The Impact of Choice on Exercise Motivation and Physical Activity in College Students

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ABSTRACT

Background: While research suggests that college courses contribute to significant health benefits, there is limited research on the effectiveness of these courses in increasing motivation and lifetime PA habits of college students.
Aim: The purpose of this study was to investigate the impact of choice in a conceptually-based college health and wellness course on exercise motivation and physical activity of undergraduate students.
Method: Participants included undergraduate students (N = 81) enrolled in a health and wellness course at a four-year liberal arts university located in the mid-Atlantic region of the U.S. Quantitative data from the Behavioral Regulation in Exercise Questionnaire and the Leisure Time in Exercise Questionnaire were collected over three time points from two groups (choice and non-choice). Qualitative data from semi-structured interviews with course instructors (N = 4) and open-ended questions were also collected.
Results: There was a significant increase in intrinsic regulation $F(2, 158) = 10.13$, $p = .00$, $\eta_p^2 = .114$; identified regulation $F(2, 158) = 7.35$, $p = .001$, $\eta_p^2 = .085$; introjected regulation $F(2, 158) = 6.61$, $p = .002$, $\eta_p^2 = .077$; and PA $F(2, 158) = 5.63$, $p = .004$, $\eta_p^2 = .067$ over time. No significant differences were found between groups.
Conclusion: While there was no significant difference between instruction type, instructors and participants suggested that choice was the preferred method for adult learners.

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Keywords: self-determination theory, adult learning theory, physical activity, autonomy, higher education

Research indicates that young adults' physical activity (PA) levels decline rapidly from high school to the first year of college, and continue to decline throughout college (Small, Bailey-Davis, Morgan, & Maggs, 2013). The typical young adult is juggling multiple responsibilities including work, school and family, which contribute to this decline. According to Medero (2012), colleges are exemplary institutions for principles of healthy living, such as diet and exercise, to be taught. Colleges and universities have the potential to impact the health of countless students annually, and can be a place to present opportunities to positively impact PA behaviors in their students (Milroy, Orsini, D'Abundo, & Sidman, 2013). Perhaps due to the similarity in contexts, behaviors that students develop during the college years have been found to have a long-term impact on adult habits relating to maintaining PA (Keating, Guan, Pinero, & Bridges, 2005).

Unfortunately, research suggests that over 50% of US college students do not participate in moderate to vigorous PA (American College Health Association, 2012). The Healthy Campus 2020 initiative was designed to provide a framework for improving the overall health status on college campuses around the United States (American College Health Association, 2012), with an objective of increasing PA in college students. Colleges and universities across the country also offer health and wellness courses in hopes of influencing students' levels of fitness. This multidimensional, concept-based class, sometimes referred to as Fitness for Life (FFL), is designed to educate students on the importance of healthy lifestyles through lecture as well as provide practical application strategies to be implemented into everyday life. FFL courses are designed to incorporate in-class lectures and out-of-class PA, with the goal of combining health and wellness content knowledge with favorable experiences in PA engagement. The

FFL approach is used in approximately 52% of colleges and universities that have a physical education requirement for general college students (Leslie, Sparling, & Owen, 2001), and is frequently a requirement in smaller institutions. Leslie et al. (2001) also indicated that 60% of all institutions offer the multidimensional, concept-based course most often referred to as FFL, whether required or not.

While research suggests that college health and wellness courses contribute to significant health benefits (Alemeda, 2009), there is limited research on the effectiveness of these courses in increasing motivation and lifetime PA patterns (Keating et al., 2005). An improved understanding of college students' motives for engaging in PA would assist in the advancement of tailored interventions in health and wellness courses, such as strategies to increase participation in PA, aiding in improved health-related fitness and overall health (Kilpatrick, Hebert, & Bartholomew, 2005).

THEORETICAL FRAMEWORK

Self-Determination Theory

Motivation plays a significant role in the success of upholding health and wellness goals. Because of the steady decline in PA among young adults and the fact that lifestyle habits acquired in young adulthood often predict similar lifestyles as older adults, determining effective strategies to motivate this population to become more PA, including increasing effectiveness of college FFL courses, is imperative.

Self-determination theory is an approach to human motivation that focuses on humans' inner resources for behavioral regulation (Ryan, Kuhl, & Deci, 1997). It is rooted in early motivation theory, and based on the driving forces of physiological and psychological needs such as competency, autonomy and relatedness (Ryan & Deci, 2000). In addition, self-determination theory ascertains that humans are active organisms motivated toward growing, mastering challenges and integrating new experiences into their sense of self (Ryan & Deci, 2000).

According to self-determination theory, motivation can be intrinsic, extrinsic, or non-existent (i.e., amotivation; Sibley, Hancock, & Bergman, 2013). Fluctuating levels of self-determination influence the selection of actions that present desired motivational outcomes (Standage, Duda, & Ntoumanis, 2003). Ryan and Deci (2008) suggest that there are two different types of motivation: autonomous and controlled. Autonomous motivation consists of both intrinsic and extrinsic motivation and can inspire greater long-term persistence, such as maintaining a physically active lifestyle (Ryan & Deci, 2008). Motivation affecting PA is likely to be more robust if it involves greater choice and self-determination rather than external control (Pethkar, Naik, & Sonawane, 2010).

According to self-determination theory, there are four categories of extrinsic motivation: external regulation, introjected regulation, identified regulation and integrated regulation. Extrinsic motivation has less autonomy, is considered externally regulated, and is satisfying an external demand is considered external regulation (Ryan & Deci, 2000). At this level of regulation, motivation is spurred solely by rewards or avoidance of punishment (DeLong, 2006). A second form of extrinsic motivation, introjected motivation, involves behaviors that are reflective of ego, guilt, anxiety, or esteem. A third form of extrinsic motivation is regulation through identification, where individuals identify motivation and evaluate the value of a certain behavior. Identified regulation occurs when individuals freely choose to participate in an activity because they begin to value it and feel that it is important (DeLong, 2006). This form of extrinsic motivation is more autonomous than the prior two forms. The most autonomous of the extrinsic types of motivation is integrated regulation. Integrated regulations are assimilated to the self (Ryan & Deci, 2000). While this category of motivation is similar to intrinsic, it is still considered extrinsic because behaviors are performed for a separable outcome rather than for internal enjoyment.

Adult Learning Theory

Knowles' (2011) adult learning theory highlights the characteristics of adult learners and how they differ from school-aged learners. The self-concept of the adult learner suggests the need and ability for autonomy and self-directed learning. In addition, adult learners value relevancy and the connection of life experiences to class material (Young, 2012). Moreover, adults prefer learning that is strongly under their own control, applicable to their own lives, and

embodied in active concrete experiences (Westbrook, 2005). Knowles (1977) suggested that the true andragogue (teacher of adults) has a built-in obligation to help the learner move from dependency toward increasing self-directedness.

The concept of autonomy that is central within both adult learning theory and self-determination theory has long been recognized as a fundamental factor in the promotion of optimal motivation. Additionally, autonomy and the need to be more self-directed in the learning process are central components in the adult learning theory. The current literature universally supports a positive relationship between teachers' classroom autonomy support and students' educational outcomes (Reeve, Jang, Carrell, Jeon, & Barch, 2004). Autonomy-supportive teachers enable self-determined motivation in students by creating an environment that nurtures student needs, interests, and preferences (Reeve et al., 2004). For example, a study by (Standage et al., 2003) on children's motivation in secondary school physical education (PE) classes concluded that PE teachers should employ alternative strategies that are autonomy-supportive and mastery-focused in order to facilitate self-determined motivation. (Reeve et al., 2004) suggested future research exploring the possibility that autonomy-supportive teaching (e.g., offering more freedom of activity choice) in a PE setting may increase engagement in PA as well as motivation. In addition, Stapleton, Taliaferro, and Bulger (2017) suggested that college PA courses should consider moving away from traditional teacher-focused models of instruction and toward more learner-centered styles which can lead to self-directed learning. Combining adult learning and self-determination theories, one can hypothesize that allowing adults to choose physical activities during FFL classes may improve exercise motivation and PA levels.

PURPOSE

The purpose of this study was to investigate the impact of choice in a conceptually-based college health and wellness course, FFL, on exercise motivation and PA of undergraduate students. Additionally, this study explored students' and instructors' descriptions of their experiences in choice versus non-choice courses.

METHOD

This study employed a sequential explanatory mixed method design to investigate the impact of choice on exercise motivation and PA. The purpose of this design was to use qualitative results to aid in explaining and interpreting the findings of a primarily quantitative study (Clark & Creswell, 2008). This study was approved by the University Institutional Review Board.

Setting

This study was conducted at a four-year liberal arts university located in the mid-Atlantic region of the US. The course in focus, FFL, was a required three-credit conceptually-based health and wellness course that included lecture/laboratory approach with a weekly PA component of 15 weeks in duration. The course introduced the dimensions of physical fitness and health-related wellness and provided students with information intended to contribute to maintaining healthy lifestyles, understanding the components of fitness, and developing a commitment to lifetime health and wellness. The physical activity and laboratory sessions included in the course allowed for practical application of concepts with the goal of establishing a pattern for a lifetime of fitness and wellness, as well as an appreciation of the fun and enjoyment of physical exercise.

Choice of activity. During the weekly PA day, students in the two choice curriculum class sections were given the opportunity to select the type of activity in which they would engage. To reinforce accountability, students turned in workout sheets each class which outlined the activities in which they participated.

During the weekly activity day, students in the two non-choice groups participated in a PA session which was planned and implemented by the instructor. The instructor determined all aspects of the activity in which the students engaged with little to no student choice. Examples of instructor-led activities consisted of team sport activities (e.g., table tennis and racquetball, group exercises, and organized game activities) or arranged workout programs for students to complete in the university wellness center.

Participants

Four instructors teaching FFL at the University in focus participated in the study. Two instructors employed the choice method during the PA portion of this course and two employed the non-choice approach. Three instructors held a terminal degree and had approximately five years of experience teaching in higher education. The fourth instructor held a master's degree with seven years of teaching and coaching experience in higher education.

Undergraduate student participants in this study included 81 college students (n = 37 female, 44 male) enrolled in four different sections of FFL who agreed to voluntarily participate and provided informed consent. Undergraduate student participants were recruited from the classes in which instructors had been established for the study. The primary researcher recruited from four sections (two choice and two non-choice) of the FFL course. The participants included 60 athletes and 26 non-athletes.

Instrumentation

Behavioral Regulation in Exercise Questionnaire. The revised Behavioral Regulation in Exercise Questionnaire (BREQ-2) was used to measure motivation (Markland, & Tobin, 2004). The BREQ-2 is a widely used measure for exercise motivation which measures five subscales of motivation: external regulation (four items); introjected regulation (three items); identified regulation (three items); intrinsic regulation (four items); and amotivation (four items; Markland & Tobin, 2004). Scores for each of the subscales of the BREQ-2 ranged from 0 – 4, with 0 indicating a low score and 4 indicating a high score. A confirmatory factor analysis by Markland & Tobin (2004) indicated an excellent fit to data (Satorra-Bentler Scaled Chi Sq = 136.49, df = 125, p = .23; CFI = .95; RMSEA = .02, 90% CI = .00 - .04; SRMR = .05), with Cronbach's alpha reliabilities for each subscale ranging from .73 - .86.

The Godin-Shephard Leisure-Time Physical Activity Questionnaire. The Godin-Shephard Leisure-Time Physical Activity Questionnaire (LTEQ) was used to measure PA (Godin, 2011). The LTEQ is a three-item questionnaire which allows the assessment of self-reported leisure-time PA. Participants are asked to recall on average the number of times per week they engage in at least 15 minutes of strenuous, moderate or mild exercise. Reported scores for each category of effort were calculated according to the procedure established by Godin (2011), resulting in a Metabolic Equivalent of Task (MET) value for the week. The validity of the LTEQ to assess leisure time PA has been confirmed through multiple studies (Godin, 2011; Godin & Shephard, 1985). Additionally, studies have shown acceptable reliability in assessing exercise behavior (Markland, 2004).

Demographics survey. The demographics survey, which was developed by the researcher to define the population being studied, was a 7-item questionnaire used to identify characteristics including gender, GPA, level in college, and current level of physical activity.

Open-ended questions. During time-point three, student participants were asked to answer four researcher-developed open-ended questions designed to help interpret findings from the survey results. Participants were asked about their perceptions of, and were asked to describe their experiences in, choice or non-choice. Prior to use in the study, the open-ended survey questions and semi-structured interview guide were reviewed by five experts in the field to provide evidence of face validity.

Semi-structured interview guide. The interview guide for the semi-structured interviews was designed by the primary researcher to gain a better understanding of the implementation of choice or non-choice from the instructor perspective. The interview contained questions focused on instructor experiences and perceptions of the impact of choice or non-choice on student motivation and physical activity. Additionally, questions were asked to analyze possible barriers and or challenges that may have been associated with teaching choice or non-choice.

Data Collection Procedures

Survey data. The primary researcher recruited participants by visiting four pre-selected FFL classes. The primary researcher visited these classes during three selected times throughout the semester; Time 1 (week 1), Time 2 (week 8), and Time 3 (week 15). Undergraduate students who volunteered to participate in the study completed the demographics survey, BREQ-2, and the LTEQ on each occasion. Each questionnaire contained four questions which generated an

SGIC (self-generated identification code). This code ensured anonymity and confidentiality for participants. During Time 3 (week 15), the survey also contained the four open-ended questions described above.

Fidelity checks. Prior to the start of the study, instructors were provided instructions and guidelines from the primary researcher on how to employ both choice and non-choice teaching strategies. The primary researcher made three unannounced visits to observe each of the instructor's FFL classes within the first two weeks of the semester, as well as two additional times throughout the semester, to confirm that instructors were implementing the assigned teaching strategy.

Semi-structured interviews. At the end of the semester (week 15), the instructors in both the choice and non-choice groups (n = 4) participated in a semi-structured interview session. Sessions lasted approximately 30 minutes and the interviews were audio-recorded.

Data Analysis

Survey data. Once scores from the BREQ-2 and LTEQ were calculated, data were entered into SPSS and analyzed. Missing data were replaced with mean scores (Norman & Streiner, 2008). Descriptive statistics and alpha confidents were calculated on all measures. Mean scores from each of the five subscales of motivation on the BREQ-2 and LTEQ scores were calculated. Cronbach's alpha coefficients were run on the subscales of the BREQ-2 to test for internal consistency. Results of chi-square tests and t-tests indicated that there were no group differences at baseline. Six separate two-way repeated measures analysis of variance (ANOVA) with Bonferroni correction were run on each of the subscales of the BREQ-2. Additionally, a two-way repeated measures ANOVA was run on the scores from the LTEQ.

Open-ended questions. Responses from the open-ended questions were transcribed into chart form. The data collected from the open-ended questions was reviewed, coded based on patterns, and categorized into emerging themes by the researcher to determine how students described their experiences in choice versus non-choice teaching styles.

Semi-structured interview. Audio files from the semi-structured interviews were transcribed verbatim. A "framework analysis" inductive approach (Gale, Heath, Cameron, Rashid, & Redwood, 2013) was used during this part of data analysis, which involves familiarization, identifying a thematic framework, indexing, charting, mapping and interpretation of data. The Framework Method is most commonly used for the thematic analysis of semi-structured interview transcripts, and aids in drawing descriptive and/or explanatory conclusions associated around themes (Gale et al., 2013). After all transcripts were coded by the lead investigator, a Co-PI independently verified the resulting themes. Discrepancies in interpretation were discussed until consensus was reached.

RESULTS AND DISCUSSION

Differences in Motivation Over Time and Between Choice and Non-choice Groups

Results of the two-way repeated measures analysis of variance (ANOVA) on each of the subscales of motivation and PA are described below. Descriptive statistics, including means and standard deviations at each time point, can be found in Table 1.

External. An individual is externally regulated when, for example, they exercise because someone tells them they should or they feel pressure from outside sources (i.e., family and friends) to exercise. The results of a 2-way ANOVA indicated no significant effect for extrinsic motivation over time, $F(2, 158) = 1.98$, $p = .14$, $\eta_p^2 = .024$. Additionally there were no significant differences between groups, $F(2, 158) = .24$, $p = .78$, $\eta_p^2 = .003$.

External regulation refers to actions controlled by contingencies external to the individual like rewards or punishment (Deci and Ryan, 1985). Overall external regulation scores were low with mean scores ranging from .58 - .89. While there were no significant differences over time or between groups, the non-choice external regulation mean scores ($M_{\text{non-choice}} = .77$ -.87) were slightly higher in each round. This could be due to the fact that the instructor in the

non-choice class was leading the activity, which is consistent with a controlling environment in which individuals feel less autonomous and self-directed. This level of regulation is not consistent with an individual continuing to engage in PA over time or remain persistent in that level of PA (Ryan & Deci, 2008).

Intrinsic. Intrinsic regulation is the highest level of self-determination and suggests that individuals exercise because they enjoy it and feel pleasure and satisfaction from exercising. Results of a two-way ANOVA revealed a significant effect over time for intrinsic motivation, $F(2, 158) = 10.13$, $p = .00$, $\eta_p^2 = .114$ with no significant difference between groups, $F(2, 158) = .42$, $p = .65$, $\eta_p^2 = .005$. Mean scores increased from 2.7 to 3.04 over time.

Intrinsic regulation significantly increased over time for both groups; however, mean scores between groups were very similar (M_{choice} = 2.5 - 2.9 and $M_{non\text{-}choice}$ = 2.8 – 3.1). The class itself and experiences in both choice and non-choice styles were effective at increasing intrinsic motivation and no one experience had a greater impact on intrinsic motivation. Ryan and Deci (2008) suggested that individuals who are autonomously motivated (which encompasses intrinsic motivation) experience a self-endorsement for their actions. This self-endorsement could be a result of goal reflection, which was encouraged in the FFL course, and adoption, and therefore may have contributed to the increase in motivation among both groups.

Identified. Identified regulation suggests that an individual exercises because they value the benefits that result from exercise (i.e., health benefits). Results of a 2-way ANOVA indicated a significant effect over time for identified motivation, $F(2, 158) = 7.35$, $p = .001$, $\eta_p^2 = .085$ with no significant difference between groups, $F(2, 158) = 1.03$, $p = .35$, $\eta_p^2 = .013$. Overall mean scores significantly increased from 2.8 to 3.09 over time.

While identified regulation is considered a type of extrinsic motivation, it has a very high degree of self-regulation as opposed to external regulation (Ryan & Deci, 2000, 2008). Results indicate that both groups increased in identified regulation from Time 1 to Time 3. One objective of the FFL course is to inform students about the health-related benefits associated with PA, and students learn how to develop personalized exercise programs. It might be hypothesized that the activities performed, whether through freedom of choice or instructor directed, might have associated with the participants' personal goals, impacting identified regulation.

Introjected. Introjected regulation suggests that an individual feels guilty or ashamed when they do not exercise. Results of a 2-wayANOVA indicated a significant effect over time for introjected motivation, $F(2, 158) = 6.61$, $p = .002$, $\eta_p^2 = .077$ with no significant differences between groups, $F(2, 158) = 2.92$, $p = .02$, $\eta_p^2 = .045$. Overall mean scores significantly increased from 1.81 to 2.2 over time.

Introjected regulation represents a form of extrinsic motivation which is characterized by the individual internalizing external regulations (Ryan & Deci, 2008). Students in the non-choice group in this study experienced a more controlling style of instruction with little autonomy, which might explain the increase in introjected motivation. The students were unable to choose activities that they may have found more enjoyable or comfortable; therefore, they may have participated because they felt an obligation to meet the course expectations. While not significant, the choice group experienced an increase in this form of regulation from Time 1 ($M = 1.8$) to Time 2 ($M = 2.0$) and a slight decrease from Time 2 ($M = 2.0$) to Time 3 ($M = 1.9$). The choice group could still have been grappling with the fact that, regardless of their choice in activity, they still had to meet the expectation of the course. Additionally, it could be hypothesized that the drop in introjected regulation from Time 2 to Time 3 for the choice group signified that these students were starting to transition toward identified or intrinsic regulation and were no longer motivated by feelings of guilt or shame. According to Ryan and Deci (2000), this type of regulation is extremely interesting due to the fact that the regulatory process is within the person, however, at the same time is relatively external to the self.

Amotivation. Amotivation is the lowest level of self-determination. This suggests that an individual has no desire to exercise and does not see any reason why they should exercise (Ryan & Deci, 2000). No significant difference was found in amotivation over time, $F(2, 158) = .04$, $p = .95$, $\eta_p^2 = .001$. Additionally, there was no significant difference between groups, $F(2, 158) = .21$, $p = .80$, $\eta_p^2 = .003$. Overall amotivation scores were very low (See Table I), which suggests that most participants in the study had some form of motivation for PA. While differences were not significant, amotivation scores from Time 3 were lower than Time 1 (baseline) for both groups. Coupled with increases in other types of regulation, these results might indicate that these students transitioned into some form of motivation.

Physical Activity. A significant effect over time was found for PA, $F(2, 158) = 5.63$, $p = .004$, $\eta_p^2 = .067$ with no significant difference between groups, $F(2, 158) = 1.34$, $p = .26$, $\eta_p^2 = .017$. Overall mean scores significantly improved from 52.19 to 61.46 over time, indicating participants were more physically active at the end of the semester than at the beginning.

Baseline mean scores for both groups were very similar and suggest that participants were a relatively active group collectively. These findings suggest that FFL as a required health and wellness course positively impacted PA levels and added support for these course requirements. The fact that FFL is a core curriculum course means that each instructor follows similar guidelines and addresses the same subject matter. The "dosing" of subject matter delivered in class did not change among groups, which could be a reason for the lack of difference in PA levels between groups. While not significant, the choice group showed a decrease in mean PA scores from 60.19 (Time 2) to 57.08 (Time 3). One hypothesis for explaining this slight decrease in the choice group could be that participants might have decreased their intensity levels during the activity days due to the timeframe falling within the last week of classes and resulting competing priorities faced by college students during this time. The non-choice group, on the other hand, may have remained consistent throughout the semester because the instructor was leading the activity and may have chosen activities that required a higher intensity level.

Student Experiences in Choice vs Non-choice Teaching Style

Analysis of the open-ended questions revealed that all but one participant in both choice and non-choice groups preferred freedom of choice. The one participant who did not favor the choice style suggested instead that there were "too many options." The overall majority of participants in the non-choice group expressed their dislike for this style, explaining that they would prefer to choose activities they enjoy or would feel comfortable engaging in. Some of the responses included: "activities felt forced on us"; "I hated lifting"; "I didn't like not doing what I wanted," and "I did not like having to divert from my own workout plan." There were, however, a few participants in the non-choice group who were seemingly indifferent or implied that the non-choice class allowed them to experience new activities that they may not have experienced had they not been exposed. Some of these responses included: "it gave me a variety of opportunities to participate," and "being able to try new activities that I would not typically think of was interesting."

Instructor Experiences Teaching Choice vs Non-Choice Styles

Overall, the instructors perceived that some form of choice ultimately presented a more positive experience for students. The issue of pre-conditioned (i.e., highly active individuals, student athletes) versus de-conditioned (i.e., not very active, novice, non-athletes) individuals was a prominent theme that emerged through the semi-structured interviews.

Instructors in both choice and non-choice saw the differing individuals (pre-conditioned and de-conditioned) as both a strength and a weakness. The choice instructors noticed that the pre-conditioned students were able to use choice in a positive way to continue a training regimen already in place or to choose activities that were motivating to them. This is supported by Ryan and Deci (2000), who suggest that individuals' inherent intrinsic regulation can flourish in the right conditions. For those students who had goals and were already adhering to programs, choice classes let them have that opportunity to be more specific in their workouts. On the other hand, some de-conditioned students seemed to lack the ability to work at an appropriate intensity level and would choose activities that were low impact and "easy."

One positive aspect of the non-choice instructional style noted by one of the instructors was that it gave the de-conditioned students some guidance in decision making with regard to their activity choices. One instructor pointed out "they lack the information to make exercise decisions for themselves and they don't know the fundamentals of it or the importance of it." This finding is consistent with Chaubal (2011), who stated that individuals who lack experience and knowledge in PA settings may find themselves overwhelmed with what to do in a choice setting.

Choice and non-choice teaching styles can affect the pre-conditioned and de-conditioned individuals differently. This phenomenon was a developing theme that emerged from the interviews as a possible barrier to choice. Some

de-conditioned students may have found more value in non-choice, where the pre-conditioned individual may have found non-choice demotivating. Research suggests that an individual's feeling of competence will not alone impact intrinsic motivation, but that there must be an association with some sense of autonomy in order to fully impact intrinsic regulation (Ryan & Deci, 2000). The pre-conditioned students are generally competent movers; however, in the non-choice setting, they seemed less motivated due the lack of autonomy and the fact that some were already committed to their own specific goals and training programs. As noted by one instructor:

> They have specific goals they are already committed to and so being told you have to exercise according to this, it was demotivating. I feel anytime you take away autonomy, when it comes to PA, that can be demotivating, especially for people that already believe that they are proficient at the motor skill of exercise or cognitively.

In the choice group, the de-conditioned individuals generally found it difficult to self-motivate while the pre-conditioned individuals thrived by finding activities that they were already doing or that could benefit their goals already in place. This was not the case, however, for all de-conditioned individuals in the choice group. Some de-conditioned students could find activities that they found enjoyable and comfortable. For example, one instructor noted that a particular deconditioned student "found a couple of really good workouts online and used them in class. In that sense, it made some of those kids that really didn't have any goals help them set some goals for themselves."

One instructor of the non-choice group suggested that the de-conditioned students may benefit from non-choice because they were presented with activities that they may not have chosen nor had prior knowledge of. Another noted "I think it's definitely the right way to start with, especially for inexperienced and the de-conditioned students it gives them the guidance that they need and it also helps motivate them knowing that they were receiving sound guidance."

One barrier that emerged from the choice instructors was that some students were not meeting an appropriate intensity level for their ability. Specifically, instructors found that choice allowed students who were not particularly motivated to do the minimum intensity required:

> So, I think they like being able to choose the type of workout that they want to spend their time doing. Now I don't necessarily know that it was any more motivating for those kids-- who didn't want to work out anyway, because I think those kids never really work to the intensity level that is high enough to give those real benefits, they were just moving. I mean, at least they did something. But it would have been even harder to get those kids to do something if I would have dictated a specific sport or specific activity for them.

The instructors further noted a need to find ways to hold unmotivated students accountable for meeting appropriate intensity levels in a choice setting.

The instructors all suggested that offering choice and creating an autonomous, self-directed environment was the preferable situation. They unanimously agreed that students preferred choosing their own activities specific to their individual skills, goals, and inclinations. Each of the instructors agreed that a gradual progression toward autonomy, specifically for the de-conditioned students, would be ideal. These findings support the tenants of adult learning theory, which proposes a shift from the instructor as the authoritative figure toward the instructor as a provider of guidance and scaffolding for student learning (Furtack & Kunter, 2012).

CONCLUSION AND FUTURE RESEARCH

Results from this study suggest that college students experienced a significant improvement in autonomous motivation and PA over time because of participation in a FFL class. Further, this study provides support for adults' desire for autonomy and self-directness within college FFL courses, as both undergraduate students and instructor participants in this study agreed that choice was the preferred method for adult learners. Additionally, instructors expressed the need to facilitate the increase of autonomy (choice) among students in the FFL setting, which supports the key components associated with the adult learning theory that suggest that students need a gradual progression from dependency toward more autonomy and self-directedness (Knowles, 1977). Implications from this study provide

evidence for continued research and support for higher education PA programs as an effective strategy for improving health and PA patterns in young adults. Given the amount of resources invested in FFL courses at universities nationwide, results from this study may help to develop curricular revisions within these courses.

While the results of this study indicate significant findings, there are some limitations that should be acknowledged. The relatively small sample size could have a potential impact on the generalizability of the study. Self-reported behavioral data may not be entirely accurate (Keating et al., 2005), which could potentially influence results. In addition, since the study took place in a small liberal arts institution, the results may not generalize to other institutions of different size/aims. Another potential limitation is instructor bias; it may have been difficult to determine whether differences in student motivation occurred because of the instructor's personality, gender, or overall teacher effectiveness. Additionally, although the fidelity checklist ensured each teaching style was being implemented as prescribed, it may be possible that students did not necessarily perceive one type of climate (teaching style) over the other. Finally, the 15-week semester may not have been sufficient time to see an effect in teaching styles.

Future research is warranted to determine whether PA levels are maintained after completion of the course, and for how long. Since it is known that autonomous motivation leads to greater persistence in a behavior (Sibley et al., 2013), future research should focus on how students' ability to become autonomous in their PA choices can impact motivation. It would also be of interest to investigate perceptions of choice based on identified pre-conditioned vs. deconditioned status of participants. Additionally, instructors from this study concluded that implementing strategies that gradually increase autonomy and self-directedness in students throughout the semester may be an optimal way to improve intrinsic motivation towards PA. Therefore, working with college instructors to facilitate and guide students toward greater autonomy and self-directedness within FFL courses through professional development workshops or online learning modules is suggested. Increasing PA among an increasingly sedentary population could have a profound effect on individuals' overall health as well as add to the growing body of literature on motivation.

Table 1

Means and Standard Deviations (SD) on the 5 subscale measures of the BREQ-2 by choice and non-choice group

	Round 1		**Round 2**		**Round 3**	
	Choice	Non-choice	Choice	Non-choice	Choice	Non-choice
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
External Regulation	.58 (.75)	.77 (.82)	.79 (.87)	.89 (.86)	.65 (.79)	.87 (.82)
Intrinsic Regulation	2.5 (1.1)	2.8 (.91)	2.9 (.93)	3.0 (.82)	2.9 (.88)	3.1 (.75)
Identified Regulation	2.6 (1.0)	3.0 (.78)	2.9 (.83)	3.1 (.61)	2.9 (.82)	3.1 (.60)
Introjected Regulation	1.8 (1.3)	1.7 (1.1)	2.0 (1.1)	2.0 (1.1)	1.9 (1.2)	2.4 (1.0)
Amotivation	.27 (.58)	.16 (.41)	.22 (.48)	.17 (.40)	.25 (.51)	.15 (.35)
Physical Activity	52 (32)	52 (28)	60 (26)	59 (22)	57 (26)	65 (24)

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