

Person-Oriented Versus Task-Oriented Spin Instruction: Differential Impact on
Participants' Mood and Sociability

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PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

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Abstract

Exercise has been shown to improve mood (Stöhle, 2009). Research has explored how exercise instructors can affect class participants' mood (Edmunds, Ntoumanis, & Duda, 2008). One style of instruction that is less understood relates to task-oriented vs. person-oriented instruction. The primary aim of this research was to explore the impact of spin-class instruction style on mood among spin-class participants. In Study 1, research assistants (RAs) evaluated the instruction of spin-class instructors and administered mood surveys to spin-class participants and instructors. Overall, positive mood improved for all spin-class participants and instructors. Instruction style did not moderate this effect. In Study 2, a refined instruction evaluation form was used to better detect person-oriented vs. task-oriented instruction. Unlike in Study 1, RAs also completed mood surveys. Overall, positive mood improved as a function of the exercise class for spin-class members and instructors, but not for RAs. Instruction style did not moderate this mood effect. Overall, the results support prior research that exercise leads to mood improvement. However, an impact of instruction style on class participants' mood was not found. One novel approach of this study was that instruction style was not manipulated. This pragmatic approach allowed the research team to explore organic instructor-student dynamics in a spin-class, which may improve the generalizability of the findings.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

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General Audience Abstract

Exercise is not only beneficial for physical health, but also mental health (Penedo & John, 2005). While a lot of exercise research has focused on treating individuals with mental disorders, research has also focused on the benefits for people without mental disorders (Stöhle, 2009). While many people exercise individually, group exercise is popular. The instruction styles of instructors in group classes have been shown to affect participant outcomes, including mood. The primary aim of this research was to explore the effects of two instruction styles that could interact with the benefits of exercise: person-oriented and task-oriented instruction. Instructors using more task-oriented instruction focus on setting specific exercise goals while instructors using more person-oriented instruction focus on establishing interpersonal relationships. It was hypothesized that mood would improve even more in person-oriented classes. In Study 1, mood surveys were administered to class participants and instructors in spin-classes. Research assistants (RAs) also completed instruction evaluation forms. While mood improved for participants receiving each style of instruction, there were no enhanced benefits for participants receiving more person-oriented instruction. In Study 2, the instruction form was modified and RAs also completed mood surveys. The instruction style of the instructors did not have an additional effect on the mood of the participants or RAs. However, mood did improve overall for instructors and participants. Overall, the results support prior literature that exercise can lead to mood improvements. Although an effect of instruction style was not found, future research looking at the impact of instruction style should be pursued.

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TABLE OF CONTENTS

Abstract.....ii

General Audience Abstract.....iii

Acknowledgements.....iv

List of Figures.....vii

List of Tables.....viii

Introduction.....1

Literature Review.....5

Study 1.....18

 Method.....18

 Results.....23

 Discussion.....34

Study 2.....35

 Method.....36

 Results.....42

 Discussion.....57

General Discussion.....63

References.....67

Appendices.....83

 Appendix A – Mood Scale for Study 1.....83

 Appendix B – Instructor Evaluation Form (RAs) for Study 1.....84

 Appendix C – Institutional Review Board (IRB) Approval Letter for Study 2.....86

 Appendix D – Instructor recruitment message – Blacksburg Weight Club (Study 1).....87

 Appendix E – Participant Evaluation Form Completed by Participants in Study 1.....88

 Appendix F – Person-oriented vs. Task-oriented Instruction per Date (Study 1).....89

 Appendix G – Pre- and Post-Mood Survey for Participants for Study 2.....91

 Appendix H – Pre- and Post-Mood Survey for Instructors for Study 2.....93

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix I – Pre- and Post-Mood Survey for RA’s for Study 2.....	95
Appendix J – Instructor Evaluation Form for Study 2.....	97
Appendix K – Institutional Review Board (IRB) Approval Letter.....	99
Appendix L – Recruitment email to Blacksburg Weight Club Manager (Study 2).....	100
Appendix M – Recruitment email to Virginia Tech Department of Recreational Sports Study 2).....	101
Appendix N – Instructor recruitment email – Blacksburg Weight Club (Study 2).....	102
Appendix O – Instructor recruitment email – Virginia Tech Department of Recreational Sports (Study 2).....	103
Appendix P – Instructor Evaluation Questions Used to Code Person and Task-Oriented Instruction for Study 2.....	104
Appendix Q – Instructor Evaluation Score and Whether the Instructor was Coded Task- or Person-Oriented for Each Class for Study 2.....	105

List of Figures

Figure 1.1: Participants’ positive mood scores as a function of exercise and the instruction style.....28

Figure 1.2: Participants’ sociability scores as a function of exercise and the instructor style.....28

Figure 1.3: Instructors’ positive mood scores as a function of exercise and the instruction style31

Figure 1.4: Instructors’ sociability scores as a function of exercise and the instruction style.....31

Figure 2.1: Participants’ positive mood scores as a function of exercise and the instruction style46

Figure 2.2: Participants’ sociability scores as a function of exercise and the instructor style47

Figure 2.3: Instructors’ positive mood scores as a function of exercise and the instruction style52

Figure 2.4: Instructors’ sociability scores as a function of exercise and the instruction style52

Figure 2.5: Research assistants’ positive mood scores as a function of exercise and the instruction style.....55

Figure 2.6: Research assistants’ sociability scores as a function of exercise and the instruction style.....56

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

List of Tables

Table 1.1: Factor loadings for the mood survey	26
Table 1.2: Mean positive mood scores for participants before and after person-oriented vs. task-oriented spin-class	27
Table 1.3: Mean sociability scores for participants before and after person-oriented vs. task-oriented spin-class	27
Table 1.4: Mean positive mood scores for instructors before and after person-oriented vs. task-oriented spin-class	30
Table 1.5: Mean sociability scores for instructors before and after person-oriented vs. task-oriented spin-class	30
Table 1.6: Mean ratings of instruction by participants (N denotes number of participants).....	33
Table 2.1: Factor loadings for the mood survey.....	44
Table 2.2: Mean positive mood scores for participants before and after person-oriented vs. task-oriented spin-classes.....	45
Table 2.3: Mean sociability scores for participants before and after person-oriented vs. task-oriented spin-classes.....	46
Table 2.4: Means of the additional questions between the two instruction styles (participants)...	49
Table 2.5: Mean positive mood scores for instructors before and after person-oriented vs. task-oriented spin-class.....	51
Table 2.6: Mean sociability scores for instructors before and after person-oriented vs. task-oriented spin-class	51
Table 2.7: Mean positive mood scores for RAs before and after person-oriented vs. task-oriented spin-class.....	54
Table 2.8: Mean sociability scores for RAs before and after person-oriented vs. task-oriented spin-class	55
Table 2.9: Means of the additional questions between the two instruction styles (RAs).....	57

Introduction

Exercise provides a host of physical benefits, including the prevention of cardiovascular disease (Schuler, Adams, & Goto, 2013), prevention and treatment of obesity (Wirth, Wabitsch, & Hauner, 2014), and increased bone strength (Allison, Folland, Rennie, Summers, & Brooke-Wavell, 2013; Fonseca, Moreira-Goncalves, Coriolano, & Duarte, 2013). Over the past few decades, research has shown that exercise has not only physical advantages, but also mental benefits, which include lower levels of depression and anxiety and higher levels of positive mood (Penedo & John, 2005).

In addition, research has shown that exercise can benefit cognitive functioning (Guiney, Lucas, Cotter, & Machado, 2015; Hillman, Erickson, & Kramer, 2008). Although some researchers have been skeptical of the effectiveness of exercise on treating mental disorders such as depression and anxiety, studies have shown that exercise can be as effective as medication in treating these disorders (Blumenthal et al., 2007). The mental benefits are not limited to people who suffer from mental disorders, as exercise generally leads to improved mood among nonclinical populations (Anderson & Shivakumar, 2013; Byrne & Byrne, 1993; Cassidy, 2016; DiLorenzo, Bargman, Stucky-Ropp, Brassington, Frensch, & LaFontaine, 1999; Rebar et al., 2015).

Benefits can be seen immediately after exercise and can remain sometime after the bout, with Sibold and Berg (2010) showing that mood improvements lasted for up to 12 hours in an exercise group when compared to a control group. However, 12 hours is on the upper end of the evidence-based mood benefits of exercise, since most studies have only measured mood within the first few minutes immediately following exercise and up to the next few hours (Sibold & Berg, 2010). In their meta-analysis, Reed and Ones (2006) showed that positive-activated affect

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

(PAA) increased immediately after low to moderate aerobic exercise that lasted up to 35 minutes, and the mood benefits lasted up to 30 minutes after exercise before returning to pre-exercise mood levels. The duration of the exercise session does not have to be very long, with positive changes in mood occurring even after only ten minutes of exercise (Hansen, Stevens, & Coast, 2001).

These findings regarding the mood benefits of exercise are meaningful because even though most people do not suffer from depression, most people are not in a state of flourishing (i.e., the optimal range of human functioning) and yearn for this state (Sin & Lyubomirsky, 2009). Therefore, exercise could potentially provide people with a mood boost to benefit their overall well-being, and at the same time lower their negative affect. Thus, exercise provides people an opportunity to flourish and be more successful in their daily lives. Research has shown that physical activity can lead to an increase in worker productivity, especially when the workplace promotes physical activity, which can contribute to overall job success (Pronk & Kottke, 2009).

Purpose of the Research

The proposed research was designed to build on the growing exercise literature by showing the impact the instruction style of instructors can have on the mood of the participants in their classes as well as the impact exercise can have on instructors and observers of the classes. The impact of instruction style on exercise classes has been studied, which has included training instructors to use a self-determination teaching style to affect student attendance and mood (Edmunds, Ntoumanis, & Duda, 2008; Wininger & Pargman, 2003). Edmunds and colleagues also showed that satisfaction with an exercise instructor can lead to more exercise

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

enjoyment. However, other dimensions of exercise instruction could have an effect on participants.

This thesis investigated another difference between exercise instruction: person-oriented versus task-oriented instruction. Task-oriented behavior is directed toward subordinates' performance and includes initiating work, organizing it, and setting deadlines and standards. Person-oriented behavior is directed toward subordinates' welfare and includes seeking to build their self-confidence, making them feel at ease, and soliciting their input about matters that affect them. (Callan, 1993). Spin-class instructors who use a person-oriented instruction style may affect their classes more positively than instructors using a more task-oriented style. For example, by talking more with their class participants, instructors using a person-oriented style may make spin-class participants feel more calm during the class. Thus, the style of instruction could interact with the effects of exercise, leading to higher gains in positive mood for spin-class members in person-oriented classes. However, spin instructors may not only be limited to one style of instruction; a spin instructor may be more task-oriented in one class and person-oriented during another class. As a result, the research reported here categorized leadership-style by *instruction* rather than by the *instructor*.

Research Questions

This research tested several hypotheses: 1) the mood for all spin-class participants will become more positive; 2) the mood following exercise will become even more positive in classes with instructors using more person-oriented instruction than task-oriented instruction; 3) the mood of all instructors will become more positive after teaching their classes; 4) the mood of the observers (i.e., RAs) will become more positive after they observe the spin-classes; 5) the mood

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

of the RA's will become even more positive after observing classes in which instructors use more person-oriented instruction than task-oriented instruction.

Significance of the Research

Group exercise classes have increased in popularity over the past few decades (i.e., Culligan et al., 2010). It is important to understand what factors can make the experience for participants more positive. Therefore, a positive experience may not only increase the number of initial participants, but also increase the number of people returning to these classes. Although exercise adherence was not measured in this thesis, the findings presented here could contribute to the group exercise and adherence literature as both adherence and mood have been shown to be related (Williams, 2008). If one style of instruction improves mood better than the other, several practical applications would be implicated.

Literature Review

Exercise and the Brain

When research first showed that exercise could be used to treat mental disorders like general anxiety disorder and depression, medical doctors had reservations about this relationship. Traditional thought among many doctors was that medication was the only feasible option for psychological disorders, even with emerging evidence that exercise could be a promising alternative and be as effective as antidepressants (i.e., Brown, Ramirez, & Taub, 1978; George & Thomas, 1995). Several decades ago researchers' lack of knowledge of what occurs in the brain during exercise explained this skepticism, but thanks to advances in psychological science, the general consensus among researchers is that exercise is beneficial for overall brain health (i.e., Colcombe et al., 2006; Cotman, Berchtold, & Christie, 2007; Svatkova et al., 2015).

Growth factors such as the brain-derived neurotrophic factor are thought to mediate the effects of exercise on depression, brain health and learning, among many other positive consequences (Gómez-Pinilla, Ying, Roy, Molteni, & Edgerton, 2002). These growth factors have been implicated in the process of neuronal plasticity, which is an important process during recovery from depression, and are considered a target of antidepressants (Castrén & Rantamäki, 2010; Martinowich, Manjui, & Lu, 2007). Exercise sessions can lead to increases in these growth factors, and consequently lead to recovery of brain regions that are reduced during depression.

The findings that exercise can be just as effective as antidepressants and other methods used to treat mental disorders, such as cognitive therapy (i.e., Lawlor & Hopker, 2001), is encouraging news for several reasons. First, not everyone responds well to the side-effects of medication, and some people fear taking medication due to potential side-effects (Anderson,

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Pace, Libby, West, & Valuck, 2012; Bet, Hugtenburg, Penninx, & Hoogendijk, 2013). Also, psychotherapy can be costly for some people, and like medication some people resist participation in psychotherapy (Klein et al., 1985). Fortunately, exercise does not suffer from these drawbacks, as low-to-moderate-intensity exercise carries minimum risk and minimal financial cost if a gym or exercise class membership is available. Since the most common forms of exercise, such as walking and bike riding, do not require the purchase of such memberships, physical exercise does not require the purchase of a gym membership.

Most people do not suffer from clinical depression, but many do experience some depressive symptoms at some point in their lives or they experience distress due to intermittent stressors. However, the same treatment methods used for clinically depressed people, such as selective serotonin reuptake inhibitors (SSRIs) and cognitive behavioral therapy, are not appropriate for healthy people, even if these people are having a “bad” day. Exercise is the exception; it is an activity that psychologically healthy and non-healthy people can do on a daily basis. Thus, it should be expected that the general population can also benefit from exercise as well, which the literature has indeed shown (Fox, 1999; Hopkins, Davis, Van Tieghem, Whalen, & Bucci, 2012; Rebar et al., 2015; Streeter et al., 2010). Nevertheless, there is still no consensus among researchers regarding the exact mechanism that improves mood, whether because exercise provides relief from life’s daily stressors (Schmitz, Kruse, & Kugler, 2004), or through the biological mechanisms and processes outlined earlier for treating mental disorders with exercise.

Many empirical studies, literature reviews, and meta-analyses have examined the effects of exercise on mood among people with and without mental disorders (Arent, Landers, & Etnier, 2000; Berger & Moti, 2000; Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991). Overall,

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

while there have been some methodological issues and some mixed findings, the trend is that single bouts of exercise can lead to improved mood among both clinical and nonclinical populations (Hogan, Mata, & Carstensen, 2013). Furthermore, engagement in exercise over a period of time (such as a few weeks) also leads to improved mood or lower reported depression at a follow-up assessment (Jaggers et al., 2014). It should be noted that in these programs the participants are exercising at least a couple times a week. They are not just exercising once and then being measured again at follow-up. Thus, it seems the psychological benefits of exercise require ongoing participation.

Mood Measurement

Several mood scales have been used to assess peoples' mood before and after exercising. The most common mood scale used during the first wave of exercise and mood studies was the *Profile of Mood States* (POMS: McNair, Lorr, & Doppleman, 1971). However, different versions of this scale have been developed, such as the *Short Form of the Profile of Mood States* (POMS-SF) (Curran, Andrykowski, & Studts, 1995); and researchers have begun to use the POMS-SF as well, since it is shorter and shown to have good convergent and discriminant validity and to be as reliable as the POMS (Baker, Denniston, Zabora, Polland, & Dudley, 2002). The *Positive and Negative Affect Schedule* (PANAS: Watson, Clark, & Tellegen, 1988) has also been used in studies of exercise and mood. A literature search revealed that most of these studies used Likert scales (e.g., POMS and PANAS).

Semantic differential scales have also been used to assess mood, such as the *Feeling Scale* (FS), but not as frequently as Likert scales (Hardy & Rejeski, 1989; Rechnitzer, Yuhasz, Paivio, Pickard, & Lefcoe, 1967). However, scales like the POMS are not without problems. The POMS is heavily skewed toward negative mood states, along with a few other mood scales in the

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

literature (Yeung, 1996). Thus, the use of scales with more balance toward both positive and negative mood states (such as the PANAS) will be necessary as more exercise studies are completed. Semantic differential scales can be used to solve this problem. Semantic differential scales have been commonly used in retailing and rating different brands of objects (Yu, Albaum, & Swenson, 2003). The bipolar nature of the semantic differential allows for a balance between negative and positive words, although semantic differentials are not without their own limitations (Gwinner & Stephens, 2001).

According to Gwinner and Stephens (2001), problems could arise when researchers analyze and interpret the results from a semantic differential scale. More specifically, the adjectives may fail to meet the bipolarity assumption and the scale-checking styles of subjects may vary, such as a tendency to use the end points more than other points) (Heise, 1969). Moreover, Friberg, Martinuseen, and Rosenvigne (2006) also discuss how semantic differentials could be more cognitively demanding than other types of scales, which could negatively affect the psychometric quality of the scale.

Nevertheless, the use of semantic differential scales provides several advantages that make it a more attractive option than other scales. Likert scales can suffer from acquiescence bias, meaning participants respond positively to items irrespective of content (Harzing, 2009). Friberg et al. (2006) showed that this bias could be reduced with a semantic differential scale. Semantic differential scales are also relatively efficient to administer and complete if formatted properly, such as having truly bipolar end points (Tucker, 1971). Therefore, semantic differential scales may prove particularly useful in situations that require quick on-the-spot responding. As a result, exercise studies might want to take advantage of these scales, as most exercise studies

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

require efficient survey administration and completion. Studies that administer semantic differential scales like the Feeling Scale are already taking advantage of this efficiency.

The type of scale has not been the only issue in the measurement of mood during exercise. The timing of measurement has also been debated among researchers. Some researchers have argued that mood changes nonlinearly during and after exercise and should be measured during exercise and not just afterwards (Parfitt & Eston, 1995). For example, Ekkekakis, Hall, and Petruzzello (2008) showed that positive affect went down during a 15-minute treadmill session, but it went up during the cooldown and after the class. Thus, the relationship between exercise and mood may not be linear, but rather curvilinear, especially for longer exercise sessions.

However, there are obvious issues with measuring mood during exercise. Participants would need to stop and complete the mood survey during the class, which could interfere with the exercise, especially if it is high intensity. The FS has been used in these studies since it only has one question and therefore is easy to complete in a short amount of time, but not every mood and exercise researcher will be inclined to rely solely on the one-item FS. Thus, future research may want to develop surveys with more than one question, but short enough to complete in a short time frame. Nevertheless, research using the FS has shown nonlinear change in mood throughout an exercise class (Ekkekakis et al., 2008).

Exercise and Mood

Some studies have compared the impact of different exercise durations (i.e., 10 min versus 30 min) on mood. Osei-Tutu and Campagna (2004) compared walkers assigned to walk either 10 min or 30 min per day for eight consecutive weeks. They found that 30 minutes of

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

walking was more effective than 10 min at reducing tension-anxiety and total mood disturbance and increasing vigor, all of which were measured with the POMS. The meta-analysis by Petruzzello et al. (1991) suggested that at least 21 minutes was necessary to achieve reductions in anxiety. However, Schöndube, Kanning, and Fuchs (2016) showed that people who exercised more felt better compared to those who exercised less, which suggests more benefits exist above a minimum time period, such as the one found by Petruzzello et al. (1991).

Does positive mood from exercise decrease over time? Research has shown strenuous runners who are running more than moderate or light runners do not experience increased health benefits, but rather increased mortality (Schnohr, O’Keefe, Marott, Lange, & Jense, 2015). More research has shown the negative physical effects of over-exercising, but some research has also shown negative psychological effects. Kim et al. (2012) showed that mental health benefits were highest for individuals who engaged in physical activity between 2.5 to 7.5 hours per week, but lower for individuals who engaged in less or more. Therefore, individuals who engage in physical exercise for more than an hour a day are not only increasing their risk of mortality or other health problems, but also general mental health problems. However, research examining the duration of exercise sessions and mood are limited. This area of research requires further study.

The American College of Sports Medicine advocates for at least 30 minutes of moderate-intensity physical activity daily (Pescatello, 2013). This is mostly for preventing or reducing hypertension, cancer, diabetes and other diseases. The above findings show that 30 minutes of exercise is also good for mood, suggesting that 30 minutes may be a good baseline for good physical and mental health. Furthermore, meta-analyses have shown a negative relationship between physical exercise and anxiety/depression (i.e., Wegner, Helmich, Machado, Nardi,

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Arias-Carrion, & Budde, 2014). Thus, people may choose to exercise for longer periods to achieve better physical or mental health outcomes, but 30 minutes per day may suffice for most individuals. Of course, the above findings also show that individuals should be careful not to over-exercise. Not only is their physical health at risk, but also their mental health.

Research has shown that the effects of exercise are not limited to only the immediate minutes following exercise. While studies vary in how many measures are taken after the completion of exercise, researchers who have taken mood measures at various times of day following exercise have shown mood to remain improved even at later points. Liao, Shonkoff and Dunton (2015) showed in a review that positive mood from physical activity lasted over a period of a few hours. Meyer, Koltyn, Stegner, Kim, and Cook (2016) studied different intensities of exercise among people with a major depressive disorder. They showed not only that the intensity did not matter for mood outcomes, but that depressed mood remained reduced 10 and 30 minutes following exercise.

Research has also examined long-term effects of exercise beyond single sessions of exercise. Gaskins, Jennings, Thind, Becker, and Bock (2014) studied the effects of yoga on mood and stress among college students over an eight-week period. During each class, mood was measured pre-yoga and post-yoga. Mood improved after most classes over the eight weeks, with the strongest improvements occurring during the first couple weeks of the yoga classes. Nevertheless, mood improved after each class throughout the eight-week period. Walter et al. (2013) monitored participants completing an exercise program for ten weeks. They showed mood improvements after each week, although the differences from week to week were not significant. However, there were issues with their study, as compliance over the ten weeks was low. This is a problem that other long-term exercise studies may also share, especially studies

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

with little to no accountability for participation. In a randomized controlled study, participants with insomnia engaged in physical activity over a period of 16 weeks and showed a reduction in depressive symptoms and improvements in vitality, with measurements being taken at the beginning and end of the study (Reid, Baron, Lu, Naylor, Wolfe, & Zee, 2010). Additionally, men between the ages of 65 to 75 who engaged in resistance exercise compared to a control group over 24 weeks had improved levels of mood and reduced anxiety (Cassilhas, Antunes, Tufik, & De Mello, 2010).

Regarding the effects of exercise intensity, research suggests that high intensity exercise leads to increased negative mood. Steptoe and Bolton (1988) showed that negative mood actually increased for people who did high-intensity physical activity compared to low-intensity physical activity. Katula, Blissmer, and McAuley (1999) found that anxiety was reduced in a light-intensity exercise condition, but did not change in the moderate-intensity condition, and actually increased in a high-intensity condition.

When low and moderate-intensity exercise were only examined among a group of college joggers, mood improved for both groups of joggers at the same levels (Berger & Owen, 1998). However, research has shown that high-intensity interval training (HIT) can lead to positive mood and affect outcomes while lowering negative mood and affect. Shepard et al. (2015) compared HIT to moderate-intensity continuous training (MIT) with regard to cardio-metabolic risk factors and psychological health, such as positive and negative affect. These researchers showed that negative affect decreased and positive affect increased in both groups, with no differences between the groups. Saanijoki et al. (2015) showed stress and negative affect were higher during HIT sessions than during MIT sessions. However, some of the negative emotions experienced during HIT were alleviated as the training sessions progressed. Therefore, it now

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

appears that even though high-intensity exercise can still make some individuals feel more stressed or have higher negative mood during the workout, over time the psychological benefits match light and moderate-intensity exercise.

Other studies have compared the effects of different types of exercise on mood, such as aerobic (e.g., running) versus anaerobic exercise (e.g., strength training). Using the POMS-SF, Chase and Hutchinson (2015) showed that the tension, anger, fatigue, depression and confusion subscales improved after people completed anaerobic or aerobic exercise. However, anaerobic exercise had a larger beneficial effect on the tension, depression and confusion subscales than aerobic exercise.

Research has also compared yoga to exercise. When comparing yoga to physical exercise such as walking, it was shown that mood and anxiety improved more in groups of volunteers who participated in yoga than other types of exercise (Govindaraj, Karmani, Varambally, & Gangadhar, 2016; Streeter et al., 2010). A review by Ross and Thomas (2010) found that yoga was just as effective or superior than physical exercise on the outcome variables they reviewed, which included mood.

Notably, one study in their review compared the effects of yoga and exercise for four months and found that both were effective at reducing the symptoms of psychosis in schizophrenic patients. These patients also improved on psychological and social measures. However, patients who participated in yoga improved more in these outcomes than the patients who exercised. Ross and Thomas (2010) speculated that these differences could be a result of the different effects yoga and exercise have on the sympathetic nervous system (SNS) and hypothalamic-pituitary-adrenal (HPA) axis. Furthermore, they speculated that the outcomes for

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

both yoga and exercise could have been more similar if more vigorous forms of yoga were compared to exercise.

Taspinar, Aslan, Agbuga, and Taspinar (2014) compared sedentary adults who completed either hatha yoga or anaerobic exercise. They found that both hatha yoga and anaerobic exercise had positive benefits on mental health and general well-being, but there were some differences. Notably, hatha yoga decreased feelings of fatigue, and increased self-esteem and quality of life more than anaerobic exercise, whereas anaerobic exercise improved body image more. Berger and Owen (1992) compared college students in swimming and yoga classes. They showed that both groups improved in mood compared to a control group. Interestingly, only men in the study showed a greater improvement in Tension, Fatigue and Anger scores on the POMS after participating in yoga compared to swimming, suggesting the possibility of gender differences with regard to the benefits of exercise.

Exercise Instructors and Instruction Style

Exercise instructors can influence their classes differentially as a function of their teaching styles. For example, Edmunds et al. (2008) compared a teaching style based on self-determination theory (SDT) with a typical teaching style in a cardio-combo exercise class in the UK. SDT has been implicated in explaining exercise motivation and the maintenance of exercise behaviors (Chatzisarantis, Biddle, & Meek, 1997; Hagger & Chatzisarantis, 2008). Edmunds and colleagues had the same instructor teach both classes, but instructed her to adjust her style for each class. Therefore, in this study classes were altered by *instruction* and not by *instructor*. In the SDT-based class, the instructor promoted autonomy by allowing class participants to choose their exercises. The instructor took the perspectives of the participants into account and acknowledged their feelings. The instructor also provided informative feedback and made class

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

expectations clear. In contrast, in typical exercise classes, the instructor's main goal is to maintain control over the entire class, which could involve pressuring participants and even providing them extrinsic rewards. The participants in the SDT group showed an increase in relatedness and perceived competence over time. They also attended the classes more regularly and had higher gains in positive affect.

Other studies have looked at how instructors using an SDT-based instruction style affect different outcomes. Moustaka, Vlachopoulous, Kabitsis, and Theodorakis (2012) also studied an instructor who used an SDT-based teaching style versus a typical teaching style and found similar findings as those observed by Edmunds and colleagues. Solberg, Halvari, Ommundsen, and Hopkins (2014) trained all instructors in their study to use SDT techniques when teaching their exercise participants and found improvements in well-being measures and attendance. While these studies show the importance of instruction style in exercise classes, more research is needed on how instruction style can affect the mood outcomes of their class participants, as research in this domain is relatively sparse compared to how instruction style affects attendance.

Person-oriented versus Task-oriented Leaders

Leaders and even exercise instructors can be categorized as person-oriented or task-oriented. Task-oriented leaders focus on “structure” or the required tasks followers must complete, whereas person-oriented leaders are “more considerate” of their followers and focus more on relationships among followers (Fleishman, 1953; Fleishman & Harris, 1962; McCleskey, 2014). Several questionnaires have been developed to measure task-oriented vs. person-oriented behavior, such as the *Leader Behavior Description Questionnaire* (LBDQ: Haplan, 1957). Task-oriented leaders are more focused on getting the job done, which may

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

include giving more detailed instructions and explicitly managing time and resources but showing less concern for socioemotional dimensions.

Furthermore, task-oriented leaders are more apt to define what is expected of followers and establish formal communication channels, while person-oriented leaders are likely to boost positive relationships and reduce conflicts among followers (McCleskey, 2014). These person-oriented leaders are more focused on the socioemotional domain, which include acting friendly and showing consideration for others' feelings (Amabile, Schatzel, Moneta, & Kramer, 2004).

Some studies suggest that leaders can influence emotions in positive ways if they provide specific team goals for the team (i.e., group goals) and for individuals (Zaccaro, Rittman, & Marks, 2001). For example, Zaccaro et al. (2001) proposed different models for team leadership, suggesting that a task-oriented leader might be more successful at increasing job satisfaction or overall satisfaction than a person-oriented leader, since task-oriented leaders tend to provide more specifics and clarity than person-oriented leaders (Brodbeck, Frese, Javidan, & Kroll, 2002).

However, the literature is more supportive of person-oriented leadership when it comes to outcomes like job satisfaction (Patra, 2004). The desirable outcomes are not just achievement or output, but also the emotional and affective aspects of the group that leads to success. In fact, a meta-analysis by Judge, Piccolo, and Ilies (2004) showed that person-oriented leadership was more strongly associated with job satisfaction, motivation and leader effectiveness than task-oriented leadership. Task-oriented leadership was more strongly associated with job and group-organization performance. Thus, even though task-oriented leadership may have its own benefits, this meta-analysis showed that person-oriented leadership is the key to overall job satisfaction, which could lead to positive emotional states.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Instructors using a person-oriented style may also be able to draw more participants to exercise classes, like instructors who are trained to use SDT techniques. Research has shown that employees who are treated with more personal consideration show greater levels of commitment to their organization (DeCotiis & Summers, 1987). Overall, person-oriented leadership seems to lead to more commitment to work organizations than task-oriented leadership (Brown, 2003). This could be the case because person-oriented leaders are “transformational” and instill self-motivation among their spin-class members; they are not simply “managing” the situation as a task-oriented or “transactional” leader (Foti & Boyd, 2016; Geller, 2016). In a spin aerobics class, commitment could mean increased class attendance by the participants or more engagement and willingness of class members to push themselves harder during intense workouts. Furthermore, like SDT instructors, spin instructors using person-oriented instruction might be more motivating and class attendants may have higher gains in positive affect than instructors using task-oriented instruction (Edmunds et al., 2008).

Study 1

Study 1 compared the effects of person-oriented spin instruction and task-oriented spin-instruction on the mood of class participants. Three hypotheses were tested: 1) the mood of all participants will improve after exercising in a spin-class, regardless of style of instruction, but mood would improve more for participants in classes with person-oriented instruction; 2) evaluations will be higher in classes in which an instructor used person-oriented instruction; and 3) the mood of all instructors will improve after teaching the class since they were “exercising” as well.

The first hypothesis was derived from prior research that showed the positive mood benefits of exercise (Berger, Darby, Zhang, Owen, & Tobar, 2016). The second hypothesis followed from knowledge that different leadership styles can lead to more favorable ratings from subordinates (Aarons, 2006). The third hypothesis evolved from the intuitive notion that since instructors are also exercising, they should experience similar mood improvements as the participants in their classes.

Method

Participants

Participants were spin-class members and instructors at the Blacksburg Weight Club (801 University City Boulevard #6, Blacksburg, VA 24060). Those 18 years or older and participants in the class were eligible to participate. A total of 15 instructors were initially contacted. Of the 15 contacted, 12 instructors responded that they were interested in participating in the study. The mean age of the spin instructors who participated was 48.8 (SD = 10.2). Of those reporting their biological sex, 77.3 % were female. Class times ranged from 5:45 am to 6:30 pm. Times between

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

this time frame included 9:00 am, noon and 5:30 pm. The average class size was 15.1 (SD = 6.78) spin-class members.

Throughout the study, the mood surveys were completed a total of 537 times by spin-class participants. This includes individuals who only completed the pre-exercise and/or post-exercise survey, and not limited to only those who completed both the pre-and post-surveys. Quite a few individuals completed multiple surveys over the duration of the study, since they were present for multiple classes and agreed to complete the survey when asked. Some of these participants wrote their names on the surveys while others did not. A total of 179 individuals wrote their names down on the surveys at least once. This meant at least 179 individuals participated in the study, but the exact number is unknown since some surveys did not have names on them.

The instruction evaluation forms from participants were completed a total of 308 times. The mean age of the spin-class participants was 43.3 (SD = 11.6), ranging from 18 to 74. Of those reporting their biological sex, 62.3 % were female. The instructor mood surveys were completed a total of 60 times, with all instructors completing the survey at least once and most completing the survey several times over the course of the study.

Assessment

A semantic differential scale to measure mood was developed by adapting the PANAS (PANAS; Watson & Clark, 1988) and the Profile of Mood States (POMS: McNair, Lorr, & Doppleman, 1971). It included nine bipolar mood word pairs, one self-esteem word pair (valuable-worthless) and one belongingness word pair (sociable-unsociable). Participants and instructors had their own version of the mood scale. A copy of the mood scale can be found in Appendix A. The scales were distributed immediately before and after the class. Undergraduate

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

research assistants (RAs) used an instruction evaluation form to observe the behaviors of the instructors. An instruction evaluation form was also developed for the participants to complete at the end of the class. A copy of the instruction evaluation form can be found in Appendix B.

Procedures

Spin-class instructors at the Blacksburg Weight Club were contacted via email about participating in the study, which was approved by Virginia Tech's Institutional Review Board (IRB). This invitation email was preapproved by the manager of the Weight Club. A copy of the study approval letter, along with a copy of the email sent to instructors, can be found in Appendices C and D, respectively.

Instructors were told that researchers in the Center for Applied Behavior Systems (CABS) at VT were interested in studying how people feel after exercise and how instructors influence participants' feelings. Specifically, they were told that CABS was interested in observing their classes and assessing some mood states of their class participants. If an instructor was interested in participating in the study, s/he was told to contact the author of this thesis project. A brief in-person meeting with each instructor prior to the first class observation was then scheduled in order to explain the study goals and answer any questions. After this meeting, the instructor shared his or her spin-class schedule with the author and times were scheduled when the Research Center could observe specific classes.

During the first spin-class observed for each instructor (except for one instructor), the author made a brief announcement about the study to the class. The author emphasized that completing the surveys handed out by the RAs was always optional. At the beginning of each subsequent spin-class, the RAs handed out brief mood surveys to the spin-class participants and

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

to the instructors, always emphasizing that filling out the surveys was completely optional and not required for participation in the spin-class.

Participants were instructed to mark a line between the two words to indicate along a scale numbered from 1 to 10 how they felt at the moment. These mood surveys only took two to three minutes for participants to complete. Participants wrote their names on the surveys and answered basic demographic questions. Having people write down their name was the most efficient way to have them fill out the forms since there was simply not enough time at the start of the class to individually assign people their own ID number. However, study codes were assigned to participants when the data were entered electronically.

During the class, the RAs completed instruction evaluation forms. Most of the questions on this form were based on prior observations of the spin-classes by the author and his advisor. Examples of these questions included: “Does the instructor give clear instructions to the class?”, “Does the instructor engage with the class by talking (i.e., not just giving instructions but engaging in conversation)?”, “Does the instructor push the class to work harder?”, and “Does the instructor adjust the lights at any point?”. The forms had a total of 26 questions and included questions pertaining to behaviors the instructors performed during the class. The RAs were required to pay attention throughout the entire class. These questions were not based on any particular scales.

At the end of each spin-class, the RAs handed out the same mood survey previously distributed at the beginning of the class, with an additional instruction evaluation form for participants to fill out as well (see Appendix E for a copy of this form). Like the pre-exercise mood survey, study codes were assigned to participants when the data were entered

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

electronically. The post-survey took less than three minutes to complete. This study ran from the end of March 2016 until the beginning of May 2016.

Instruction Coding

The RA instruction evaluation forms were used to code the instruction in each class as person-oriented, task-oriented, or both. To code the instruction, responses from the RAs evaluation forms (Appendix B) were used. Although there were 26 questions on the evaluation form, only seven were coded since these questions were relevant (these seven questions are bolded in Appendix B). There were four person-oriented instruction questions and three task-oriented instruction questions. If an RA said that the instructor engaged in a person-oriented behavior (i.e., the instructor engages in the class by talking about things unrelated to exercise), the instructor received one point for person-oriented instruction. On the other hand, if instructors specified in detail what is expected of cyclists, they received one point for task-oriented instruction. Therefore, instructors could receive multiple points for both styles of instruction. Instructors could receive a max of four points for person-oriented instruction and three points for task-oriented instruction from each RA.

Since there were more opportunities for person-oriented behavior, proportions were compared rather than raw number of behaviors performed. The person-oriented instruction behaviors reported were divided by four and the task-oriented instruction behaviors reported were divided by three. Once the proportions were calculated for the two styles of instruction, the scores between the instruction styles were compared. If the instructor had a higher person-oriented instruction score, the instruction for the class was classified as person-oriented instruction and vice versa for a higher task-oriented instruction score. If the instructor received equal task-oriented and person-oriented scores, the instruction for the class was classified as

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

both. Classes with multiple instructors were not coded since some RAs evaluated in the instruction style of all the instructors in a class while some RAs only evaluated the instruction of one instructor.

A total of 26 classes had instructors who were operationalized as displaying more person-oriented instruction and 18 had instructors who engaged in more task-oriented instruction; three classes had instructors who engaged in equal amounts of each style. Classes with instructors who used both styles of instruction equally were not included in any subsequent analyses due to inadequate sample size. While a few instructors only engaged in one style of instruction, most instructors engaged in both styles of instruction at least once. See Appendix F for a table of the classes observed and the style of instruction that an instructor engaged in during the class.

Results

Inter-rater reliability

The inter-rater reliability of the instruction evaluation forms completed by the RAs was calculated with Cohen's Kappa whenever there were only two raters, and with Fleiss's Kappa when there were more than two raters. (On some occasions, there were up to five raters.) However, there were problems for a significant number of classes as sometimes multiple instructors taught a class, whereas for other classes multiple instructors biked at the front of the room with only one person instructing or a few of the multiple instructors giving verbal commentary. However, Cohen's Kappa and Fleiss's Kappa were still calculated for multiple instructor classes in which all RAs evaluated only one instructor. If the RAs evaluated more than one instructor in the class, these responses were not included. Since it was impossible to

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

determine the individual effect of more than one instructor in a class, multiple instructor classes were excluded in subsequent analyzes.

In total, Cohen's Kappa was calculated for four classes (κ ranged from .25 to .89, all $p < .05$ excluding the .25 case). The average overall κ was .65 (SD = .28). Fleiss's Kappa was calculated for 42 classes (κ ranged from .27 to 1, all $p < .05$). The average overall Fleiss's κ was .58 (SD = .14).

Based on benchmarks from Landris and Koch (1977), the strength of agreement for the four classes in which Cohen's κ was calculated was "substantial". Strength of agreement for the other classes in which Fleiss's κ was calculated was "moderate". Kappa values under 0.00 are typically labeled as "poor" strength of agreement, values from 0.00 to 0.20 are labeled as "slight", values from 0.21 to 0.40 are labeled as "fair", values from 0.41 to 0.60 are labeled as "moderate", values from 0.61 to 0.80 are labeled as "substantial," and values from 0.81 to 1.00 are labeled as "almost perfect".

Factor Analysis

A factor analysis was completed to see if words from the semantic differential loaded onto different factors. It was discovered that all nine mood word-pairs and one self-esteem word-pair and belongingness word-pair were correlated with each other (all r 's $> .30$ except for *sociable* and *valuable*, $r = .23$ and *sociable* and *calm*, $r = .19$), but still loaded onto two factors. The extraction method used was Principal Component Analysis and the factors were rotated obliquely by using the Oblimin method (Osborne & Costello, 2009). It was discovered that *valuable*, *interested*, *optimistic*, *cheerful*, *calm*, *carefree*, *motivated*, *happy* and *pleased* loaded onto one factor, whereas *energetic* and *sociable* loaded onto another (Note: the positive word

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

from the bipolar word pair is used to refer to each word pair). Since most participants and instructors completed multiple mood surveys during the study, the first one completed by each person was selected to include in the factor analysis. A total of 179 pre-exercise surveys were included in the factor analysis.

The first factor was labeled appropriately as “positive mood” while the second factor was considered “sociability”. If a variable’s factor loading was greater than 0.40, it was included in the factor (Beavers et al., 2013). No variables cross-loaded onto one of the two factors, which would have been if a variable had two loadings greater than 0.40 (Beavers et al., 2013). The results of the factor analysis are summarized in Table 1.1. The reliability of two sub-scales was calculated. Cronbach’s alphas for positive mood (nine items) before and after exercise were both 0.95 and 0.94, respectively. Cronbach’s alphas for sociability (two items) before and after exercise were 0.58 and 0.69, respectively.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Table 1.1. Factor loadings for the mood survey

	Factor	
	1	2
Calm	.91	-.21
Carefree	.90	
Cheerful	.93	
Energetic	.31	.61
Happy	.56	.37
Interested	.80	
Motivated	.64	.33
Optimistic	.92	
Pleased	.77	.15
Sociable		.90
Valuable	.94	

*Note: coefficients < 0.1 are not reported

Participants' Results

Composite scores on the two sub-scores were created based on the findings of the factor analysis. A “positive mood” score was created using *calm, carefree, cheerful, happy, interested, optimistic, motivated, pleased* and *valuable*. A “sociability” sub-score was created using *energetic* and *sociable*. Positive mood scores could range from 1 to 90, with higher scores suggesting a higher positive mood. Sociability scores could range from 1 to 20, with higher scores suggesting higher sociability. The mean scores for positive mood for participants in each

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

type of class before and after the spin-class are shown in Table 1.2. The mean scores for sociability in each type of class before and after exercise are shown in Table 1.3. These scores are graphically depicted in Figure 1.1 and 1.2, respectively.

Table 1.2. Mean positive mood scores for participants before and after person-oriented vs. task-oriented spin-class

	Instruction-orientation (based on RAs observations)	Mean positive mood score
Pre	Person	66.17 (13.58)
	Task	66.39 (14.37)
Post	Person	77.44 (13.49)
	Task	76.03 (13.78)

Table 1.3. Mean sociability scores for participants before and after person-oriented vs. task-oriented spin-class

	Instruction-orientation (based on RAs observations)	Mean sociability score
Pre	Person	13.24 (3.40)
	Task	13.57 (2.90)
Post	Person	16.67 (3.06)
	Task	16.34 (2.79)

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Figure 1.1. Participants' positive mood scores as a function of exercise and the instruction style

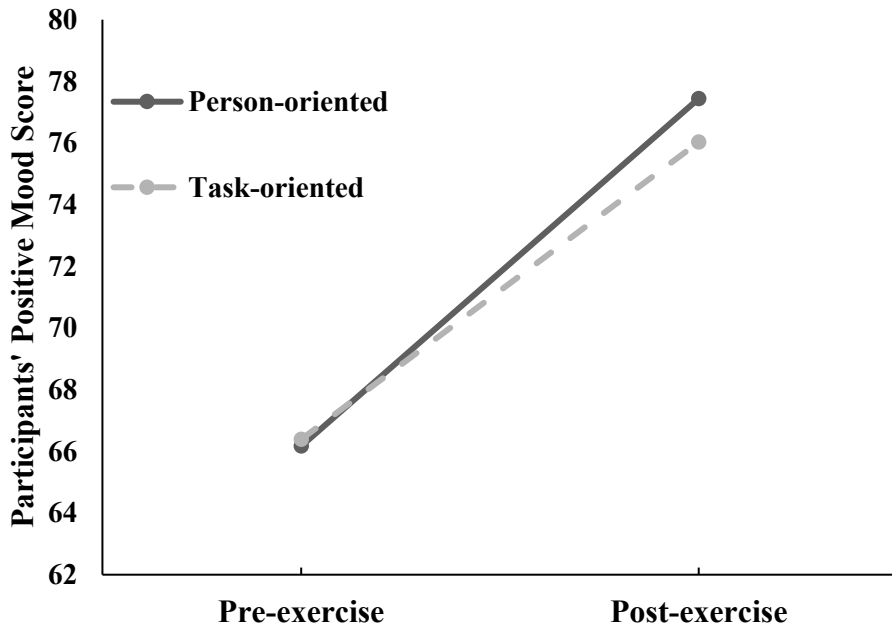
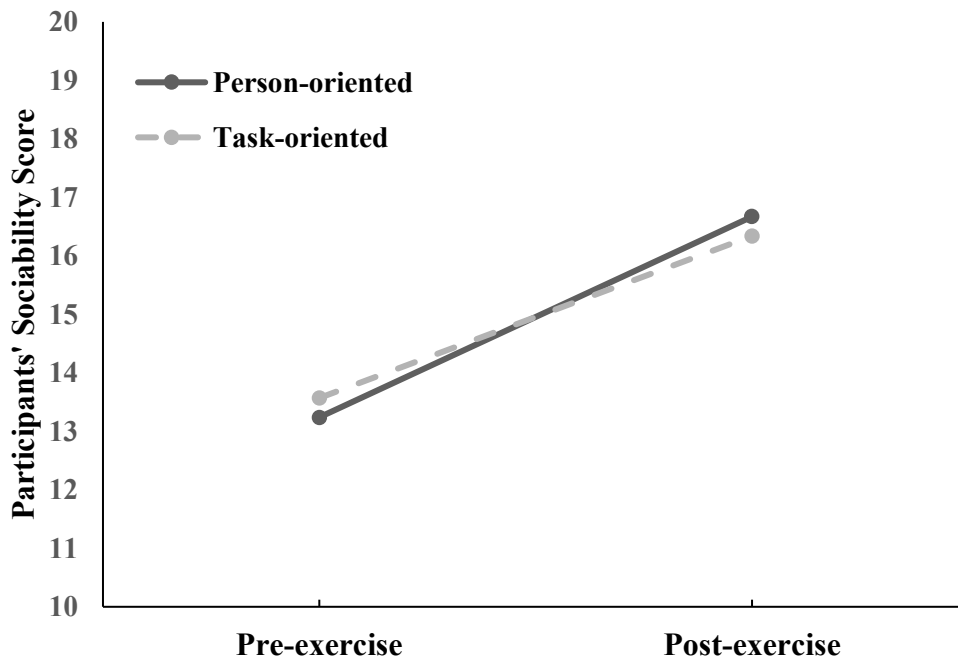


Figure 1.2. Participants' sociability scores as a function of exercise and instruction style



PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model Multivariate Analysis of Variance (MANOVA) with positive mood and sociability as the dependent variables was conducted to evaluate participants' mood as a function of exercise and instruction style. Only participants that completed both pre- and post-exercise surveys were included in all mixed model MANOVAs conducted in this document. A total of 129 participants who experienced person-oriented instruction and 67 participants who experienced task-oriented instruction were included in the MANOVA.

The main effect for exercise was significant: $F(2,193) = 124.42, p < .001$. The interaction term between instruction style and exercise over time was not significant, $F(2,193) = 1.07, p = .45$. Follow-up univariate tests were conducted to analyze the dependent variables separately. Only participants that completed both pre- and post-exercise surveys were included in all mixed model Analysis of Variances (ANOVAs) conducted in this document.

A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model ANOVA with positive mood indicated a significant main effect for exercise: $F(1,195) = 220.64, p < .001$. The interaction term between instruction style and exercise was not significant: $F(1,195) = 2.01, p = .36$. A total of 129 participants who experienced person-oriented instruction and 68 participants who experienced task-oriented instruction were included in the ANOVA.

A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model ANOVA with sociability indicated a significant main effect for exercise: $F(1,195) = 179.14, p < .001$. The interaction term between instruction style and exercise was not significant: $F(1,195) = 1.81, p = .18$. A total of 130 participants who experienced person-oriented instruction and 67 participants who experienced task-oriented instruction were included in this analysis.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Instructors' Results

Composite scores on the two sub-scores were created based on the findings of the factor analysis. The mean scores for positive mood for instructors in each type of class before and after exercise are shown in Table 1.4, and Table 1.5 displays mean scores for sociability in each type of class before and after exercise. These scores are depicted graphically in Figure 1.3 and 1.4, respectively.

Table 1.4. Mean positive mood scores for instructors before and after person-oriented vs. task-oriented spin-class

	Instructor-orientation (based on RAs observations)	Mean positive mood score
Pre	Person	78.93 (10.40)
	Task	71.29 (16.96)
Post	Person	81.50 (11.03)
	Task	80.15 (9.66)

Table 1.5. Mean sociability scores for instructors before and after person-oriented vs. task-oriented spin-class

	Instructor-orientation (based on RAs observations)	Mean sociability score
Pre	Person	17.14 (2.57)
	Task	15.92 (3.12)
Post	Person	18.29 (2.55)
	Task	18.17 (2.37)

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Figure 1.3. Instructors' positive mood scores as a function of exercise and the instruction style

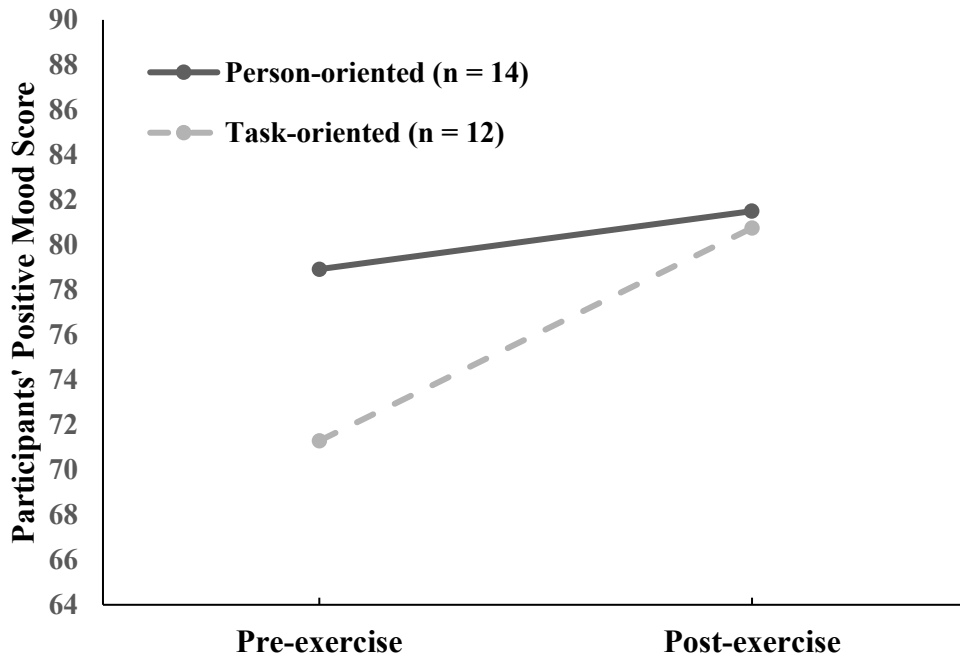
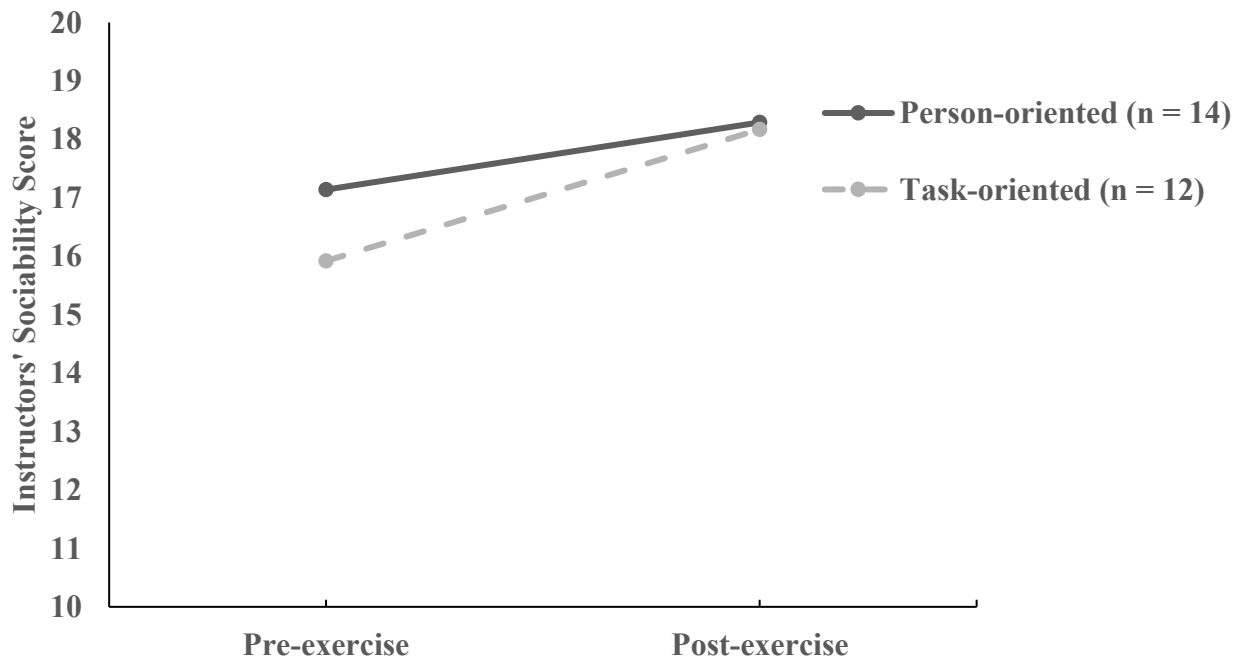


Figure 1.4. Instructors' sociability scores as a function of exercise and the instruction style



PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Prior to conducting a MANOVA, it was discovered that for the instructors, the positive mood and sociability variables displayed multicollinearity ($r > 0.9$), violating an assumption of the MANOVA test. Thus, two ANOVA tests were conducted instead. A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model ANOVA was conducted to test instruction effect on positive mood, then on sociability.

The mixed model ANOVA for positive mood indicated a statistically significant main effect of exercise: $F(1,24) = 7.28, p = .013$. The interaction term between instruction style and exercise was not statistically significant: $F(1,24) = 2.39, p = .136$. There were 14 instructors that engaged in person-oriented instruction and 12 instructors that engaged in task-oriented instruction included in the mixed model ANOVA.

The mixed model ANOVA for sociability indicated a statistically significant main effect of exercise: $F(1,24) = 12.23, p = .002$. The interaction term between instruction style and exercise was not statistically significant: $F(1,24) = 1.30, p = .27$. There were 14 instructors that engaged in person-oriented instruction and 12 instructors that engaged in task-oriented instruction included in the mixed model ANOVA.

Evaluation of Instructors Form Results

Since there were twice as many instructors evaluated who engaged in task-oriented instruction and the ratings were not distributed normally based on tests of normality (the ratings were heavily negatively skewed), Mann-Whitney U tests were used to compare the groups. Overall, it was discovered that participants rated both styles of instruction highly. However, participants rated instructors using person-oriented instruction as easier to hear and to understand ($U = 2945.50, p = .016$). The participant evaluation forms did not include many questions that

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

were clearly either person-oriented or task-oriented, although there were questions that could fall into one of the two categories (e.g., “Was the instructor happy, smiling, enthusiastic, etc?). The mean scores for each style of instruction are shown in Table 1.6.

Table 1.6. Mean ratings of instruction by participants (N denotes number of participants)

Instruction evaluation question	Person-oriented instruction score (out of 5)	Task-oriented instruction score (out of 5)
Did the instructor appear confident?	4.93 (.26) (N = 99)	4.85 (.40) (N = 68)
Was it easy to hear and understand the instructor? *	4.90 (.33) (N = 100)	4.72 (.57) (N = 68)
Was it easy to hear and understand the music?	4.62 (.80) (N = 100)	4.75 (.58) (N = 68)
Was the instructor happy, smiling, enthusiastic, etc?	4.96 (.24) (N = 100)	4.90 (.35) (N = 68)
Did the instructor provide intensity modifications?	4.83 (.45) (N = 100)	4.79 (.51) (N = 67)
Was the intensity of this class satisfactory to your needs?	4.85 (.38) (N = 96)	4.81(.53) (N = 68)
Overall, did you enjoy the class?	4.74 (.51) (N= 100)	4.74 (.57) (N = 68)
To what extent did you like the music?	4.18 (1.05) (N = 101)	4.38 (.88) (N = 68)
How much did the music facilitate your exercise?	4.33 (.99) (N= 100)	4.43 (.72) (N = 68)
Average rating of the instructor (average of the above)	4.71 (.38) (N = 101)	4.71 (.43) (N = 68)

* $p \leq .05$

Discussion

Overall, Study 1 showed that exercise leads to significant improvements in mood, which corroborates prior findings in the literature (e.g., Sibold & Berg 2010). Instructors mood also improved, showing that instructors are reaping the benefits of exercise even as though they are also doing their jobs. However, instruction style did not differently affect the mood of participants. Prior studies that showed an impact of instruction trained the instructors to teach a specific way. However, those studies were experiments. This study was naturalistic with no training component, which might explain the null finding for instruction style. While the instructors may have had different teaching styles, the instruction styles were not different enough to significantly affect participants' mood or the participants' instructor evaluations.

Based on the participant evaluation forms, it appears that instruction style may not be a significant factor for mood change in the spin-classes since both styles of instruction received very high ratings, and the participants in both classes improved equally in both positive mood and sociability. Even though one difference was found (i.e., people in person-oriented classes said it was easier to hear and understand the instructor), both ratings for this item were very high. Therefore, this finding should be interpreted with caution. But if the evaluation form had included questions such as: "Did the instructor engage in cheerful conversation?" and "Is the instructor being sociable and making everyone feel welcomed during the class?" it is possible instructors who used task-oriented instruction may have received lower ratings than instructors who used person-oriented instruction.

Limitations

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Several limitations of Study 1 will be addressed in Study 2. First, the evaluation form was not developed to measure person-oriented vs. task-oriented instruction, but only to measure general differences between instruction style. Therefore, all results must be interpreted with caution. While there are some merits to these findings, more questions were raised than answered. Also, during RA training it was not anticipated that so many classes would have more than one instructor, so RAs did not fully understand how to observe multiple instructor classes. Thus, the RAs were confused about how to observe these classes, leading to the exclusion of these classes from further analyzes. This resulted in the removal of a significant portion of data. Classes with multiple instructors could also affect mood, but it was not possible to analyze those potential differences along with instruction style. Future research could examine the effects of multiple instructor classes.

Also, the number of participants differed significantly in the person-oriented and task-oriented spin-classes. More participants received person-oriented instruction than task-oriented instruction. It is typically not appropriate to use unequal sample sizes in MANOVA or ANOVA models, but the mean scores between the groups were virtually the same. Therefore, if there were equal participants with the same mean scores, there would likely not be any group differences. However, given that more instructors were classified as person-oriented suggests that the instructors either inherently use more person-oriented instruction or that task-oriented instruction was not detected as much as person-oriented instruction.

Study 2

Study 2 attempted to improve on the limitations of Study 1 with a study design that measured person-oriented and task-oriented instruction more accurately. Study 2 had several

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

hypotheses: 1) mood will become more positive for all spin-class participants who complete mood surveys before and after their spin-class; 2) mood will become even more positive for spin-class participants in classes where instructors use more person-oriented instruction than task-oriented instruction; 3) mood will become more positive for all instructors after they teach their classes; 4) mood will become more positive for all RAs after they observe the spin-classes; and 5) mood will become even more positive for RAs who observe classes in which instructors use more person-oriented than task-oriented instruction.

The first hypothesis follows from prior exercise research, including Study 1 of this thesis. The second hypothesis was derived from research showing the benefits of person-oriented leaders (Abma, Bultmann, Varekamp, & van der Klink, 2013). No differential effects of person-oriented versus task-oriented instruction were found in Study 1, but differential effects were expected in Study 2. The third hypothesis follows from the findings of Study 1. The fourth and fifth hypotheses were exploratory, which might be explained by the processes of vicarious learning (Bandura, Ross, & Sheila, 1963). Vicarious learning involves indirect learning, such as through observation (Askew, Dunne, Ozdil, Reynolds, & Field, 2013). By observing exercise classes, it is possible the RAs become more motivated to participate in exercise classes, which could be reflected in their mood surveys.

Method

Participants

Participants were spin-class members and instructors at the Blacksburg Weight Club (801 University City Boulevard #6, Blacksburg, VA) and McComas Hall Gym on Virginia Tech's Campus. Members who were 18 years or older in the class were eligible to participate. Nine instructors (three from the Blacksburg Weight Club and six from McComas Gym) participated

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

for the duration of the study. The mean age of the spin instructors who reported their age ($n = 7$) was 30 ($SD = 14.01$). The mean age of the instructors at the Blacksburg Weight Club ($n = 2$) was 50.5 ($SD = .71$), and the mean age of the instructors at McComas Gym ($n = 5$) was 21.9 ($SD = 0.45$), of which these were the means of the instructors who reported their age. Of those reporting their biological sex ($n = 7$), 100 % were female. The instructor mood surveys were completed on a total of 24 occasions, with all but two instructors completing the survey at least once and most completing the survey several times over the course of the study. Class times ranged from 5:45 am to 8:00 pm. Class times within this time frame included 8:00 am, 9:30 am and 4:00 pm. The average class size was 14.3 spin-class members ($SD = 5.52$; ranging from 2 to 26).

The mean age of the spin-class participants ($n = 201$) was 26.43 ($SD = 11.46$), ranging from 18 to 74. Of those reporting their biological sex ($n = 127$), 92.1 % were female. Of those reporting their ethnicity ($n = 151$), 88.1 % were White, 6 % were Asian/Pacific Islander, 3.3 % were Black or African American, 0.7 % were Hispanic or Latino and 2.0 % were Other. The mean age of participants at the Blacksburg Weight Club ($n = 40$) was 44.90 ($SD = 13.05$), ranging from 26 to 74. Of those reporting their biological sex at the Weight Club ($n = 22$), 77.3 % were female. Of those reporting their ethnicity ($n = 26$), 100 % were White. There were at least 38 unique participants at the Weight Club. The mean age of participants at McComas Gym ($n = 162$) was 21.55 ($SD = 4.07$), ranging from 18 to 54. Of those reporting their biological sex ($n = 105$) at McComas Gym, 94.3 % were female. Of those reporting their ethnicity ($n = 125$), 86.7 % were White, 6.2 % were Asian/Pacific Islander, 3.9 % were Black or African American, 0.8 % were Hispanic or Latino and 2.4 % were Other. There were at least 161 unique participants at McComas Gym.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Assessment

Participants, instructors and RAs completed mood surveys during the class. The same pre- and post-exercise mood scale used during Study 1 was used for Study 2. However, a few additional word pairs were added to the mood survey regarding the instructor: 1) Was the instructor more person-oriented or task-oriented, 2) The instructor did not motivate me (the participant) or the instructor motivated me (the participant), and 3) The instructor was positive or negative. Only the participant and RA mood surveys included these pairs. See Appendix G, H and I for the participant, instructor and RA scales, respectively.

An instruction evaluation form was refined from that used in Study 1, and was used by the RAs. The form not only asked whether the instructor engaged in conversations unrelated to exercise, but the new form also asked whether the instructor was friendly and approachable and if the instructor stated exercise goals to achieve. Questions were drawn from the *Leader Behavior Description Questionnaire – Form XII* (LBDQ; Stogdill, Goode, & Day, 1962) and the *Scale of Quality in Fitness Services* (SQFS; Chang, K., 1998). The selected questions were modified to reflect the exercise setting. Questions used in Study 1, such as whether or not the instructor calls out people's names or whether or not the instructor gets off his/her bike and walks around the room, may also distinguish task and person-oriented instruction, so these questions remained in the evaluation form (See Appendix J for a copy of this evaluation form).

Procedures

Study 2 applied the basic observation protocol used in Study 1, with the addition of another exercise setting: McComas Hall gym on the VT campus. A new Institutional Review Board (IRB) protocol was developed to reflect the addition of McComas Hall Gym and changes

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

to the study questionnaires and evaluative procedures. A copy of the approval letter is given in Appendix K. Approved IRB emails about the study were sent to the manager of the Blacksburg Weight Club and Recreational Sports at VT (McComas Hall Gym is under Recreational Sports). Copies of these emails can be found in Appendices L and M, respectively. Both organizations were told about the objectives of the research and asked if permission could be obtained to email their spin-class instructors. Both organizations agreed to participate in the study and allowed the author to email spin-class instructors about their participation. Using approved IRB email scripts, instructors were emailed at both the Blacksburg Weight Club and McComas Hall Gym, indicating that if they were interested in participating in the study they should reply with their spin-class schedules. Copies of these emails are included in Appendices N and O, respectively.

Class observations started in late-October 2016, but spin-class participants did not complete surveys until early November. During the October classes, the RAs completed evaluation forms based on the instructors' behaviors and completed their own mood survey before and after the class. At this time, the RAs observed the classes but did not administer the surveys to class participants or instructors. However, these additional pre-survey classes provided more data and practice for the RAs. During early November, a new spin-class room was opened at the Blacksburg Weight Club and all subsequent classes were held in the new room. Mood surveys were administered in a few classes in the old spin-room before moving to the new room.

During the first spin-class observed for each instructor, the author or an RA made a brief announcement highlighting that the Research Center was interested in studying how people feel after exercise and how certain styles of instruction affect these feelings or mood states. It was emphasized that completing the surveys handed out by the RAs was always voluntary. However,

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

if class members participated in the study and completed a pre- and post-exercise survey, they would be eligible for one of twenty \$10 Starbucks gift cards. Classes designated as gift-card classes were chosen at random on the schedule of spin-classes and RAs were told to randomly select a participant in the class.

During subsequent classes the RAs distributed brief mood surveys to the spin-class participants and to the instructors before the class began. The RAs also completed their own mood survey as well. All of these surveys were on clipboards, which included a pre-exercise and post-exercise survey. Participants wrote their name on the surveys and answered demographic questions. Study codes were assigned to participants when the data were entered electronically. These surveys only took participants, instructors and RAs two to three minutes to complete. During the classes, the RAs completed instruction evaluation forms. The number of RAs varied from one to three for each spin-class.

At the end of the classes, the participants, instructors, and RAs completed the post-exercise mood survey, which was stapled to the pre-exercise survey. All rooms were limited in space, which included the old and new rooms at the Blacksburg Weight Club, making it difficult for the RAs to navigate around. By having the pre-exercise and post-exercise surveys stapled together, the need for RAs to move around rooms with little space, was eliminated. The RAs were encouraged to go around at the beginning of the class to turn the page of the surveys so the post-exercise survey was the first page showing at the end of the class. However, because of the space limitations the RAs could not do this in every class, particularly when attendance was high.

Throughout the study, the mood surveys were completed a total of 271 times by spin-class participants. This included individuals who only completed the pre-exercise survey or post-

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

exercise survey, and not limited to only those who completed both the pre- and post-surveys. Most individuals completed only one pre- and post-exercise survey, but there were also many individuals who completed more than one pre- and post-exercise survey over the duration of the study. These individuals were present for multiple classes and agreed to complete the survey when asked. The average number of times a survey was completed by a participant was 1.35 times ($SD = 0.73$). This includes participants who only completed a pre-exercise survey, but not the post-exercise survey. Only three surveys did not have their names on them. A total of 199 individuals wrote their names down on the surveys at least once. This meant at least 199 different individuals participated in the study, but the number could be 202 since three surveys had no name indicated.

Instruction Coding

Each class was coded as being more person-oriented or task-oriented by using a median split of the instruction evaluation forms completed by the RAs. Questions that were not relevant to person-oriented or task-oriented instruction on the evaluation form were not included in the coding process. In addition, only classes in which mood surveys were administered to participants, were included. The scores on each item were added up and divided by the total number of questions included in the coding process (there were a total of 16 questions) to create an instruction style mean score. A few questions from the evaluation form were reversed scored prior to adding the scores for each instructor (i.e., Questions 3, 5, 7, 16 and 18). The questions that were selected for the median split can be found in Appendix P.

The instruction evaluation scores for each class, along with whether the instruction for that class was coded as person-oriented or task-oriented, can be found in Appendix Q. If more than one RA observed a class, the instruction style mean scores for each RA were averaged

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

together to create an instruction style mean score for that class. There were 31 classes, with a median score of 4.60. Classes that were lower than 4.60 were classified as task-oriented and classes that were 4.60 or higher were classified as person-oriented. Therefore, higher scores indicated the instructor was using more person-oriented instruction and lower scores indicated the instructor was using more task-oriented instruction. In 20 classes, more than one RA observed the class. The mean number of RAs present per class was 1.77.

A total of 16 classes had instruction that was more person-oriented whereas 15 classes had instruction that was more task-oriented. From the coding, it was apparent that instructors vary in their style of teaching from one class to another. Only one instructor used person-oriented instruction throughout the entire study. All other instructors were both task-oriented and person-oriented at different points throughout the study.

Results

Inter-Rater Reliability

The inter-rater reliability of the instruction evaluation forms filled out by the RAs was calculated using intraclass correlations (ICC), which is a measure of consistency of agreement. This was done whenever there were two or more RAs observing a class. The ICC of each class with multiple RAs was calculated using the 26 questions from the evaluation form. A total of 21 classes had multiple RAs. The average ICC of each class was 0.78, suggesting there was moderate agreement among the RAs. This justified using the average person-oriented/task-oriented score when there were multiple RAs coding instruction style.

Factor Analysis

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

A factor analysis was completed to see if words from the semantic differential loaded onto different factors. Including participants, instructors and RAs, 224 individuals completed at least one survey. Only the first survey completed by each participant was included in the analysis.

The first factor analysis in Study 1 included the belongingness and self-esteem word pairs. The results may have differed if only the mood words were included in the factor analysis. Thus, the nine word pairs were included in the factor analysis with the belongingness and self-esteem word pairs excluded. Prior to running the factor analysis, it was discovered that all nine mood word pairs and the self-esteem and belongingness word pairs were correlated with each other (all r 's > .30, except for the correlations between *calm* and *sociable*, *carefree* and *sociable* and *valuable* and *sociable*). (Note: for the remainder of this document, the positive words from the semantic differential are used to refer to the bipolar word pairs). The extraction method used was Principal Component Analysis and the factors were rotated obliquely by using the Oblimin method. However, only one factor was revealed. Thus, the solution could not be rotated.

All word pairs (i.e., including belongingness and self-esteem) were included in a second factor analysis to see if this resulted in multiple factors. The extraction method used was Principal Component Analysis and the factors were rotated obliquely by using the Oblimin method (Osborne & Costello, 2009). Two factors were discovered when including all of the word pairs in the factor analysis. *Energetic* and *sociable* loaded onto one factor while *calm*, *carefree*, *cheerful*, *interested*, *motivated*, *optimistic*, *pleased* and *valuable* loaded onto the other factor. *Happy* cross-loaded onto both factors (both loadings were greater than 0.4). Thus, following recommendations of Beavers et al. (2013) and Schönrock-Adema, Heijne-Penninga, van Hell, and Cohen-Schotanus (2009), *Happy* was removed and the factor analysis was

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

completed again. With this factor analysis, two factors were replicated again, with *energetic* and *sociable* loaded onto one factor and *calm*, *carefree*, *cheerful*, *interested*, *motivated*, *optimistic*, *pleased* and *valuable* loaded onto the second factor.

The first factor can best be thought of as “sociability” while the second factor can be thought of as “positive mood”. For all further analyses, *happy* was not included. Instead, the two factors were used in all of the analyses. Factor loadings from this factor analysis are shown in Table 2.1. The reliability of two sub-scales was calculated: Cronbach’s alphas for positive mood (eight items) before and after exercise were both 0.89. Cronbach’s alphas for sociability (two items) before and after exercise were 0.78 and 0.77, respectively.

Table 2.1. Factor loadings for the mood survey

	1	2
<i>Calm</i>	.89	-.19
<i>Carefree</i>	.77	
<i>Cheerful</i>	.85	
<i>Energetic</i>		.83
<i>Interested</i>	.75	.21
<i>Optimistic</i>	.91	
<i>Motivated</i>	.68	.24
<i>Pleased</i>	.54	.39
<i>Sociable</i>		.88
<i>Valuable</i>	.92	-.13

*Note: coefficients < 0.1 are not reported

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Participants' Results

Composite scores on the two sub-scores were created based on the findings of the factor analysis. A “pre-sociability” sub-score was created by adding the *pre-energetic* and *pre-sociable* scores and averaging them; a “post-sociability” sub-score was created by adding the *post-energetic* and *post-sociable* scores and averaging them. A “pre-positive mood” sub-score was created by averaging *pre-pleased*, *pre-interested*, *pre-optimistic*, *pre-cheerful*, *pre-calm*, *pre-carefree*, *pre-motivated* and *pre-valuable* scores; and a “post-positive mood” sub-score was created by averaging the *post-pleased*, *post-interested*, *post-optimistic*, *post-cheerful*, *post-calm*, *post-carefree*, *post-motivated* and *post-valuable* scores.

Sociability scores and positive mood scores ranged from 1 to 10, with higher scores suggesting higher sociability and positive mood, respectively. The mean scores for positive mood for participants in each type of class before and after exercise are shown in Table 2.2. The mean scores for sociability in each type of class before and after exercise and shown in Table 2.3. These scores are shown in Figure 2.1 and 2.2 graphically, respectively.

Table 2.2. Mean positive mood scores for participants before and after person-oriented vs. task-oriented spin-classes

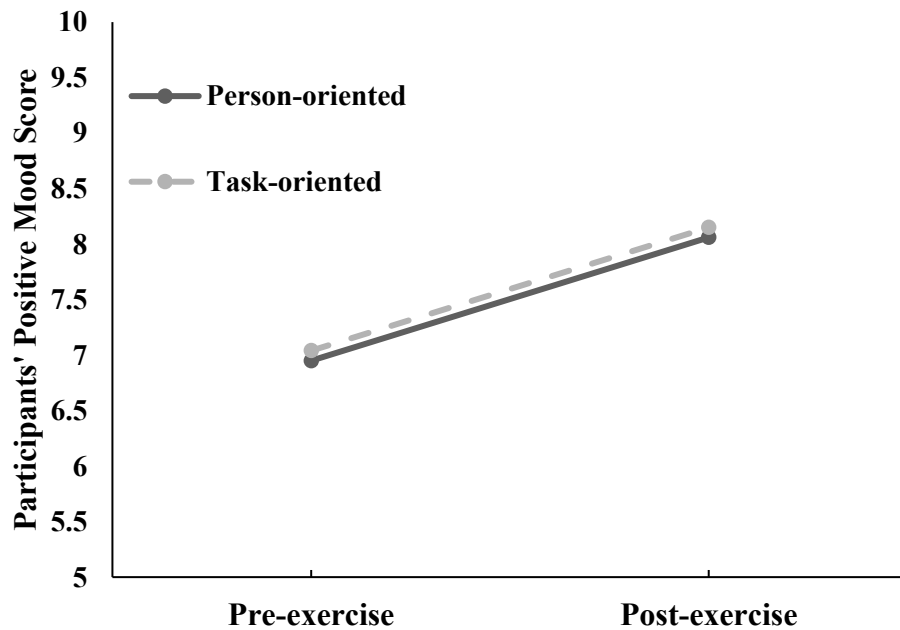
	Instruction style (based on RA evaluation form)	Mean positive mood score
Pre	Person	6.95 (1.57)
	Task	7.04 (1.70)
Post	Person	8.06 (1.67)
	Task	8.15 (1.61)

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Table 2.3. Mean sociability scores for participants before and after person-oriented vs. task-oriented spin-classes

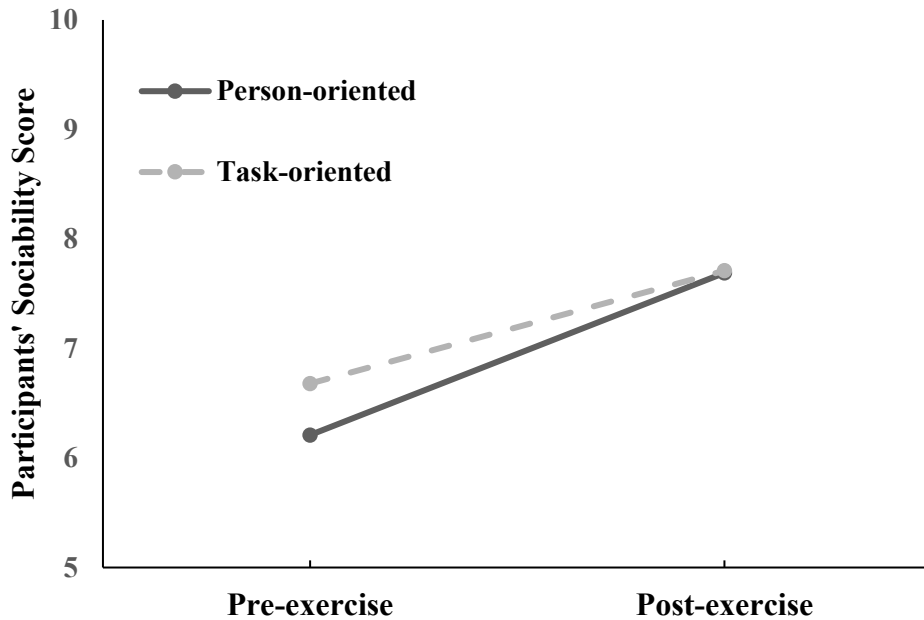
	Instruction style (based on RA evaluation form)	Mean sociability score
Pre	Person	6.21 (1.69)
	Task	6.68 (1.74)
Post	Person	7.69 (1.69)
	Task	7.71 (1.62)

Figure 2.1. Participants' positive mood scores as a function of exercise and the instruction style



PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Figure 2.2. Participants' sociability scores as a function of exercise and the instruction style



A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model multivariate analysis of variance (MANOVA) with positive mood and sociability as the dependent variables was conducted to test instruction effect on mood outcomes. A total of 123 responses from person-oriented classes and 134 from task-oriented classes were included in the analysis. Age of the participants was entered as a covariate since age has been shown to moderate the effects of exercise on mood (Anneis & Westcott, 2005).

The main effect for exercise was significant: $F(2,253) = 33.98, p < .001$. There was no interaction between instruction style and exercise: $F(2,253) = 2.37, p = .095$, although this interaction approached significance. However, age was a significant covariate before and after exercise, $F(2, 253) = 3.10, p = .047$, showing that age was related to the mood changes of participants. Specifically, correlational tests showed that positive mood scores before class were positively associated with age ($r = .163, p = .008; N = 267$). Follow-up univariate tests were conducted to analyze the dependent variables separately.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model ANOVA with positive mood indicated a significant main effect for exercise: $F(1,256) = 59.96, p < .001$. The interaction term between instruction style and exercise was not significant: $F(1,256) = .13, p = .718$. However, age was a significant covariate before and after exercise: $F(1, 256) = 6.10, p = .014$. Specifically, correlational tests showed that positive mood scores before class were positively associated with age ($r = .163, p = .008; N = 267$). A total of 125 responses from person-oriented classes and 134 responses from task-oriented classes were included in the analysis.

A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model ANOVA with sociability indicated a significant main effect for exercise: $F(1,259) = 36.20, p < .001$. The interaction term between instruction style and exercise was significant: $F(1,259) = 4.71, p = .031$. A t-test of the pre- and post-exercise scores indicated no differences at post-exercise, $t(1,260) = .32, p = .75$, however the means were significantly different at pre-exercise, $t(1,260) = 2.51, p = .013$. Participants in task-oriented classes had higher sociability scores at pre-exercise than participants in person-oriented classes. Age was not a significant covariate before and after exercise for sociability: $F(1,259) = 2.84, p = .093$. A total of 126 responses from person-oriented classes and 136 responses from task-oriented classes were included in the analysis.

Lastly, the three additional questions participants answered on the post-exercise mood survey about the instructor were examined. The first word pair asked whether the instructor was more person-oriented or task-oriented, the second pair asked whether the instructor motivated the participant or not, and the last asked whether the instructor was positive or negative. The means of the word pairs can be found in Table 2.4.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Table 2.4. Means of the additional questions between the two instruction styles (participants)

	Task-oriented	Person-oriented
Did not motivate me or Motivated me	8.75 (1.73)	9.02 (1.47)
Negative or Positive	9.14 (1.48)	9.23 (1.63)
Task-oriented or Person-oriented	7.12 (2.42)	6.96 (2.61)

Independent sample t-tests were conducted between person- and task-oriented spin-classes and the three word pairs. For the instructor motivating question, there was no difference between the style of instruction, $t(261) = -1.337, p = .18$. For the instructor being positive or negative, there was no difference between the style of instruction, $t(259) = -.458, p = .65$. For the instructor being more task- or person-oriented, there was no difference between the style of instruction, $t(261) = .52, p = .60$.

No hypotheses were made regarding impact of McComas Gym vs. Blacksburg Weight Club. However, a MANOVA was conducted comparing McComas Gym and the Blacksburg Weight Club. A 2 (Pre/Post exercise) x 2 (McComas Gym/Blacksburg Weight Club) mixed model MANOVA with positive mood and sociability as the dependent variables was conducted to test gym facility on mood outcomes. A total of 193 responses were included in the McComas Gym sample and 67 responses in the Blacksburg Weight Club sample.

The main effect for exercise was significant: $F(2,257) = 66.42, p < .001$. The interaction term between instruction style and exercise was significant, $F(2,257) = 3.43, p = .034$. Thus, follow-up univariate tests were conducted to analyze the dependent variables separately.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

A 2 (Pre/Post exercise) x 2 (McComas Gym/Blacksburg Weight Club) mixed model ANOVA with positive mood indicated a significant main effect for exercise: $F(1,260) = 105.49$, $p < .001$. The interaction term between gym facility and exercise was significant: $F(1,260) = 7.37$, $p = .007$. A t-test of the pre- and post-exercise scores indicated no differences at post-exercise, $t(1,260) = -.21$, $p = .83$, however the means were significantly different at pre-exercise, $t(1,260) = -2.50$, $p = .013$. Positive mood scores before exercise were higher at the Blacksburg Weight Club than McComas Gym, but were the same after exercise. A total of 195 responses were included in the McComas Gym sample and 67 responses in the Blacksburg Weight Club sample.

A 2 (Pre/Post exercise) x 2 (McComas Gym/Blacksburg Weight Club) mixed model ANOVA with sociability indicated a significant main effect for exercise: $F(1,263) = 80.85$, $p < .001$. The interaction term between gym facility and exercise was not significant: $F(1,263) = .345$, $p = .345$. A total of 198 responses were included in the McComas Gym sample and 67 responses in the Blacksburg Weight Club sample.

Instructors' Results

Composite scores on the two sub-scores were created based on the findings of the factor analysis. The mean scores for positive mood among instructors for each style of instruction before and after exercise are shown in Table 2.5. The mean scores for sociability for each style of instruction before and after exercise and shown in Table 2.6. These scores are shown graphically in Figure 2.3 and 2.4, respectively.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Table 2.5. Mean positive mood scores for instructors before and after a person-oriented vs. task-oriented spin-class

	Instruction style (based on RAs observations)	Mean positive mood score
Pre	Person	6.46 (1.56)
	Task	6.90 (1.88)
Post	Person	8.68 (0.66)
	Task	8.13 (1.19)

Table 2.6. Mean sociability scores for instructors before and after person-oriented vs. task-oriented spin-class

	Instruction style (based on RAs observations)	Mean sociability score
Pre	Person	6.11 (2.89)
	Task	6.59 (1.74)
Post	Person	8.83 (1.72)
	Task	8.77 (1.25)

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Figure 2.3. Instructors' positive mood scores as a function of exercise and the instruction style

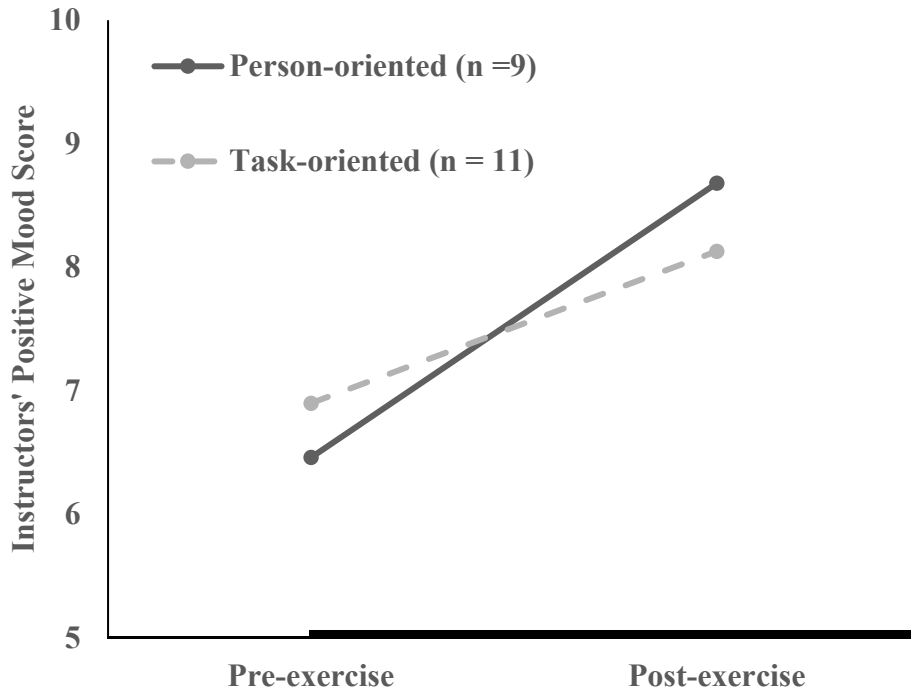
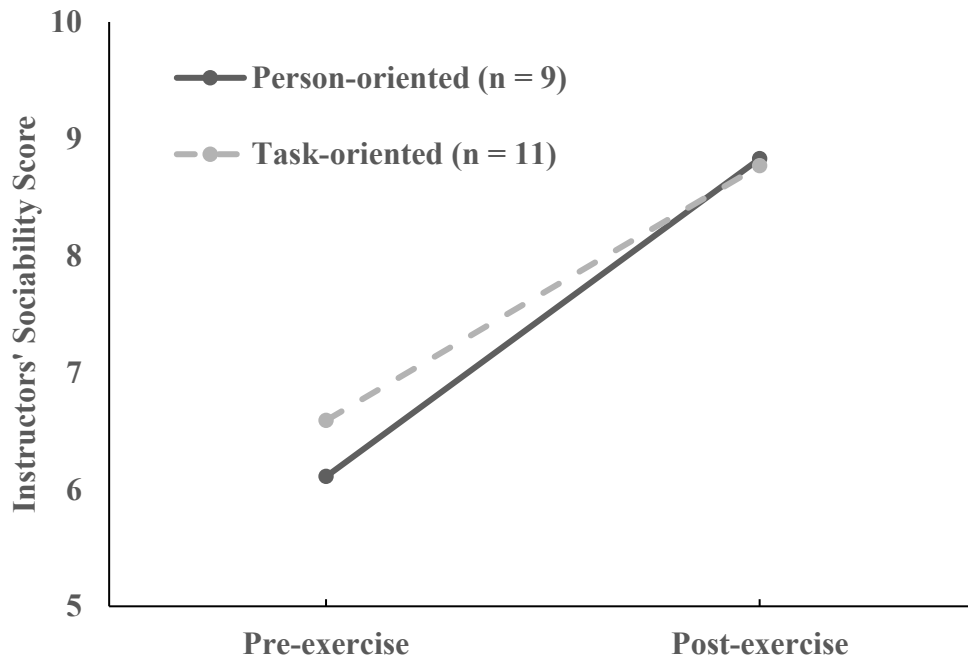


Figure 2.4. Instructors' sociability scores as a function of exercise and the instruction style



PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model MANOVA with positive mood and sociability as the dependent variables was conducted to test instruction effect on mood outcomes for the instructors. A total of nine responses were included from person-oriented classes and 11 responses were included from task-oriented classes. Age of each instructor was entered as a covariate.

The main effect for exercise was significant: $F(2,16) = 11.19, p = .001$. The interaction term between instruction style and exercise was not significant, $F(2,16) = 1.67, p = .22$. Age was not a significant covariate over time, $F(2, 16) = 2.97, p = .08$. Follow-up univariate tests were conducted to analyze the dependent variables separately.

A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model ANOVA with positive mood indicated a significant main effect for exercise: $F(1, 17) = 20.07, p < .001$. The interaction term between instruction style and exercise was not significant: $F(1, 17) = .13, p = .087$. However, age was a significant covariate before and after exercise: $F(1, 17) = 5.48, p = .032$. Correlational tests showed that positive mood before exercise was not significantly associated with age, but this relationship approached significance ($r = .405, p = .061; N = 22$). Positive mood was higher for older instructors at the beginning of the class than for younger instructors. A total of nine responses were included from person-oriented classes and 11 responses were included from task-oriented classes.

A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model ANOVA with sociability indicated a significant main effect for exercise: $F(1,18) = 22.36, p < .001$. The interaction term between instruction style and exercise was not significant: $F(1,18) = .77, p = .390$. Age was a significant covariate before and after exercise for sociability: $F(1,18) = 7.11, p = .016$. Correlational tests showed that sociability before exercise was not significantly

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

associated with age, but this relationship approached significance ($r = .378, p = .075; N = 23$).

Sociability was higher for older instructors at the beginning of the class than for younger instructors. A total of nine responses were included from person-oriented classes and 12 responses were included from task-oriented classes.

Research Assistants' Results

The RAs' scores on the mood scales were added up to create a positive mood sub-score and sociability sub-score. The mean scores for positive mood for the RAs for each style of instruction before and after exercise are shown in Table 2.7. The mean scores for sociability for each style of instruction before and after exercise are shown in Table 2.8. These scores are depicted graphically in Figure 2.5 and 2.6, respectively.

Table 2.7. Mean positive mood scores for RAs before and after person-oriented vs. task-oriented spin-class

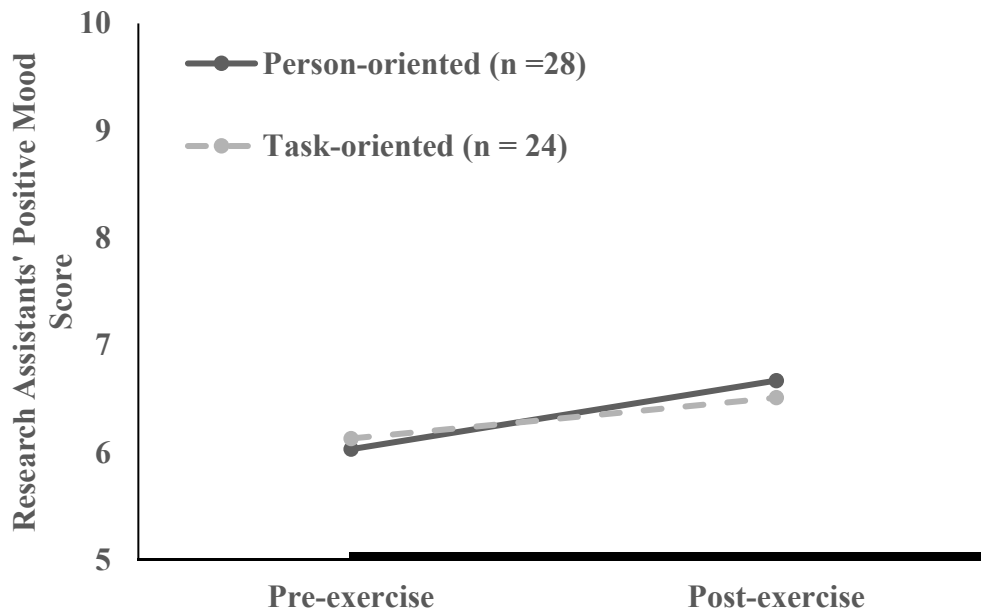
	Instruction style (based on RAs observations)	Mean positive mood score
Pre	Person	6.03 (1.29)
	Task	6.13 (1.06)
Post	Person	6.67 (1.18)
	Task	6.51 (0.82)

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Table 2.8. Mean sociability scores for RAs before and after person-oriented vs. task-oriented spin-class

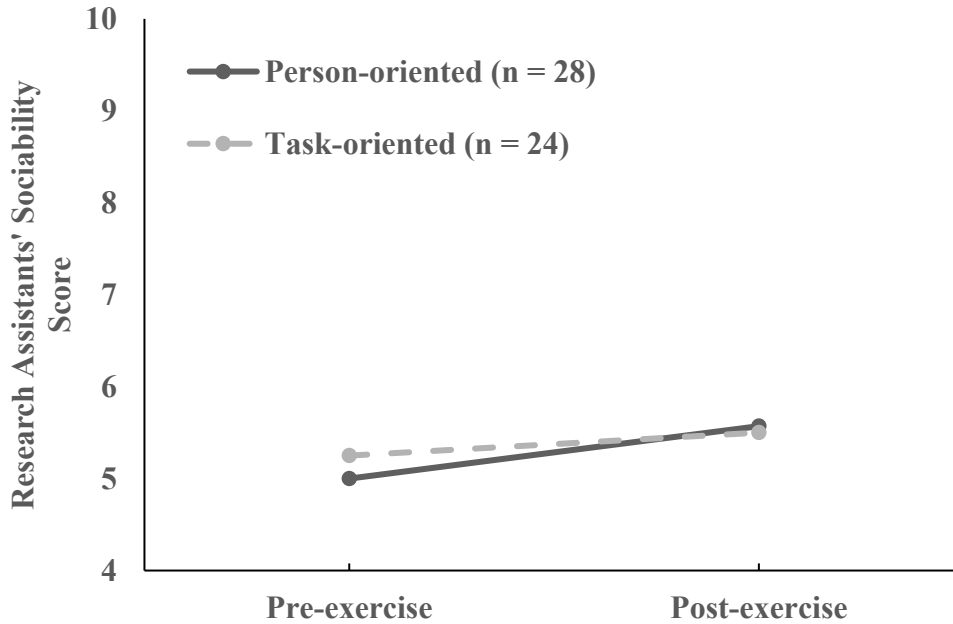
	Instruction style (based on RAs observations)	Mean sociability score
Pre	Person	5.00 (1.71)
	Task	5.25 (1.50)
Post	Person	5.57 (1.64)
	Task	5.50 (1.26)

Figure 2.5. Research assistants' positive mood scores as a function of exercise and the instruction style



PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Figure 2.6. Research assistants' sociability scores as a function of exercise and the instruction style



A 2 (Pre/Post exercise) x 2 (Person-oriented/Task-oriented Instruction) mixed model MANOVA with positive mood and sociability as the dependent variables was conducted to test instruction effect on mood outcomes for the RAs. A total of 24 responses were from task-oriented class and 28 responses were from person-oriented classes. Age of the RAs was entered as a covariate.

The main effect for exercise was not significant: $F(2,48) = .42, p = .658$. The interaction term between instruction style and exercise was not significant, $F(2,48) = 1.18, p = .316$. Age was not a significant covariate over time, $F(2, 48) = .46, p = .635$. A total of 24 responses were from task-oriented classes and 28 responses were from person-oriented classes.

Lastly, the three additional questions RAs answered on the post-exercise mood survey about the instructor was examined. The first word pair asked whether the instructor was more

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

person-oriented or task-oriented, the second pair asked whether the instructor motivated the participant or not, and the last asked whether the instructor was positive or negative. The means of the word pairs are given in Table 2.9.

Table 2.9. Means of the additional questions between the two instruction styles RAs)

	Task-oriented	Person-oriented
Did not motivate me or Motivated me *	6.71 (1.81)	8.17 (1.83)
Negative or Positive	8.63 (1.17)	9.10 (0.98)
Task-oriented or Person- oriented	3.17 (1.66)	4.34 (2.61)

* $p \leq .05$

Independent sample t-tests were conducted between person- and task-oriented spin-classes and the three word pairs. For the instructor motivating the RAs or not, there was a significant difference between the type of classes, $t(51) = -2.91, p = .005$. That is, the RAs were more motivated in the person-oriented classes than in the task-oriented classes. For the instructor being positive or negative, there was no statistical difference between the type of classes, $t(51) = -1.62, p = .11$. For the instructor being more task- or person-oriented, the assumption of homogeneity of variance was violated using Levene's Test of Equality of Variances. Therefore, equal variances between the groups was not assumed and corrected t -statistics and degrees of freedom were used. There was no statistical difference between the type of classes, $t(-1.99) = .52, p = .052$, although this difference approached significance.

Discussion

Overall, mood improved for both the participants and instructors during the class. Specifically, both sociability and positive mood, the factors obtained from the factor analysis,

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

were significantly higher after the class than before the class for both participants and instructors. However, sociability and positive mood did not improve significantly for the RAs, who were not exercising. Also, there were no effects of instruction style on the mood outcomes of the participants or RAs. While the mixed model MANOVA showed a significant difference between instruction style and sociability for participants, the means indicated this difference was a result of mood differences before the class, rather than after the class. The mean scores showed that for classes in which the instructor was more task-oriented, participants started these classes with more sociability than participants in classes with instructors using more person-oriented instruction. It is unclear whether this finding was by chance or whether this is a meaningful finding. Perhaps participants attracted to more task-oriented classes are more sociable or energetic at the beginning of the class to compensate for the less engaging and sociable experience expected during the class than in a person-oriented class.

Instructors using more task-oriented instruction were rated as more task-oriented and instructors using more person-oriented instruction were rated as more person-oriented by the RAs. However, with a score of 4.34 out of 10, the person-oriented instructors were still being rated as if they were task-oriented, suggesting there is some disconnect between the evaluation form and the question or the person-oriented and task-oriented instruction was really not that different. The person-oriented score that was calculated in Appendix Q suggests this, with scores ranging from 3.06 to 5.25 (out of 7). Thus, no instructors were rated as purely task-oriented or person-oriented. Most were rated somewhere in the middle.

It is not too surprising the RAs' mood did not improve after the classes. Even though the RAs were in a highly active environment in which instructors' motivating statements could have affected their mood through the processes of vicarious or observational learning, the RAs were

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

not engaging in exercise. Apparently, the biological mechanisms of exercise cannot be replicated by simply watching people exercise. It is likely the vicarious experience did not increase their motivation to participate in a spin-class. However, the RAs were not specifically asked if they were more motivated to exercise after observing the classes. Future research could explore whether or not motivation to exercise increases after observing others exercise.

Unlike the spin-class participants, the RAs rated person- and task-oriented instruction differently using the three word pairs at the end of the post-mood survey. Specifically, the RAs rated person-oriented instruction as more motivating than task-oriented instruction. This suggests that person-oriented instruction might influence motivation if it does not influence mood, indicating that follow-up research should address changes in motivation as well as mood. The RAs also indicated on the instruction evaluation forms that instructors using person-oriented instruction were more person-oriented than those using task-oriented instruction. This finding checked the RAs understanding of person vs. task-oriented instruction. However, the relatively small difference and skewness toward the task-oriented side suggests the RAs either did not fully understand the distinction or that it was difficult to distinguish between these two styles of instruction.

As in Study 1, two factors from the mood scale were found and these factors were replicated, excluding the removal of the “happy-sad” word pair in the positive mood factor. This subtle difference could be a result of a difference in sample. The Study 1 sample was exclusively participants from the Blacksburg Weight Club, whereas the Study 2 sample included participants from both the Blacksburg Weight Club and McComas Gym. Therefore, the differences could have resulted from a difference in either the sample and/or the environmental settings.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Unlike Study 1, Study 2 had no classes with multiple instructors. While this reduced the number of factors in the MANOVA model, there was still interest in observing multiple instructor classes and studying how person vs. task-oriented instruction interact with the number of instructors in the class. Multiple-instructor classes are structured differently than single-instructor classes, with one instructor in multiple-instructor classes leading the class at one point and the other instructors leading at different points. Thus, it would be interesting to know whether these classes have added benefit to single-instructor classes. For example, instructors who all use person-oriented instruction might have a synergistic effect on the class. That is, three instructors who are all using person-oriented instruction might have an effect on the class not found in a class with one instructor using person-oriented instruction. Or the class might benefit if instructors have multiple styles: one who is more person-oriented, the other who is task-oriented and another is somewhere in between.

Additionally, pre-positive mood scores were different between McComas Gym and Blacksburg Weight Club exercisers. Positive mood scores were higher at the beginning of the class for participants at the Blacksburg Weight Club. It is unclear why mood would be different between the gym facilities. One plausible reason for this finding could be due to the high stress on college campuses (Misra, & McKean, 2000), which was reflected by the mood surveys. Another explanation could be due to age differences, as the correlational tests showed that mood before exercise increased as the age of participants increased. The Blacksburg Weight Club had older participants while McComas Gym had younger participants.

Limitations

While significant improvements were made from Study 1, a few limitations in Study 2 should be addressed in follow-up research. First, the person vs. task-focused evaluation form was

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

adapted from the *Leader Behavior Description Questionnaire (LBDQ)*, *Scale of Quality in Fitness Services (SQFS)*, and several questions from the evaluation form used in Study 1. While the SQFS was developed for exercising settings, it was not developed to evaluate person-oriented or task-oriented instructors. While questions relevant to this distinction remain, its primary purpose is to measure service qualities of employees in fitness environments, which can also include instructors. The LBDQ was developed to measure leader behaviors, with some of the behaviors on the questionnaire falling under the task-oriented (initiation of structure) or person-oriented (consideration) domain.

The LBDQ is 100 questions and the initiation of structure and consideration subscales each have ten questions. Questions were drawn from each of these subscales, but all questions were not used from each subscale. Instead, questions most relevant to the exercise domain were used; many of the questions did not connect to physical exercise.

For those questions from the LBDQ, the wording was modified to match a spin-class. For example, the question, “He looks out for the personal welfare of individual group members” was changed to “The instructor(s) looks out for the personal welfare of spin-class members”. Thus, not only were a select number of questions from the individual subscales used, words were changed to match language appropriate for an exercise class. Whereas it was not problematic to change some words, as the meaning of the question remained, it could be problematic to use a subset of the items in the subscale for a new scale. Although the questions in the evaluation form were related to person-oriented or task-oriented instruction, the questions all came from several sources. The questions may have been valid for a particular scale, but taken together there may have been some validity and reliability issues. Unfortunately, sufficient evaluation forms were not completed to attempt a validation analysis.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

A median split was used on the evaluation form and this procedure has issues since values on a continuum are now placed into nominal categories that may or may not make the most sense. While median splits have been criticized due to concerns of loss in individual variability, several researchers have defended their use (Iacobucci, Posavac, Kardes, Schneider, & Popovich, 2015). Some instructors may have been both task- and person-oriented throughout the class and categorizing them as either one or the other could have oversimplified this independent variable. For example, an instructor may know most of the individuals' names in the class and engage in periodic conversation with class members, but still set specific exercise goals throughout the class. Depending on the RA's score for that class and the median split, this instructor would either be categorized as using person-oriented or task-oriented instruction. Some instructors were very close to the median cut-off (i.e., one class received a score of 4.56, when the median was 4.60). It is very difficult to argue that both classes were significantly different. This may suggest that task-oriented and person-oriented instruction might be best studied as continuous variables, which might be a direction for future research.

Most spin-class participants were regular class attendees. While there were some newcomers in many of the spin-classes, the participants were mostly regulars, especially at the Blacksburg Weight Club. This was less so at McComas Gym as the participants were primarily undergraduate college students. Anecdotally, several participants at McComas Gym asked the RAs the name of the instructors as it was the first time they attended that class, but not the first time in a spin-class since they went to other instructors' spin-classes. On the other hand, many participants at the Blacksburg Weight Club are older and have full-time jobs, meaning the class they choose to attend is more aligned with their work schedule and they were more likely to attend the same spin-class and have the same instructor.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Nevertheless, participants can be drawn to a class not only because it fits their schedule, but because they like the instructor. This was not taken into account. Participants may like an instructor even though they are very task-oriented, and thus they would still have a high mood boost compared to others in a person-oriented class. Furthermore, participants may be drawn to specific styles of instruction, such as instructors using more task-oriented instruction. Therefore, there may be an effect of instruction, but its moderated by whether the participant likes the particular style of instruction.

Lastly, instructors were not trained to use person-oriented or task-oriented instruction. Instead, the naturalistic behaviors of the instructors were observed. Task-oriented and person-oriented instruction could truly have a differential impact on the mood outcomes of spin-class participants, but it was not tested whether an instructor who is trained to use only one type of instruction has a differential impact on spin-class participants.

General Discussion

Overall, Studies 1 and 2 replicated prior research that has shown exercise to increase the positive moods of participants. It was shown that the instructors of exercise classes experienced increases in their positive moods after the exercise classes. This implies that instructors are reaping benefits on the job, which includes a mix of instruction and personal exercise. However, it was not shown that instruction style affected the mood outcomes among participants and RAs.

Future Directions

As mentioned earlier, future research should focus specifically on the task-oriented and person-oriented domain in exercise classes. The instructor's impact on group exercise is not just important for mood, but also for other outcomes, such as exercise adherence. Research has

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

shown that different instructor behaviors can influence group cohesion, which can also influence exercise adherence (Izumi et al., 2015). Specifically, instructors who create more cohesive exercise groups are able to get members of their groups to attend more classes.

It is possible instructors who use more person-oriented instruction create more cohesive exercise groups, which then leads to higher attendance in these classes. In contrast, instructors who use more task-oriented instruction might create less cohesive groups, leading to lower class attendance. Furthermore, task- and person-oriented instruction could differently predict cohesion, with task-oriented instruction being more associated with task cohesion (motivation to achieve group goals) and person-oriented instruction being more associated with social cohesion (motivation to build and/or maintain relationships within the group). For example, individuals in classes with task-oriented instruction may be motivated as a group to achieve goals, but they might not care to improve social relationships with other members in the class. On the other hand, individuals in classes with person-oriented instruction may be motivated to build social relationships with members in the class, but might not be as concerned about achieving group exercise goals.

Future studies should validate a scale to measure task-oriented vs. person-oriented instruction. Exercise instruction in the group exercise setting is not a dyadic relationship between leader and follower, which is the basic context for the LBDQ. Beauchamp, Welch, and Hulley (2007) explored the relationship between transformational leadership in exercise instructors and self-efficacy among exercisers. They used the Multifactor Leadership Questionnaire (MLQ) Form 5x (Bass & Avolio, 1995) to measure transformational leadership. Research that measured transformational leadership in exercise classes, which is related to person-oriented leadership in several ways, could be used as a starting point to develop person- and task-oriented scales.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Also, future research on mood and exercise should establish a consistent set of mood scales. The Profile of Mood States (POMS) remains the most popular scale, but its length makes it an issue for most exercise research, primarily because of time constraints. Beyond the Short Form of the POMS (POMS-SF; Shacham, 1983), the number of well-validated shorter scales is limited. If the mood scale used in Study 1 and 2 can be validated, its shorter length and efficient administration and scoring will make it very useful in exercise studies, especially those interested in measuring mood during exercise (i.e., at multiple time points during an exercise session).

Conclusions

Exercise instructors vary widely in their style of teaching. Even though a consistent effect of instruction style in both studies was not found, other studies have shown that instruction style affects many outcomes beyond mood. While it is advantageous to show that exercise benefits mental health with overall improvement in mood after the class, there is still knowledge to gain. More experiments should be designed to test causal relationships between certain styles of instruction and mood. This does not have to be limited to person- and task-oriented instruction. Instructors using transformational leadership behaviors have been studied (Beauchamp, Welch, & Hulley, 2007) and might also be studied alongside person- and task-oriented instruction. However, to test whether or not task-oriented and person-oriented instruction is a useful dimension to categorize instruction, research that trains instructors to use one or other style should be pursued.

Also, the consistent findings from the factor analyses conducted in Study 1 and 2 suggest that the mood survey might have future use in other exercise studies. In pre-established classes (i.e., classes that already exist prior to the research study), researchers may be limited in the amount of time they can administer surveys to participants. Having access to a survey that does

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

not take participants very long to complete before and after exercise may prove beneficial.

However, additional validation work must be done with the survey before it becomes a tool for researchers to administer.

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PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendices

Appendix A – Mood Scale for Study 1

Participant Name:
Gender (circle one): Male Female Other
Age:

Instructor Name:
Date:
Class Time:

For each pair of words place a mark on the line that reflects your feelings at the moment. (pre-exercise)

Unsociable	-----	Sociable
	1 2 3 4 5 6 7 8 9 10	
Sad	-----	Happy
	1 2 3 4 5 6 7 8 9 10	
Tired	-----	Energetic
	1 2 3 4 5 6 7 8 9 10	
Irritated	-----	Pleased
	1 2 3 4 5 6 7 8 9 10	
Worthless	-----	Valuable
	1 2 3 4 5 6 7 8 9 10	
Indifferent	-----	Interested
	1 2 3 4 5 6 7 8 9 10	
Pessimistic	-----	Optimistic
	1 2 3 4 5 6 7 8 9 10	
Depressed	-----	Cheerful
	1 2 3 4 5 6 7 8 9 10	
Nervous	-----	Calm
	1 2 3 4 5 6 7 8 9 10	
Worried	-----	Carefree
	1 2 3 4 5 6 7 8 9 10	
Un-motivated	-----	Motivated
	1 2 3 4 5 6 7 8 9 10	

Appendix B – Instructor Evaluation Form (RAs) for Study 1

CABS DC #:
Instructor Name:
Date:
Class Time:

Number of Participants in class:

Instructor evaluation form

The following questions refer to the instructor of the spin-class you are observing. For most questions, yes/no/not sure/N/A answers should suffice, but feel free to elaborate on any of your answers to add justification for your answer.

- 1) Does the instructor welcome everyone to the class (i.e., a brief introduction and/or outline of today’s class)? Roughly how long is this introduction?**
- 2) Does the instructor seem to know the names of the participants?**
- 3) Does the instructor introduce any new people at the beginning of the class?
- 4) Does the instructor give clear instructions to the class?**
- 5) Does the instructor engage with the class by talking (i.e., not just giving instructions but engaging in conversation)? How long do these conversations last (i.e., a few seconds vs. a couple minutes)**
- 6) Does the instructor give explanations for why they do certain things (i.e., being seated in this position maximizes the workout vs. not giving an explanation)?**
- 7) Does the instructor push the class to work harder?**
- 8) Does the instructor get off his/her bike during the class to walk around? If so, what does the instructor do and/or say while walking around? Roughly how long is the instructor off the bike?
- 9) Does the instructor make an effort to call out peoples’ names during the class? If so, try to keep track of how many times the instructor does this for each person in the class (Use the space below to keep count).**
- 10) Does the instructor call out any specific people more than others? (Use above question to answer)

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix B – continued

- 11) How would you describe the instructor's mood (i.e., anxious, alert, relaxed)?
- 12) Does the instructor let the class know the time and/or how much time is left?
- 13) Does the instructor change the temperature of the room (i.e., turn on the AC)?
- 14) Is music being played during the class?
- 15) Is the music soft, medium or loud? (Subjective question, but use your best judgment)
- 16) Does the instructor change the volume of the music?
- 17) Do people ask the instructor to change the volume of the music?
- 18) Is there a variety of music being played throughout the class?
- 19) Does the instructor adjust the lights at any point?
- 20) What percentage of the class were most of the lights on _____ vs. off _____. (Give rough percentages)
- 21) Does the instructor follow a predictable and consistent routine throughout the session?
- 22) If you have seen this instructor for more than one session, does s/he follow a similar routine?
- 23) Overall, did the class appear engaged during the session?
- 24) In your opinion, how did the instructor do? Use the scale below to answer.

Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5
- 25) Why did you give the instructor the above rating?
- 26) Any additional comments about the instructor or the class?

Appendix C – Institutional Review Board (IRB) Approval Letter for Study 2



Office of Research Compliance
Institutional Review Board
North End Center, Suite 4120, Virginia Tech
300 Turner Street NW
Blacksburg, Virginia 24061
540/231-4606 Fax 540/231-0959
email irb@vt.edu
website <http://www.irb.vt.edu>

MEMORANDUM

DATE: April 12, 2016
TO: Scott Geller, Trevin Earl Glasgow
FROM: Virginia Tech Institutional Review Board (FWA00000572, expires January 29, 2021)
PROTOCOL TITLE: The Effects of "Green"; Exercise and Instructors on Mood, Belongingness and Self-Esteem in Spin Classes
IRB NUMBER: 16-100

Effective April 11, 2016, the Virginia Tech Institution Review Board (IRB) Chair, David M Moore, approved the Amendment request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Exempt, under 45 CFR 46.110 category(ies) 2**
Protocol Approval Date: **February 22, 2016**
Protocol Expiration Date: **N/A**
Continuing Review Due Date*: **N/A**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

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An equal opportunity, affirmative action institution

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix D – Instructor recruitment message – Blacksburg Weight Club (Study 1)

Hi Blacksburg Weight Club instructors,

Below is what I plan on saying to both you and your classes at the start of the study. If you are interested in participating, please email me (Trevin Glasgow).

Hello, my name is Trevin Glasgow/ (or undergrad researcher introducing study if I am not present). Our research center is currently working on a Virginia Tech pilot research project for my/a master's thesis that involves exercise and mood. During class, undergraduate researchers will be observing your spin-classes. They will be taking notes of what you say and do during the spin-class. Before and after the class, you (the instructors) will have the opportunity to fill out a questionnaire that ask questions about mood and feelings. Filling out the questionnaire is completely optional and we can still do everything else without you filling out the questionnaire. At the top of each form you will write down your name, since it is important to keep track of which specific instructors participate in the study. You will also write down the date and class time. Study codes will be assigned to keep your identification confidential."

This is what I plan on telling the whole class: "Hello, my name is Trevin Glasgow/ (or undergrad researcher introducing study if I am not present). Our research center is currently working on a Virginia Tech pilot research project for my/a master's thesis that involves exercise and mood. During class, undergraduate researchers will be observing the classes. They will be taking notes of what the instructor says and does during the spin-class. Before and after the class, you all (the spin-class participants) will have the opportunity to fill out questionnaires that ask questions about mood and feelings. Filling out these questionnaires is completely optional and will not affect your normal participation in the class. At the top of each form you will write down your name and instructor's name. You will also write down the date and class time. Study codes will be assigned to you and the instructors in order to keep identification confidential when the data is entered and stored.

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix E – Participant Evaluation Form Completed by Participants in Study 1

Participant Name:

Date:

Instructor Name:

Class Time:

Using the scale below, rate the performance of your instructor and the class today.

1. Not at All

2. Barely

3. Somewhat

4. Quite a Bit

5. Very Much

Did the instructor appear confident? _____

Was it easy to hear & understand the instructor? _____

Was it easy to hear & understand the music? _____

Was the instructor happy, smiling, enthusiastic, etc? _____

Did the instructor provide intensity modifications? _____

Was the intensity of this class satisfactory to your needs? _____

Overall, did you enjoy the class? _____

To what extent did you like the music? _____

How much did the music facilitate your exercise? _____

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix F – Person-oriented vs. Task-oriented Instruction per Date (Study 1)

Date[month(mm), day(dd), year(yy)]	Person vs. Task vs. Both	Class size
04/06/16	task	10
04/02/16	person	9
04/04/16	person	5
04/04/16	person	9
03/28/16	person	14
03/28/16	person	7
03/30/16	person	9
04/01/16	task	15
04/01/16	task	19
04/18/16	person	4
04/17/16	task	7
04/13/16	person	16
04/11/16	task	10
04/11/16	person	15
04/08/16	person	20
04/08/16	person	13
04/25/16	person	13
04/23/16	person	8
04/25/16	person	2
04/20/16	person	10
04/25/16	task	17
04/22/16	task	12
04/23/16	person	14
04/08/16	person	20
04/23/16	person	20
04/22/16	person	12
04/25/16	task	17
04/25/16	task	2
04/27/16	person	28
04/27/16	task	13
04/22/16	task	15
04/22/16	task	23
04/29/16	task	25
04/18/16	person	23
04/16/16	task	11
04/15/16	task	22
04/16/16	person	14
04/18/16	task	10
05/02/16	person	20

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

04/30/16	both	9
04/30/16	person	3
05/02/16	task	23
05/02/16	person	12
05/04/16	person	12
05/04/16	both	24
05/06/16	both	26
05/06/16	task	10

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix G – Pre- and Post-Mood Survey for Participants for Study 2

PARTICIPANT FORM

Note: Anybody 18 years or older can complete this survey.

Your Name: _____ Instructor Name: _____

Your Age: _____ Class Time: _____ Date: _____

Sex (circle one): Male Female Other

Ethnicity origin (or Race) (circle one):

White

Black or African American

Asian/Pacific Islander

Hispanic or Latino

Native American or American Indian

Other

For each pair of words place a mark on the line that reflects your feelings at this moment.

Unsociable											Sociable
	1	2	3	4	5	6	7	8	9	10	
Sad											Happy
	1	2	3	4	5	6	7	8	9	10	
Tired											Energetic
	1	2	3	4	5	6	7	8	9	10	
Irritated											Pleased
	1	2	3	4	5	6	7	8	9	10	
Worthless											Valuable
	1	2	3	4	5	6	7	8	9	10	
Indifferent											Interested
	1	2	3	4	5	6	7	8	9	10	
Pessimistic											Optimistic
	1	2	3	4	5	6	7	8	9	10	
Depressed											Cheerful
	1	2	3	4	5	6	7	8	9	10	
Nervous											Calm
	1	2	3	4	5	6	7	8	9	10	
Worried											Carefree
	1	2	3	4	5	6	7	8	9	10	
Un-motivated											Motivated
	1	2	3	4	5	6	7	8	9	10	

STOP: DON'T FILL OUT THE REST OF THIS SURVEY UNTIL AFTER THE CLASS

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix G – continued

PARTICIPANT FORM

Note: Anybody 18 years or older can complete this survey.

For each pair of words place a mark on the line that reflects your feelings at this moment.

Unsociable	-----	Sociable
	1 2 3 4 5 6 7 8 9 10	
Sad	-----	Happy
	1 2 3 4 5 6 7 8 9 10	
Tired	-----	Energetic
	1 2 3 4 5 6 7 8 9 10	
Irritated	-----	Pleased
	1 2 3 4 5 6 7 8 9 10	
Worthless	-----	Valuable
	1 2 3 4 5 6 7 8 9 10	
Indifferent	-----	Interested
	1 2 3 4 5 6 7 8 9 10	
Pessimistic	-----	Optimistic
	1 2 3 4 5 6 7 8 9 10	
Depressed	-----	Cheerful
	1 2 3 4 5 6 7 8 9 10	
Nervous	-----	Calm
	1 2 3 4 5 6 7 8 9 10	
Worried	-----	Carefree
	1 2 3 4 5 6 7 8 9 10	
Un-motivated	-----	Motivated
	1 2 3 4 5 6 7 8 9 10	

Regarding the spin instructor, s/he was:

(Note: *Task-focused instructors* emphasize exercise accomplishment. *People-focused instructors* talk about personal factors beyond cycling.

Task-focused	-----	People-focused
	1 2 3 4 5 6 7 8 9 10	
Did not motivate me	-----	Did motivate me
	1 2 3 4 5 6 7 8 9 10	
Negative	-----	Positive
	1 2 3 4 5 6 7 8 9 10	

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix H – Pre- and Post-Mood Survey for Instructors for Study 2

INSTRUCTOR FORM

Instructor Name: _____

Your Age: _____ Class Time: _____ Date: _____

Sex (circle one): Male Female Other

Ethnicity origin (or Race) (circle one):

White

Hispanic or Latino

Black or African American

Native American or American Indian

Asian/Pacific Islander

Other

For each pair of words place a mark on the line that reflects your feelings at this moment.

Unsociable											Sociable
	1	2	3	4	5	6	7	8	9	10	
Sad											Happy
	1	2	3	4	5	6	7	8	9	10	
Tired											Energetic
	1	2	3	4	5	6	7	8	9	10	
Irritated											Pleased
	1	2	3	4	5	6	7	8	9	10	
Worthless											Valuable
	1	2	3	4	5	6	7	8	9	10	
Indifferent											Interested
	1	2	3	4	5	6	7	8	9	10	
Pessimistic											Optimistic
	1	2	3	4	5	6	7	8	9	10	
Depressed											Cheerful
	1	2	3	4	5	6	7	8	9	10	
Nervous											Calm
	1	2	3	4	5	6	7	8	9	10	
Worried											Carefree
	1	2	3	4	5	6	7	8	9	10	
Un-motivated											Motivated
	1	2	3	4	5	6	7	8	9	10	

STOP: DON'T FILL OUT THE REST OF THIS SURVEY UNTIL AFTER THE CLASS

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix H – continued

INSTRUCTOR FORM

For each pair of words place a mark on the line that reflects your feelings at this moment.

Unsociable											Sociable
	1	2	3	4	5	6	7	8	9	10	
Sad											Happy
	1	2	3	4	5	6	7	8	9	10	
Tired											Energetic
	1	2	3	4	5	6	7	8	9	10	
Irritated											Pleased
	1	2	3	4	5	6	7	8	9	10	
Worthless											Valuable
	1	2	3	4	5	6	7	8	9	10	
Indifferent											Interested
	1	2	3	4	5	6	7	8	9	10	
Pessimistic											Optimistic
	1	2	3	4	5	6	7	8	9	10	
Depressed											Cheerful
	1	2	3	4	5	6	7	8	9	10	
Nervous											Calm
	1	2	3	4	5	6	7	8	9	10	
Worried											Carefree
	1	2	3	4	5	6	7	8	9	10	
Un-motivated											Motivated
	1	2	3	4	5	6	7	8	9	10	

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix I – Pre- and Post-Mood Survey for RA’s for Study 2

RESEARCH ASSISTANT FORM

CABS DC#: _____ Instructor Name: _____

Your Age: _____ Class Time: _____ Date: _____

Sex (circle one): Male Female Other

Ethnicity origin (or Race) (circle one):

White

Black or African American

Asian/Pacific Islander

Hispanic or Latino

Native American or American Indian

Other

For each pair of words place a mark on the line that reflects your feelings at this moment.

Unsociable	-----	Sociable
	1 2 3 4 5 6 7 8 9 10	
Sad	-----	Happy
	1 2 3 4 5 6 7 8 9 10	
Tired	-----	Energetic
	1 2 3 4 5 6 7 8 9 10	
Irritated	-----	Pleased
	1 2 3 4 5 6 7 8 9 10	
Worthless	-----	Valuable
	1 2 3 4 5 6 7 8 9 10	
Indifferent	-----	Interested
	1 2 3 4 5 6 7 8 9 10	
Pessimistic	-----	Optimistic
	1 2 3 4 5 6 7 8 9 10	
Depressed	-----	Cheerful
	1 2 3 4 5 6 7 8 9 10	
Nervous	-----	Calm
	1 2 3 4 5 6 7 8 9 10	
Worried	-----	Carefree
	1 2 3 4 5 6 7 8 9 10	
Un-motivated	-----	Motivated
	1 2 3 4 5 6 7 8 9 10	

STOP: DON'T FILL OUT THE REST OF THIS SURVEY UNTIL AFTER THE CLASS

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix I – continued

RESEARCH ASSISTANT FORM

For each pair of words place a mark on the line that reflects your feelings at this moment.

Unsociable	-----	Sociable
	1 2 3 4 5 6 7 8 9 10	
Sad	-----	Happy
	1 2 3 4 5 6 7 8 9 10	
Tired	-----	Energetic
	1 2 3 4 5 6 7 8 9 10	
Irritated	-----	Pleased
	1 2 3 4 5 6 7 8 9 10	
Worthless	-----	Valuable
	1 2 3 4 5 6 7 8 9 10	
Indifferent	-----	Interested
	1 2 3 4 5 6 7 8 9 10	
Pessimistic	-----	Optimistic
	1 2 3 4 5 6 7 8 9 10	
Depressed	-----	Cheerful
	1 2 3 4 5 6 7 8 9 10	
Nervous	-----	Calm
	1 2 3 4 5 6 7 8 9 10	
Worried	-----	Carefree
	1 2 3 4 5 6 7 8 9 10	
Un-motivated	-----	Motivated
	1 2 3 4 5 6 7 8 9 10	

Regarding the spin instructor, s/he was:

(Note: *Task-focused instructors* emphasize exercise accomplishment. *People-focused instructors* talk about personal factors beyond cycling.)

Task-focused	-----	People-focused
	1 2 3 4 5 6 7 8 9 10	
Did not motivate me	-----	Did motivate me
	1 2 3 4 5 6 7 8 9 10	
Negative	-----	Positive
	1 2 3 4 5 6 7 8 9 10	

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix J – Instructor Evaluation Form for Study 2

CABS DC #:
Instructor Name:
Date:
Class Time:

Number of Participants in class:

The following is a list of items that describe the behavior of the instructor(s) and the class you are observing. Each item describes a specific kind of behavior, but does not ask you to judge whether the behavior is desirable or undesirable. Although some items may appear similar, they express important differences. Please consider each item as separate of the rest.

Using the following scale, rate how much you disagree or agree with each statement about the instructor(s) and class.

- 1 – Strongly disagree
- 2 – Disagree
- 3 – Somewhat disagree
- 4 – Neither agree nor disagree
- 5 – Somewhat agree
- 6 – Agree
- 7 – Strongly agree

The instructor(s) are willing to help cyclists. 1 2 3 4 5 6 7

Cyclists guide each other. 1 2 3 4 5 6 7

The instructor(s) teach cyclists individually how to use the cycling equipment and/or do the activity.

1 2 3 4 5 6 7

The instructor(s) are responsive to cyclists. 1 2 3 4 5 6 7

The instructor(s) specify in detail what is expected of cyclists. 1 2 3 4 5 6 7

There is a sense of family among cyclists. 1 2 3 4 5 6 7

The instructor(s) give corrective feedback when called for. 1 2 3 4 5 6 7

The instructor(s) are courteous with cyclists. 1 2 3 4 5 6 7

The instructor(s) are friendly and approachable. 1 2 3 4 5 6 7

The instructor does little things to make it a pleasant experience. 1 2 3 4 5 6 7

The instructor(s) asks for suggestions from the spin-class participants. 1 2 3 4 5 6 7

The instructor(s) looks out for the personal welfare of spin-class members. 1 2 3 4 5 6 7

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

The instructor(s) engage with the class by talking about topics unrelated to cycling (i.e., not just giving instructions but engaging in conversation). 1 2 3 4 5 6 7

The instructor(s) push the participants to work harder. 1 2 3 4 5 6 7

The instructor(s) get off his/her/their bike during the class to walk around. 1 2 3 4 5 6 7

The instructor(s) state goals to achieve during class. 1 2 3 4 5 6 7

The instructor(s) ask about environmental conditions affecting comfort and/or performance. 1 2 3 4 5 6 7

The instructor(s) ask about accomplishment numbers (i.e., miles traveled) recorded on one or more participants' bike. 1 2 3 4 5 6 7

The instructor(s) show qualities I expect from a leader. 1 2 3 4 5 6 7

The instructor(s) say things that inspired the participants to try harder. 1 2 3 4 5 6 7

The instructor(s) express interest in personal issues beyond cycling. 1 2 3 4 5 6 7

The instructor(s) make "late-comers" and "first-timers" feel comfortable. 1 2 3 4 5 6 7

The instructor(s) give significant attention to individual participants in the spin-class. 1 2 3 4 5 6 7

The instructor(s) let the class know how much time is left in the class (i.e., "We have 15 minutes left" is a yes, "10 more seconds of sprints" is not how much time is left in the class)?

Never Seldom Occasionally Often Always

1 2 3 4 5

What would you rate the level of name calling of the instructor (1 = calls out no names, 3 = calls out a few names, 5 = calls out quite a lot of names) 1 2 3 4 5

Rate the overall performance of the instructor(s) for this class (*circle only one number please*):

Poor Fair Good Very Good Excellent

1 2 3 4 5

Any additional comments about the instructor(s) and/or class? If so, leave them below.

Appendix K – Institutional Review Board (IRB) Approval Letter



Office of Research Compliance
Institutional Review Board
North End Center, Suite 4120, Virginia Tech
300 Turner Street NW
Blacksburg, Virginia 24061
540/231-4606 Fax 540/231-0959
email irb@vt.edu
website <http://www.irb.vt.edu>

MEMORANDUM

DATE: January 25, 2017
TO: Scott Geller, Trevin Earl Glasgow
FROM: Virginia Tech Institutional Review Board (FWA00000572, expires January 29, 2021)
PROTOCOL TITLE: Person-oriented vs. Task-oriented Instruction: Differential Impact on Participants' Mood and Motivation
IRB NUMBER: 16-397

Effective January 24, 2017, the Virginia Tech Institution Review Board (IRB) Chair, David M Moore, approved the Amendment request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at: <http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Exempt, under 45 CFR 46.110 category(ies) 2,4**
Protocol Approval Date: **August 31, 2016**
Protocol Expiration Date: **N/A**
Continuing Review Due Date*: **N/A**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

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An equal opportunity, affirmative action institution

Appendix L – Recruitment email to Blacksburg Weight Club Manager (Study 2)

Subject line: Research Study: Spin-classes at Blacksburg Weight Club

This email message is an approved request for participation in research that has been approved or declared exempt by the Virginia Tech Institutional Review Board (IRB).

Hi Christie,

I hope that everything is going well at the Weight Club. I would like to continue studying spin-classes at the Weight Club as I collect actual data for my master's thesis. The pilot study during Spring 2016 was promising, so I hope to build off what was accomplished during that study. I do plan on observing spin-classes at McComas Gym this semester, but also would like to continue observing classes at the Weight Club.

The procedure will mostly be the same as during the pilot study. During class, undergraduate research assistants (RAs) will be observing the spin-classes. They will be completing an evaluation form throughout the class, which could be used to provide feedback to instructors at the end of the study if they wish. Before and after the class, both the spin-class members and the instructors will have the opportunity to fill out a questionnaire that asks questions about their mood and feelings. In addition to the mood survey, participants (but not instructors) will have the chance to fill out instructor evaluation forms post-exercise. Filling out the questionnaire is completely optional and we can still observe the class if instructors or the spin-class members do not wish to fill out the forms.

This time, we plan to observe the classes for approximately three weeks. Once I begin to analyze the data and get some basic results, I can provide individual instructors with feedback. I provided some general feedback from the pilot study earlier, but can also provide instructors with more specific feedback from the pilot study if they wish.

Also, we plan to reward spin-class members that participate in our study with \$10 Starbucks gift cards. During random classes, we'll reward a participant that completes a survey with one \$10 Starbucks gift cards. We plan on giving out 20 throughout the study. Based on estimated participation, we approximate the odds of winning a gift card from 1/15 to 1/20.

If you would like to have us back again for a few weeks to study the spin-classes at the Weight Club, let me know. We can schedule a time to meet to talk more about how study procedure will go for each class and how to get interested instructors involved.

Thanks!

Trevin

Appendix M – Recruitment email to Virginia Tech Department of Recreational Sports Study 2)

Subject line: Research Study: Spin-classes at McComas Gym

This email message is an approved request for participation in research that has been approved or declared exempt by the Virginia Tech Institutional Review Board (IRB).

Hi Department of Recreational Sports at Virginia Tech,

My name is Trevin Glasgow. I am currently a 2nd year Industrial-Organizational Psychology PhD student at Virginia Tech. I work in the Center for Applied Behavior Systems (CABS), which is directed by Scott Geller. Our research center is currently working on a Virginia Tech study for my master's thesis that involves exercise and mood. I completed a pilot study during Spring 2016 at the Weight Club and found some promising results. I hope to continue the actual study at the Weight Club, but I would also like to study spin-classes at McComas Gym as well.

The basic procedure is as follows: during undergraduate research assistants (RAs) will be observing spin-classes. They will be completing an evaluation form throughout the class, which could be used to provide feedback to instructors at the end of the study if they wish. Before and after the class, both the spin-class members and the instructors will have the opportunity to fill out a questionnaire that asks questions about their mood and feelings. In addition to the mood survey, participants (but not instructors) will have the chance to fill out instructor evaluation forms post-exercise. Filling out the questionnaire is completely optional and we can still observe the class if instructors or the spin-class members do not wish to fill out the forms.

We plan to observe the classes for approximately three weeks. Once I begin to analyze the data and get some basic results, I can provide individual instructors with feedback.

Also, we plan to reward spin-class members that participate in our study with \$10 Starbucks gift cards. During random classes, we'll reward a participant that completes a survey with one \$10 Starbucks gift cards. We plan on giving out 20 throughout the study. Based on estimated participation, we approximate the odds of winning a gift card from 1/15 to 1/20.

If this seems like a feasible study that could be done during the spin-classes at McComas Gym, please let me know. The next step would be getting in contact with individual spin instructors and I would need help in contacting them about the study.

Thank you!

Trevin

Appendix N – Instructor recruitment email – Blacksburg Weight Club (Study 2)

Subject line: Research Study: Spin-classes at Blacksburg Weight Club

This email message is an approved request for participation in research that has been approved or declared exempt by the Virginia Tech Institutional Review Board (IRB).

Hi Blacksburg Weight Club Spin-class Instructors,

This is Trevin Glasgow again for those that know me and for those that do not, I am currently a 2nd year Industrial-Organizational Psychology PhD student at Virginia Tech. I work in the Center for Applied Behavior Systems (CABS), which is directed by Scott Geller. Our research center is currently working on a Virginia Tech study for my master's thesis that involves exercise and mood. I completed a pilot study during Spring 2016 at the Weight Club and found some promising results. I hope to continue the actual study with you guys, in addition to spin instructors at McComas Gym.

The procedure has remained mostly the same for those that have participated in the past. During class, undergraduate research assistants (RAs) will be observing your spin-classes. They will be completing an evaluation form throughout the class, which could be used to provide feedback to you at the end of the study if you wish. Before and after the class, both the spin-class members and you (the instructors) will have the opportunity to fill out a questionnaire that ask questions about your mood and feelings. In addition to the mood survey, participants (but not instructors) will have the chance to fill out instructor evaluation forms post-exercise. Filling out the questionnaire is completely optional and we can still observe the class if you or the spin-class members do not wish to fill out the forms.

This time, we plan to observe the classes for approximately three weeks. Once I begin to analyze the data and get some basic results, I can provide individual instructors with feedback. I provided some general feedback from the pilot study earlier, but can also provide instructors with more specific feedback from the pilot study if they wish.

Also, we plan to reward spin-class members that participate in our study with \$10 Starbucks gift cards. During random classes, we'll reward a participant that completes a survey with one \$10 Starbucks gift cards. We plan on giving out 20 throughout the study. Based on estimated participation, we approximate the odds of winning a gift card from 1/15 to 1/20.

If you would like to participate and don't mind having your class observed, please respond to my email. Let me know when you normally teach and we will find times that the RAs can observe your classes. If you do not want to participate, then you do not have to respond at all. Even if you participated in the pilot study, you can participate again. If you have any questions, please feel free to let me know.

Thank you!

Trevin

Appendix O – Instructor recruitment email – Virginia Tech Department of Recreational Sports (Study 2)

Subject line: Research Study: Observing Spin-classes at McComas Gym

This email message is an approved request for participation in research that has been approved or declared exempt by the Virginia Tech Institutional Review Board (IRB).

Hi McComas Gym Spin-class Instructors,

My name is Trevin Glasgow. I am currently a 2nd year Industrial-Organizational Psychology PhD student at Virginia Tech. I work in the Center for Applied Behavior Systems (CABS), which is directed by Scott Geller. Our research center is currently working on a Virginia Tech study for my master's thesis that involves exercise and mood. I completed a pilot study during Spring 2016 at the Weight Club and found some promising results. I hope to continue the actual study at the Weight Club, but I would also like to study spin-classes at McComas Gym as well.

The basic procedure is as follows: during class, undergraduate research assistants (RAs) will be observing your spin-classes. They will be completing an evaluation form throughout the class, which could be used to provide feedback to you at the end of the study if you wish. Before and after the class, both the spin-class members and you (the instructors) will have the opportunity to fill out a questionnaire that ask questions about your mood and feelings. In addition to the mood survey, participants (but not instructors) will have the chance to fill out instructor evaluation forms post-exercise. Filling out the questionnaire is completely optional and we can still observe the class if you or the spin-class members do not wish to fill out the forms.

We plan to observe the classes for approximately three weeks. Once I begin to analyze the data and get some basic results, I can provide individual instructors with feedback.

Also, we plan to reward spin-class members that participate in our study with \$10 Starbucks gift cards. During random classes, we'll reward a participant that completes a survey with one \$10 Starbucks gift cards. We plan on giving out 20 throughout the study. Based on estimated participation, we approximate the odds of winning a gift card from 1/15 to 1/20.

If you would like to participate and don't mind having your class observed, please respond to my email. Let me know when you normally teach and we will find times that the RAs can observe your classes. If you do not want to participate, then you do not have to respond at all. If you have any questions, please feel free to let me know.

Thank you!

Trevin

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix P – Instructor Evaluation Questions Used to Code Person and Task-Oriented Instruction for Study 2

The instructor(s) are willing to help cyclists. 1 2 3 4 5 6 7

The instructor(s) teach cyclists individually how to use the cycling equipment and/or do the activity. 1 2 3 4 5 6 7

The instructor(s) are responsive to cyclists. 1 2 3 4 5 6 7

The instructor(s) specify in detail what is expected of cyclists. 1 2 3 4 5 6 7

The instructor(s) give corrective feedback when called for. 1 2 3 4 5 6 7

The instructor(s) are courteous with cyclists. 1 2 3 4 5 6 7

The instructor(s) are friendly and approachable. 1 2 3 4 5 6 7

The instructor does little things to make it a pleasant experience. 1 2 3 4 5 6 7

The instructor(s) asks for suggestions from the spin-class participants. 1 2 3 4 5 6 7

The instructor(s) looks out for the personal welfare of spin-class members. 1 2 3 4 5 6 7

The instructor(s) engage with the class by talking about topics unrelated to cycling (i.e., not just giving instructions but engaging in conversation). 1 2 3 4 5 6 7

The instructor(s) state goals to achieve during class. 1 2 3 4 5 6 7

The instructor(s) ask about accomplishment numbers (i.e., miles traveled) recorded on one or more participants' bike. 1 2 3 4 5 6 7

The instructor(s) express interest in personal issues beyond cycling. 1 2 3 4 5 6 7

The instructor(s) make “late-comers” and “first-timers” feel comfortable. 1 2 3 4 5 6 7

The instructor(s) give significant attention to individual participants in the spin-class. 1 2 3 4 5 6 7

PERSON-ORIENTED VERSUS TASK-ORIENTED INSTRUCTION

Appendix Q – Instructor Evaluation Score and Whether the Instructor was Coded Task- or Person-Oriented for Each Class for Study 2

Date(mm/dd/yy)	Class size	Task- or person-oriented	Person-oriented score (average if from more than one RA)
11/07/16	13	person	4.78
11/14/16	12	person	4.68
12/05/16	12	person	5.13
11/14/16	23	person	4.69
11/15/16	7	task	4.44
11/29/16	20	person	4.81
12/05/16	7	person	4.60
11/14/16	20	task	4.47
11/17/16	9	task	4.50
11/28/16	24	person	4.64
12/01/16	18	task	4.38
12/05/16	20	person	4.76
11/15/16	15	task	3.69
11/29/16	10	person	4.69
12/06/16	15	task	3.80
11/15/16	14	task	4.50
12/06/16	17	task	4.56
11/16/16	8	task	4.29
12/07/16	2	person	4.81
11/16/16	14	task	4.21
11/17/16	11	task	4.53
11/30/16	9	task	4.35
12/01/16	12	task	4.47
12/06/16	12	task	4.41
12/07/16	12	person	5.06
11/04/16	10	person	4.79
11/11/16	26	person	5.06
11/16/16	8	task	4.69
11/18/16	15	person	4.79
12/02/16	16	task	4.50
12/09/16	19	person	4.69
11/29/16	20	person	4.69