

Two Cans Short of Six-Pack Abs: the Influence of Goal-Orientation on Mood in the Achievement of Physical Activity Goals

Jonathan Flinchum & Cienna Hopkins
Department of Psychology
University of Wisconsin - La Crosse
1725 State Street
La Crosse, WI 54601

Faculty Advisor: Dr. Alessandro Quartiroli

Abstract

Physical activity and happiness have been consistently correlated together, but there has been limited research concerning the influence of physical activity goals and their achievement on happiness. Added to this, people's unique characteristics such as their goal-orientation (i.e., how an individual defines success in sport) can affect how one reacts to achievement (or lack thereof). This study attempted to answer the question of whether or not achievement of a physical activity goal could affect a person's mood based upon their goal-orientation. A total of 120 participants were given a goal to keep their average heart rate below a value standardized to their fitness level as they underwent a treadmill task. Each participant's general happiness level and mood were assessed before and after the task using the Subjective Happiness Scale (SHS) and Brunel Mood Scale (BRUMS), respectively. The Perception of Success Questionnaire (POSQ) assessed each participant's goal-orientation, which measured both task- and ego-orientation. The task fit both of these orientations as participants had to individually reach their goal (task-orientation) and were also told that the average college student was able to achieve this goal (ego-orientation). Falsified results of the task were given to see how participants were affected by their assigned achievement condition (i.e., achieve, not achieve, or control). Based upon previous studies, it was hypothesized that people with higher levels of either or both goal-orientation types (task and/or ego) would have higher fluctuations in mood as compared to their counterparts (in either direction depending on if they achieved or did not achieve the task). However, results did not support this. 2x3 ANOVAs were conducted to test whether or not achievement affected mood with goal-orientation as a moderating variable. Results of these tests showed that only negative moods increased (e.g., anger) if the goal was not achieved. Study limitations are discussed to justify these results.

Keywords: Goal-orientation, mood, physical activity goals

1. Introduction

Throughout history, people have emphasized the centuries-old belief in a positive relationship between health-related behaviors (such as diet and exercise) and reported happiness/positive moods—a relationship that has now been supported by modern research.^{9, 13, 25} Both factors—health-related behaviors and positive affect—are likely driving one another. Several studies have shown that happiness and/or more positive moods can lead to an increase in healthy behaviors.^{2, 5} On the opposite side of the spectrum, studies have also shown that healthy behaviors such as physical activity have led to an increase in positive affective outcomes.^{4, 8, 16, 20}

1.1 Physical Activity And Happiness/Positive Moods

One consistent correlate of happiness/positive moods is healthy behavior such as physical activity.^{4, 8, 16, 20} In fact, the Centers for Disease Control and Prevention (CDC) supports this claim in its 2015 report stating that physical activity can aid in improved mental health and mood.⁶ Added to this, research has found that physical activity can decrease mood instability, which has been shown to be the foundation for neuroticism.⁴ It was also found that being more physically active may decrease one's stress and increase one's happiness levels.²⁰ Both of these studies and other related findings have laid the foundation for the use of physical activity not only as a way to become physically healthier, but also as a way to treat mood disorders.^{7, 10}

1.2 Achievement And Happiness/Positive Moods

Added to this relationship, many studies have found that goals and their achievement also play an important role in individual happiness and/or well-being.^{1, 12} One study found that career success can lead to happiness in the workplace.²⁴ Others, however, have found that this relationship between achievement and happiness can be applied to the realm of physical activity. A seminal study found that satisfaction among Olympians differed depending upon how they placed in their event.¹⁹ Gold medalists were the most satisfied, while silver medalists were the least satisfied, surprisingly. These researchers hypothesized that the results found were due to counterfactual thinking—the tendency for people to have “if only” thoughts about an event that has already taken place (e.g., ‘*If only* I ran a little faster I would have won’). In this situation, silver medalists were one position away from gold which led to increased counterfactual thinking and thus less satisfaction with their performance. Bronze medalists, on the other hand, were happy just to receive a medal. This study demonstrates how achievement can directly affect one's mood—a relationship that has been found to be non-directional as one's mood can also dictate how one performs in sport as well.¹⁴

1.3 Physical Activity, Achievement, And Happiness/Positive Moods

The interplay between physical activity, a person's happiness/mood, and achievement has been heavily supported with empirical evidence. It was found that happiness and/or positive moods have a non-directional, positive relationship with physical activity.^{2, 4, 5, 8, 9, 16, 20, 25} It was also found that happiness and/or positive moods have this same non-directional, positive relationship with achievement.^{1, 12, 14, 19, 24} With all of the focus on healthy behaviors, achievement, and happiness, it is important to understand why these variables even matter. The benefits of physical activity—including but not limited to elevating one's mood—have already been stated through the CDC's report.⁶ Achievement has also been discussed, in which an elevation in mood may ensue as well.^{1, 12, 24} Though these relationships are non-directional, research has supported that both physical activity and achievement can lead to the shared potential outcome of happiness/elevated mood.^{1, 4, 8, 12, 16, 19, 20, 24} The physical and mental effects of being happy are unquestionably pleasing to experience, but it is important to understand what other positive effects happiness can add to one's life.

1.4 Benefits Of Happiness/Positive Moods

As Aristotle once said, “Happiness is the meaning and the purpose of life, the whole aim and end of human existence.”²⁸ What Aristotle might not have known at the time, however, is that happiness does in fact have several important real life implications that have now been confirmed through empirical evidence. For instance, a link between happiness and increased personal growth, health, and development has been found.³⁰ These researchers also found that happier people are more receptive to outside stimuli, and that their happiness aides in creativity. Though mixed results have been found, people have argued that happiness can also positively affect academic performance.²³ Not only this, but studies have also found that happier people tend to have higher incomes¹¹ and have been found to be more successful in life in general.¹⁷ However, this relationship is not necessarily non-directional. A recent study has found that higher incomes can lead to less sadness in one's life, but not increased happiness.¹⁵ Research has also found that career success can lead to one's happiness, but it was discovered that this only happened if the person was satisfied and committed to their job.²⁴

1.5 Goal-Orientation

The focus of the current study was founded on the relationships between achievement, physical activity, and positive affect. The current study looked to extend this string of relationships in a direction where there was limited research by adding a new variable: one's goal-orientation, or the idea of how one defines success in achievement situations.²² Goal-orientation theory has been applied to many fields including but not limited to academics, leadership, organizational outcomes, and sport.²² One's goal-orientation is split up into two parts: task-orientation and ego-orientation. People who are highly task-oriented focus on mastering tasks individually. People who are highly ego-oriented focus on competing with others on a task and beating them. These characteristics can influence how individuals perform in achievement situations for the better or worse, which depends on what the situation entails—focusing solely on the task itself and/or focusing on competition with others performing the task.²² Goal-orientation was added as a new variable in order to see how individual traits would affect the previous relationships explained between physical activity, achievement, and positive affect. Current researchers believed that one's goal-orientation could influence the effects of achievement in a physical activity task on one's mood depending on if participants were more task-oriented or ego-oriented.

1.6 Self-Determination Theory

Self-determination theory explains the mechanisms behind one's motivation—the reason(s) that people behave in a particular way.²⁹ Researchers have proposed that one's innate traits as well as the social situation that they are in can influence how people will behave depending on if their basic needs (i.e., autonomy, competence, and relatedness) are met. One study found that having other people around a person while they exercise can influence that person's motivation and enjoyment of exercising.²¹ This theory and research supporting it are important as the current study sought to see if one's goal-orientation (i.e., an innate trait) would influence their motivation to achieve a specified physical activity task as well as their mood that followed depending on if they did or did not achieve the task.

1.7 Purpose And Hypotheses

Many variables have come into play so far, in which the following relationships were found through empirical sources. First, physical activity has a positive, non-directional correlation with positive affect/happiness.^{2, 4, 5, 8, 9, 16, 20, 25} Second, achievement also has a positive, non-directional correlation with positive affect/happiness.^{1, 12, 14, 19, 24} Though both of these variables are non-directional, studies have shown that both physical activity and achievement can lead to the shared outcome of positive affect/happiness.^{1, 4, 8, 12, 16, 19, 20, 24} Lastly, positive affect/happiness has been seen to lead to better life outcomes such as higher incomes¹¹ and general life success.¹⁷ To add to this model, the current study looked at another variable—one's goal-orientation—in order to extend what is known about this string of relationships between variables.

The current study thus looked at how achievement (or lack thereof) in a physical activity task affected one's mood depending upon participants' goal-orientations. Figure 1 below outlines the basis of how this study was constructed based upon the empirical evidence provided, and shows the strings of variable relations previously examined.

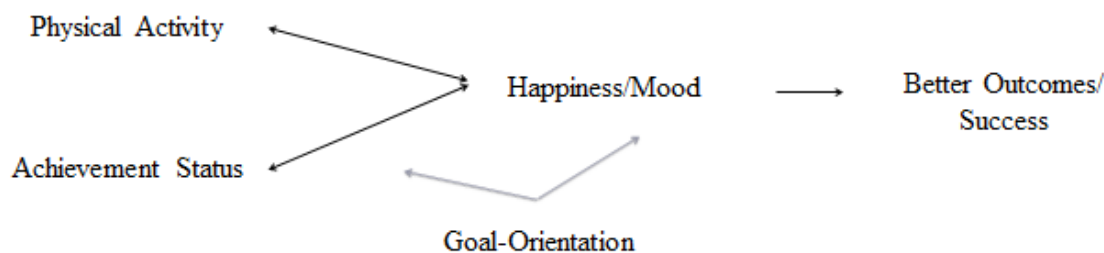


Figure 1. Correlational model used for study's hypothesis based on empirical research.

It was hypothesized that people with higher goal-orientation levels (i.e., ego-orientation and/or task-orientation) would have higher fluctuations in mood (i.e., higher for achieving and lower for not achieving) than participants with lower levels of these orientations. This was hypothesized as people that have higher levels of either goal-orientation tend to be more competitive with themselves (i.e., task-orientation) or with others (i.e., ego-orientation)—in which the current study both accounts for in its designated task.²¹ This hypothesis is supported by self-determination theory as one's goal-orientation (i.e., an innate trait) and the social situation that participants are in (i.e., competing against themselves and others on the task) are predicted to influence participants' motivation and ensuing moods regarding their achievement of a specific physical activity task. ^{21, 29}

2. Methods

2.1 Participants

One hundred and twenty (120) undergraduate students (75% female, 89% Caucasian, 92.5% ages 18-22 years old) were acquired from the psychology and exercise sport science departments at a small Midwestern university. Participants received either extra credit in an introductory psychology course or were put into a drawing for one of six twenty-five dollar Subway gift cards for their participation.

2.2 Materials

2.2.1 Brunel mood scale (brums)

The Brunel Mood Scale (BRUMS) designed by Terry, Lane, Lane, and Keokane was used to measure participants' moods before and after the task.³¹ The measure contains 24 items and consists of six subscales: anger, depression, fatigue, tension, vigour, and confusion. Each subscale has one-word or short phrase descriptors (e.g. 'confused') that participants responded to. This was done by rating how much they felt the descriptor at that instant using a 7-point Likert scale from 'Not at All' to 'Extremely'.

2.2.2 Subjective happiness scale (shs)

Lyubomirsky and Lepper's Subjective Happiness Scale (SHS) was used to measure participants' general happiness levels before and after the task as well.¹⁸ The SHS contains four (4) items that participants answered on a 7-point Likert scale. Each question asked a specific question about their general happiness levels, in which they responded to the Likert-scale depending on how happy they considered themselves (e.g. 'In general, I consider myself: 1) not a very happy person ... 7) a very happy person').

2.2.3 Perceptions of success questionnaire (posq)

The Perceptions of Success Questionnaire (POSQ) created by Roberts, Treasure, and Balague was used in order to determine participants' goal-orientation.²⁷ This questionnaire consists of 12 statements that participants answered based upon what makes them feel most successful during sport. It is split up into six (6) questions per each orientation: task-orientation and ego-orientation (e.g. 'I reach a goal' (task-orientation) or 'I beat other people' (ego-orientation)). A 5-point Likert scale was used to answer how strongly participants agreed or disagreed with how each question fit their ideas of success in sport.

2.2.4 Borg's exertion scale and hr max equation

Borg's exertion scale was used to determine the level of exertion that participants' endured during the task.³ This scale consists of numbers six (6) to twenty (20) that correlate to a heart rate if multiplied by a factor of ten (e.g., a score of 20 indicates a heart rate of 200 beats per minute). These numbers also match with a word description (e.g., 20 – maximum exertion).

A specified equation (i.e., maximum heart rate = 220-age (in years)) used in exercise science was also used to calculate each participant's maximum heart rate to determine a heart rate value standardized to their fitness level.²⁶

2.2.5 administration of questionnaires

Two questionnaires were used for this experiment, a pre- and a post-test. These questionnaires were created and completed online using Qualtrics. The pre-test questionnaire was composed of all three scales—BRUMS (mood), SHS (general happiness), and POSQ (goal-orientation)—along with questions about their physical activity (e.g. what types of physical activity do you typically do?), how many times they worked out each week, and how frequently they trained with a heart rate monitor.

The post-test questionnaire consisted of two of the three scales—BRUMS (mood) and SHS (general happiness)—along with Borg's exertion scale, questions about how difficult this task was compared to their other workouts, questions about the participants' goals in life (e.g. have you used goals in your life in general?), and demographic questions (e.g., race/ethnicity).

2.3 Procedure

Participants were randomly assigned to one of three experimental conditions: (1) achieved, (2) not achieved, and (3) control. All participants entered the lab believing that the current researchers were looking at people's ability to control their heart rate during physical activity. There was only one timeslot per data collection period, and each timeslot lasted between forty-five minutes to an hour long.

First, all participants signed an informed consent and were read an overview of the experiment. Next, both groups (i.e., control and experimental groups) completed the pre-test questionnaire. Once finished, the initial treadmill task was explained to participants and 65% of each participant's maximum heart rate was calculated to standardize the task to their fitness level. This number was recorded, and participants received a heart rate monitor to put on. Participants were shown that the heart rate monitor worked, and they proceeded to do a one (1) minute non-treadmill warm up (i.e., 15 seconds of jumping jacks, high knees, butt kicks, and lunges).

Participants then stepped onto the treadmill to standardize the speed to their designated 65% heart rate value. First, the treadmill started out at 1.5 miles per hour (mph) with an incline of 0%. Every 20 seconds after this, the incline was increased by 3% to reach a total of 15% incline. Following this (if needed), the speed was increased by 0.5 mph increments every 30 seconds to fit participants' standardized heart rate values—which were between 60% to 70% of their maximum heart rate. Their speeds were recorded after this heart rate mark was reached, and they were asked if they were physically able to hold this pace for 10 minutes for the actual task. When confirmed, participants were instructed to stop the treadmill and step off. Participants were encouraged to stretch after this task while the experimenters explained the actual treadmill task.

The actual treadmill task involved participants using a breathing technique (i.e., taking deep breathes in and out at a slow pace) to keep their heart rates below 65% of their maximum heart rate values. Participants' heart rate values were recorded every 2.5 minutes for a total of 10 minutes on the treadmill. The experimental groups (i.e., achieved and not achieved) were informed that "the average college student is able to keep their average heart rate below 65% of their maximum heart rate for this task using this technique." The control group was not read this statement. All participants were not informed if their heart rates were below their designated values or not during the task.

Participants then stepped back onto the treadmill to complete the actual treadmill task. After this task was finished, all participants were encouraged to stretch. The control group went directly to answering the post-test questionnaire after this period. However, before the experimental groups completed the post-questionnaire, they were informed of their results based upon the achievement statuses that they were randomly assigned to. The achievement group's version read, "After 10 minutes, you have succeeded in keeping your heart rate below the designated average heart rate. Your ability to control your heart rate exceeded the standards of the average college student." The group that did not achieve the task's read, "After 10 minutes, you have failed to keep your heart rate below the designated average heart rate. Your ability to control your heart rate does not meet the standards of the average college student." The experimental groups then completed the post-test questionnaire. Once the post-test was finished, the heart rate monitor was collected and each participant was thanked for their time. Lastly, participants were provided the true purpose of the study as well as the deception that was used to ensure unbiased results.

3. Results

A series of 2x3 mixed ANOVAs were conducted to determine if achievement status and goal-orientation affected the mood of participants after completing the physical activity task. Analyses indicated no significant interaction between achievement status and goal-orientation, and no main effects for goal-orientation. However, significant main effects were seen concerning the differing achievement statuses for the following mood subscales: anger, depression, and tension. Individual results can be seen below for each subscale.

3.1 Anger

Achievement status had a significant effect on the anger that participants experienced ($F(2,117) = 6.96, p = .001, \eta^2 = 0.106$). Post-hoc analyses found that those who did not achieve the task ($M = 0.23, SD = 1.62$) were significantly more angry after the task than those who did achieve it ($M = -0.98, SD = 1.75$), $p = .002$. Those who did not achieve the task were also more angry than those who were in the control group after the task was completed ($M = -0.75, SD = 1.15$), $p = .014$. There was no significant difference in anger between those who achieved the task and the control group, $p = .788$.

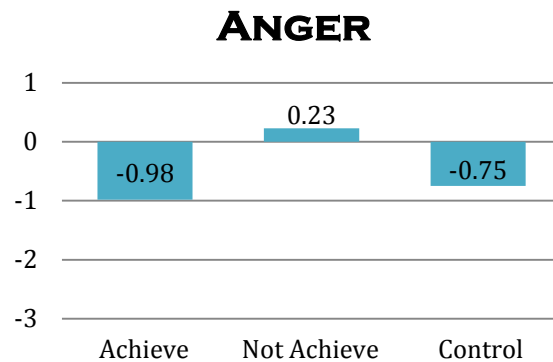


Figure 2. The average difference between pre- and post-test responses for each achievement status concerning anger.

3.2 Confusion

Achievement status did not have a significant effect on the confusion that participants experienced ($F(2,117) = 1.72, p = .183, \eta^2 = 0.029$). Due to this, no post-hoc analyses were run for the differences between achievement statuses concerning confusion: achieved ($M = -1.38, SD = 2.12$), not achieved ($M = -0.58, SD = 2.10$), and control ($M = -1.08, SD = 1.58$).

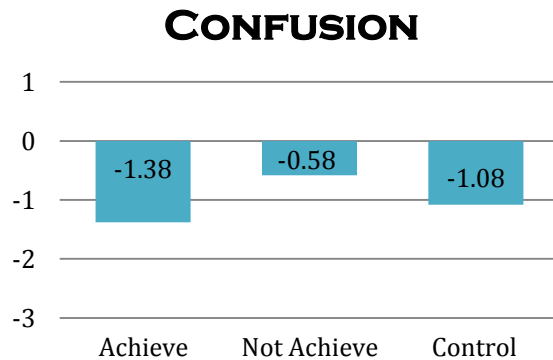


Figure 3. The average difference between pre- and post-test responses for each achievement status concerning confusion.

3.3 Depression

Achievement status had a significant effect on the depression that participants experienced ($F(2,117) = 3.26$, $p = .042$, $\eta^2 = 0.053$). Post-hoc analyses found that those who did not achieve the task ($M = -0.20$, $SD = 1.14$) were significantly more depressed after the task than those who did achieved it ($M = -1.00$, $SD = 1.83$), $p = .041$. There was no significant difference between the control group ($M = -0.80$, $SD = 1.32$) and those who did not achieve the task ($p = .161$) nor with those who achieved the task concerning depression, $p = .813$.

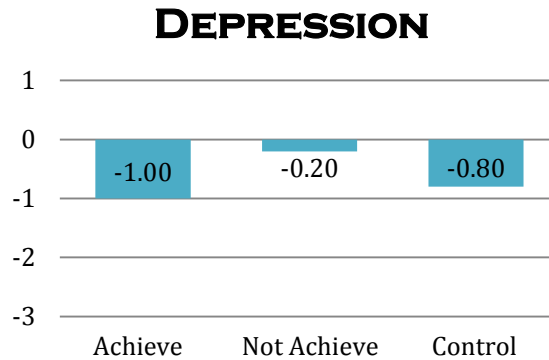


Figure 4. The average difference between pre- and post-test responses for each achievement status concerning depression.

3.4 Fatigue

Achievement status did not have a significant effect on the fatigue that participants experienced ($F(2,117) = 0.41$, $p = .664$, $\eta^2 = 0.007$). Due to this, no post-hoc analyses were run for the achievement statuses concerning fatigue: achieved ($M = -2.43$, $SD = 2.89$), not achieved ($M = -1.88$, $SD = 2.83$), and control ($M = -2.33$, $SD = 2.95$).

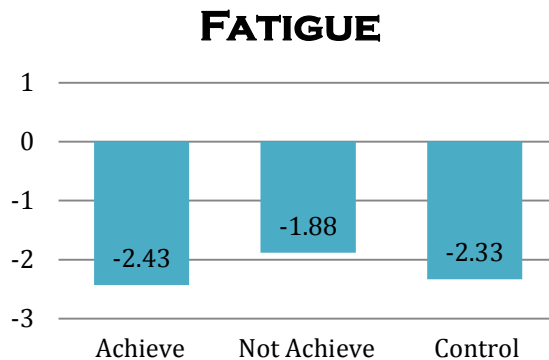


Figure 5. The average difference between pre- and post-test responses for each achievement status concerning fatigue.

3.5 Tension

Achievement status had a significant effect on the tension that participants experienced ($F(2,117) = 4.81$, $p = .010$, $\eta^2 = 0.076$). Post-hoc analyses found that those who did not achieve the task ($M = -1.05$, $SD = 2.45$) were significantly more tense after the task than those who did achieved it ($M = -2.80$, $SD = 3.06$), $p = .007$. There was no significant difference between the control group ($M = -1.98$, $SD = 1.94$) and those who did not achieve the task ($p = .233$) nor with those who achieved the task concerning tension, $p = .313$.

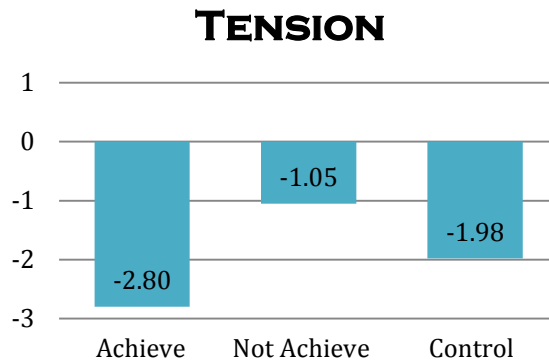


Figure 6. The average difference between pre- and post-test responses for each achievement status concerning tension.

3.6 Vigour

Achievement status did not have a significant effect on the vigour that participants experienced ($F(2,117) = 1.21$, $p = .301$, $\eta^2 = 0.020$). Due to this, no post-hoc analyses were run for the achievement statuses concerning vigour: achieved ($M = 0.25$, $SD = 2.76$), not achieved ($M = -0.20$, $SD = 2.46$), and control ($M = 0.68$, $SD = 2.29$).

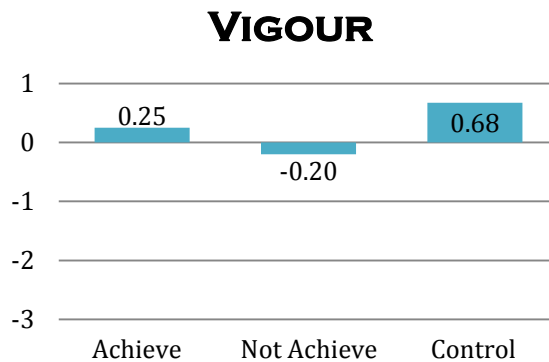


Figure 7. The average difference between pre- and post-test responses for each achievement status concerning vigour.

4. Discussion

Contrary to what was hypothesized, there was no evidence to support the claim that higher goal-orientation levels (i.e., ego-orientation and/or task-orientation) had higher fluctuations in mood (i.e., higher for achieving and lower for not achieving) than participants with lower levels of these orientations. This was true for goal-orientation combined with the varying achievement statuses as no interaction was found between these variables, as well as for goal-orientation on its own as no main effects were discovered for goal-orientation.

However, there were main effects found for achievement status on mood as significant evidence showed that participants that did not achieve the task held more negative moods (i.e., anger, depression, and tension) than participants who did achieve the task. One anomaly also showed that participants that did not achieve the task were more angry than participants in the control group. Overall, it was found that people who did not achieve the task held more negative moods than those who did achieve the task or were a part of the control group.

4.1 Limitations

Although the hypothesis was not supported, limitations of the study may help explain the results found.

First, the task and/or goal of keeping one's heart rate below a standardized value may have affected results. This task in itself is subjective as one may question whether or not it is possible to control one's heart rate, which could have confounded results.

Second, by using two surveys, participants could have experienced carryover effects. There was limited time between the administration of the two surveys (i.e., around 20-30 minutes), in which participants could have subconsciously or intentionally marked similar answers to how they first responded. This is important as some scales (i.e., BRUMS and SHS) were used in both questionnaires, and were the framework for the results of this study. This also led to demand characteristics and hypothesis guessing as many participants questioned the true purpose of the study when seeing the same questions being asked on the second survey.

Lastly, convenience sampling was used in which college students were recruited. Not only this, but participants signed up autonomously and knew that the study involved exercise. Due to this method of recruitment, most of the participants that joined the study were physically active. Added to this, the Midwestern campus used for recruitment is stereotypically known for its active and competitive environment. Combined together, most of the students recruited were highly fit in regards to physical activity and were also highly competitive. This restricted the range of people who participated, and could have skewed the results.

4.2 Future Directions

Though results were primarily null, the results found lay the groundwork for future studies. However, limitations must be accounted for before this is done. First, the goal and/or task used should be one that is objective in nature. Next, one questionnaire should be used at the end of the task instead of two overall surveys in order to limit confounded results due to such things as carryover effects. This could also limit demand characteristics and hypothesis guessing. Lastly, a more diverse population of people concerning fitness levels and motives should be used to limit a restriction of range. By adjusting these problem areas, more reliable results will be found.

Once these limitations are accounted for, future researchers could re-run this study to see if these areas indeed confounded results. This study holds importance for if significant results were found in regards to goal-orientation, findings would provide people with better knowledge concerning how they react to achievement in physical activity. This newfound knowledge could help dictate what types of goals people should be setting concerning the type of physical activity task that is being performed, with the intention of limiting negative moods and aggregating positive ones—leading to the benefits of happiness/positive affect explained before.

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