYL CHATFIELD <slchatfi@go.olemiss.edu>, JOHN C GARNER <jcgarner@olemiss.edu>

T

Ms. Chatfield:

This is to inform you that your application to conduct research with human participants, "Men's preferences for physical activity interventions: A factorial survey research study" (Protocol #14x-133), has been approved as Exempt under 45 CFR 46.101(b)(#2).

Please remember that all of The University of Mississippi's human participant research activities, regardless of whether the research is subject to federal regulations, must be guided by the ethical principles in The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research

It is especially important for you to keep these points in mind

- You must protect the rights and welfare of human research participants
- Any changes to your approved protocol must be reviewed and approved before initiating those changes
- You must report promptly to the IRB any injuries or other unanticipated problems involving risks to participants or others

If you have any questions, please feel free to contact the IRB at irb@olemiss.edu.

Jennifer Caldwell, PhD

Senior Research Compliance Specialist, Research Integrity and Compliance

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APPENDIX B: PARTICIPANT CONSENT

Description

We are interested in finding ways to help adult men become more regularly physically active. We would like to ask that you help with this research study by completing a survey. We would like for you to use your personal knowledge and experience to rate how attractive each of 8 possible exercise programs would be to a 45-year old man called James who is currently inactive. Each of the 8 programs is described in a few sentences and each is different in one or more ways. In some of these scenarios, James also has a health concern that we have identified. After you have rated all 8 programs, we have left a space for you to offer your thoughts on the exercise program you think James would find ideal. We would like it if you would complete the entire survey, but you may skip any item or items. You may also go back and change your responses at any time, if something you read later on makes you think differently about how you scored an earlier item. When you are finished, please place the survey into the provided envelope. The first three questions ask for some basic information including age range, race or ethnicity, and your exercise habits. Please do not include your name or any identifying information on this survey.

Risks and Benefits

We do not believe that there is any risk to you in completing this survey. The information you are providing will be very helpful to us and other researchers who would like to develop exercise programs for inactive adult men.

Cost and Payments

This survey will take you approximately 5-15 minutes to complete depending on whether you revise your responses and how much time you spend on the written item. There are no costs or payments for participation in this study. After we have collected all of the surveys we need, we will make the summary of results available in case you are interested.

Confidentiality

We are not requesting any personally identifying information in connection with this research. When we report results, they will reflect summary totals of all responses.

Right to Withdraw

You do not have to take part in this study. If you start the survey and decide that you do not want to finish, all you have to do is stop and discard the survey form. Because we are not collecting any personally identifying information, we will not be able to remove your survey from the research after you have placed it in the envelope.

IRB Approval

This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). The IRB has determined that this study fulfills the human research subject protections obligations required by state and federal law and University policies. If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the IRB at (662) 915-7482.

APPENDIX C: IPA PARTICIPANTS

Participant	Age at initiation of PA	Current age	Primary activities
A	50	62	Swimming; hiking
B	38	64	Bicycling; running
C	40	65	Bicycling; triathlon

APPENDIX D: IPA MASTER TABLE
OF THEMES

IPA Master Table of Themes

Super-ordinate	Sub Themes	Participant	Data	Line
INFLUENTIAL OTHERS				
	Mentoring/ Being Mentored	A	Whenever there's somebody who's a stranger . . . I like to help them feel a part of that sort of group	288-298
		B	So I bought a bike for \$60 or something like that, and started hanging out with these guys, and found how much fun it was I wish I could change (Co-worker) some, is who I wish I could change	87-89 708-709
		C	He says "You need to try [triathlons]. You just need to get some good shoes and learn to stretch I'm trying to convince [co-worker] to get a bicycle.	161-164 369-375
	Social and Family Influences	A	As of about 2001, or 2002, is when this concerted hiking and backpacking with my son started. I was in terrible shape, and so a regular exercise program made it possible for me to do those things and actually to get better at it.	147-151
		B	My dad had drinking problems and . . . once you decide to quit – you tend to fall back, and you start and then you fall back. And so, just recognize that, once you have control of your life and you're not drinking . . . how much more you do have control, how much more focused you can be	759-766
		C	She (wife who is ill) still wants me to participate and all this kind of stuff. [My dad] was active until six months before he died . . . and he had a really good quality of life . . . and that's the factor I think that will keep me going	360-361 520-521, 533-537

	Activity Identity	A	<p>I've done it now for so long that nobody even thinks to ask me if they can visit with me early in the morning, because they know the answer's going to be, "well, I'm in the pool until I get out at 8:30."</p> <p>The notion that I'm a (job title) and I'm going to (professional responsibilities) doesn't come up in the pool, so it's a very free and liberating kind of thing.</p>	464-68 299-302
		B	<p>Like nice afternoons, they (co-workers) say: "Looks nice out there – are you sneaking out today?"</p> <p>When I ride with (local residents), they want to know . . . what's happening here, what's going on there, and stuff. So I don't really get away . . . I just don't really want to get into another discussion with someone about something going on here, because it's kind of defeating my whole purpose of why I'm out there.</p>	692-694 316-327
		C	<p>Most everybody knows that I do it – all of the friends . . . they'll ask me: "How'd you finish?" in this race, if I did one or something.</p>	390-393
IN AND OUT OF CONTROL				
	Being in Control	A	<p>I do this every day; I do it on a regular basis. And I know that (starting out) [is] going to remind me of my age . . . but fundamentally, I know that I'm going to be able to keep going.</p> <p>That sort of knowledge, that, that regular process gives you that . . . I guess it is confidence</p>	559-564 564-566
		B	<p>(in the past) all of the sudden I started feeling really good about myself; I was following a strict regiment, I was very focused. So when I decided (later) that I needed to get a little more control of my life, I started running again.</p>	69-75

			So they kind of reinforced each other – being in control of my life and also. . . wanting to improve in your active lifestyle	122-125
		C	Off and on, I’d worked out through he years, but I’d never stuck it out. This (swimming) was the first thing I could stick with.	104-106
	Not Being in Control	A	I was driving back and forth to handle various aspects . . . and I wasn’t swimming hardly at all. And I felt terrible. And I gained weight, and it was like a downward spiral, you know. And then I got back in the pool . . . corrected that trajectory.	194-199
		B	After I graduated, I kind of fell back into my old pattern of staying up all night and running around doing things that I shouldn’t be doing.	39-41
		C	You’re not getting any exercise playing (tennis) doubles. And I got frustrated and gave it up. And then I’m starting to put on the pounds . . . this was really beginning to be frustrating for me	39-47
			And I was at a football game and a friend kind of patted me on the belly, with his finger and said, “Hey, you’re catching the rest of us”	427-429
	Strategies for Control	A	And that (scheduling no work before 9 a.m.) pretty much put a lock on that time frame right before it, so that I could do that.	519-520
		B	You have to learn that, if I ride with a group, I want to know exactly where we’re going and who we’re going with and all of that stuff, so I can enjoy the ride. I’m pushing myself . . . it’s structure. . . I’m three miles from my car. I go on the same road. People who drive on the road see me there all of the time	308-311 361-364
		C	And, having that knowledge, and realizing what was	135-145

			important . . . as soon as I got back (from vacation), the very next day, I hit the pool. And so that's how I got rolling. And how I managed to keep it up.	
	Activity Influence on Other Aspects	A	I think my (job responsibilities) are better; I think my interactions . . . are better Everyone . . . my kids know that when I am swimming regularly, I'm in better shape, and that affects everything	603-604 377-379
		B	And so all of the sudden . . . my focus was there, but my success started; I became much more successful at my job.	106-109
		C	Moved to present home because he formerly lived in a place where he could not bicycle out his door (from written notes)	593-595
WHAT I GET FROM ACTIVITY				
	Cleaning out my brain	A	I find that I'm personally better off; I'm in a better frame of mind when I have regular aspects to my life, a certain regularity. Then usually, if there was something that was bugging me at the beginning of the swim, but the end of it, I've usually forgotten what it was . . . that's the value of doing a mile, is it gives you time to forget all of that stuff you were fretting about.	180-183 319-327
		B	I think about things and I get a different perspective on what problems I have. I'll say I don't come up with necessarily solutions, but I do notice I do look at things a little differently.	269-272
		C	N/A	
	Relishing the effort	A	I know that the first lap, or the first 200 yards, or whatever it happens to be are going to remind me of my age and how sore my muscles are . . . but fundamentally, I know that I'm going to be able to keep going	559-564

			I know that, that first instance when I lift my 40 pound pack on my back and know that we're hiking 17 miles that particular day that I'm going to be tired at the end of the day. And that pack sure is heavy first think in the morning, and five minutes down the trail, it feels like I'm swimming again.	571-583
		B	What I do now is . . . hill repeats and do it on my own, and wear a heart monitor. And I know if I'm up in the 160, 150 beats per minute, I'm pushing myself . . . it's structured – I do 10 of them, I'm three miles from my car. You've just got this little fatigue feeling, and can't wait to go home and eat and take a shower, and maybe take a 20-minute nap. It's fun.”	358-363 278-281
		C	And even when you run – I mean, I can run an hour, and that's really taking everything I've got in my legs . . . I can keep my heart rate up for the same amount for three hours on a bicycle. So you can get so much more long term aerobic, to do that things that help you, on a bicycle. when we ride in groups , when we hit the hills and everybody takes off, and I'm doing my best to hang with the young guys that are in their 30s and 40s, and some of them I can stay pretty close to the people that are stronger can do more pulling and so everybody can stay (together) . . . you can have the little spurts where you can sprint or do some hills and then you get back together.	378-385 401-407 447-451
	Other Health Benefits	A	Better hiker, longer distances, and all of that kind of stuff.	155-156

			My father and my brother have diabetes problems, and the doctor (says), “So, you’re basically dealing with diabetes through diet and exercise.”	1119-1122
		B	It was really to support my idea to quit drinking, and to, I thought I could smoke and still exercise for a while.	76-78
		C	I used to get sick probably twice a year in the winter . . . and from the time I started swimming, that very first winter, all of the way to now, I think I’ve only gotten sick twice in a winter two times. And many winters, I’ve gone through the entire winter and not caught a cold.	305-312
THE FUTURE				
	What I see myself doing	A	<p>I basically want to keep hiking and be there when (my son) has kids. I want to be the grandpa that can actually still do that.</p> <p>When (my daughters) start their families, I basically want to be fit enough to be a part of their lives.</p> <p>I want to be able to walk up and down the stairs in the stadiums</p>	<p>1042-1045</p> <p>1052-1054</p> <p>1067-1068</p>
		B	I’m looking forward to it (retirement) . . . I just see myself as having lots of time to be able to go biking and go do races that I probably hadn’t done before. . . . I see it as being central to whatever I do for retirement.	791-802
		C	<p>I’m planning to really work hard training this winter so I can come out of the winter in good shape and try to do one last run at it.</p> <p>So I plan on doing it – not quite as aggressively at some point, but I still plan on doing it. And keep getting enough</p>	<p>456-458</p> <p>554-558</p>

			to get the heart rate up and keep going for a long time.	
	Inspiration	A	So (person's) last trip out of the [Grand] Canyon was a...7 mile hike, up 4000 feet in elevation. And he did that when he was in his mid-80s. And I thought, yeah, I could do that.	1015-1020
		B	He (Fast cyclist) would clean everybody's clock without even trying . . . he's 66 years old . . . (it's) good, he's trying, I like that	405-406, 531, 562-563
		C	There's a guy that's around 80 that runs a bunch of these 5ks around here . . . I've seen him in a couple of races. To be still running at that age.	568-571

APPENDIX E: SAMPLE FACTORIAL SURVEY

Description

We are interested in finding ways to help adult men become more regularly physically active. We would like to ask that you help with this research study by completing a survey. We would like for you to use your personal knowledge and experience to rate how attractive each of 8 possible exercise programs would be to a 45-year old man called James who is currently inactive. Each of the 8 programs is described in a few sentences and each is different in one or more ways. In some of these scenarios, James also has a health concern that we have identified. After you have rated all 8 programs, we have left a space for you to offer your thoughts on the exercise program you think James would find ideal. We would like it if you would complete the entire survey, but you may skip any item or items. You may also go back and change your responses at any time, if something you read later on makes you think differently about how you scored an earlier item. When you are finished, please place the survey into the provided envelope. The first three questions ask for some basic information including age range, race or ethnicity, and your exercise habits. Please do not include your name or any identifying information on this survey.

Risks and Benefits

We do not believe that there is any risk to you in completing this survey. The information you are providing will be very helpful to us and other researchers who would like to develop exercise programs for inactive adult men.

Cost and Payments

This survey will take you approximately 5-15 minutes to complete depending on whether you revise your responses and how much time you spend on the written item. There are no costs or payments for participation in this study. After we have collected all of the surveys we need, we will make the summary of results available in case you are interested.

Confidentiality

We are not requesting any personally identifying information in connection with this research. When we report results, they will reflect summary totals of all responses.

Right to Withdraw

You do not have to take part in this study. If you start the survey and decide that you do not want to finish, all you have to do is stop and discard the survey form. Because we are not collecting any personally identifying information, we will not be able to remove your survey from the research after you have placed it in the envelope.

IRB Approval

This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). The IRB has determined that this study fulfills the human research subject protections obligations required by state and federal law and University policies. If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the IRB at (662) 915-7482.

I am at least 18 years old Y N

If you not at least 18 years old, you are not eligible to participate in this research. If you are not at least 18, please do not complete the survey items and place the form in the envelope provided.

Age (Please check one)	
18-29	
30-39	
40-49	
50-59	
60-69	
69 +	

Race (Check all that apply)	
Black	
Hispanic	
Asian or Pacific Islander	
American Indian or Alaska Native	
White	
Other (please write in):	

How often do you currently exercise? (Please check one <u>or</u> write a description in the last item)	
5 or more days per week, most weeks of the year	
3 or 4 days per week, most weeks of the year	
1 or 2 days per week, most weeks of the year	
I have not exercised regularly for the last 1 to 2 months	
I have not exercised regularly for the last 3 to 6 months	
I have not exercised regularly for more than 6 months	
Other (please describe):	

Directions:

James is 45 and does not exercise on a regular basis. He would like to start.

On the following pages, there are 8 different versions of an exercise program. In some of these scenarios, James also has specific health concerns.

I would like to know how likely you think James would be to begin to exercise regularly if he was offered each of these programs, based on your knowledge and experience. Some of these programs include equipment (for instance: bicycles) or facilities (for instance: pools). You can assume for the purposes of this survey that James will be given equipment or facility use if he chooses those programs.

For each program, you may assign a score between 0 and 100, with 0 meaning that you think James is not likely to try this program and 100 meaning that you think James would be very likely to begin to exercise regularly if he was offered this program. *You may go back and revise your ratings at any time.* Indicate your score by making a mark anywhere on the line. If you want to change your score, you may erase or X out your prior score, or circle your revised score.

After you have considered all of these programs, there is a space at the end of this form for you to describe the exercise program you think would be most likely to inspire James to exercise regularly. If you complete this portion, you can use any of the features from the programs contained in this survey, or you can suggest your own ideas. You do not need to complete this section if you do not wish to. After you have finished, please place your completed pages in the envelope provided.

Survey # X

Program 8

The activity is weight training 3 days per week and jogging 2 days per week

James will be exercising in a group of 25

James will be exercising in the morning

The health coach helps James set goals once a week

James has a family history of heart disease

Between 0 and 100, with zero meaning *not at all likely* and 100 meaning *very likely*, how likely is James to begin exercising if Program 8 is offered?

(Place a mark anywhere on the line)*

Not

At all

Likely

Very

likely

0 | | | | | | | | | | | | | | | | | | | | 50 | | | | | | | | | | | | | | | | | | | | 100

*(THIS LINE IS NOT AT THE PRECISE SCALE)

I think the ideal exercise program for James (you can use ideas from the programs in this survey or come up with your own ideas for this response):

Thank you for your time.

APPENDIX F: DETAILED DEMOGRAPHIC INFORMATION AND
ITEM COMPOSITION OF SURVEYS

Demographic information

UM*: 32 participants = 256 observations

AR**: 21 participants = 167 observations (1 missing program score)

4 unusable/1 from AR (no verification of age)

Age Band	UM Frequency	AR Frequency	Total
18-29	9	6	15
30-39	9	8	17
40-49	7	5	12
50-59	6	2	8
60-69	1	0	1

Self-identified race/ethnicity	UM Frequency	AR Frequency	Total
Black	5	12	17
Hispanic	1	0	1
White	26	8	34
Other	0	1	1

Reported current exercise	UM Frequency	AR Frequency	Total
5 or more days/week; most weeks	4	4	8
3-4 days/week; most weeks	8	3	11
1-2 days/week; most weeks	8	6	14
No regular exercise, last 1-2 months	2	3	5
No regular exercise, last 3-6 months	0	1	1
No regular exercise, more than 6 months	10	4	14

*UM: University of Mississippi non-administrative staff

**AR: Contract employees of Aramark food service working on U of M campus

Item composition of completed surveys

Activity	Frequency/ %
Basketball	66 / 15.57
Bicycling	59 / 13.92
Jogging	83 / 19.58
Swimming	84 / 19.81
Tennis	51 / 12.03
Weights/Jogging	81 / 19.10

Group	Frequency/%
Alone	91 / 21.46
25	83 / 19.58
8 - 12	89 / 20.99
Group once per week; alone otherwise	79 / 18.63
One partner	82 / 19.34

Time of Day	Frequency
Evening	145 / 34.20
Midday	130 / 30.66
Morning	149 / 35.14

Work hours	Frequency/%
Null	220 / 51.89
Can work flexible hours for exercise	204 / 48.11

Coach	Frequency/%
Null	109 / 25.71
Weekly Goals	110 / 25.94
Monthly Goals	85 / 20.05
Participant contacts	120 / 28.30

Health Concerns	Frequency/%
Family history heart disease	90 / 21.23
High blood pressure	76 / 17.92
No current health concerns	96 / 22.64
Joint pain/arthritis	79 / 18.63
Overweight	83 / 19.58

VITA

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Spring 2014

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EDUCATION

The University of Mississippi, University, MS

Ph.D. candidate, Health and Kinesiology, with emphasis health behavior and promotion.

Dissertation: *Developing a physical activity intervention targeted at middle-aged males: A mixed methods research study*. Expected graduation: May 2014.

Nova Southeastern University, Ft. Lauderdale, FL.

Graduate certificate in qualitative research (18 hour program). Expected completion: August 2014.

The University of Southern Mississippi, Hattiesburg, MS

Master of Science, Recreation, with emphasis therapeutic recreation. December 2008.

The Ohio State University, Columbus, OH.

Bachelor of Arts, Communication, with emphasis organizational communication. August 1986.

INSTRUCTIONAL EXPERIENCE

INSTRUCTOR OF RECORD

The University of Mississippi

ES 440 Behavioral aspects of exercise (Spring 2013; Fall 2013)

ES 351 Measurement and statistics in exercise science (Fall 2012; Spring 2013)

HP 204 First Aid (Summer 2011; Summer 2012)

HP 191 Personal and community health (Fall 2010, 2011, 2012; Spring 2011, 2012; Summer 2011, 2013)

PRM 473 Administration and supervision of therapeutic recreation programs (Fall 2011)

PRM 372 Procedures in therapeutic recreation (Spring 2011; 2012)

PRM 262 Introduction to therapeutic recreation (Summer 2012)

PRM 194 Foundations of leisure and recreation (Fall 2010)

The University of Southern Mississippi

HPR 453 Professional issues in therapeutic recreation (Spring 2010)
HPR 452 Recreation programs for the older adult (Spring 2010)
HPR 451 Processes and techniques in therapeutic recreation (Fall 2009)
HPR 450 Therapeutic recreation programming (Fall 2009)
HPR 351 Community recreation services for people with disabilities (Spring 2010)
HPR 322 Theory of recreation program planning (Fall 2009)
HPR 140 Bicycling (Fall 2006; Spring 2007)
HPR 105 Concepts in physical fitness (Fall 2006; Spring 2007)
HPR 102 Fitness Walking (Fall 2006; Summer 2006; Spring 2007)

PROGRAM COORDINATOR

The University of Southern Mississippi
Recreation, 2009-2010

GUEST LECTURES

The University of Mississippi
HP 625 Research design and evaluation: April 25, 2013
PRM 372 Procedures and techniques in TR: Jan 22, 29, Feb 5, 12, 19, 2013
HP 750 Doctoral seminar: Jan 29, Feb 5, 12, 2013
HP 626 Statistical analysis I: October 30, 2012
PRM 200 Park and recreation program leadership: Feb 23, 2012

TEACHING ASSISTANT

The University of Mississippi
HP 626 Statistical analysis I (Fall 2012)

PRACTICUM/INDEPENDENT STUDY SUPERVISOR

The University of Mississippi
PRM 490 (Spring 2012)
The University of Southern Mississippi
HPR 210 (Fall 2007; Spring 2008)

PEER REVIEWED PUBLICATIONS

PUBLISHED

Chatfield, S.L., Mumaw, E. Davis, T. & Hallam, J.S. (2014). Pre-test data and lessons learned from a group research project examining changes in physical activity behavior following construction of a rails-to-trails facility. *Journal of Community Health, 39(2), 386-393*. DOI: 10.1007/s10900-013-9775-9

Cottingham II. M.P. Byon, K., **Chatfield, S.**, & Carroll, M. (2013). Examining the influence of relationship to disability on the motivations of wheelchair basketball spectators. *Disability Studies Quarterly, 33(3)*, <http://dsq-sds.org/article/view/3345>.

Cottingham II, M.P., **Chatfield, S.L.**, Gearity, B.T., Allen, J.T., & Hall, S.A. (2012). Using points of attachment to examine repatronage and online consumption of wheelchair rugby spectators. *International Journal of Sport Management*, 13(2), 160-172.

UNDER REVIEW

Chatfield, S.L. Characteristics of lifelong physically active older adults.

Walsh, S.M., Umstadd Meyer, M.R., **Chatfield, S.L.**, & Hallam, J.S. Rural older adult perspectives on lifestyle activities: A content analysis using a new comprehensive mobility framework.

Chatfield, S.L., Cooper, R., Holden, E. & Macias, K. Enhancing the experience: A multiple case study of students' experiences using arts-based techniques learning to conduct qualitative research.

IN PROGRESS

Cottingham, M., **Chatfield, S.L.**, Velasco, F., & Florida, B. Perceptions of inspiration in the context of disability sport: A focus group study.

Cambron, A. & **Chatfield, S.L.** Perceptions of barriers to active recreation among members of the lesbian, gay, bisexual, transgender and queer (LGBTQ) communities.

Chatfield, S.L. The science and art of transcription: Use of technology to facilitate acceptance, investment, and growth.

INVITED BOOK CHAPTERS

IN PRESS

Cooper, R., **Chatfield, S.L.**, Holden, E., & Macias, K. Creative combinations in peace education: The use of collage and poetry in teaching, researching, and practicing peace. Chapter in L. Finley, J. Connors, and B. Wien (eds.) *Teaching Peace Through Popular Culture*. Charlotte, NC: Information Age.

IN PROGRESS

Chatfield, S.L. & Hallam, J.S. Mixed methods research in substance abuse. Chapter in J. VanGeest, T. Johnson, & S. Alemagno, (eds.) *Handbook of Research Methods in the Study of Substance Abuse*. New York, NY: Springer.

BOOK REVIEWS

PUBLISHED

Chatfield, S.L. (2013). Student versus scholar: A review of *Qualitative data analysis: An introduction (2nd ed.)* by Carol Grbich. *The Qualitative Report*, 18(Rev.20), 1-4.
<http://www.nova.edu/ssss/QR/QR18/.pdf>

UNDER REVIEW

Chatfield, S.L. Toward a more qualitative approach to quantitative data analysis: A review of *Indigenous statistics: A quantitative research methodology* by Maggie Walter and Chris Andersen.

PRESENTATIONS

Cottingham, M., **Chatfield, S.**, Velasco, F., & Florida, B. *The impact of disability and the supercrip image on perceptions of inspiration in sport: A qualitative focus group study.* Accepted (oral presentation) at the North American Society for Sport management (NASSM) 2014 Conference, Pittsburgh, PA, May, 2014.

Chatfield, S.L. *Switching channels from “Lifetime” to “Spike TV”:* A female researcher explores men’s exercise behaviors. Accepted (oral presentation) at the Sarah Isom Center Student Gender Conference, The University of Mississippi, Oxford, MS, March, 2014.

Chatfield, S.L. *The science and art of transcription.* Presented (oral presentation) at The Qualitative Report: TQR 2014, Nova Southeastern University, Fort Lauderdale, FL, January 17, 2014.

Cooper, R., & **Chatfield, S.** *Pedagogical research on arts-based qualitative research.* Presented (panel presentation) at The Qualitative Report: TQR 2014, Nova Southeastern University, Fort Lauderdale, FL, January 17, 2014.

Chatfield, S.L. *A qualitative exploration of characteristics of lifelong physically active older adults.* Presented (oral presentation) at the 141st American Public Health Association Annual Meeting, Boston, MA, November 2013. *Considered for the APHA Retirement Research Foundation Doctoral Student Research Award (not awarded).*

Chatfield, S.L., Mumaw, E., & Davis, T. *Lessons learned while planning and implementing a group research project designed to assess changes in physical activity behavior as a result of a newly constructed multi use trail.* Presented (poster presentation) at the 141st American Public Health Association Annual Meeting, Boston, MA, November 2013.

Chatfield, S.L. *Gender roles and constraints: Attitudes toward sports participation among Kenyan adolescent females.* Presented (oral presentation) at the Sarah Isom Center Student Gender Conference, The University of Mississippi, Oxford, MS, February 2013.

Cottingham, M. & **Chatfield, S.** *Examining the influence of disability and relationship to disability on the motivations of spectators attending the 2011 Collegiate Wheelchair Basketball National Championships.* Presented (oral presentation) at the College Sports Research Institute Conference on College Sport. University of North Carolina, Chapel Hill, NC, April 2012.

Chatfield, S.L. *Beyond APIE: Using purposeful recreation to facilitate sustainable behavior change.* Presented (oral presentation) at the Mississippi Recreation and Park Association Annual Conference, Olive Branch, MS, September 2011.

Chatfield, S.L. *PAPERS: Practitioner-academic partnerships for essential research.* Presented (oral presentation) at the Mississippi Recreation and Park Association Mid-Year Therapeutic Recreation Conference, Whitfield, Mississippi, April 2011.

Cottingham II, M., Gearity, B., **Chatfield, S.**, & Drane, D. *Using points of attachment to analyze the consumption behavior of quad rugby spectators.* Presented (oral presentation) at The 8th Annual Conference of the Sport Marketing Association, New Orleans, LA, October 2010.

Cottingham II, M. & **Chatfield, S.L.** *Legal and ethical responsibilities of providing disability inclusive and population specific programming.* Presented (oral presentation) at the American Therapeutic Recreation Association Mid-Year Conference, Biloxi, MS, February 2010.

Chatfield, S.L. *Best practices for senior adult recreation.* Presented (oral presentation) at the Area Conference on Aging, The University of Southern Mississippi, Hattiesburg, MS, January 2010.

Chatfield, S.L., Williams, M., Hazlitt, M. & Green, F.P. 1) *Free verse poetry*, 2) *Low or no cost leisure resources.* Presented (oral presentations) at the Mississippi Recreation and Park Association Mid-Year Therapeutic Recreation Conference, Whitfield, MS, April 2008.

WORKSHOPS

Chatfield, S.L. & Vinson, L. *A symphony of sights, a rainbow of sounds: Purposeful recreation targeting individuals with sensory impairments.* One-day staff workshop held at the North Mississippi Regional Center, Oxford, Mississippi, May 2012.

Helms, D. & **Chatfield, S.L.** *Meaningful Motions.* Community recreation workshop held at the Oxford Activity Center, Oxford, MS, May 2011.

Chatfield, S.L. & Johnson, L. *From Adaptation to Zen: Purposeful recreation programs for persons with developmental disabilities.* One-day staff workshop held at the North Mississippi Regional Center, Oxford, MS, April 2010.

Chatfield, S.L. *Reach: Purposeful recreation programming for students in the gifted program.* Activity workshop held at Thames Elementary School, Hattiesburg, MS, April 2008.

Chatfield, S.L. *Bridges: Inclusive recreation programming for students in gifted and special educational programs*. Activity workshop held at Burger Middle School, Hattiesburg, MS, October 2007.

SERVICE

Abstract Reviewer. 142nd American Public Health Association Annual Meeting; physical activity interest group. March 2014.

FUNDING

The University of Mississippi Graduate School Dissertation Fellowship Grant. Spring Semester, 2014. \$6500.

Lego Children's Grant. Facilitation and assessment of disability inclusive recreation at Thames Elementary School, Hattiesburg, MS. January, 2008. \$5000. (Not awarded.)

RESEARCH SOFTWARE

Quantitative analysis software: "R" versions 2.15 – 3.02; SPSS/PASW versions 18-21; AMOS versions 18-21; SAS version 9.3

Qualitative analysis software: NVivo versions 8 – 10; Hyperresearch version 3.5; Dedoose.

Transcription software: ExpressScribe (Win and Mac OS); F4; F5; Transana version 2.5.

Audio/visual software: Wavepad version 5.34; Audacity, 1.3.14; Final Cut Pro X

CERTIFICATIONS AND MEMBERSHIPS

Certified Therapeutic Recreation Specialist (C.T.R.S.), January 2009 – present.

Member- American Public Health Association (APHA)

Member - American Alliance for Health, Physical Education, Recreation, and Dance (AAPHERD)