Spring 5-1-2017

Environmental Factors: Honors Student's Level of Physical Activity and Exercise

Shelby Hyre
shyre@bgsu.edu

Environmental Factors: Honors Student's Level of Physical Activity and Exercise

Shelby Lynn Hyre

HONORS PROJECT

Submitted to the Honors College at Bowling Green State University in partial fulfillment of the requirements for graduation with

UNIVERSITY HONORS

May 1, 2017

_Fredrick F. Andres, Ph.D, School of Human Movement, Sport and Leisure Studies__,

Advisor Typed Name and Department

_Paul Cesarini, Ph.D, College of Technology__,

Advisor Typed Name and Department

Abstract

Introduction: This study was undertaken to determine whether Bowling Green State University (BGSU) provided an environment that encouraged physical activity and exercise with Honors students (HS). The Trans-theoretical model was used to determine the intent/behavior related to participation in physical activity and exercise. **Methods:** A computer-based survey was distributed to all HS (N=909). The survey was derived from three previously published surveys. **Results:** Data were reduced and visually inspected for trends. The response rate was 29.2%. In general, HS were physical active (~70%) and/or exercised (~90%). Distance from the exercise facility did not seem to be important. The HS seemed to be extrinsically motivated when it came to positive social influences and more intrinsically motivated when it came to negative influences. Therefore, positive influences were more important in determining the likelihood of the HS to be physically active and/or exercise and resulted in a positive relationship. HS who had a positive attitude towards physical activity and exercise where more likely to participate. Neither class standing nor employment activity appeared to influence the stage of change. **Conclusion:** HS at BGSU were more physically active and exercised more than expected. Positive influences played the larger role in determining physical activity and exercise participation. Positive social factors were more important than negative. Physical environmental factors did not seem to affect the stage either. Human behavior related to physical activity and exercise continues to be multifactorial and complex; therefore, additional studies should be undertaken.

The Honors College at Bowling Green State University (BGSU) was established in 2013 after first becoming an Honors Program in 1978. Students who are enrolled in the Honors College at BGSU are given benefits above other traditional students: priority scheduling, smaller classes, enhanced opportunities for research and learning, greater access to faculty, and opportunities to develop and refine critical thinking skills. Students of all majors and backgrounds may enrolled in the Honors College if they meet the criteria that the college has deemed as appropriate. Honors students commonly demonstrate good test-taking skills and have high GPAs, but there are many other characteristics that tend to be connected to honors students. When compared to non-honors students, honors students seem to be more eager, exploratory, and experienced. They are often be described as academically focused individuals (Achterberg, 2005). With so much focus on academics, do honors students find time to be physically active and/or exercise? This study was designed to explore whether BGSU provides an environment that encourages positive attitudes about physical activity and exercise that results in honors students being in the later stages of the Trans-theoretical model, and thus be expected to be more physically active and exercise more often.

By adding the Trans-theoretical model, it has the potential to strengthen the study. Several studies on exercise adherence include a theory in effort to strengthen the study, but the theory differs between studies (Buckworth, 2001). The Trans-theoretical model was used in this study to add a different view point. The Trans-theoretical "model of intentional behavior change defines health behavior adoption and maintenance as a process that occurs through a series of behaviorally and motivationally defined stages" (Buckworth, 2001). In the present study, this model was used to determine the level of intention the participant has to become or stay physically active and exercise. The Trans-theoretical model contains five stages: precontemplation, contemplation, preparation, action, and maintenance. "Precontemplation" is often described as "I have never thought about it." In the case of this study, "it" is either physical activity or exercise depending on the specific question. "Contemplation" is described as "I have thought about it, but never done it." Precontemplation and Contemplation are often grouped together in other studies (Buckworth, 2001). "Preparation" is used to indicate that the participants are planning to be physically active or exercise but have yet to do so. They are finding a time that would work for them and deciding the types of physical activity in which they will participate. "Action" is the stage that participants have begun taking part in physical activity or exercise, but have not yet proven that they will adhere to the program; meaning that they have done it for less than six months. The criterion of six months was chosen because approximately 50% of participants will discontinue participation within six months (Pinto & Marcus, 1995). If the participants take part in the physical activity or exercise for more than six months, then they have entered the "maintenance stage". The action and maintenance stages are often grouped together in other studies.

To answer the questions that inspired this study, the author has proposed five hypotheses:

1. if the distance to the location of exercise is a barrier, then honors students will be in earlier stages of the trans-theoretical model,
2. if the social environment encourages physical activity, then honors students will be in later stages of the trans-theoretical model,
3. if honors students have a positive attitude toward physical activity, then they will be in later stages of the trans-theoretical model,

4. if honors students are freshmen, then they will be in earlier stages of the trans-theoretical model, and

5. if honors students hold physically active jobs, then they will be less likely to be physically active outside of work and therefore in earlier stages of the trans-theoretical model.

When the author mentions the earlier stages of the trans-theoretical model, she is referring to the first three stages: precontemplation, contemplation, and preparation. The later stages would then be the last two: action and maintenance.

The author looked at other studies and reviews to determine the first hypothesis: if the distance to the location of exercise is a barrier, then honors students will be in earlier stages of the trans-theoretical model. Many other sources agree with this statement such as Dishman, Sallis, and Orenstein (1985). In their review article, they mention that perceived convenience to exercise setting and actual geographic proximity play a part in an individuals' level of activity. The authors also included other physical environmental factors that determine how much a person participates in physical activity and/or exercise such as weather and the time pressures (Dishman, Sallis, & Orenstein (1985). Giles-Cortia and Donovan (2002) found that spatial access was a significant predictor to the activity level of individuals within a health program. They also found that "positive perceptions about the convenience of facilities and neighborhood safety increased exercise self-efficacy, a factor known to influence intention to be physically active" (Giles-Ortia & Donovan, 2002). Living in a community that promotes walkability (i.e. well maintained sidewalks) and feasibility to walk or bicycle for transportation rather than taking a car or bus, has the potential to have individuals who participate in physical activity more often. (Bouchard, 2010).

The social environment includes family members, peers, and health professionals (Dishman, Sallis, and Orenstein, 1985). Dishman, Sallis, and Oreinstein (1985) found that a spouse is the most important and influential to an individual's social environment. Giles-Corta and Donovan (2002) conducted a study to examine a person's social environment and their levels of activity. They found that those with a positive social environment that was conducive to exercising were more likely to acquire the recommended amounts of physical activity and exercise (Giles-Corta & Donovan, 2002). Okun, Ruehlman, Karoly, Lutz, Fairholme, Schaub (2003) found similar results: social support was a significant predictor of physical activity. Okun, Ruehlman, Karoly, Lutz, Fairholme, Schaub (2003) mentioned another study that reported "low levels of social support were twice as likely to be sedentary as individuals who reported high levels of social support." Therefore, the author of the present study hypothesized: if the social environment encourages physical activity, then honors students will be in later stages of the trans-theoretical model.

The attitude a person has towards exercise and physical activity has been noted to be a significant predictor of participation (Okun, Ruehlman, Karoly, Lutz, Fairholme, Schaub, 2003). Whether or not a person is in a supportive or negative environment, their attitude will determine if he or she participates in physical activity and/or exercise (Okun, Ruehlman, Karoly, Lutz, Fairholme, Schaub, 2003). Based on these conclusions from other studies, the current author hypothesized: If honors students have a positive attitude toward physical activity, then they will be in later stages of the trans-theoretical model

Buckworth and Nigg (2004) conducted a study that compared the hours spent with technology to the activity levels of college students. They found that the more hours the student used the computer increased with the student's class standing, but decreased the level of physical activity and exercise. Younger students spent more time devoted to being active compared to older students. Pinto and Marcus (2004) also conducted a study to compare year in school and the stage of the Trans-theoretical model the student was is for exercise. They found no significant difference between the stages and the year in school. Despite the literature presented, the present author hypothesized that freshman would be in earlier stages of the trans-theoretical model with knowledge that participation in physical activity and exercise decreases after graduation from high school.

Finding no comparable literature related to the fifth hypothesis, the author hypothesized based on previous knowledge. She predicted that if students are active during their work hours, then they might consider themselves active enough during that time to suffice for the rest of the day. This might lead them to feel as if they do not need to be active with the rest of their day since they consider themselves active enough during work. Therefore, she hypothesized that if honors students hold physically active jobs, then they will be less likely to be physically active outside of work and therefore in earlier stages of the trans-theoretical model.

Methods

A survey instrument was distributed to the 909 students enrolled in the honors college by using Canvas, the university's learning management and messaging system. The author sent out the survey on a Wednesday morning. The students were given one week to reply to the survey. After a week, another message was sent to remind those who have not taken the survey to take it if they would like and to thank those who have already taken it. The following Thursday, after the second message, the survey was closed for responses. Of the 909 students, freshman through graduate students, who were sent the survey, 266 of them (29.2%) responded. The survey consisted of questions based upon the San Diego Health and Exercise Survey and a multidimensional scale by Chogahara (1999) that includes questions focused on the social environment. The San Diego Health and Exercise Survey was developed to "determine the perception of neighborhood design features hypothesized to be related to physical activity." Questions used were those focused on the physical environment and contained questions that asked about the proximity of facilities, safety of the neighborhood, and street access (Brownson et al., 2004). Chogahara's questionnaire consisted of 15 positive and 12 negative social environment questions. The questions that were chosen to appear in the present survey had a correlation between the type of person selected (family member, friend, or expert) and the type of influence that was greater than 0.9 from Chogahara's original study (Chogahara, 1999). The survey had ten positive and eight negative social environment questions. The participants were also given a definition for physical activity and exercise and asked to choose which of the five stages they were in for each. This is how the author determined which stage each participant was in of the Trans-theoretical model. In total the survey was made up of 12 demographic questions and 14 questions pertaining to the student's environment. The author analyzed the response to these questions and presented them in a semi-quantitative way. This was considered best because some of the results will be better understood using numbers while others are better understood explaining the results.

Results and Discussion

1st Hypothesis Results and Discussion

The majority of the honors students who completed the survey lived in Founders Hall (on-campus residence) or less than five miles away from campus. The living arrangements came as no surprise because the Honors Learning Community, which many honors students are involved in, is housed in Founders Hall. Also, there are numerous apartment complexes for students to live in within a five-mile radius from campus. The other possible living arrangements had too few respondents to be analyzed. Founders Hall was the dorm furthest away from the Student Recreation Center (SRC). Of those living in Founders Hall, which were 43% of the respondents, 33% of the students considered themselves within the first three stages of the Trans-theoretical model and 67% in the last two stages. Of the 29% of respondents that lived within five miles of campus, 29% of them are in the first three stages of the model and the other 71% are in the last two stages. For distance and its effect on the stage of exercise compared to physical activity, there appears to be a slightly different pattern. There is a large increase in percent between the second (have thought about it, but never done it) and third stage (planning to). Of the 112 respondents, 93 live in Founders Hall are within the last three stages, and 71 of the 75 respondents living zero to five miles away from campus are within the last three stages. These students are regularly physically active and exercise despite the distance to the SRC or place of activity. Seeing that these two living arrangements are farther from the SRC compared to other options, the distance to the SRC did not seem to be a barrier. Based on these data, the first hypothesis was rejected. This finding is at variance to the majority of other studies conducted on this topic which found the physical environment to be a significant predictor of one's participation in physical activity (Giles-Corta & Donovan, 2002). See Table 1 in Appendix A.

Respondents were asked about the perceived safety of the physical environments to determine if that affected in their activity levels. They were asked on a scale of very unsafe to very safe, "How safe is it to walk or jog alone in your neighborhood during the day?" More than half (60%) of the respondents said that the environment was very safe. Only 4% of the students said that the environment was very unsafe or somewhat unsafe. Therefore, the majority of the students found the environment to be safe. What was surprising was that those that said the environment was very unsafe or somewhat unsafe were all within the last three stages of the Trans-theoretical model when it came to physical activity. However, 71% of those that have been physically active for less than or greater than six months said that the environment was very safe or somewhat safe. For exercise, only 57% of those in the last two stages said that the environment was very safe or somewhat unsafe. The author also asked how difficult it was to walk/or jog in their neighborhood because of factors such as broken sidewalks (i.e. not crime). This was deemed as important because Popkin, Duffey, and Gordon-Larsen (2005) found that "perceived neighborhood characteristics, such as aesthetics, convenience, and accessibility of activity resources have been shown to be associated with physical activity." Of the respondents, 81% said that it was not difficult. Safety and difficulty did not appear to play roles in the stage of the Trans-theoretical model for the students. The results were consistent with Maddison et al. (2009): perceived safety was not significantly connected to physical activity levels.

2nd Hypothesis Results and Discussion

The first three stages (not thinking about it; have thought about it, but never done it; and planning to) and the last two stages (have been physically active/exercising for less than and greater than six months) were combined to analyze the social environment because of the lower numbers in each category. The survey contained ten positive and eight negative environment questions in which the student could chose friend, family member, expert, other and/or no one. The connections between the positive environment and physical activity were examined first. As the stages increase in intent to participate in physical activity, the percent of those reporting positive influences from no one decreases. Therefore, it can be said that when a friend, family member, expert or other gave positive reinforcement to a person, the person was more likely to participate in physical activity. This supports the hypothesis. Gile-Corta and Donovan (2002) found similar results: the likelihood of participating in physical activity was increased with a positive social environment. Okun, Ruehlman, Karoly, Lutz, Fairholme, Schaub (2003) found social support to be a significant predictor of the intent to be active. Dishman, Sallis, and Orenstein (1985) mention that "personalized social reinforcement from program staff or an activity partner has also been found to be a potent determinant of adherence to clinical programs in several studies but not in all studies." Therefore, having an expert, such as a personal trainer, or a friend to be physically active or exercise with might be helpful to move a person to a more active stage within the model and therefore be more physically active. For the present study, of those that were in the "not thinking about it" stage, 46% of them were not getting positive reinforcement from anyone. 45% of those in the "have thought about it, but never done it" stage are also not getting positive influences from anyone. After the first two stages, the percent of the those not getting positive influences decresaes. As expected, the percent of those getting positive reinforcement increases as the stages increase. However, in the friend category, 32% of those "not thinking about it" are getting positive reinforcement from their friends, but only 21% of those in the "have thought about it, but never done it" are getting positive reinforcement. After the second stage, positive reinforcement from friends increases. These means that extrinsic factors played an important role for honors student's physical activity levels. Extrinsic factors are those that come from an outside source such as a coach telling an athlete to run faster.

For the negative social environment, a higher number in the "no one" category indicates that there are less people getting negative influences about physical activity. For physical activity, the percent of those receiving negative influences was similar for "friend, family member, expert, other and no one" independent of stage. In the "no one" category, the percents range from 64-73% with the lowest percentage value appearing in the "have been physically active for less than six months" category. Besides the "no one" category, the highest percents appear in the "family member" category with those in the first two stages of the Trans-theoretical model. The majority of the negative reinforcements were coming from the student's own family members. Dishman, Sallis, and Orenstein (1985) mention that the spouse, which is part of a person's family, is the most important influence. Those that "reported low levels of social support were twice as likely to be sedentary as individuals who reported high levels of social support" (Okun, Ruehlman, Karoly, Lutz, Fairholme, Schaub (2003). This might be one of the reason that the students were in the first two stages instead of exercising regularly.

As for the positive social environment and exercise, the same type of pattern was present as with physical activity. The "no one" category percents decrease as the stages increase; meaning that as a student partakes in more exercise, the more likely they are to be in a supportive environment. Conversely, a person who is in a supportive environment may be more likely to become more involved

with exercise as a result of the environment. This also supports the hypothesis. Overall, exercise compared to positive social environment followed the same patterns with positive environment and physical activity. This once again shows that when it comes to the positive environment, honors students are more extrinsically motivated compared to intrinsically.

For the negative environment and exercise, there was relatively little variability across the stage. It was surprising to see that the percent of people receiving negative influences did not decrease as the student increased his or her intent to participate in exercise; the same with physical activity and the negative environment. Therefore, the negative environment may not have a large effect on how often/how much a student participates in exercise and these appear to be more intrinsically motivated. However, behavior may be independent of reinforcement and might be a reason for the results. There was less variability between the stages and the percents within each category with the negative environment than there was with the negative environment and physical activity. Giles-Corta and Donovan (2002) found similar results with their study: "After adjustment for other determinants, exercising as recommended was more strongly associated with individual determinants than either social environmental or physical environmental determinants." See Table 2 and 3 in Appendix B.

3rd Hypothesis Results and Discussion

The survey asked "with exercise I will…" and then continued with a series of statements which the students had to agree or disagree. Each statement was a possible positive outcome of exercise and/or physical activity. For the first two stages of the Trans-theoretical model, there were not enough respondents for analysis. For those that were in the "planning to" stage of physical activity, they agreed with the majority of the statements (79%). "I will meet more people" was one of the options that had more disagreements (63%) than agreements (37%). "I will do better at my job" was the other one with more disagreements (51%) than agreements (49%) Those in the "have been physically active for less than and greater than six months" had similar tendencies.

When examining the attitudes towards exercise, there were still not enough respondents in the first two stages to interpret. The same pattern of agreeing and disagreeing occurred throughout each stage as it did with physical activity: the majority of the statements were agreed upon, but the same two statements as before had more people disagree. However, students who had reported participating in exercise for more than six months disagreed with each statement less often than any other stage. This means that the author's hypothesis is not rejected. The results are similar to those of Okun, Ruehlman, Karoly, Lutz, Fairholme, Schaub (2003). They found that "attitude was a significant predictor of intent to exercise." They also discovered that even if the individual has a positive environment around them, if his or her attitude is not positive toward exercise then the individual will not exercise. If the individual is in a negative environment towards exercise but has a positive attitude towards it, then he or she is much more likely to exercise (Okun, Ruehlman, Karoly, Lutz, Fairholme, and Schaub, 2003). See Table 4 in Appendix C.

4th Hypothesis Results and Discussion

For class standing, 68% of freshman were in later stages of the Trans-theoretical model. Therefore, hypothesis was rejected because the majority of freshman were physically active. The percent of sophomores (73%) who regularly participate in physical activity increased. The number of juniors who were physical active remains similar (72%), and the number of seniors slightly decreased

(64%). Theresults are similar to the findings of Buckworth and Niggs (2004). For exercise, there is a fairly even distribution across each of the classes. These findings are in agreement with the results of Pinto and Mucus's (1995) study that found no significant correlation between class standing and participation in exercise. In the present study, the number of students in each class standing who did or did not exercise were too close to make a strong conclusion. Even though graduate students were included in this survey, there were too few respondents (N = 1) for analysis. Given the results of the present study, the hypothesis was rejected. See Table 5 in Appendix D.

5th Hypothesis Results and Discussion

Overall, BGSU honors students report holding sedentary jobs. The author compared the hours sitting, standing, walking, lifting heavy things, and other strenuous tasks to physical activity and exercise. When the amount of physical activity increased for work, the less physically active they were outside of work. Of the respondents, 51% of those who were physically active for more than six months spent more than five hours sitting at their job. Long work hours and other student time constraints such as homework may be determinates. When comparing the job activities to exercise stage, there does not appear to be a large effect on the first three stages. For the categories of two to five hours and greater than five hours, there was a decrease between the "planning to" stage and the "have been exercising for less than six months" stage for each of the actions surveyed during work hours (sitting, standing, walking, lifting heavy things, and other strenuous tasks). A graph of the results can be found in appendix A. In general, the amount of work did not seem to have an effect on the amount of exercise the student did outside of work. Therefore, the hypothesis was rejected. See Table 6 in Appendix E for results.

Strengths and Weakness:

Buckworth (2001) observed that the trans-theoretical model has not used in its entirety for many exercise focused studies. Most of the studies that use the trans-theoretical model combine the five stages in to two (precontemplation, contemplation, and preparation, and action and maintenance). Since each of the stages was included within our study, this is a strength. Because of the low responses in some areas of the study, the author collapsed precontemplation, contemplation and preparation together and action and maintenance together. For the physical environment compared to physical activity, social environment compared to physical activity and exercise, class standing compared to physical activity and exercise, and the working hours compared physical activity and exercise the author combined each of the stages like explained above. Pinto and Marcus (1995) as well as various other studies combined stages the same way. The also mention that this is common among other studies.

The present study was focused on honors students. IN this regard the present study was unique. Not many studies are focused on college students (Buckworth, 2001) and even fewer on honors students (Achterberg, 2005). However, given that only honors students were asked, the results cannot be generalized to other types of students, but that was not intended.

Some categories could not be analyzed because of the low number of respondents despite the high respondent rate (29%). Including results from other colleges/universities would improve reliability and validity. The majority of the students lived in either Founders Hall or within zero to five miles of campus, which are both farther away from the SRC compared to other living arrangements. When analyzing the results based on the physical environment, the environment was not a barrier to the students participation in physical activity or exercise because more the half of the students participated

regularly. However, for those that lived off campus, the survey asked how far away the student lived from campus, not specifically the SRC. This means that some students lived closer to the SRC than others despite still living within zero to five miles of campus. Of the two living arrangements that were analyzed, both remain within walking distance to the SRC; therefore, some might consider the results of the physical environment hypothesis weak.

The results of this study were treated as semi-quantitative or qualitative. The author believed this to a strength. Results of some of the hypotheses were better presented using a qualitative analysis while others were better presented using a quantitative analysis.

Conclusion

The author examined five hypotheses. The first hypothesis predicted that the more accommodating the physical environment was to physical activity and exercise, the more likely the student would be in later stages of the Trans-theoretical model. Only two of the possible living arrangements were analyzed because of the low number of respondents in the other possibilities. The majority of the students living in Founders Hall (67%) and less than five miles from campus (71%) were within the last two stages of the Trans-Theoretical model; therefore, this hypothesis was not rejected. The second hypothesis analyzed the effects of the social environment. When it came to the positive environment, the honors students seemed to be more extrinsically motivated. The number of students receiving positive influences increased as the participation in physical activity or exercise increased. However, when it came to negative influences, the students seemed to be more intrinsically motivated. Those students in the last two stages received similar amounts of negative influence as those in the first three stages. This hypothesis was not rejected. The third hypothesis examined the effect attitude on participation in physical activity and exercise. For students with a positive attitude the student, the more likely they are to have the intention to be physically active and exercise. Therefore, this hypothesis was also not rejected. The fourth hypothesis analyzed the effect of class standing on intent to be physically active and exercise. When examining physical activity, the numbers are similar across each of the four classes. As for exercise, the numbers were also similar. The hypothesis was rejected since the majority of freshman were physically active and regularly participated in exercise. The fifth hypothesis concerned the effects of what a student does during work hours and to the intent to be physically active and exercise. When the amount of physical activity increased for work, the less physically active they are outside of work. However, the amount of activity done during work hours did not have an effect on the amount of exercise a student participated in. Therefore, this hypothesis was rejected.

This was one of the first studies done that examined honors students physically activity and exercise levels, and the students were all from the same college. In order to explore the validity and reliability of these results, the study should be repeated at other colleges. Also, there need to be a larger number of respondents so that each of the variables can be analyzed.

References

Achterberg, C. (2005) What is an honors student? *Journal of the National Collegiate Honors Council*, 6, 75-84.

Brownson, R. C., Chang, J. J., Eyler, A. A., Ainsworth, B. E., Kirtland, D. A., Saelens, B. E., & Sallis, J. F. (2004). Measuring the environment for friendliness toward physical activity: A comparison of the reliability of 3 questionnaires. *American Journal of Public Health*, 94(3): 473–483.

Buckworth, J. (2001). Exercise adherence in college students: Issues and preliminary results. *Quest, 53*, 335-345.

Buckworth, J. & Nigg, C. (2004). Physical activity, exercise, and sedentary behavior in college students. Journal of American College Health, 53, 28-34.

Chogahara, M. (1999). A multidimensional scale for assessing positive and negative social influences on physical activity in older adults. *Journal of Gerontology: Social Sciences*, 54B (6), S356-S367.

Dishman, R. K., Sallis, J. F., & Orenstein, D. R. (1985). The determinants of physical activity and exercise. *Public Health Reports*, *100*, 158-171.

Giles-Cortia, B., & Donovan R. J. (2002). The relative influence of individual, social and physical environment determinants of physical activity. Pergamon Social Science & Medicine, 54, 1793–1812.

Maddison, R., Vander Hoorn, S., Jiang, Y., Ni Mhurchu, C., Exeter, D., Dorey, E., Bullen, C., Utter, J., Schaaf, D., & Turley, M. (2008). The environment and physical activity: The influence of psychosocial, perceived and built environmental factors. International Journal of Behavioral Nutrition and Physical Activity, 6, 1-10.

Okun, M. A., Ruehlman, L., Karoly, P., Lutz, R. Fairholme, C., & Schaub, R. (2003). Social support and social norms: Do both contribute to predicting leisure-time exercise? American Journal of Health Behavior, 27, 493-507.

Pinto, B. M. & Marcus, B. H. (1995). A stages of change approach to understanding college students' physical activity. *Journal of American College Health*, 44, 27-31.

Popkin, B. M., Duffey, K., & Gordon-Larsen, P. (2015). Environmental influences on food choice, physical activity and energy balance. Elsevier: Physiology & Behavior, 86, 603-613.

Appendix A

Table 1: Physical environment Factors

	Stage	Where the student lives	
		0-5 miles off campus	**Founders Hall**
Physical Activity	**not thinking about it**	1 (1%)	2 (2%)
	have thought about it, but never done it	2 (3%)	10 (9%)
	planning to	19 (25%)	25 (22%)
	have been < 6 mo	12 (16%)	22 (20%)
	have been > 6 mo	41 (55%)	53 (47%)
Exercise	**not thinking about it**	1 (1%)	1 (1%)
	have thought about it, but never done it	3 (4%)	18 (16%)
	planning to	29 (39%)	34 (30%)
	have been < 6 mo	15 (20%)	24 (21%)
	have been > 6 mo	27 (36%)	35 (31%)

Appendix B

Table 2: Positive Environmental Factors

	Stage	friend	family member	expert	other	no one
Physical activity	**not thinking about it**	16 (32%)	6 (12%)	0 (0%)	0 (0%)	23 (46%)
	have thought about it, but never done it	31 (21%)	50 (33%)	17 (11%)	1 (0.7%)	68 (45%)
	planning to	227 (41%)	146 (26%)	56 (1%)	19 (3%)	206 (36%)
	have been < 6 mo	204 (46%)	130 (29%)	34 (8%)	27 (6%)	158 (27%)
	have been > 6 mo	745 (54%)	601 (44%)	178 (6%)	115 (8%)	381 (28%)
Exercise	**not thinking about it**	17 (24%)	7 (10%)	0 (0%)	0 (0%)	37 (53%)
	have thought about it, but never done it	60 (21%)	62 (22%)	22 (8%)	3 (1%)	154 (55%)
	planning to	334 (41%)	237 (29%)	70 (9%)	40 (5%)	302 (37%)
	have been < 6 mo	239 (49%)	163 (33%)	41 (8%)	37 (7%)	157 (32%)
	have been > 6 mo	573 (62%)	464 (50%)	152 (17%)	82 (9%)	189 (21%)

*The percentages were calculated by first determining how many people were in each stage. The total number of possible responses in each category calculated. This was determined by multiplying the number of people within that stage by the number of questions (i.e. 10 positive environment questions, 8 negative environment questions) The number of people who actually chose that category was divided by the total number of possible responses.

Table 3: Negative Environment Factors

	Stage	friend	family member	expert	other	no one
Physical activity	**not thinking about it**	1 (3%)	7 (18%)	0 (0%)	0 (0%)	27 (68%)
	have thought about it, but never done it	13 (11%)	20 (17%)	8 (7%)	2 (2%)	80 (67%)
	planning to	47 (10%)	53 (12%)	14 (3%)	6 (1%)	335 (73%)
	have been < 6 mo	19 (5%)	32 (9%)	8 (2%)	7 (2%)	266 (64%)
	have been > 6 mo	142 (13%)	146 (13%)	46 (4%)	43 (4%)	769 (70%)
Exercise	**not thinking about it**	1 (2%)	5 (9%)	0 (0%)	0 (0%)	42 (75%)
	have thought about it, but never done it	23 (10%)	34 (15%)	10 (4%)	2 (0.9%)	158 (71%)
	planning to	72 (11%)	75 (11%)	22 (3%)	15 (2%)	474 (72%)
	have been < 6 mo	32 (8%)	43 (11%)	12 (3%)	10 (3%)	284 (72%)
	have been > 6 mo	94 (13%)	98 (13%)	32 (4%)	31 (4%)	519 (71%)

Appendix C

Table 4: Attitude Factors

With exercise…	Agree	Disagree
I will feel less depressed and/or bored	213 (85%)	27 (15%)
I will improve my self-esteem	229 (92%)	21 (8%)
I will meet new people	93 (37%)	157 (63%)
I will lose weight or improve my shape	238 (95%)	12 (5%)
I will build up my muscle strength	241 (96%)	9 (4%)
I will feel less tension and stress	207 (83%)	43 (17%)
I will improve my health or reduce my risk of disease	247 (99%)	3 (1%)
I will do better on my job	128 (51%)	121 (49%)
I will feel more attractive	209 (84%)	40 (16%)
I will improve my heart and lung fitness	248 (99%)	2 (1%)

Note: These percentages are not associated with the stage of physical activity and exercise. They are the responses of the participants without looking at what stage they are in.

Appendix D

Table 5: Class Standing

		Freshman	Sophomore	Junior	Senior
physical activity	not thinking about it	1 (1%)	3 (5%)	1 (2%)	0 (0%)
	have thought about it, but never done it	7 (10%)	4 (6%)	0 (0%)	4 (8%)
	planning to	15 (21%)	11 (17%)	17 (26%)	13 (25%)
	have been < 6 mo	17 (23%)	10 (15%)	9 (14%)	8 (15%)
	have been > 6 mo	33 (45%)	38 (58%)	38 (58%)	28 (53%)
Exercise	not thinking about it	4 (5%)	2 (3%)	1 (2%)	0 (0%)
	have thought about it, but never done it	11 (15%)	7 (11%)	5 (8%)	5 (9%)
	planning to	22 (30%)	20 (30%)	21 (32%)	18 (34%)
	have been < 6 mo	14 (19%)	14 (21%)	12(18%)	9 (17%)
	have been > 6 mo	22 (30%)	23 (35%)	26 (40%)	21 (40%)

Table 6: Physical Activity During Work Hours

		sitting			Standing			Walking			Lifting Heavy Things			Other Strenuous Tasks		
	Stage	0-1	2-5	>5	0-1	2-5	>5	0-1	2-5	>5	0-1	2-5	>5	0-1	2-5	>5
Physical Activity	not thinking about it	1 (1%)	0 (0%)	1 (2%)	2 (2%)	0 (0%)	0 (0%)	1 (1%)	1 (1%)	0 (0%)	2 (1%)	0 (0%)	0 (0%)	2 (1%)	0 (0%)	0 (0%)
	have thought about it, but never done it	3 (4%)	3 (5%)	4 (7%)	5 (6%)	4 (5%)	2 (6%)	7 (7%)	3 (4%)	1 (3%)	10 (6%)	0 (0%)	0 (0%)	9 (6%)	1 (3%)	0 (0%)
	planning to	13 (19%)	16 (24%)	17 (28%)	18 (21%)	21 (27%)	6 (18%)	20 (21%)	20 (28%)	6 (20%)	36 (23%)	7 (23%)	2 (29%)	38 (24%)	6 (19%)	0 (0%)
	have been < 6 mo	14 (20%)	11 (16%)	8 (13%)	16 (19%)	6 (8%)	9 (27%)	15 (15%)	11 (15%)	6 (20%)	25 (16%)	5 (16%)	2 (29%)	30 (19%)	1 (3%)	0 (0%)
	have been > 6 mo	39 (56%)	37 (55%)	31 (51%)	44 (52%)	47 (60%)	16 (48%)	54 (57%)	36 (51%)	17 (57%)	85 (54%)	19 (61%)	3 (43%)	79 (50%)	23 (74%)	4 (100%)
Exercise	not thinking about it	2 (3%)	0 (0%)	1 (2%)	2 (2%)	0 (0%)	1 (3%)	1 (1%)	1 (1%)	1 (3%)	3 (2)	0 (0%)	0 (0%)	3 (2%)	0 (0%)	0 (0%)
	have thought about it, but never done it	5 (7%)	6 (9%)	9 (15%)	7 (8%)	10 (13%)	4 (12%)	11 (11%)	6 (8%)	4 (13%)	18 (11%)	1 (3%)	1 (14%)	17 (11%)	2 (6%)	1 (25%)
	planning to	21 (30%)	21 (31%)	25 (41%)	25 (29%)	28 (36%)	12 (36%)	26 (27%)	31 (44%)	10 (33%)	50 (32%)	13 (42%)	3 (43%)	54 (34%)	10 (32%)	0 (0%)
	have been < 6 mo	22 (31%)	8 (12%)	8 (13%)	20 (24%)	9 (12%)	7 (21%)	19 (20%)	13 (18%)	5 (17%)	26 (16%	10 (32%)	1 (14%)	32 (20%)	4 (13%)	0 (0%)
	have been > 6 mo	20 (29%)	32 (48%)	18 (30%)	31 (36%)	31 (40%)	9 (27%	40 (41%)	20 (28%)	10 (33%)	61 (39%)	7 (23%)	2 (29%)	52 (33%)	15 (48%)	3 (75%)