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The Relationship Between Musicianship, Academic Achievement, Academic Motivation, and Self-Esteem

Ellie Krumsieg

Olivet Nazarene University, ejkrumsieg@gmail.com

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Running Head: MUSICIANSHIP, MOTIVATION, ACADEMIC ACHIEVEMENT, SELF-ESTEEM

THE RELATIONSHIP BETWEEN MUSICIANSHIP, ACADEMIC MOTIVATION,
ACADEMIC ACHIEVEMENT, AND SELF-ESTEEM

by

Elizabeth J. Krumsieg

Honor's Scholarship Project

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in

Mathematics Education

Scholarship Project Advisor (printed)

Signature

Date

Honors Council Chair (printed)

Signature

Date

Honors Council Member (printed)

Signature

Date

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ABSTRACT

Background

Past research suggests that students involved in music are intrinsically motivated. For example, Diaz (2010) showed that undergraduate musicians possessed high levels of academic intrinsic motivation. Intrinsic motivation is a predictor of high academic achievement as well. Additionally, past research indicates that music education is positively correlated with academic achievement and self-esteem. This study continues to investigate the relationships between musicianship and academic motivation, academic achievement, and self-esteem, but does so using a post-secondary sample and an expanded classification system for musicianship.

Methods and Procedures

A survey link was emailed to all undergraduate students at a small, Christian university in the Midwest. Participants were asked to share their past music experience along with demographic information like major, GPA, and ACT score. They also completed 28 items from Vallerand's Academic Motivation Scale (Vallerand, 1992) as well as 10 items from Rosenthal's Self-Esteem Scale (Rosenthal, 1965). Five hundred and fifty-eight students completed the survey. The participants were categorized into four levels of musicianship: music majors/minors ($n=40$), non-music majors/minors in collegiate level music ensembles ($n=216$), non-music majors/minors not in collegiate level music ensembles ($n=136$), and non-musicians ($n=164$). Inferential statistics were used to compare the academic motivation, academic achievement, and self-esteem of the groups.

Results

Using an independent samples t -test, it was found that musicians (both music majors/minors and non-music majors/minors in collegiate level ensembles) had higher academic

motivation and ACT scores than non-musicians. No other statistically significant differences were found between any other groups on academic motivation, academic achievement, and self-esteem.

Keywords

Academic motivation, academic achievement, intrinsic motivation, self-esteem, music education, musicianship

Introduction

Students in the United States are falling behind other modern nations in mathematics and science. Of American high school seniors, only 16 percent are mathematically proficient and pursuing STEM careers. Furthermore, 81 percent of Asian-American and 71 percent of white secondary students have access to a complete mathematics and science department that offers critical courses like calculus or physics for success in STEM fields. The availability of these courses for minority students is even lower (U.S. Department of Education). U.S. leaders are concerned with these alarming statistics that might put the American economy and its technology behind other global leaders. This has led to an emphasis on training STEM educators and encouraging kindergarten through twelfth grade students to study STEM subjects (Rosenthal, 2013). Due to this emphasis, arts programs are often the first to be cut or reduced in schools during economic struggles (Catterall, 2014). The research on music education and academic achievement suggests that cutting music programs will, in the long run, not only damage student performance in STEM subjects but in overall academic performance (Catterall, 2014). If it can be shown that music education is a unique contributor to the academic achievement of students at all levels, then perhaps the education system will place greater emphasis on the importance of learning music.

Positive correlations have been found between musicianship and academic motivation (Asmuc, 1986; Diaz, 2004; Schmidt, 2005; Stoeber & Eismann, 2007; Willie, 2014), musicianship and academic achievement (Bobbett & Dorothy, 1990; Evans, 2018; Fehr, 2016; Gouzouasis, Guhn, & Kishor, 2007; Graziano, Peterson, & Shaw, 1999; Harris, 2008; Santos-Luiz, Coimbra, & Fernandes da Silva, 2009), and musicianship and self-esteem (Costa-Giomi (2004; Henley, Caulfield, Wilson, & Wilkinson, 2012; Yücesan & Sendurur, 2018). However, no

research studies explore musicianship, academic motivation, academic achievement, and self-esteem in regards to students at the university level. In addition, many of these studies treat musicianship as a dichotomous variable. Because musicianship may be more nuanced than this, the present study will focus on relationships between musicianship, academic motivation, academic achievement, and self-esteem, but with stratified levels of musicianship within a large sample of college students.

Academic Motivation

According to Young (2005), a successful student is characterized as being a self-regulated learner, and one aspect of achieving self-regulated learning is a student's academic motivation. Motivation is broken into two strands: intrinsic motivation and extrinsic motivation. Intrinsically motivated students are motivated by internal factors like self-determination, curiosity, and effort while extrinsically motivated students are motivated by external factors like rewards and consequences (Santrock, 2014). The current consensus among education professionals is that intrinsic motivation is key to successful education. However, it is important to note that extrinsic motivation and intrinsic motivation are not in opposition to each other. The two are both at work in a student's academic career (Santrock, 2014). The motivation students possess is important to their overall success in their studies.

Asmus (1986) found that elementary and secondary students in music programs attributed their success or failure to internal motivation. Another study found similar results. Middle and high school band students characterized their performance ability, effort, and practice time as stemming from intrinsic motivation (Schmidt, 2005). Still other researchers looked at the motivational aspects of high school band students' skills, finding that effort and achievement in music was associated with intrinsic motivation while performance anxiety and

emotional stress from music involvement was associated with extrinsic motivation (Stoeber & Eismann, 2007). Willie (2014) implemented a “band bucks” program in his high school band classes in which students were awarded band bucks for completing practicing goals. He found that the students were at first extrinsically motivated to practice for the reward of band bucks. However, over time, the students began to practice for the enjoyment and achievement of playing a piece well instead of simply for the reward of band bucks. The successful students were ultimately intrinsically motivated to practice (Willie, 2014).

Much of the current study is inspired by Diaz’s (2010) work with post-secondary musicians. He analyzed intrinsic and extrinsic motivation among instrumentalists in college. The participants consisted of 169 undergraduate and graduate students in band or orchestra ensembles. Researchers collected gender, academic major, primary instrument, graduate status, year in school, and a motivation survey. Results indicated that intrinsic motivational factors contributed to students’ overall music motivation. It is important to note that the participants in his study were collegiate musicians.

The current study now seeks to compare the academic motivation of collegiate musicians and collegiate non-musicians. Diaz (2010) focused on music majors and the differences between distinct music majors. However, there has been little to no research done on the academic motivation of music majors, non-music major musicians, and non-musicians.

Academic Achievement

Educators assert that children involved in band or music lessons are more productive and engaged students than those not learning to play music (Fehr, 2016). Research studies have affirmed that music involvement is a positive contributor to success in school. On the elementary level, one study found that children receiving piano and spatial video game training scored

significantly higher on a spatial and mathematics skills test than children only receiving video game training or no training (Graziano, Peterson, & Shaw, 1999). Harris (2008) found that a musically enriched classroom in a Montessori school scored higher on the Test of Early Mathematics Ability 3 than the traditionally taught Montessori classroom, shedding light on integrated music instruction.

Another study focused on students receiving piano lessons over 5-7 years and over 3-4 years compared to students receiving no training. Results indicated that the longer students persevered in piano lessons, the higher their spatial and numerical reasoning (Santos-Luiz, Coimbra, & Fernandes da Silva, 2009). Continued music education is more successful than short exposure to music training. It is important to note the distinction between several years of music training and short-term exposure to music training. In the current study, participants are divided into groups of different musical levels of post-secondary musicians who have either spent many years practicing and performing in their music concentrations, simply taken a few music lessons in elementary school, or anywhere in between.

Furthermore, music was a unique contributor to academic success according to a study that examined high school band students' scores in core subjects like math, biology and English to non-music students and students in visual arts classes. The band students' scores were significantly higher than non-music students and visual arts students which implies that the benefits of music education are not the same as benefits offered by art education (Gouzouasis, Guhn, & Kishor, 2007). While other artistic endeavors like the visual arts are valuable, the benefits of music education is not equivalent with art education.

Individual musical training is important in developing techniques and musical IQ, but music is an art to be shared and performed through social music-making. Many teachers have

concluded that students in band are high achieving students in their other core classes. In fact, according to 96% principals interviewed across the United States, music programs encourage and motivate students to stay in school. Furthermore, 86% said that high-quality music education contributed to high graduation rates (Fehr, 2016). In most schools, playing in band is a privilege given to students who achieve above average grades which in turn benefits students' chances of graduation. In fact, schools with music programs have higher graduation rates than schools without music programs (Fehr, 2016).

Studies linking music education to academic achievement do not stop short at the elementary and secondary grades. One study focused on students taking music and sound design classes in an undergraduate program. The participants reported that they benefited academically from the music and sound design classes. The study recommended further evidence-based research be done on the effect of arts education on the academic achievement of postsecondary students (Evans, 2018).

Bobbett and Dorothy's (1990) study on musical independence looked at the high school and college experiences of musical students. They found that musical independence enhanced the Scholastic Achievement Test scores of participants and established four factors students with musical independence need and develop: natural intellectual skills, musical experiences, time on task, and effective study habits (Bobbett & Dorothy, 1990). The study supports the idea that the skills a student at both the secondary and postsecondary levels develops when learning music can be beneficial to other areas of academia and, therefore, his or her overall academic achievement.

Self-Esteem

Another aspect of music education is the personal benefits it provides to students. Costa-Giomi (2004) studied the effects of piano lessons for 4th grade students over the course of 4

years. He found that their self-esteem was positively affected by the piano lessons as compared to students not receiving any training. Another group of researchers (Henley, Caulfield, Wilson, & Wilkinson, 2012) analyzed the benefits that the Good Vibrations Project—a social music making program specializing in Javanese music—provided to adult prison inmates. Their results showed that the program had a direct positive relationship with the inmate’s social well-being as well as their self-esteem and overall emotional stability.

Students participating in bands, choirs, and orchestras are developing positive social and personal skills while learning music. However, Costa-Giomi’s (2004) study simply focused on elementary students while Henley et al’s (2012) project was removed from education. Some research has been done on music and self-esteem at the undergraduate level. It was found that college students that participated in music therapy, poetry therapy, and creative drama had higher percentages of self-esteem than the control group who did not participate in any of the three outlets (Yücesan & Sendurur, 2018). While the current study does not explore the effects of music therapy on college students, it is important to note that music participation, whether it be through social music making or music therapy, has a positive relationship with self-esteem. Therefore, looking at self-esteem among musicians and non-musicians is relevant to the existing body of research.

Current Study

The current study investigated three dependent variables, academic motivation, academic achievement, and self-esteem, at the undergraduate level. Academic motivation was being explored because it is an important aspect to the overall self-regulation and academic outcome of students from elementary school to higher education. Furthermore, Diaz (2010) showed that postsecondary musicians have positive levels of academic motivation. Academic achievement

was important to this study not only because academic motivation is a key component to a student's overall academic success but because music education has been shown to be a factor in the academic success of students both in elementary school, high school, and college. The current study sought to connect academic motivation and academic achievement of college students. Finally, self-esteem is being included because past research shows it has a positive relationship with music education and social music-making.

No research has compared academic motivation, academic achievement, and self-esteem of undergraduate students with differing levels of music experience. The present study compared the academic motivation, academic achievement, and self-esteem of music majors/minors, non-music major musicians of varying years of experience (See Table 1), and non-musicians.

Research Questions and Hypothesis

Three research questions drove the research:

1. Is there a significant difference between Music Majors/Minors and Non-Music Major/Minors Musicians in academic motivation, academic achievement, and self-esteem?
2. Is there a significant difference between Musicians and Non-Musicians in academic motivation, academic achievement, and self-esteem?
3. Is there a significant difference between Musicians of different music experience in academic motivation, academic achievement, and self-esteem?

It was hypothesized that there would be a significant difference between each of the above listed groups in academic motivation, academic achievement, and self-esteem.

Furthermore, in general, it was hypothesized that college students with more musical experience would have high levels of academic motivation, academic achievement, and self-esteem such

that each level of musicianship represented in Table 1 would have subsequently higher levels of academic motivation, academic achievement, and self-esteem. For example, music majors would have significantly greater academic motivation, academic achievement, and self-esteem than other musicians and non-musicians while non-music-major musicians in collegiate ensembles would have significantly greater academic motivation, academic achievement, and self-esteem than non-music-major musicians not in collegiate ensembles with greater than five years of music experience.

Methods

Participants

Undergraduate students from a private, Christian university in the Midwest were asked to participate. A total of 558 participants took the survey. Based on their own self-report, participants were sorted into one of four different groups: music majors/minors ($n=40$), non-music majors musicians in collegiate ensembles ($n=136$), non-music-major musicians not in collegiate ensembles ($n=164$), and non-musicians ($n=218$). All groups and sub-groups are listed in Table 1. The non-music majors/minors in collegiate ensembles subgroups were determined based on the ensemble requirements at the sampled university and another university with similar size, mission, and demographic.

Materials

Academic motivation was measured using Vallerand's Academic Motivation Scale (Vallerand et al., 1992). The scale measured self-determination, which determines positive or negative academic motivation. The scale utilized a 7-point Likert scale with endpoints that range from 1 (does not correspond) to 7 (corresponds exactly) and consisted of 12 intrinsic motivation items, 12 extrinsic motivation items, and 4 amotivation items. The scale combined each aspect of

motivation, intrinsic, extrinsic, and amotivation, to determine a participant's self-determination or overall academic motivation. Each participant received an overall self-determination index with 16 being high self-determination and -16 being low self-determination. The mean and standard deviation for this scale can be found in Table 2.

Academic Achievement was measured using participants' ACT or SAT score. ACT and SAT scores have been shown to be predictors of collegiate success both in terms of program success and collegiate perseverance (Burton & Ramist, 2001; Zwick & Sklar, 2005; Radunzel & Noble, 2012; Westrick, 2017). Twenty participants reported SAT scores, and scores were converted to ACT scores using College Board's online Instructions for Concoring New SAT Scores to Old SAT Scores.

However, it is understood that ACT and SAT score represents the past academic achievement of postsecondary students. Therefore, current college GPA was also collected to reflect the current academic achievement of postsecondary students. Since all GPAs were compared on a 4.0 scale, any reported GPA score was converted from a 5.0 scale to a 4.0 scale using Texas Southern University's GPA converter (<http://em.tsu.edu/registrar/gpacc.php>). The mean and standard deviation for GPA and ACT score can be found in Table 2.

Self-esteem was measured using Rosenberg's Self-Esteem Scale (Rosenberg, 1965). Participants completed 5 positive and 5 negative self-esteem items on a 5-point Likert scale with endpoints that range from 1 to 5. The mean and standard deviation for this scale can be found in Table 2.

Participants reported their level of musicianship through a series of single answer and open response prompts. First, each participant shared whether or not he or she played an instrument or sang, the instrument(s) he or she played, and whether or not he or she considered

himself or herself a proficient musician. The open response section asked participants who played an instrument to describe their past musical experience, their participation in collegiate ensembles, and their participation in collegiate-level music lessons. The date of graduation, gender, major, and minor (if applicable) was also reported by each participant.

Procedures

All participants were asked to complete a survey via campus email. Each undergraduate student received an email with a brief description of the project and a link to an informed consent page. After giving consent, participants answered prompts about their music experience and involvement. In this section, students listed the instrument or instruments they played. The participants who played instruments used free response to communicate all music experience including lessons, ensemble experience, and history of playing.

Next, participants completed Vallerand's Academic Motivation Scale (Vallerand et al., 1992) and Rosenberg's Self-Esteem Scale (Rosenberg, 1965) before moving on to the demographics section of the survey.

Results

Table 2 shows the correlation between the dependent variables of academic motivation, ACT score, current college GPA, and self-esteem. There were significant positive correlations between GPA and academic motivation, GPA and ACT score, self-esteem and academic motivation, and self-esteem and GPA.

For research question 1, independent samples *t*-tests were used to compare music majors/minors to all students that played an instrument or vocal students and did not major or minor in music on academic motivation, academic achievement, and self-esteem. Table 3 shows

that there were no significant differences between the academic motivation, ACT scores, GPA, and self-esteem of music majors/minors and non-music-major musicians.

For research question 2, participants who played an instrument or sang were compared to participants who did not play an instrument or sing on academic motivation, academic achievement, and self-esteem. Independent samples *t*-tests were used to do this. Table 4 shows that there were no significant differences between musicians and non-musicians on GPA and self-esteem. However, there was a significant difference between musicians and non-musicians on academic motivation and ACT score. Table 4 shows that musicians score significantly higher than non-musicians on academic motivation and ACT scores.

For research question 3, one-way ANOVAs were used to compare five different levels of musicianship on academic motivation, academic achievement, and self-esteem. The five groups compared were: music majors/minors, musicians in collegiate ensembles, musicians not in collegiate ensembles with five or more years of experience, musicians not in collegiate ensembles with three to five years of experience, and musicians not in collegiate ensembles with less than three years of experience (see Table 1). Table 5 shows that there were no significant differences between any of the groups, and table 6 gives the mean and standard deviation of the groups' academic motivation, ACT score, GPA, and self-esteem.

Discussion

The purpose of this study was to explore relationships between musicianship, academic motivation, academic achievement, and self-esteem using an expanded classification scheme for musicianship within a large sample of college students. No significant differences occurred between the music majors/minors and non-music-major musicians in terms of academic motivation, ACT score, GPA, and self-esteem. Both groups had similar levels of academic

motivation with positive academic motivation scores. Furthermore, when comparing different levels of non-music-major musicians, in ensembles and not in ensembles, no differences were found between the four variables. This was not surprising since Diaz (2010) found that the motivation of separate groups of musicians did not vary greatly from the larger set of musicians. In other words, the overall motivation and academic achievement of Diaz's musicians did not differ depending on experience and expertise.

However, when comparing musicians and non-musicians the outcome was different. While GPA and self-esteem did not significantly vary, the academic motivation and ACT scores of the two groups was significantly different. While both groups had positive academic motivation, the musicians had significantly higher scores than non-musicians. In other words, musicians had higher academic motivation than non-musicians. Again, this supports past research conclusions in which musicians and music students possessed high academic and intrinsic motivation (Diaz, 2010; Schmidt, 2005; Willie, 2014). Specifically, Diaz found that his participants, all musicians, had high intrinsic motivation. However, it is important to note that Diaz concluded that musicians had high intrinsic motivation instead of simply high academic motivation. Diaz focused specifically on intrinsic and extrinsic motivation factors, not academic motivation in general. Furthermore, the musicians had significantly higher average ACT scores than non-musicians which is consistent with past research that shows a positive relationship between musicianship and academic achievement (Gouzouasis, Guhn, & Kishor, 2007; Graziano, Peterson, & Shaw, 1999; Harris, 2008; Santos-Luiz, Coimbra, & Fernandes da Silva, 2009). However, these studies did not address academic achievement and musicianship of post-secondary students, and many were longitudinal studies.

The study was limited by the method of classification used to define musicians and non-musicians. During data collection, participants answered survey questions about music experience and involvement. Most questions were open-ended so that participants had complete control over the description of their music history. This limited the study due to each individual's potentially biased definition of their own skills causing some participants to over-qualify or under-qualify their experience and expertise.

Another limitation was that the number of participants in the subgroups of non-music majors/minors not in collegiate ensembles was significantly smaller than other groups. Specifically, non-music majors/minors not in collegiate ensembles with 3-5 years of experiences and with less than 3 years of experience only included 25 and 24 participants respectively.

This study was further limited by the definition of academic achievement. ACT score and current GPA was used to measure academic achievement. However, perhaps academic achievement is not purely defined by quantitative achievements. For example, it might be useful to view academic achievement in terms of grit (Duckworth, Peterson, Mathews & Kelly, 2007). It is recommended that the idea of academic achievement be explored in future research by including leadership, communication abilities, and rigor of study as components of academic achievement.

It is recommended that further research more clearly defines the classification of musicians and non-musicians by asking about level of theory knowledge, sight-reading skills, performance experience, chair level, classical training or the lack thereof, and instrument diversity. Future studies could use more sophisticated tools to quantify participants' musical skill and look at the academic motivation, academic achievement, and self-esteem of participants.

More precise definitions of musicianship will help to better the understanding of how academic motivation is linked to level of musicianship.

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Table 1

Groups and subgroups of musicians based on music experience

Groups	Music Majors/Minors (<i>n</i> =40)	Non-Music Majors/Minors in Collegiate Ensembles (<i>n</i> =136)	Non-Music Majors/Minors Not in Collegiate Ensembles (<i>n</i> =164)	Non-Musicians (<i>n</i> =218)
Subgroups	N/A	N/A	<ol style="list-style-type: none"> 1. 5 years of experience with instrument/voice AND/OR high school band, choir, or lesson experience AND/OR collegiate/professional level experience (<i>n</i>=106) 2. Between 3-5 years of experience with instrument/voice AND/OR only middle school/elementary band, choir, or lesson experience (<i>n</i>=25) 3. Less than 3 years of experience with instrument/voice AND/OR only church experience AND/OR other (<i>n</i>=24) 4. Unknown (<i>n</i>=8) 	N/A

Table 2
Descriptive statistics and intercorrelations for
academic motivation, ACT score, GPA, and self-
esteem.

Variable	M	SD	Alpha	1 Academic Motivation	2 ACT	3 GPA	4 Self-Esteem
1 Academic Motivation	6.59	3.76	.91				
2 ACT	26.37	4.14	N/A	.05			
3 GPA	3.50	.42	N/A	.22**	.41**		
4 Self-Esteem	38.26	6.99	.86	.38**	-.04	.12**	

Note: $N_s = 472 - 501$. ** $p < .01$

Table 3

Descriptive statistics and independent-samples *t*-test results comparing music majors/minors and non-music-major musicians on academic motivation, academic achievement, and self-esteem.

Variables	t	df	p	Music Majors/Minors		Non-Music-Major Musicians	
				Mean	SD	Mean	SD
Academic Motivation	1.75	304	.08	8.13	2.87	7.05	3.54
ACT	-.99	314	.32	26.14	5.74	26.87	3.99
GPA	1.10	328	.27	3.59	.35	3.51	.45
Self-Esteem	.91	318	.36	39.16	6.45	38.07	6.99

Note: *N*s for the Music Majors/Minors group ranged from 36 to 38. *N*s for the Non-Music-Major Musicians group ranged from 270 to 292.

Table 4

Descriptive statistics and independent-samples *t*-test results comparing musicians and non-musicians on academic motivation, academic achievement, and self-esteem

Variables	t	df	p	Musicians		Non-Musicians	
				Mean	SD	Mean	SD
Academic Motivation	4.37	499	.00	7.17	3.48	5.69	4.02
ACT	2.79	517	.01	26.78	4.23	25.75	3.95
GPA	.89	539	.37	3.52	.44	3.48	.39
Self-Esteem	-.28	526	.78	38.20	6.97	38.37	7.05

Note: *N*s for the Musicians group ranged from 306 to 330. *N*s for the Non-Musicians group range from 195 to 211.

Table 5

One-way ANOVA comparing musicians of differing experience on academic motivation, academic achievement, and self-esteem.

Variables	Sum of Squares	df BG	df WG	Mean Square	F	Sig.
Academic Motivation	86.43	4	294	21.81	1.85	.12
ACT	7288.86	4	303	1822.22	.57	.68
GPA	.272	4	317	.068	.34	.85
Self-Esteem	177.73	4	306	44.43	.91	.46

Table 6

**Academic motivation, academic achievement, and self-esteem
descriptive statistics for musicians of differing experience.**

Variables	Music Majors/Minors	Musicians in Collegiate Ensembles	Musicians Not in Collegiate Ensembles (5+ years of experience)	Musicians Not in Collegiate Ensembles (3- 5 years of experience)	Musicians Not in Collegiate Ensembles (less than 3 years of experience)
Academic Motivation	8.13 (<i>sd</i> =2.87)	7.23 (<i>sd</i> =3.45)	7.29 (<i>sd</i> =3.41)	5.58 (<i>sd</i> =4.45)	7.19 (<i>sd</i> =2.93)
ACT	26.14 (<i>sd</i> =5.74)	26.86 (<i>sd</i> =4.09)	37.09 (<i>sd</i> =99.38)	27.18 (<i>sd</i> =2.92)	25.90 (<i>sd</i> =3.96)
GPA	3.59 (<i>sd</i> =.35)	3.53 (<i>sd</i> =.49)	3.49 (<i>sd</i> =.45)	3.54 (<i>sd</i> =.44)	3.51 (<i>sd</i> =.35)
Self-Esteem	39.16 (<i>sd</i> =6.75)	37.76 (<i>sd</i> =7.09)	38.54 (<i>sd</i> =6.79)	38.17 (<i>sd</i> =8.06)	35.95 (<i>sd</i> =6.23)