



The Effect of Moderate Intensity Aerobic Exercise on Affect and Exercise Intention in Active and Inactive College Students



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INTRODUCTION

- Regular physical activity is known to decrease risk of cardiovascular disease, diabetes, obesity, anxiety, and depression, among other issues (Haskell et al., 2007; Pate et al., 1995).
- Physical inactivity is a rampant problem worldwide, with approximately two-thirds of the adult population not meeting minimum recommendations for physical activity (Cavill, Kahlmeier, & Racioppi, 2006) and 68% of American adults classified as overweight or obese (Ogden, Carroll, Kit, & Flegal, 2014).
- Exercise, or lack thereof, has become an increasingly larger concern in regard to the college student population, where rates of exercise have been found to decline and weight gain is also observed (Lox, Martin Ginis, & Petruzzello, 2014).
- There are a number of factors that influence exercise participation, with one of those factors being affect, a measure of well-being.
- Research on affect has found that affect increases following an exercise session, however, some recent studies have also found that when measured during exercise, affect tends to be lower (Lox et al., 2014). In other words, while exercise may make people feel better afterwards, if people are not enjoying themselves during the workout itself, this could explain why some individuals do not engage in exercise.
- There are few studies to date that have examined affect during exercise, so more research in this area is necessary.
- Examining specific differences in affect during exercise between active and inactive college students will advance the research in this area, and could also lead to the improved design of exercise interventions and strategies to increase physical activity in college students.

PURPOSE

The purpose of this study was to explore the differences in affect during exercise between active and inactive college students. The following research questions guided this study:

- Does affect during moderate-intensity exercise differ between active and inactive college students?
- Does affect during moderate-intensity exercise differ between males and females?
- Is there a relationship between level of affect during moderate-intensity exercise and future exercise intention?

METHODS

Participants: All participants provided informed consent prior to testing. A total of 72 students ($N=72$) were recruited from Texas A&M University-Kingsville, where $n_{Male} = 41$, $n_{Female} = 31$, and $n_{Active} = 38$, $n_{Inactive} = 34$.

Instrumentation:

- Positive and Negative Affect Survey (PANAS; Watson, Clark, & Tellegen, 1988) [Figure 1]
- Heart Rate Monitor (Polar FT1)
- Cycle Ergometer (Lode Corival)
- Exercise Intention Index (modified from Budden & Sagarin, 2007; Helfer, Elahi, & Geers, 2015) [Figure 2]

Procedures:

- Pre-participation screening:
 - Informed Consent, Health History Questionnaire, Exercise Participation Survey
- PANAS explanation
- 30 min cycling bout at moderate intensity (60-75% HR_{MAX})
- PANAS administered at 28 min mark of exercise
- Exercise Intention Index administered post-exercise

Statistical Analysis: Differences between male/female and active/inactive for affect and exercise intention were analyzed using Mann-Whitney U tests. Spearman rank order correlation was used to assess relationship between level of affect and exercise intention. $\alpha=0.05$ for all tests.

Positive and Negative Affect Scale					
Feelings Scale					
Directions					
Read each item and then circle the appropriate answer next to the word. Indicate to what extent you feel this way right now .					
	Very Slightly of not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

Figure 1: PANAS

Exercise Intention Index (modified from Budden & Sagarin, 2007; Helfer, Elahi, & Geers, 2015)							
Please indicate your level of agreement with the below statements by circling the corresponding number.							
1. I intend to exercise at least 5 days a week over the next 3 months.	1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
2. I intend to exercise at least 3 days a week over the next 3 months.	1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
3. I intend to exercise at least 1 day a week over the next 3 months.	1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
4. I do not intend to exercise over the next 3 months.	1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
5. I intend to exercise at least 5 days in the next week.	1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
6. I intend to exercise at least 3 days in the next week.	1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
7. I intend to exercise at least 1 day in the next week.	1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
8. I do not intend to exercise in the next week.	1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	

Figure 2: Exercise Intentions Index

RESULTS

Table 1: Gender and Affect

Gender	n	Positive Affect Score		Negative Affect Score		Exercise Intention Score	
		Median	Mean \pm SD	Median	Mean \pm SD	Median	Mean \pm SD
Male	41	34*	34 \pm 7	14	14 \pm 4	6	6 \pm 1
Female	31	28*	29 \pm 9	11	14 \pm 5	7	6 \pm 1

Positive affect differed between genders ($*p=0.026$), but no significant differences between genders was seen for negative affect or exercise intention ($p>0.05$).

Table 2: Activity Level and Affect

	n	Positive Affect Score		Negative Affect Score		Exercise Intention Score	
		Median	Mean \pm SD	Median	Mean \pm SD	Median	Mean \pm SD
Inactive	41	33	33 \pm 9	13	15 \pm 5	6	5 \pm 1
Active	31	35	32 \pm 8	13	13 \pm 3	7	7 \pm 1

No significant differences between activity levels was seen for positive affect, negative affect, or exercise intention ($p>0.05$).

Table 3: Affect and Exercise Intention Correlation

	Positive Affect	Negative Affect	Exercise Intention
Positive Affect	—	$r_s = .097$	$r_s = .098$
Negative Affect	$r_s = .097$	—	$r_s = -.058$
Exercise Intention	$r_s = .098$	$r_s = -.058$	—

No significant relationship was detected between either positive affect or negative affect, and exercise intention ($p>0.05$).

CONCLUSIONS

- No significant differences were found between active and inactive individuals on affect scores. This contradicts what previous research (e.g., Ekkekakis, 2009) proposed, that active individuals would feel more positively and less negatively than those who are inactive during a short bout of exercise. Meaning, that the deterrent of exercise participation in our sample is not what was previously thought to be affect during exercise.
- A significant difference was found between males and females for positive affect. Males experienced higher levels of positive affect than women during the exercise bout. This could mean males enjoyed the exercise more than females. A study by Azevedo et al. (2007), found that 47.9% of males reported participating in exercise for enjoyment reasons, while only 24.6% of women indicated this.
- Potential limitations to this study include: social desirability bias, mode of exercise selected, and the use of the PANAS to measure affect.
- Social desirability is the tendency for individuals to provide responses mirroring socially desirable traits rather than the latter (Zerbe & Paulhus, 1987). This may have occurred given the PANAS was completed verbally.
- Another potential limitation could be the mode of exercise used for the study. For example, some participants may have preferred a treadmill to the cycle ergometer, therefore, making the exercise bout less enjoyable. Furthermore, research has found that allowing participants to select their own choices, such as exercise mode or intensity, can impact affect (Ekkekakis, Lind, & Vazou, 2010).
- Finally, while the PANAS has been found to have both high internal consistency and validity (Watson et al., 1988), it is not an exercise-specific measure. However, it has been used in previous studies (Bixby, Spalding, & Hatfield, 2001), and measurement issues also exist with the instruments developed for the exercise population. Thus, the PANAS was deemed appropriate for this study.
- Findings from this study can be valuable to the fitness professional, as similar interventions and training may generate similar results for both inactive and active populations. Additionally, given the gender discrepancies found for positive affect, practitioners may need to consider using different training techniques or interventions for males and females.

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