Influence of Age, Sex, and Race on College Students' Exercise Motivation of Physical Activity

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Abstract. Objective: The authors examined differences in exercise motivation between age, sex, and race for college students. **Participants**: Students from 156 sections of physical activity classes at a midsize university were recruited ($n = 2,199$; 1,081 men, 1,118 women) in 2005–2006 and volunteered to complete the Exercise Motivation Inventory. **Methods**: Quantitative, cross-sectional descriptive research design was employed. **Results**: Significant differences were found in 3 of 14 exercise motivational subscales by age (affiliation, health pressures, and ill health avoidance) ($p < .05$). Males were motivated by intrinsic factors (strength, competition, and challenge) ($p < .05$) and females by extrinsic factors (ie, weight management and appearance) ($p < .05$); only 2 subscales proved not to be significant by sex. Race differences provided 8 significant differences by exercise motivations ($p < .05$). **Conclusions**: Significant differences for exercise motivations in college-aged population by demographics were documented. Understanding these differences is important for college health professionals for programming strategies and promoting physical activity.

Keywords: exercise, gender, health education

The incidence of obesity in the US college-aged population has increased from 12% in 1991 to 36% in 2004.[1] Although college demographics have changed, in recent reports, 32.5% of college students in Fall 2009 were classified as overweight or obese according American College Health Association's reports compared to the 31.3% in Fall 2008.[2] The Centers for Disease Control and Prevention's last comprehensive behavior risk survey on college students was completed in 1997; at this point there are no large studies on overweight and obesity statistics in college students.[3] Nevertheless, studies have indicated that college students are at a critical period; weight gained during the college years could increase students' likelihood to become obese in the future.[4,5] There are numerous health risk factors associated with being overweight and obese, including hypertension, high cholesterol, diabetes mellitus, detrimental blood lipid profiles, and cardiovascular disease. An important underlying and contributing factor to obesity is lack of physical activity.[6] Health professionals working with college-aged students are in a unique position to understand the reasons students do or do not participate in physical activity on a weekly basis.[7]

Current research indicates nearly 24.2% of college students participate in no moderate physical activity. Moreover, 41.4% participate in no vigorous physical activity, only 56.7% participate in 1 to 4 days of moderate activity, and 30% participate in vigorous activity on a weekly basis.[2] Additionally, over 30% of college students are considered overweight (body mass index [BMI] 25.0–29.9 kg/m^2) or obese (BMI $>$ 30.0 kg/m^2).[2] To be in accordance with national physical activity guidelines,[8] college and university health promotion services ought to encourage regular participation in both vigorous and moderate physical activity.[8] Health benefits can be achieved by participating in either 150 minutes of moderate or 75 minutes of vigorous physical activity per week,[8] but the motivation to participate in these 2 types of activity would differ. For example, activities that are vigorous include short bouts of high-intensity movements such as basketball, soccer, or plyometric training, whereas moderate exercise might include walking, biking, or weight lifting. Students will have very different motivation for participating in these various exercises.

Some researchers have looked at exercise motivation in order to better understand participation in physical activity.[9] Exercise motivation is understood as the impetus for exercise participation.[10] People with higher exercise motivation participate more regularly over a sustained period of time than people with low exercise motivation.[11] Biddle[10] cites research that people have many different motivations to maintain exercise adherence. Numerous researchers have concluded that the motivation to exercise or engage in physical activity can

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be a function of intrinsic and extrinsic factors.[12–14] Deci and Ryan's[15] self determination theory (SDT) provides a framework to understanding the multidimensional approach to exercise motivation. Li[13] suggests that this theory allows scientists to examine the antecedents of exercise motivation, as well as the correlates and consequences of those processes. A subtheory of the SDT, the cognitive evaluation theory, is often used to explain exercise motivation. It suggests that specific exercise motivation variables can be intrinsic or extrinsic.[16] Intrinsic motivation variables are related to competence and interest–enjoyment, whereas extrinsic motivational variables center on the achievement of outcomes that are extraneous to participation in the exercise.[16–18] However, it is important to note that Ingledew and Sullivan[19(p324)] suggested that there is a fluidity in motivation "individuals can move along this continuum. Thus individuals who are initially externally regulated can eventually feel self-determined, even if they are never truly intrinsically motivated." The role of the health professional is to help the individuals move towards internal factors for exercise motivation.[15,16]

Several studies have looked at exercise motivation in the college population.[20–23] One study examined the motivation of college students before and after spring break; and found that students' weight management, performance motives, and general health motives were the most cited motivation for exercise.[20,21] More specifically, someone who has continually lived an exercise-led lifestyle in an organized program for 6 months is likely to be active a year or 2 later. Maltby and Day[21] found exercise motivation to be different according to the length of adherence; furthermore, they also related exercise adherence with intrinsic and extrinsic motivation. Ingledew and Sullivan[19] investigated sex differences in exercise motivation in the adult population, revealing men and women had different motives to exercise. Recent studies indicate that women were found to be more motivated by weight management, whereas men were motivated by the challenge and appearance aspects.[24,25] Limited literature is available on exercise motivation by age and race. Due to the changing demographics and generational characteristics of college students, it is important to continue to track reasons why college students participate in exercise and use this information to help drive health programming.

A widely utilized instrument with established and acceptable psychometric measurements to measure different types of exercise motivation is the Exercise Motivation Inventory (EMI).[26] The EMI was developed as a means of assessing exercise motivations as they influence levels of participation, choice of activities undertaken, affective reasons for exercising, and reciprocal influence on participation motives.[27] Authors designed the original instrument to determine what motivated individuals to participate and adhere to exercise programs. Although the EMI addresses health and fitness factors, it did not break down those factors into subscales. The Exercise Motivation Inventory–2 (EMI-2) was developed to further breakdown health and fitness categories. Old items were modified and new items were created to make the EMI-2 applicable to both exercisers and nonexercisers.[28]

Studies that analyze motivations of college students in relation to physical activity and exercise exist; however, there is still a lack of research in relation to how motivation differs between various demographics of the college-aged population. The purpose of this study was to examine differences between exercise motivation by age, sex, and race in the college-age population. To guide their inquiry, the researchers of this study set the alternative, nondirectional hypothesis to be:

H_1: Exercise motivation among college students by demographic variables (age, sex, race) are not equal.

Tracking differences by demographic variables may help guide health/exercise programming at the college level.

METHODS

Population and Sampling

The research design employed was a quantitative, quasi-experimental, cross-sectional descriptive study. Students from 156 sections of physical activity classes at a midsize southeastern university were recruited to participate in the study. Sampling methodology included the entire population of students in physical activity classes and was voluntary. A total population of 5,108 students registered for 156 sections of physical activity courses for the 2005–2006 academic year. Students were verbally recruited in their physical activity classes by instructors with an incentive (bonus points in class) offered to complete the survey. Surveys were collected over 2 semesters: Fall 2005 and Spring 2006. Surveys were posted to the online course learning management system. Of the 5,108 students enrolled, 2,214 (43%) completed the instruments. No attempt was made to follow-up on nonrespondents. Table 1 describes the demographic breakdown of participants, which is reflective and representative of the student population at the university. Among sex demographic, 50.8% ($n = 1,182$) were female and 49.2% ($n = 1,081$) were male. Most students take their physical activity requirement in their freshman or sophomore year as reflected by 63.4% ($n = 1,377$) reported being 19 or younger. A 35.4% ($n = 783$) reported being 20 or older. The majority of the respondents reported being white (64.4%, $n = 1,527$), followed by black (21.7%, $n = 478$) and others (8.8%, $n = 194$). Grouping of "others" includes all other racial/ethnic groups combined (Asian, Hispanic, and others) due to the small number in each of these. The university's Human Subjects Institutional Review Board approved the study. Students read the informed consent and gave passive consent by completing the survey.

Instrument

The EMI-2 was used to measure participant's exercise motives. The EMI-2 is composed of 51 items and 14 subscales, which consist of affiliation, appearance, challenge, competition, enjoyment, health pressures, ill-health avoidance, nimbleness, positive health, revitalization, social recognition, strength and endurance, stress management, and weight management. Response items range from 0 to 5, with 0 depicting

TABLE 1. Frequency and Percentiles of Demographic Characteristics of Study Participants ($N = 2,214$)

Variable	*n*	%		*n*	%
Sex ($n = 2,199$)*			Age ($n = 2,160$)+		
Female	1,182	50.8	< 20 years	1,377	63.8
Male	1,081	49.2	≥ 20 years	783	35.4
Race ($n = 2199$)*					
White/Caucasian	1,527	69.4			
Black/African American	478	21.7			
Others	194	8.8			

*15 respondents did not respond to this question.
+54 respondents did not respond to this question.

"not at all true for me" to 5 "very true for me." Subscales are comprised of 3 to 4 questions, with subscale scores obtained by calculating the mean for the appropriate items as designated by the scoring key provided by the Inventory's authors.[28] An example of the EMI-2 inventory items is given below:

Personally, I exercise (or might exercise). . .

To give me goals to work towards 0 1 2 3 4 5

To have a good body 0 1 2 3 4 5

To spend time with friends 0 1 2 3 4 5

Examples of intrinsic factors include challenge, affiliation, revitalization, and enjoyment, whereas examples of extrinsic factors include appearance improvement, weight management, health pressure, ill-health avoidance, and competition.[24] Other motives (eg, social recognition, stress management) are more difficult to classify along dichotomous categories.[26,28] Markland and Ingledew[26] have determined past validity and reliability for this instrument. Reliability for the instrument in this study was determined by Cronbach alpha for overall motivations and subscales. Reliability of overall motivation was $\alpha = .966$, whereas the subscales ranged from $\alpha = .929$ for competition (highest reliability) to $\alpha = .0729$ for health pressures (lowest reliability). Any Cronbach alpha score of .60 or higher is considered acceptable.[29]

Data Analysis

Variations in exercise motivation preferences among this college-age population were reported by mean and standard deviation. Statistical tests included descriptive (frequencies, means) and inferential statistics (*t* tests, analyses of variance [ANOVAs]). Demographics (age, sex, race) served as the independent variables, and the 14 subscales were the dependent variables. Means were utilized to determine group ranking of exercise motivations. ANOVAs determined significant difference of motivation by age, sex, and race. For racial categories, a 1-way ANOVA with Tukey post hoc analysis using harmonic mean sample size determined significant differences between races. Alpha levels were set at $p < .05$, reported with 95% confidence intervals. SPSS version 17.0 was used to calculate the data.

RESULTS

For this overall college sample, positive health ($M = 3.86$, $SD = 1.03$) and ill-health avoidance ($M = 3.42$, $SD = 1.15$) ranked as the top 2 motivations (Table 2). These motivations were followed by appearance ($M = 3.41$, $SD = 1.08$), strength and endurance ($M = 3.395$, $SD = 1.07$), and weight management ($M = 3.34$, $SD = 1.34$). Factors that were listed as the least important motivational factors included affiliation ($M = 2.56$, $SD = 1.22$), social recognition ($M = 2.37$, $SD = 1.32$), and health pressures ($M = 1.95$, $SD = 1.33$).

TABLE 2. Descriptive Statistics Reported by Means and Standard Deviations for Exercise Motivation Subscales (EMI-2)

	Source of variation	*M*	*SD*
1.	Positive health	3.860	1.03
2.	Ill-health avoidance	3.420	1.15
3.	Appearance	3.410	1.08
4.	Strength and endurance	3.395	1.07
5.	Weight management	3.340	1.34
6.	Nimbleness	3.310	1.18
7.	Revitalization	3.260	1.12
8.	Enjoyment	3.210	1.23
9.	Stress management	3.200	1.21
10.	Challenge	3.050	1.18
11.	Competition	2.790	1.51
12.	Affiliation	2.560	1.22
13.	Social recognition	2.370	1.32
14.	Health pressures	1.950	1.33

TABLE 3. Ranking of Exercise Motivation Subscales Reported by College Subjects Given by Frequency and Percentiles ($N = 2,214$)

	Sex		Age		Race		
Subscale	Men	Women	< 20 years	≥ 20 years	White	Black	Others
Affiliation	12	11	12	12	12	12	12
Appearance	6	3	3	4	3	5	5
Challenge	9	10	10	10	10	6	9
Competition	7	12	11	11	11	11	11
Enjoyment	5	9	8	9	9	9	8
Health pressures	14	14	14	14	14	14	14
Ill-health avoidance	4	5	5	3	5	3	3
Nimbleness	3	7	6	5	7	4	4
Positive health	2	1	1	1	1	1	1
Revitalization	8	8	7	7	6	8	6
Social recognition	13	13	13	13	13	13	13
Strength and endurance	1	4	2	2	2	2	2
Stress management	10	6	9	8	8	10	10
Weight management	11	2	4	6	4	7	7

Note. Range = 1 (most important) to 14 (least important).

Top motivators by age, sex, and race were determined (Table 3). Results are given for all 14 subscales of motivation, with a "1" indicating most important motivation to "14" being least important motivation. Considering the top 5 motivators per demographic groups, results demonstrated that males were more motivated by intrinsic factors (strength, positive health, and enjoyment), whereas females were more motivated by extrinsic factors (weight management and appearance). For the age variable, 2 age groups were created, participants < 20 years old and those ≥ 20 years old. Ranking of exercise motivation varied little by age groupings. All races identified positive health and endurance as their top choices.

Table 4 highlights significant differences in motivation by age and sex. Between the 2 age categories, significant differences were found by affiliation ($p = .036$), health pressure ($p = .002$), and ill-health avoidance ($p = .020$). Participants younger than 20 years old were more likely to be motivated by health pressure and ill-health avoidance, whereas those 20 years old and greater were more likely to be motivated by affiliation. Of the 14 exercise motivational subscales that the EMI-2 measured, 12 subscales were found to be significantly different ($p \leq .05$) by sex. Males were more likely to be motivated to exercise for enjoyment, challenge, social recognition, affiliation, competition, and strength and endurance ($p < .005$). Females were motivated to exercise for ill-health avoidance, maintain positive health, weight management, and appearance ($p < .05$). The only 2 exercise motivational factors similar among males and females were stress management and revitalization.

Table 5 highlights differences of exercise motivation by race. Of the 14 motivational factors for exercising, 10 significant differences existed between races ($p < .05$). Whites were significantly ($p = .007$) more likely to be motivated to exercise for stress management than blacks. Whites ($p = .001$, $p = .024$) and others ($p = .001$, $p = .018$) were more likely to exercise for revitalization and enjoyment than blacks, respectively. Others were more motivated to exercise by the challenge than whites ($p = .008$), for social recognition than blacks ($p = .005$), and for affiliation ($p = .009$). Whites ($p = .000$) and others ($p = .019$) were more likely to exercise for weight management, whereas blacks and others were motivated to exercise for health pressures ($p = .000$), ill-health avoidance ($p = .000$), and nimbleness ($p = .000$).

In summary, the 4 significant motivators for whites were stress, revitalization, enjoyment, and weight management. Blacks were significantly motivated by health pressures, ill health avoidance, and nimbleness. Others were significantly motivated by revitalization, enjoyment, challenge, social recognition, affiliation, weight management, health pressures, health avoidance, and nimbleness.

The present study used the EMI-2 to investigate the motives of college students and examined differences by age, sex, and race. Multiple significant differences in each of the demographics were found among college-aged students.

TABLE 4. Report of Significant Differences by Demographic Variables (Age and Sex) and Exercise Motivation as Determined by Independent *t* Tests With Mean Scores Reported (*N* = 2,214)

Source of variation		*M*	*SD*	*t* value	Significance
Age					
Affiliation	≥ 20 yrs old	2.59	1.17	2.097	.036*
	< 20 yrs old	2.48	1.30		
Health pressures	≥ 20 yrs old	1.86	1.30	−3.077	.002*
	< 20 yrs old	2.05	1.34		
Ill-health avoidance	≥ 20 yrs old	3.38	1.15	−2.329	.020*
	< 20 yrs old	3.50	1.12		
Sex					
Enjoyment	Male	3.33	1.18	5.006	.000*
	Female	3.07	1.26		
Challenge	Male	3.22	1.14	6.928	.000*
	Female	2.88	1.19		
Social recognition	Male	2.66	1.28	10.705	.000*
	Female	2.07	1.28		
Affiliation	Male	2.79	1.21	9.055	.000*
	Female	2.32	1.19		
Competition	Male	3.31	1.36	17.139	.000*
	Female	2.27	1.46		
Health pressures	Male	2.09	1.34	4.954	.000*
	Female	1.80	1.30		
Ill-health avoidance	Male	3.36	1.18	−2.394	.017*
	Female	3.48	1.11		
Positive health	Male	3.79	1.07	−3.242	.001*
	Female	3.93	0.99		
Weight management	Male	2.96	1.36	−13.864	.000*
	Female	3.73	1.21		
Appearance	Male	3.32	1.09	−4.017	.000*
	Female	3.51	1.07		
Strength and endurance	Male	3.89	1.02	8.520	.000*
	Female	3.50	1.10		
Nimbleness	Male	3.38	1.18	2.766	.006*
	Female	3.24	1.17		

*Significance at alpha level .05.

TABLE 5. Report of Significant Differences by Race and Exercise Motivation as Determined by ANOVAs With Mean Scores Reported (*N* = 2,214)

	Mean score				
Source of variation	White	Black	Others	*F* value	Significance
Stress management	3.24[a]	3.05[a]	3.25	4.771	.009*
Revitalization	3.29[a]	3.08[ab]	3.43[b]	8.745	.000*
Challenge	3.00[a]	3.11	3.27[a]	5.307	.005*
Enjoyment	3.23[a]	3.06[ab]	3.35[b]	4.859	.008*
Social recognition	2.38	2.24[a]	2.60[a]	5.039	.007*
Affiliation	2.54[a]	2.48[b]	2.81[ab]	4.749	.009*
Health pressures	1.87[ab]	2.05[a]	2.25[b]	8.915	.000*
Ill-health avoidance	3.44[ab]	3.58[a]	3.64[b]	11.555	.000*
Weight management	3.41[a]	3.09[ab]	3.40[b]	10.646	.000*
Nimbleness	3.25[ab]	3.42[a]	3.53[b]	7.791	.000*

Note. Post hoc analysis difference using Tukey; variables sharing superscripts are significantly different.
*Significance at alpha level .05.

COMMENT

Overall, participants listed general health issues (ie, positive health, ill-health avoidance), appearance, strength and endurance, and weight management as their top motivations behind exercising. This finding was consistent with Kimbrough et al,[20] who cited that weight management, performance, psychological motives, and general health were among the top reasons for physical activity among their college sample. These reasons have been broken down further by designating these motivations as either extrinsic or intrinsic motivators. Extrinsic factors such as appearance, weight management, and stress management proved to be related to exercise motivators, whereas intrinsic factors such as enjoyment and challenge proved to be related to engagement in sport.[24]

This research found both intrinsic and extrinsic motivation factors to be important when considering physical activity, which is consistent with findings of previously research.[21] Maltby and Day found extrinsic and intrinsic motivations to predict psychological well-being in relation to exercise level; college students who were physically active for less than 6 months showed more extrinsic motivations, which were significantly related to poorer psychological well-being.[21] Additionally, college students physically active for more than 6 months were more intrinsically motivated and had significantly higher positive psychological well-being.[21] Further research is needed to explore this trend.

This research distinguished motivation between those younger than 20 years old and $\geq$ 20 years old, and the groups significantly differed among 3 items: affiliation, health pressures, and ill-health avoidance. Those less than 20 years old were more motivated by the general health issues (health pressures and ill-health avoidance), which are both extrinsic factors. Those who were 20 years old or older were more motivated by the factor of affiliation within a group. It could be hypothesized that those who are younger than 20 years old use exercise to stay socially engaged due to heavier class workloads. Further investigation is needed to examine affiliation within the college population. In addition, future research could focus on how underclassmen identify health issues as an important factor for exercise, yet continue to become more obese.

The greatest area of differences between demographics and exercise motivation was sex. For the 14 subscales that measured exercise motivation, 12 were significantly different between males and females. Males and females are motivated to participate in exercise for entirely different reasons. The current findings demonstrated that males tend to be more motivated by intrinsic factors, whereas females were more motivated by extrinsic factors. Health professionals may want to consider that intrinsic motivation has been positively linked with exercise adherence,[24] and although women are especially motivated by weight management,[25] the emphasis could be placed on exercise goals that focus on intrinsic factors to promote exercise adherence. Health educators and professionals need to be cognizant of the differences between sexes when promoting physical activity within these 2 groups. For example, health educators might use extrinsic motivation factors with females, and then progress to introducing intrinsic tools for motivation. This would be a different overall approach that one would take when working with males.

Along with age and sex, differences in exercise motivation between races were investigated in this study. Ten significant differences existed between racial categories. Whites were more likely to be motivated to exercise for stress management, revitalization, enjoyment, and weight management. Blacks and others were motivated to exercise for health pressures, ill-health avoidance, and nimbleness. The "others" race category in this study may not be indicative of substantive findings; most of the motivator subscales (9 out of 14) were significant. This is probably due to the "others" category being a composite grouping, which did not differentiate between smaller race categories. Racial differences between whites and blacks coincide with past research on racial differences and physical activity. In the 1990s, Kumanyika[30] and Rand and Kuldau[31] cite that many behavioral factors (both qualitatively and quantitatively) exist between race and physical activity. This might be because of the social emphasis of physical activity that is stressed within white and black communities. Although findings from this study support past research, additional studies on race and physical activity should be done before generalizing such findings. The overall differences from an intrinsic and extrinsic perspective cannot be fully defined as both cite external and internal rationales. Health pressures (such as "because my doctors advise me to") was the highest factor in the "others" classification compared to white and blacks. With "others" category being comprised of numerous racial groups, further analysis by individual groups is needed to help understand this phenomenon.

Limitations

There were several limitations to this study. First, this sample is representative of one southern university and might not be representative of other geographical regions. The sampling methodology was voluntary, self-select. A limitation to this type of methodology is that usually participants are persons with strong views on the subject under study or influenced by the incentive. All measurements relied on self-report, thus the extent to which participants were inclined to provide socially desirable responses is not fully known. Honest responses were an expectation of the study. The study was a cross-sectional design and provided only a snapshot of current status. Understanding exercise motivation and how motivation can change among individuals over time would be better comprehended if a longitudinal study design was employed. Racial grouping of "others" was a conglomerate with no attempt made to distinguish between the many races that made up this catch-all category. This study did not take into account the different socioeconomical levels that might have impacted participant motivation to exercise.

Additionally, this study did not measure exercise motivation to actual physical activity patterns. Lastly, the SDT has often been cited as the framework for exercise motivation studies. Although this is the case, researchers may need to be mindful of classifying certain variables as extrinsic or intrinsic because it may not be as simple as a dichotomous categorization. Future studies may want to include the subtheories of the SDT to provide rationale for extrinsic motivation. More specifically, Markland and Ingledew[26(p362)] suggests that Deci and Ryan's[16] organismic integration theory suggests how participants can "internalize regulation by external constraints and come to feel more self determined in the regulation of behavior." In other words, certain variables can be both intrinsic and extrinsic in nature rather than fit into a dichotomous classification. Moreover, Biddle et al[32] suggests that a developmental continuum of self-determination can be used, with intrinsic motivation on one end, external regulation on the other end, and introjections/identification lying in the middle.

Conclusions

The implications of this study are directed towards college health professionals. Understanding the motivations to exercise in the college-age population is key to increasing physical activity in this population. This study suggests different programming strategies would be beneficial to address variations that exist according to age (class), sex, and race. These suggestions are concurrent with Arthur and Raedeke[33] who recommend health professional design and implement sex-specific and race appropriate programs that would motivate students to adopt a more active lifestyle. These strategies could consist of population specific physical activity courses. Weinberg and Gould[34] suggest that having similar social group classes can have an impact on exercise adherence rates. Thus, classes that are gender specific (female body conditioning class or male Olympic weightlifting class) may produce higher exercise motivation levels. Moreover, Fukukawa et al[35] suggest that age should be considered when developing exercise programs. Thus, creating programs and classes that are geared toward the current millennial generation may enhance exercise adherence. Lumpkin and Avery[36] contend that colleges and universities must be mindful with the changing times and offer activities that attract and meet the needs of the current generation. Interestingly, Joyner et al,[37] Zwald et al,[38] Czech et al,[39] and Melton et al[40] found that activity class preferences vary over time. Melton et al[40] found that the current student generation enjoys the extreme activities such as rollerblading, skateboarding, self-defense, and aquatic experiences. Health educators that are mindful of these differences can promote physical activity within these groups in a more effective manner.

When considering such differences between and within demographics and how to apply it, one might consider the self determination theory to motivation in physical activity.[15] Working among a diverse population one may encounter many different personalities who may be motivated by different internal and external factors. If one is to take a one-dimensional approach to instructing physical activity, it may be beneficial, yet research suggests that it may not be optimal. Instilling a multidimensional approach within instruction could allow a group of individuals to take what they need in order to best benefit personal motivational needs.

NOTE

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REFERENCES

1. Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA*. 2006;295:1549–1555.

2. American College Health Association. National College Health Assessment II: Fall 2008. Available at: http://www.acha-ncha.org/docs/ACHA-NCHA_Reference_Group_Executive Summary_Fall2008.pdf. Accessed June 24, 2009.

3. Centers for Disease Control and Prevention. Youth risk behavior surveillance: National College Health Risk Behavior Survey—United States, 1995. *MMWR Morb Mort Wkly Rep*. 1997;46(SS-6):1–54. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/00049859.htm. Accessed March 25, 2010.

4. Racette SB, Deusinger SS, Strube MJ, Highstein GR, Deusinger HR. Weight changes, exercise, and dietary patterns during freshman and sophomore years of college. *J Am Coll Health*. 2005;53:245–251.

5. Conklin MT, Lambert CU. Nutrition Information at point of selection could benefit college students. *Top Clin Nutr*. 2005;20:90–96.

6. Desai MN, Miller WC, Staples B, Bravender T. Risk factors associated with overweight and obesity in college students. *J Am Coll Health*. 2008;57:109–113.

7. Chu H, Bushman BA, Woodard RJ. Social physique anxiety, obligation to exercise, and exercise choices among college students. *J Am Coll Health.* 2008;57:7–14.

8. Centers for Disease Control and Prevention. Physical activity for everyone: how much physical activity do adults need? Available at: http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html. Assessed March 25, 2010.

9. Seo DC, Nehl E, Agley J, Ma SM. Relations between physical activity and behavioral and perceptual correlates among Midwestern college students. *J Am Coll Health.* 2007;56:187–197.

10. Biddle SJH. Exercise motivation across the life span. In: Biddle SJH, ed. *European Perspectives on Exercise and Sport Psychology*. Champaign, IL: Human Kinetics; 1995:3–25.

11. Frederick CM, Morrison C, Manning T. Motivation to participate, exercise affect and outcomes behaviors towards physical activity. *Percept Mot Skills*. 1996;82:691–701.

12. Dishman RK. Motivation and exercise adherence. In: Silva JM, Weinberg RS, eds. *Psychological Foundations of Sport*. Champaign, IL: Human Kinetics; 1984:420–434.

13. Li F. The Exercise Motivation Scale: its multifaceted structure and construct validity. *J Appl Sport Psychol*. 1999;11:97–115.

14. Weinberg RS, Silva JM. The relationship between extrinsic rewards and intrinsic motivation. In: Silva JM, Weinberg RS, eds. *Psychological Foundations of Sport*. Champaign, IL: Human Kinetics; 1984:177–187.

15. Deci EL, Ryan RM. A motivational approach to self: integration in personality. In: Dienstbier R, ed. *Perspectives on*

Motivation. Lincoln, NE: University of Nebraska Press; 1991:237–288. *Nebraska Symposium on Motivation*; vol 38.

16. Deci EL, Ryan RM. *Intrinsic Motivation and Self-Determination in Human Behavior*. New York, NY: Plenum; 1985.
17. Pelletier LG, Fortier MS, Vallerand RJ, Tuson KM, Brière NM, Blais MR. Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: the Sport Motivation Scale (SMS). *J Sport Exerc Psychol*. 1995;17:35–53.
18. Ryan RM, Vallerand RJ, Deci EL. Intrinsic motivation in sport: a cognitive evaluation theory interpretation. In: Staub WF, Williams JM, eds. *Cognitive Sport Psychology*. Lansing, NY: Sport Science Associates; 1984:231–242.
19. Ingledew DK, Sullivan G. Effects of body mass and body image on exercise motives in adolescence. *Psychol Sport Exerc*. 2002;3:323–338.
20. Kimbrough S, Rose M, Vallee J, Nelan CD Jr. Use of a shortened EMI-2 in assessment of exercise motivation of participating college group exercise. *Res Q Exerc Sport*. 2005;76:A101.
21. Maltby J, Day L. The relationship between exercise motive and psychological well-being. *J Psychol.* 2001;135:651–660.
22. Smith BL, Handley P, Eldredge DA. Sex differences in exercise motivation and body image satisfaction among college students. *Percept Mot Skills*. 1998;86:723–732.
23. Vartanian LR, Shaprow JG. Effects of weight on exercise motivation and behaviors a preliminary investigation among college-aged females. *J Health Psychol*. 2008;13:131–138.
24. Kilpatrick M, Hebert E, Bartholomew J. College students' motivation for physical activity: differentiating men's and women's motives for sport participation and exercise. *J Am Coll Health.* 2005;54:87–94.
25. Grogan S, Conner M, Smithson H. Sexuality and exercise motivations: are gay men and heterosexual women most likely to be motivated by concern about weight and appearance? *Sex Roles*. 2006;55:567–572.
26. Markland D, Ingledew DK. The measurement of exercise motives: factorial validity and invariance across gender of a revised Exercise Motivations Inventory. *Br J Health Psychol*. 1997;2:361–376.
27. Markland D, Hardy L. The Exercise Motivations Inventory: preliminary development and validity of a measure of individuals' reasons for participation in regular physical exercise. *Pers Individ Dif*. 1993;15:289–296.
28. Ingledew DK, Markland D, Medley A. Exercise motives and stages of change. *J Health Psychol*. 1998;3:477–489.
29. McDermott RJ, Sarvela P. *Health Education Evaluation and Measurement: A Practitioner's Perspective*. New York, NY: McGraw-Hill; 1999.
30. Kumanyika S. Obesity in black women. *Epidemiol Rev*. 1987;9:31–50.
31. Rand CSW, Kuldau JM. The epidemiology of obesity and self-defined weight problem in the general population: gender, race, age, and social class. *Int J Eat Disord*. 1990;9:329–343.
32. Biddle SJH, Hagger MS, Chatzisarantis NLD, Lippke S. Theoretical frameworks in exercise psychology. In: Tenenbaum G, Eklund RC, eds. *Handbook of Sport Psychology*. 3rd ed. Hoboken, NJ: John Wiley & Sons; 2006:537–559.
33. Arthur L, Raedeke TD. Race and sex difference in college student physical activity correlates. *Am J Health Behav.* 2009;33:80–90.
34. Weinberg R Gould D. *Foundations of Sport and Exercise Psychology*. Champaign, IL: Human Kinetics; 2008.
35. Fukukawa Y, Nakashima C, Tsuboi S, et al. Age differences in the effect of physical activity on depressive symptoms. *Psychol Aging*. 2004;19:346–351.
36. Lumpkin A. Avery, M. Physical education program survey. *J Teach Phys Educ*. 1986;5:185–197.
37. Joyner A, Zwald D, McRaney J. Incorporating student interests in required education activity programs. *GAHPERD J*. 1996;30:53–53.
38. Zwald ADA, Czech D, Joyner B. Incorporating student interests in required education activity programs. *GAHPERD J.* 2000;33:8–9.
39. Czech D, Zwald ADA, Joyner B, Watson T. An evaluation of physical activity program participation in a collegiate stetting. Incorporating student interests in required education activity programs. *GAHPERD J*. 2004;38:21–23.
40. Melton B, Bullet E, Czech DR, Zwald ADA. Follow-up evaluation of physical activity course participation in a southeastern collegiate setting. *GAHPERD J.* 2007;40:27–30.