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Examining Sex Differences in Physical Activity Motivation

Anna Isabelle Matrosovs Smallwood
Huron University College

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Examining Sex Differences in Physical Activity Motivation

Anna Isabelle Matrosovs Smallwood

Huron University College at Western University

Abstract

The purpose of this experiment was to examine the influence of emphasizing either the health benefits or social benefits of physical activity and the influence of the participant's biological sex on their completion of a physical activity related goal. Male and female participants were given a half-page, written cue to guide them towards focusing on either health or social motivations behind physical activity. All participants were assigned the goal of losing two pounds in two weeks. Screening procedures took place to eliminate any participants who possibly had an eating disorder. It was hypothesized that participants of different genders who had the same motivation cues would show a smaller biological sex difference than those with different motivational cues. After two weeks had passed, the participants were asked to indicate whether they had or had not achieved the assigned goal. When comparing the four participant groups of Male-Health, Male-Social, Female-Health, and Female-Social, there were no significant differences in the amount of participants who achieved the assigned goal. The results were examined in terms of comparing males and females, and health emphasis and social emphasis.

Keywords: biological sex differences, health motivation, physical activity motivation, social motivation.

Human beings are often curious about understanding why they make the choices or do the actions that they do. An aspect of this that is often focused on is whether or not males and females differ in their reasoning behind certain actions. Branching off of this, many studies have been conducted with the purpose being to analyze the motivational differences between males and females. Specifically, studies have found differences between the motivation behind female and male physical activity. Various different factors have been found to influence the motivation of males and females to engage in physical activity or sports. In one study, males were found to

put particular emphasis on achievement oriented motivations, while females placed importance on social motivators (Wold and Kannas, 1993). One study found a biological sex difference when it came to health motivation (Iannotti et al., 2013). When examining males and females, males were found to have health motivation related to physical activity (Iannotti et al., 2013). However females were not shown to have health benefits as a motivation for physical activity (Iannotti et al., 2013). In the same study, social motivation was found to be a significant type of motivation for both males and females (Iannotti et al., 2013). In another study female participants were shown to report higher social motivations than male participants (Wold and Kannas, 1993). A third study found that males placed more importance on intrinsic motivators and females more importance on extrinsic motivators (Verkooijen et al., 2009). In the study the example of an intrinsic motivator was competition and the example of an extrinsic motivator was losing weight (Verkooijen et al., 2009). In general however, health motivation for physical activity would be classified as a more intrinsic motivator and social motivation for physical activity would be a more extrinsic motivator based on their driving forces. Based on these studies, it has been shown that the importance of health and social motivators has varied between genders.

Another study on sex differences in physical activity motivation examined whether age played a factor as well (Wold and Kannas, 1993). When it came to health motivation, there was no difference between males and females in the 11- and 13-year-old age groups, however there was a gender difference with the 15-year-old age group (Wold and Kannas, 1993). Another effect of age was indicated when examining the differences in the importance of social motivators for physical activity, specifically sport motivation, for females (Wold and Kannas, 1993). The data indicated that the importance of social motivators increased as the age group of

the females increase (Wold and Kannas, 1993). Due to this influence of age, the current experiment chose to use university students as participants in the hopes that using an older age group than in previous studies would aid in having biological sex differences in regards to physical activity motivation.

In one of the aforementioned studies, region was determined to be an influence on which motivators are considered important to either gender (Iannotti et al., 2013). It was suggested that the reason these differences based on region were found was that there was different emphasis placed on the different benefits of physical activity based on the region (Iannotti et al., 2013). These emphases varied across both regions and genders. Due to the apparent influence of the emphasis on the benefits of physical activity on physical activity motivation across genders, this experiment was designed to determine if manipulating the emphasis on the benefits would influence the apparent gender differences. Specifically, this experiment attempted to manipulate the biological sex difference that tends to be found between males and females by putting emphasis on either health or social motivators to complete a physical activity related goal. It was thought that by placing emphasis on either social or health motivators behind physical activity, the biological sex difference between males and females would have reduced and both sexes would have been shown to value the motivator that has been emphasized in their group. Furthermore, it was believed that the differences between groups of different biological sexes and different motivations would show gender differences similar to those that have been found in previous studies.

Method

Participants

Participants in this study were undergraduate students at Western University or one of its affiliate colleges. Participants were recruited using posters at Huron University College, posted with the permission of the Huron University College Student Council, and by verbal invitations. The Huron University College SONA System was employed as well however no participants were recruited from this system. The participants' ages ranged from 19 to 27. Fifteen males and 18 females participated in the in-person sessions. Of these 33 participants, three males and three females were asked not to continue in the study based on their scores on the Eating Attitudes Test (EAT-26) questionnaire. After the disqualifications, there were six males in the health group, six males in the social group, seven females in the health group and eight females in the social group.

Materials

The materials used in this study were information letters and consent forms, the EAT-26 questionnaire, an electronic scale, a custom weight chart, motivational cues, and a debriefing form. The consent form included two pledges and a space for the participant to record their email address. The pledges were to ensure participants in the study were not influenced by other participants, especially in regards to their motivational cues. Their email address was requested for two reasons. Reason one was to allow the researcher to contact the participant if their score on the EAT-26 indicated the possibility of an eating disorder. Reason two was to allow the researcher to contact the participant when two weeks had passed to determine whether the participant had achieved their goal. The EAT-26 was a highly reliable and valid established test which indicates whether participants have a possibility of an eating disorder based on their

answers (Garner, 2009). The EAT-26 has been reproduced with permission. The questionnaire consisted of three sections on which varying scores indicate the possibility of an eating disorder. The first section gathered background information about the participant and allowed the researcher to calculate their Body Mass Index (BMI) (Garner, 2009). If the participant's BMI was in the "underweight" or "extremely underweight" range, then it was counted as an indication of a possible eating disorder (Garner, 2009). The second section consisted of 26 questions that were answered on a scale of "always" to "never" (Garner, 2009). The answers were then scored and if the participant received a score of 20 or more than it indicated the possibility of an eating disorder (Garner, 2009). The third section consisted of behavioural questions and depending on which answer the participant checked off for the specific question it may have been a possible indication of an eating disorder (Garner, 2009). The items in the three sections were also organized into three subscales when scoring: dieting, bulimia and food preoccupation, and oral control (Garner, 2009). This measure was included to screen out any participants who may have an eating disorder because of the provided goal being to lose two pounds. Ethically, the researcher had to verify that they were not causing someone who is underweight or has an eating disorder to lose any weight. An electronic scale was provided for participants to use to establish a base weight and, if they so requested, to allow them to determine if they had achieved their goal. A custom weight chart was provided for the participants to record their weight on after weighing themselves if they wished to. The weight chart listed the participant numbers from 1 – 60 and had a slot for the participant to record their weight beside their number. There were also some random weights written on the chart. This was done to assure that no participants could determine other participants' weights. The motivational cues used in this study were two, half-page typed information sheets. One sheet emphasized the health benefits of physical activity and

maintaining a healthy weight, the other emphasized the social benefits. These sheets were intended to cue the participant to think about their goal with the mindset of either the social benefits or the health benefits. The participants were not aware that the cues varied.

Procedure

Once signed up to participate in the study, the participants were randomly assigned to one of the four experimental groups according to a specific process. First, the participant was sorted according to their biological sex. Second, the participant was sorted randomly into one of the two groups using a random number generator with the number one to represent health and the number two to represent social. When one of the two groups reached seven participants, then all of the participants of that biological sex were sorted into the other group until that group also reached seven. Once both groups were at seven, then the participants were sorted using the random number generator again. The participants were also assigned a random participant number from 1 – 60 using the same random number generator.

After the sorting process, the first component of this study was an in-person session in which the letter of information and consent form were given to the participant, the EAT-26 questionnaire was completed, and the participant read one of the motivational cues, in the stated order. All participants were told in the letter of information and in the in-person session that their goal was to lose two pounds in two weeks. An electronic scale was provided during this session to allow participants to weigh themselves to establish a base weight and record their current weight on the EAT-26 questionnaire. The weight chart with participant numbers and a space to record their weight was provided on a table beside the electronic scale. Once the participant returned their EAT-26 questionnaire, the researcher recorded their random participant number in the top right corner. This was done to allow the researcher to know which participant filled out

each EAT-26 in case a participant had to be contacted regarding their score. A participant would be contacted via email if their score on the EAT-26 indicated a possibility of an eating disorder. The participant would be informed of how they scored, and given some links and resources to further pursue the possibility of an eating disorder diagnosis by a professional if they so wished to. The researcher gave the participant a motivational cue for the group they were assigned to and asked them to read the cue.

Close to two weeks after the in-person session, participants were emailed to be reminded that their two weeks was almost finished and asked to set up an in-person session to weigh themselves within two days of their two week date if they required a scale to weigh themselves. Two weeks after the in-person session, the researcher emailed the participants to determine if they had achieved their goal of losing two pounds in two weeks. All emails were answered within five days of the participant's two week date. Once the participant replied to the email with a statement about their achievement of their goal, a debriefing form was emailed to the participant. The participant was also informed that they had received an entry into the incentive draw. The draw was conducted on April 8th, by the course administrator. Two participants won one \$25 gift card each. The participants were contacted and they chose a gift card from a list provided by the researcher.

Results

The number of participants who achieved and who did not achieve their goal of losing two pounds in two weeks is illustrated in the chart in Figure 1. The chart has the participant divided into their assigned groups: Male and Health, Male and Social, Female and Health, and Female and Social. The Male-Health group had two participants who achieved the goal and four

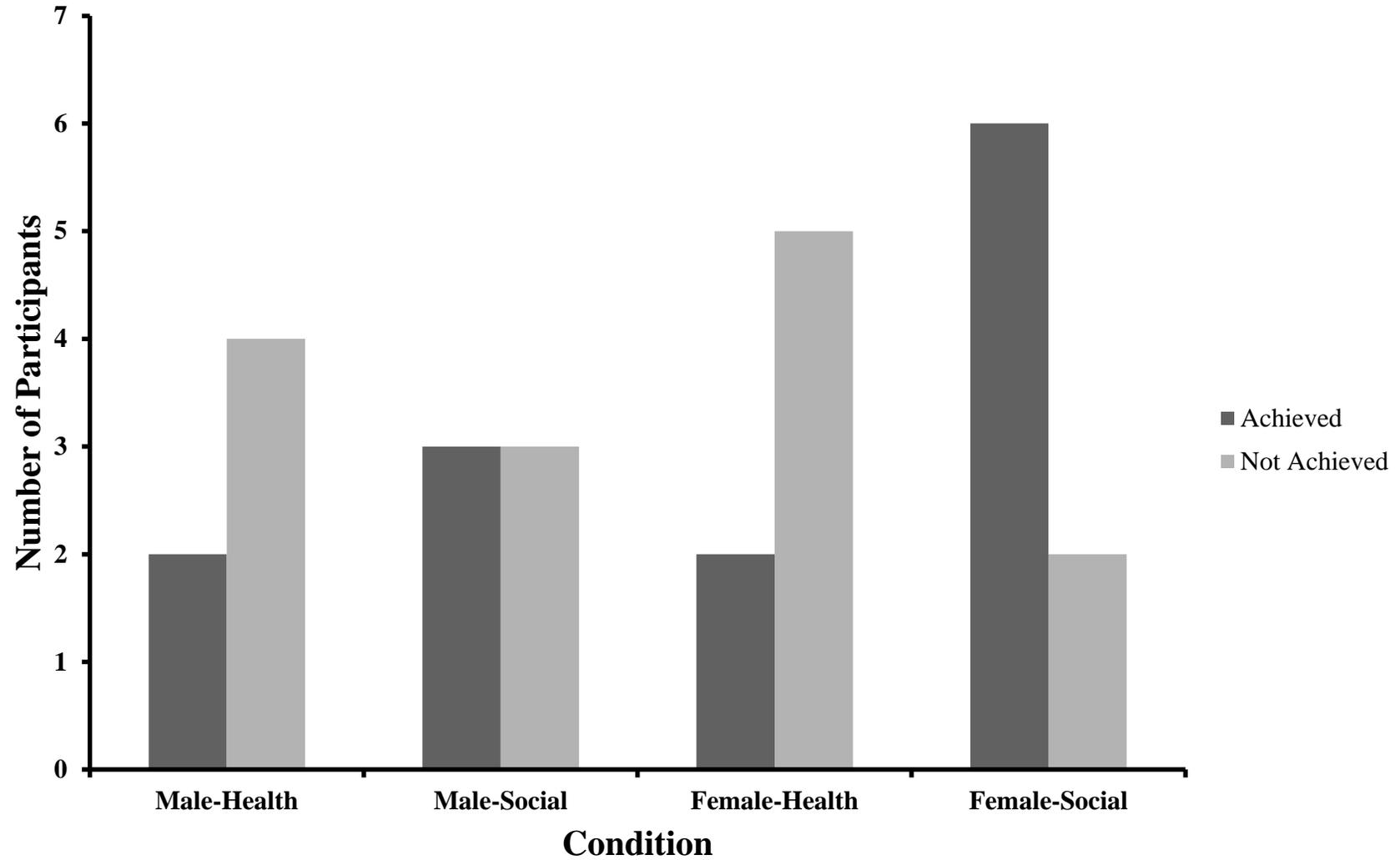


Figure 1. The number of participants who achieved and did not achieve the assigned goal of losing two pounds in two weeks in each category. A total of 27 participants.

participants who did not achieve the goal. The Male-Social group had three participants for both the achieved and not achieved groups. The Female-Health group had two participants who achieved their goal. Finally, the Female-Social group was the only group who had more participants who achieved versus did not achieve with six and two respectively.

The data from this experiment was analyzed using non-parametric tests since the outcome variable was categorical. A Chi-Square Test of Independence was used to analyze the data from the participants who did achieve their goal, and another Chi-Square Test of Independence was used to analyze the data from the participants who did not achieve their goal. The first Chi-Square Test of Independence comparing the participants who did achieve their goal did not find a significant difference between males ($n = 5$) and females ($n = 8$) or between health ($n = 4$) and social ($n = 9$) motivation, $\chi^2(1, N = 13) = 0.23, p > 0.05$. The Chi-Square Test of Independence comparing the participants who did not achieve their goal did not find a significant difference between males ($n = 7$) and females ($n = 7$) or health ($n = 9$) and social ($n = 5$) motivations, $\chi^2(1, N = 14) = 0.32, p > 0.05$. Cramer's V was not calculated since neither test found significant results.

Four Chi-Square Goodness of Fit Tests were conducted to compare groups with different biological sexes and different motivations. The first Chi-Square Goodness of Fit Test compared the males in the health category ($n = 2$) and the females in the social category ($n = 6$) who completed their goals and did not find a significant difference, $\chi^2(1, N = 8) = 2.00, p > 0.05$. The second Chi-Square Goodness of Fit Test compared the males in the social category ($n = 3$) and the females in the health category ($n = 2$) who completed their goals and did not find a significant difference, $\chi^2(1, N = 5) = 0.20, p > 0.05$. The third Chi-Square Goodness of Fit Test compared the males in the health category ($n = 4$) and the females in the social category ($n = 2$)

who did not complete their goals and did not find a significant difference, $\chi^2 (1, N = 6) = 0.66, p > 0.05$. The last Chi-Square Goodness of Fit Test compared the males in the social category ($n = 3$) and the females in the health category ($n = 5$) who did not complete their goals and did not find a significant difference, $\chi^2 (1, N = 8) = 0.50, p > 0.05$. Cramer's V was not calculated due to none of the tests finding significant results.

Discussion

The results of this experiment were not consistent with the hypothesis. There was no effect of biological sex on goal achievement, however since there was also no effect of motivation on goal achievement it is unlikely that the lack of a gender difference can be attributed to the manipulation of the motivational cues. As well, if the manipulation of the motivations was effective, then there should have been a difference when comparing groups with different biological sexes and different motivations. No such difference was found. When examining Figure 1, it can be seen that when comparing the number of participants in each category who did achieve their goal, there is relatively no difference. The same can be seen when comparing those who did not achieve their goal. The greatest difference was found between the male-health and female-social groups for those who did achieve their goal. However this difference was not significant so no solid interpretations as to its meaning can be made.

Due to the sample size, it is not surprising that there were no significant findings. A total of 27 participants is a small sample size and two groups only had six participants. One of the likely reasons for the small sample size was the screening measure that was implemented. The EAT-26 indicates when there is a possibility of an eating disorder, however that does not mean the person has one, and therefore some participants were likely eliminated when they would not have posed any risk to themselves while participating. A stricter screening procedure would have

been ideal however a procedure such as asking the participant if they have a diagnosed eating disorder would be more open to participants answering falsely. Another reason that possibly contributed to the small sample size is that this experiment involved a time commitment and conscious, likely physical, effort had to be put in in order to complete the assigned goal. Adding to these possible deterrents was the lack of an ability to ensure the participants compensation of some kind. The participants who fully completed the study were all entered in a draw to win one of \$25 gift cards; however some prospective participants were likely turned away by not being guaranteed some sort of compensation. As this was an undergraduate project, there was no clear way to remedy this when designing the experiment. If this experiment is replicated in the future, a larger sample size is strongly recommended and may yield significant results.

Another possible reason for the insignificant findings was the motivational cues. The cues were half a page long and therefore not too detailed, and were only read once. Having cues that were more detailed and the reminded the participant of the motivation they should be focusing on more often may have led to significant findings. A suggested example would be a poster or an audio recording for the participant to look at or listen to daily. Along with the motivational cues possibly not being salient enough, the participants may have had their own motivations that confounded with the motivation the experiment was trying to have them focus on.

An issue with this experiment occurred when the participants' data was being collected. Some participants did not reply to the two week email until four days after their two week period to lose the two pounds had finished. If the participants weighed themselves on the day they replied, they would have had four days longer than the other participants to achieve their goal. Having the participants reply via email rather than requiring them to participate in another in-

person session was done for the convenience of the participants and to entice more participants to participate in the experiment. To collect more accurate data, it would be more beneficial to require participants to have a second in-person session on the date of exactly two weeks after the first in-person session.

A confounding variable in this study was the participant's attitude towards or general motivation towards physical activity. While the motivation was ideally manipulated during the study based on the cues, if a participant genuinely detested physical activity, they likely would not try to achieve their goal regardless of the motivational cue the participant was given. Another confounding variable was how the participant lost the two pounds in two weeks. Differing body compositions in regards to metabolism may have influenced how easily a person lost weight. A participant may have been able to lose the two pounds in two weeks without actually engaging in any active effort. Another possibility is that the participant did actively try to lose the two pounds in two weeks however they did not engage in physical activity to do so.

A possible future direction for this study would be to perform this experiment with students or other participants who actively engage in physical activity such as those found at a campus or local gym. This would increase the chances of the participants being willing to engage in physical activity and therefore any differences could be more likely contributed to the experimental manipulation rather than a confounding variable such as general interest in physical activity. Another possible future direction would be to change the outcome measure to something that is nominal as opposed to categorical. A suggestion would be giving all the participants the goal of losing as much weight as they can in two weeks and then comparing their base and post-experimental weights. Another suggestion would be to change the outcome variable to a measure such as the number of hours spent per week engaging in physical activity. If replicated, the study

could be restricted to purely using physical activity as a means of achieving the assigned goal to try to eliminate possible confounding variables.

Due to the lack of significant findings, no concrete interpretations can be taken from the data found in this experiment. However, the general concept of the experiment could be promising when the suggestions mentioned earlier in the discussion are implemented. Increasing sample size and specifying the experiment to remove confounding variables would increase the likelihood of a similar experiment to this finding a significant result would increase.

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Appendix A



Examining Sex Differences in Physical Activity Motivation

Letter of Information & Participant Consent Form

This study is being conducted by Anna Smallwood, a 3rd year honours specialization student in the Department of Psychology, under the supervision of Dr. Mark Cole, in support of a project for Psychology 2280E. The study that you are being asked to participate in a study on sex differences in a student's motivation for completing a physical activity related goal. The purpose of this research is to determine if males and females show a difference in the motivational factors behind their completion or failure to complete a physical activity related goal.

About the study

If you agree to participate, you will be asked to complete a paper copy of the Eating Attitudes Test (EAT-26), a brief questionnaire on eating habits. Then you will be asked to read a short passage on the benefits of physical activity. You will be given the goal of losing two pounds in two weeks by whatever means you wish to use, **as long as it does not endanger your health or wellbeing**. You will be given the option to privately weigh yourself to establish a base weight during this session if you do not know your weight or have a means of weighing yourself. After this session you will not be contacted for two weeks. Two weeks after this date, you will receive one email from me asking you to please reply with whether you did or did not achieve the designated goal. I do not need specific weight data or any information on your motivation. If you do not reply, I will send up to three reminder emails. This study will take less than 40 minutes to complete all of the components of the first session. The follow up will take place **2 weeks later via email**. In this email, you will be given the option of coming in for a second weigh session 2 weeks after this session if you wish, but this is not mandatory.

If your score on the EAT-26 indicates the possibility of an eating disorder, you will be contacted via email and informed that it is suggested that you do not continue in this study. Some resources on eating disorders will also be provided in this email. If you have any health concerns that would cause the goal of losing two pounds in two weeks to be dangerous in this study, you are not eligible to participate. In either case, you will still receive your Psychology 1100E participation credit, if applicable, but will not be entered into the gift card draws. This study does require fluency in English.

Important Information Related to Your Participation

This study requires only one in-person session. It does require a reply to a follow up email from the researcher that will be sent two weeks after this date. There is an option to come in for a follow up weigh session when this email is sent if you wish to weigh yourself to determine if you met the goal and are not able to do this on your own. The study will not take more than 40 minutes of your time for the first session and the reply to the email will take less than 3 minutes. *Participation is voluntary* and you may refuse to participate, refuse to answer any questions or withdraw from the study at any time. A refusal to

participate will have no adverse consequences on your grade in Psychology 1100E, nor on your status at Huron University College.

Confidentiality

All information and data provided by you will remain confidential. You will not be identified in any reports of this study. After you sign this form, you will be given a randomly assigned participant number. This number will be used to identify which EAT-26 questionnaire is your questionnaire and which base weight belongs to you if you choose the option to weigh yourself and record it during this session. Your name is not to be put on the EAT-26 questionnaire or the weight chart. Your participant number will be kept in a secure location for **5 years** and will be kept confidential. Your name will never be mentioned in the report on this experiment.

Risks, Costs and Benefits to You

There are no known risks to participation in this study, however possible risks may occur depending on the method(s) you use to lose the two pounds. **Do not use any method(s) that put you or your health at risk.** Psychology 1100E students will receive their research participation when they have finished reading this information sheet. A credit will be provided regardless of whether you fully participate in the study an regardless of whether you achieve the goal. Upon completion of **this session and follow up weigh-in session or the reply to the email with information on if you met the goal**, your name will be entered in a draw to win one of two \$25 gift cards. The gift card will be to an establishment of your choosing from a list provided by the researcher. You will be notified by email if you have won one of the draws. Participants are expected to have a 1 in 20 chance of winning one of the two gift cards based on there being 40 participants in the study.

Other Information

Your participation in this study does not require you in any way to participate in any future research at Huron University College or at The University of Western Ontario.

If you are interested in participating in our research project or would like to learn more about the study, please contact Anna Smallwood (asmallw3@uwo.ca).

Thank you for your time and interest in our research project. This letter is yours to keep for future reference.

Contact information:

Researcher: Anna Smallwood – asmallw3@uwo.ca

Supervisor: Dr. Mark Cole – mcole@huron.uwo.ca

If you have any questions about your rights as a research subject, you may contact the Chair of the Department of Psychology, Huron University College.



Examining Sex Differences in Physical Activity Motivation

PARTICIPANT CONSENT FORM

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

I pledge to reply to the follow up email from the researcher that will be sent two weeks after this date. I understand that if I do not reply, I will receive reminder emails.

I also pledge not to discuss the details of this study, outside of the information on the posters advertising the study, or my participation in this study with any other participants or students at Western University or one of its affiliates until after the date of Wednesday, April 8th, 2015.

Name of Participant (please print)

Signature of Participant

Date

Email of Participant

Name of Researcher Obtaining Consent (please print)

Signature of Researcher Obtaining Consent

Date

Appendix C

Why Being at a Healthy Weight is Important

It is important for everyone to be at a healthy weight for their height and gender. It is especially important however, for adolescents and young adults to be at a good weight for their body composition. It is common knowledge that obesity has become a problem in our society.

A major reason why it is important for you to maintain a healthy bodyweight is because of the health benefits it will bring you. If you have a healthy bodyweight you lower your risk of developing many adverse conditions such as: heart disease, having a stroke, diabetes, and high blood pressure. In addition, you can even lower the risk of many types of cancers. You owe it to yourself to be as healthy as you can be, and having a healthy bodyweight is part of that. There are many ways to lose weight healthily including eating healthier and exercising regularly.

Think about how healthy you will feel when you have/maintain a healthy bodyweight.

Why Being at a Healthy Weight is Important

It is important for everyone to be at a healthy weight for their height and gender. It is especially important however, for adolescents and young adults to be at a good weight for their body composition. It is common knowledge that obesity has become a problem in our society.

A major reason why it is important for you to maintain a healthy bodyweight is because of the social benefits having a healthy bodyweight brings you. Think about how confident you will feel when you have/maintain a healthy bodyweight. You will want to hang out with your friends more as a result of your increased confidence therefore your interpersonal relationships will benefit. Increased happiness has also been shown to result from exercise and maintaining a healthy bodyweight. There are many ways to lose weight healthily including eating healthier and exercising regularly.

Think about how happy you will feel when you have/maintain a healthy bodyweight.