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**SAME-SEX VS. CO-ED CLASSROOMS: DO GENDER DIFFERENCES CARRY  
OVER INTO A CO-ED COLLEGE?**

by

Laura M. O'Malley

A Thesis

Submitted to the

Department of Psychology

College of Liberal Arts and Sciences

In partial fulfillment of the requirement

For the degree of

Master of Arts in School Psychology

at

Rowan University

April 26, 2011

Thesis Chair: John Klanderman, Ph.D.

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Laura M. O'Malley

## **Dedication**

I would like to dedicate this manuscript to my mother, Angela O'Malley, without whom I would truly be lost, to Mrs. Debra Mobile, whose shining example of what a School Psychologist is and should be has renewed and strengthened my vocational pursuits, and to Samantha Levine, for keeping me sane and helping me in more ways than I deserved.

## **Acknowledgments**

I would like to acknowledge Dr. John Klanderman and Dr. Roberta Dihoff for all of their unwavering support, direction, and understanding throughout my research experience.

## Abstract

Laura M. O'Malley  
SAME-SEX VS. CO-ED CLASSROOMS: DO GENDER DIFFERENCES CARRY  
OVER INTO A CO-ED COLLEGE?

2010/11

John Klanderman, Ph.D.  
Master of Arts in School Psychology

The purposes of this exploratory investigation were to (a) ascertain the current academic performance of Rowan University freshman ( $n=117$ ) in their second semester, compare this with academic performance in their senior year of high school, and (b) determine to what extent, if any, their high school classroom gender composition influenced their current performance.

Overall, female students who had single-sex instruction (SSI) averaged an 8% improvement in grades, while co-ed taught girls averaged 3% better. Male SSI students averaged 40% worse, while co-ed males averaged 12% worse. For male participants, data showed a moderate positive correlation ( $r = .38$ ) between amount of time spent in SSI and change in academic performance, meaning the more time spent in SSI, the larger decrease in academic performance overall. This is inconsistent with hypothesized results, and previous findings. However, for female participants, results showed a strong positive correlation ( $r=.65$ ) between the amount of time spent in SSI and change in academic performance. In other words, the more time spent in SSI, the more academic performance decreases in the first year at a co-ed college. This is consistent with the current school of thought that same-sex learning environments are conducive to better academic performance for girls.

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## Chapter 1

### Introduction

#### *Need for the Study*

The benefits and risks of single-sex instruction (SSI) and single-sex education (SSE) as opposed to coeducational instruction have long been debated. In SSI settings, students are taught in same-sex classrooms within an overall coeducational (CE) setting, while in SSE settings, the school is comprised wholly of one sex (Hoffman, Badgett & Parker, 2008). Some researchers, like G. Stanley Hall, feel that both girls and boys do their best work in gender-segregated environments (Graebner, 2006), while other studies have found that girls excel more in single-sex schools, but boys do best in co-educational schools (Wong, Lam & Ho, 2001). Little research, however, has been done on how the effects of classrooms with different gender compositions may carry over into freshman year of college, specifically in a co-ed college setting. With so few single-sex colleges in the United States, it would seem necessary to research the best option for students, and the differences, if any, between boys' and girls' best possible environment. There is a clear need for more research in the area, therefore creating a need for this study.

#### *Purpose of the Study*

The purpose of the study is to determine whether the grades of students currently attending Rowan University, a co-educational institution, correlate to the gender composition of schools they have attended previously, and if so, the effect of the length of time in those respective settings. This information will be collected through an online survey that will collect demographic, adjustment, and academic data, from both senior year of high school, and the first (Fall 2010) semester of college at Rowan. Current GPA

will be compared to number of years, if any, in both co-ed and same-sex educational settings.

### *Significance of the Study*

The results from this study could certainly contribute to the current knowledge pool concerning classroom composition in the K-12 setting, and possibly classroom composition of colleges as well. It is the intent and the responsibility of our educational system to provide the most optimal learning environment for all students, whenever possible. Most educators are aware that the SAT is a valid predictor of freshman GPA nationally. However, if classroom gender composition was found to be a valid predictor of college success as well, many students could potentially increase their odds of being accepted to college, choosing the right college for their needs, as well as excelling once they are in college, simply by learning in the most advantageous gender environment. These results could have implications about the type of college environment is best for students as well. If it the results show that same-sex classrooms yielded good grades and a high GPA in the K-12 setting, but the student's performance has deteriorated now that he or she is attending a co-educational college, the implication would be that segregated schooling at the college level could be equally beneficial to the student as it is at the K-12 level.

### *Hypothesis*

The hypothesis of this research study is that findings will be concurrent with the majority of theorists, in that girls benefit more from same-sex classroom settings, while boys excel more in co-ed settings. In order for this hypothesis to be supported, (1) the results would show that girls who learned in same-sex environments for the longest

period of time had better GPA's as high school seniors than girls who attended co-ed school K-12, and (2) that the girls who were in same-sex environments would have the most significant decreases in GPA upon entry to a co-ed college, while girls who have been in co-ed settings previously will do just as well or better than before with respect to GPA. Meanwhile, (3) boys who attended co-ed schools for the longest period of time will have higher high school GPA's than boys who attended all-boys schools in the K-12 setting, and (4) will continue to do better than their all-boys counterparts upon entering Rowan University.

### *Operational Definitions*

- Single-sex instruction, abbreviated 'SSI,' is defined as a classroom setting comprised of only boys or only girls, within a co-educational school (Hoffman, Badgett & Parker, 2008).
- Single-sex education, abbreviated 'SSE,' is defined as an overall school setting composed of only one sex, either all boys, or all girls (Hoffman, Badgett & Parker, 2008).
- Co-educational settings, abbreviated 'CE,' are defined as schools attended by both boys and girls, with both genders in all classes (Hoffman, Badgett & Parker, 2008).
- Note: High School will be abbreviated as (H. S.) throughout.

### *Assumptions and Limitations*

This study will be utilizing members of the Rowan University subject pool for research participants. While the only qualifications for participation are that the student be over 18 years of age and a freshman, there are possible limitations. These students are

generally all Liberal Arts majors, and are almost always in a class wherein research participation is a requirement in order to pass. Therefore, the participation in this study is not voluntary and does not necessarily represent a diverse sample of college students. In addition, private schools and public schools that offer same-sex environments are highly outnumbered by coeducational public schools in the United States. Therefore, the odds of finding an equal number of students who attended each type of school are low.

While measures will be taken to match students across as many demographic variables as possible, many confounding variables still may exist. For instance, it is common for college freshman to be distracted by a number of factors, such as being away from family or home for the first time, new class schedules and/or class structure, new sense of freedom, etc. In addition, some students signing up for the survey may be ‘non-traditional’ students, who are coming to Rowan after any number of years in the workforce. It is not necessarily reasonable to make any connections between these students’ high school performance and their current college performance, as time elapsed and environmental factors in the time between high school and coming to Rowan would be significant confounding variables. These factors could all have a significant impact on a student’s grades, and would be nearly impossible to control for. For the sake of this research, we will assume that these variables are controlled for.

### *Overview*

In the following two chapters, previous data findings and research methods will be explained. In Chapter 2, approximately 40 related studies and/or articles will be referenced as to their concurrent or opposing research findings in this subject area. In addition, a brief synthesis of data attempting to determine the reason behind the general

findings that female students do better in SSE/SSI instructional settings, while male students do better in CE settings will be discussed. In Chapter 3, specific research methods involved in this study will be discussed, including an outline of the participants and participant recruitment techniques, research design, measures used, and data collection methods.

## Chapter 2

### Literature Review

#### *Introduction*

The jury is still out on the issue of classroom gender composition. Since 1830, the time of the American Revolution, when coeducation was first proposed, there has been controversy over whether boys and girls should learn in the same classroom (Graebner, 2006). The current, most widely-accepted school of thought is that single-sex instruction (SSI) is best for girls, while co-ed (CE) instruction is better for boys, even to the extent of influencing parents in their decision on what type of school to enroll their children in (Jackson & Bisset, 2005). However, research can be found to support a wide spectrum of theories. Plenty of research aimed only at girls demonstrates that SSI is the better option; however a few studies found the opposite. Many researchers determined that SSI yields poor performance from boys, while another researcher found that it was actually a positive experience. Quite a few studies found that SSI was best both for boys and girls, while a few found that there was no difference at all in performance between students in CE settings and students in SSI settings. In the following sections, these research findings will be outlined.

#### *SSI: Good for girls*

Research findings as early as 1998 and as recent as 2010 can show that girls at numerous ages and grade levels benefit from being segregated by gender in school, and it is clear that the majority of data available on the topic is concurrent with this ideal. The data from these studies indicate a multitude of potential benefits to be reaped from SSI, in

areas ranging from academic performance to self-concept and gender-typed behavior patterns.

Keeler (1998) found that female eleventh and twelfth graders in CE classrooms reported significantly higher mean scores on the Femininity Scale than girls from SSI environments. This sheds a positive light on SSI instruction, as the dominant hypothesis is that “androgynous individuals are more ‘behaviorally flexible’ than others, (Spence & Helmreich, 1980),” meaning that a lower score on the Femininity Scale is advantageous for girls. Additionally, Crombie, Abarbanel & Trinneer (2002) found that eleventh grade girls from SSI Computer Science classrooms “reported higher levels of perceived teacher support, confidence, and future academic and occupational intentions than did females from mixed-gender classes.” Another study on Computer Science classes found that girls in SSI settings were significantly happier with their classroom experience than girls in CE settings (Logan, 2007). Treanor, Graber, Housner, and Wiegand found SSI to be equally well-perceived in the physical education setting, reporting that girls “perceived that they performed skills and played team sports better, received more practice opportunities, and were less fearful of injury in same-sex [settings] (1998).” Similar results relating to physical education were obtained in a Turkish study by Koca, Asci, and Demirham (2005), indicating that female students prefer to be in all-girls gym classes.

A particularly interesting British study by Younger and Warrington (2002) found that the majority of female students, as well as their teachers and parents, perceive SSI settings to be advantageous in a number of ways. SSI classrooms are perceived to be pleasant and safe, hassle-free, confidence-building, promoting private and personal



exploration, and overall beneficial and conducive to learning (Younger & Warrington, 2002).

In 2003, Shapka and Keating studied a group of ninth and tenth grade girls who received SSI in the context of a coeducational public school, and found that the students performed significantly better in both math and science, and course enrollment was significantly higher. In a 2009 study, Shapka also found SSI to be a “protective mechanism” against the typical ‘U-shaped’ math score trajectory throughout high school, as girls receiving SSI did not experience the same drop in grades from tenth to twelfth grade that girls in CE settings commonly exhibit. English performance also improves significantly with SSI according to Mulholland, Hansen, and Kaminski (2004). In a recent 2010 study, Sullivan, Joshi and Leonard found that SSI is positive for 16-year old girls in a multitude of academic outcomes.

#### *SSI: Bad for Girls*

Although much more difficult to procure, a small amount of research does exist arguing that SSI is detrimental to female students. Limbert (2001) administered the Eating Disorder Inventory (EDI) to a group of 647 female college students, on which a higher score indicates a higher likelihood of an eating disorder. She found that “students who had previously attended single-sex schools and boarding schools obtained higher scores than their contemporaries from co-educational or day schools on some of the EDI subscales.”

Additionally, in direct contradiction to the aforementioned Spence and Helmreich study, Meinster and Rose (2001) found that girls in SSI environments were more gender-

typed than those in CE settings, showing stronger interest in traditionally female-dominated careers.

*SSI: Bad for boys*

The dominating school of thought is that CE settings are better for boys. Studies show that boys may even prefer CE classrooms as well. Lirgg (1994) found this to be the case for middle school as well as high school boys, who perceived SSI instruction very unfavorably. A study of eighth grade students in Thailand by Jimenez and Lockheed (1989) found that coeducational schools help boys to improve performance in math. Similar results were found in secondary school students in Hong Kong (Wong, Lam & Ho, 2002), pertaining to not only math but to a multi-subject standardized test. Both of these results are concurrent with British research by Jackson and Bisset (2005).

In addition to the academic deficit found for boys in SSI settings, research also suggests that there are social deficits as well. Jackson (2002) found that SSI schools may exacerbate the “problematic macho male cultures inherent in schools,” and certainly do little to challenge them, which can lead boys to become more gender-typed and therefore more rigid in their gender role ideas.

*SSI: Good for boys*

Though less frequently reported, some studies do suggest that boys can benefit from SSI environments. In a 2003 study on male high school graduates, James and Richards found that boys who graduated from SSI settings exhibit higher interest in the humanities in college and career settings. Similarly, Karpiak, Buchanan, Hosey and Smith found that men from SSI secondary education backgrounds were significantly

more likely to “declare and graduate in gender-neutral majors than those from coeducational schools (2007).”

Studies like that of Treanor, Graber, Housner, and Wiegand (1998) also show that boys may prefer to be in SSI settings, in this case pertaining to physical education. In this particular study, middle school boys “perceived that they performed skills and played team sports better, received more practice opportunities, competed harder, learned more, behaved better, and were less fearful of injury in same-sex physical education.” Similar results relating to physical education were obtained in a Turkish study by Koca, Asci, and Demirham (2005), indicating that male students prefer to be segregated by sex in gym class. Male students in a British study, as well as their teachers and parents, perceive SSI as being a constructive and beneficial learning environment (Younger & Warrington, 2002). Also, results from an Australian study indicate that SSI settings improve English performance for boys (Mulholland, Hansen & Kaminski, 2004).

#### *SSI: No difference*

While much of the available research findings on the most beneficial classroom gender composition lean to one side or the other, a fair amount of studies show no difference at all between CE settings and SSI settings in a number of areas. For instance, one study found that the frequency of incidents of sexism was not significantly different across school types (Lee, Marks & Byrd, 1994), and another found that academic self-concept is not affected by classroom gender composition (Jackson & Smith, 2000). A French-Canadian study of middle and high school girls found no significant environmental effect in the areas of perceived parental and teacher support, competence beliefs, utility value, or achievement goals (Choinard, Vezeau & Bouffard, 2008).

Evidence from a study by Fleming and Zucker (2002) showed that “type of high school alone did not influence any life goal.” Interestingly this finding directly contradicts the previously mentioned studies’ findings that SSI increases the likelihood that boys declare gender neutral majors (Karpiak, et al., 2007), and that SSI is related to boys’ higher interest in the humanities in college and career settings ( James & Richards, 2003).

*Highlight: Recent Study*

In a 2008 study in The Center for Evaluation and Assessment at the University of Nevada, Las Vegas, Hoffman and Badgett evaluated the effectiveness of SSI on “achievement outcomes, instructional practices, teacher efficacy, student behaviors, and classroom culture in an urban, at-risk high school primarily composed of individuals from disadvantaged populations.” The students of both genders were provided SSI in algebra and English class and were compared to students in CE settings through comparison of standardized test scores, course grades, surveys, classroom observation, teacher interviews, and focus group discussion. The results were fascinating, some areas confirming previously stated findings, and others refuting them.

In this study, there were mixed results in the area of academic achievement. While one aforementioned study indicated that both male and female students showed a significant improvement in English performance in SSI settings (Mulholland, et al., 2004), this study reported no difference between English achievement between SSI and CE groups (Hoffman & Badgett, 2008). The researchers did find an improvement in mathematics performance in the first year of SSI, which corroborates findings from studies by Shapka and Keating (2003) as well as Shapka (2009); however they found no

significant improvement in the second year of SSI. Overall, CE students performed better on standardized tests than SSI students (Hoffman & Badgett, 2008). Additionally, Hoffman and Badgett (2008) found that SSI “provided a supportive environment for girls, inducing a greater participation and academic risk-taking,” which is a relatively common finding among researchers.

In the area of student and teacher perception about SSI, the results were equally inconsistent. Results indicated that teachers perceived SSI to be conducive to learning, which upholds results obtained by British researchers Younger and Warrington (2002). However, in direct contrast to this same study, Hoffman and Badgett found that both male and female students “denounced both the social and academic benefits of SSI (2008).”

## Chapter 3

### Methodology

#### *Introduction*

This study consisted of an online survey accessible to Rowan University Psychology students through the psychology subject pool, administered to freshman in their second semester of study (Spring 2011). This survey, created by the researcher and adapted from the “CIRP Freshman Survey (2011)” collected basic demographic information, including gender, age, race, religious preference, distance of Rowan from home, current living situation, enrollment status (full-time or part-time) and whether English is the native language. Participants were asked to choose reasons why they chose both the high school they attended as well as why they came to Rowan, whether they considered going to a single-sex university, and whether they felt they made the right choice in the end to come to Rowan. The survey also collected information on academic performance in the senior year of high school as well as in the first semester of college. In addition, the survey solicited the amount of time before college the student spent in mixed-sex or single-sex classrooms (See Appendix A).

The data from the survey were separated and analyzed in a few ways. The students who had been in SSI settings were considered the experimental group, while the students who had only ever been in co-ed classrooms were considered the control group. First, each group was separated into two subgroups according to gender. In order to attain the most generalized conclusions, the control group was narrowed based on age, gender, native language, previous difficulty in major subjects, and other demographic characteristics to a cohort that most closely compared to the students in the SSI group.

Next, each group and subgroup was compared as a whole in terms of high school academic performance and current academic performance, and how this performance has changed from senior year of high school to the current semester. Then, within the experimental group, the correlation between amount of time spent in SSI and academic achievement were calculated.

### *Subjects*

Subjects were 117 freshman students ages 18-20 in their second semester at Rowan University, and it was strictly required that the participants be at least 18 years of age. The students were recruited from the psychology research pool through the posting of the online survey entitled “Freshman Survey.” Students were given thirty minutes worth of research participation credit in exchange for participation in the survey.

### *Design*

The independent variables in this study were the classroom composition from k-12, and the length of time spent in SSI. The dependent variable was academic performance. This study’s reliability cannot be confirmed as the survey instrument was created by the researcher, and therefore has yet to be replicated. However, steps taken to increase validity were the use of SAT scores, as a standardized and reliable assessment tool, as well as a survey adapted from the reliable, nationally-used ‘Freshman Survey.’ The study seems to be valid as it appears to assess the targeted variables.

### *Procedures*

First, the survey was generated and posted on the Rowan University psychology subject pool website. The study was posted for approximately three weeks before the sign-up period ended. After the surveys were given, the results were arranged into four

groups for statistical comparison: Group A was for female participants who had spent time in SSI, Group B consisted of female participants who had only been in co-ed classrooms, Group C was male students who had SSI, and Group D was male students with only co-ed classes.

Group A consisted of 5 students, and group C consisted of 7 students, for a total of 12 students who received SSI. From the remaining 105 participants, the pool was narrowed in order to most closely match the control groups (B and D) to the experimental groups (A and C). Any students who reported that English was not their first language were eliminated for statistical analysis. Group B had 21 members, while Group D had 18. For all four groups, SAT scores were converted to a 4.0 scale [ $((\text{SAT score}/1600)*4)$ ] then averaged with high school GPA [ $(\text{GPA} + \text{SAT})/2$ ] to obtain an 'overall GPA.' Current GPA was then subtracted from 'overall GPA' to determine the change in overall academic performance. Additionally, for Groups A and C, change in overall academic performance was correlated with the percent of k-12 instruction spent in SSI classes.

### *Summary*

This study consisted of a survey created by the researcher, administered to 117 Rowan University freshmen, ages 18 to 20. This survey gathered basic demographic data, high school GPA information, SAT scores, and current GPA. In exchange for completing the survey, members of the Rowan University psychology research subject pool were given 30 minutes worth of research participation credits. High school and SAT performance were compared to current performance, and for students who had SSI, amount of time spent in SSI was correlated with change in academic performance.

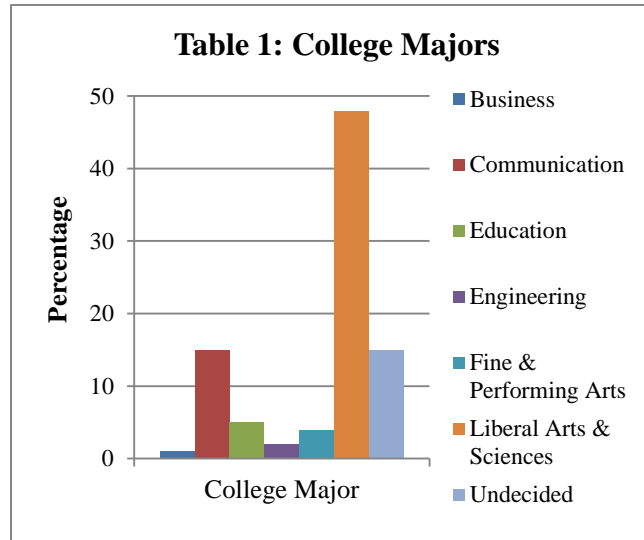


## Chapter 4

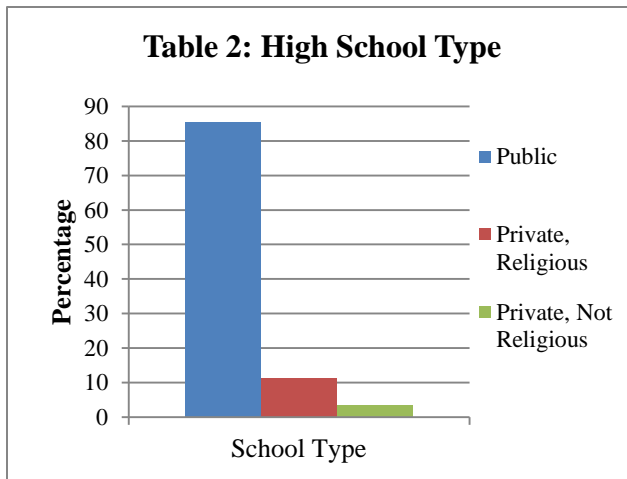
### Findings

The 117 survey respondents as a whole were 56.4% male, and 43.6% female. The majority (38.5%) of students were 19 years old. Students tended to be Caucasian

(79.5%), and full-time students (94%). The most commonly reported majors were Liberal Arts and Sciences (41%), Communication (12.8%) and Undecided (12.8%) (See Table 1). 85.5% of participants attended public high schools, 11.1% attended private, a religious high

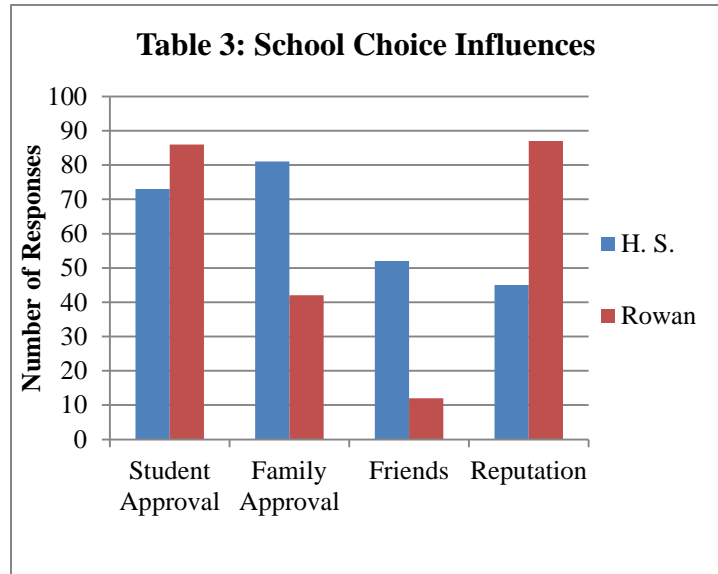


school, and 3.4% attended a private, non-religious high school.



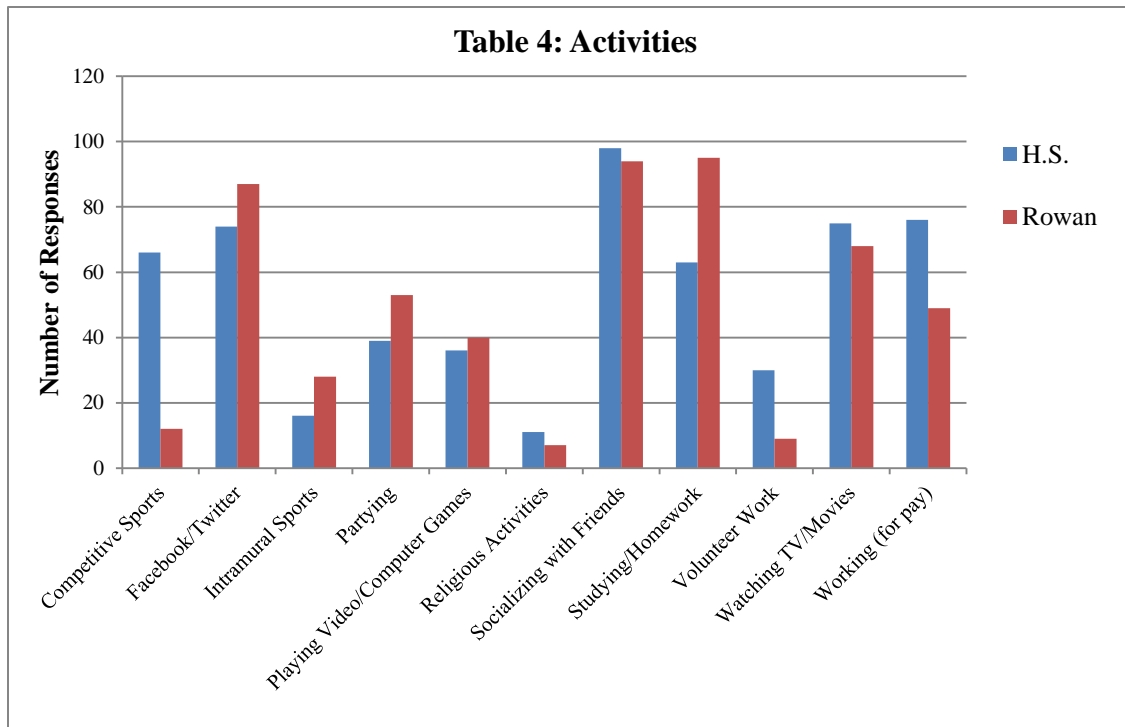
When asked for the reasoning behind the students' attendance at their high school, the most common responses were that the student chose and/or liked the school, the student's parents chose and/or liked the school, the majority of the student's friends attended the school, or because it had a good reputation. When asked about the reasons for attending Rowan University, the majority of students reported choosing Rowan because they liked the campus, they liked the size of the school, and they liked the cost of

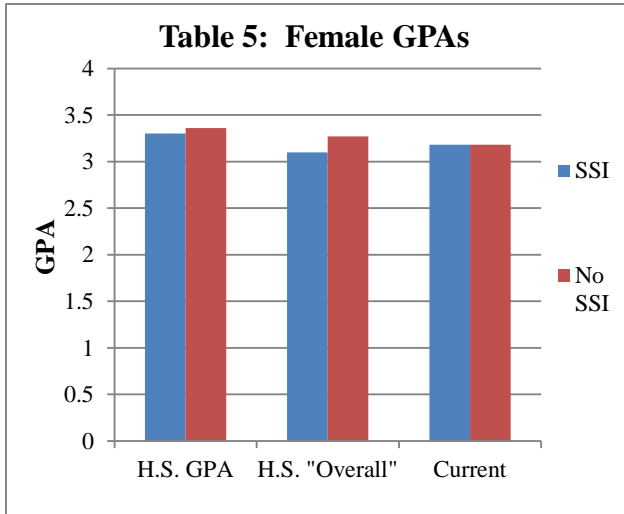
tuition. 91.45% of respondents indicated that they did not and would not consider attending a same-sex university, while 8.55% said that this was something they'd consider. Out of those who indicated that they'd consider a same-sex



college, the majority (73.68%) felt they made the right choice in attending Rowan University, and the remainder (26.32%) felt they did not make the correct decision.

When asked to mark each of the activities they spent at least an hour per week on during high school, the most commonly reported answer was socializing with friends, followed by working for pay, watching TV/movies, and Facebook/Twitter. When asked

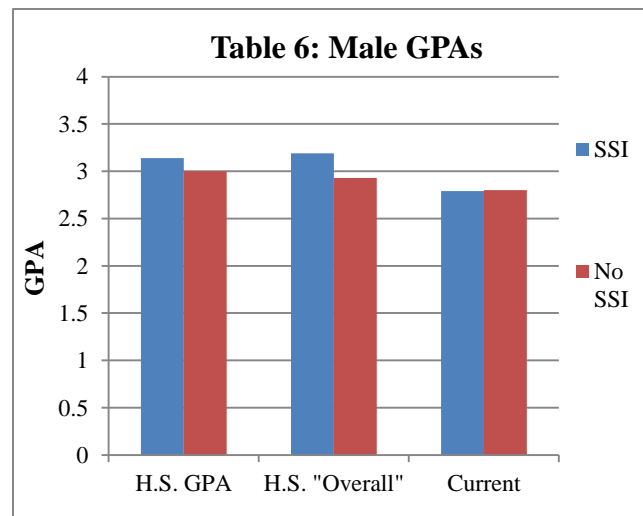




the same question about how they spent their time during the fall semester of college at Rowan, studying/homework was the most commonly reported answer, followed by socializing with friends and Facebook/Twitter (See Table 4).

The Female students from SSI backgrounds (Group A) had an average high school GPA of 3.3, an average ‘overall GPA’ of 3.1, while female co-educated students (Group B) reported an average high school GPA of 3.36, and the average ‘overall GPA’ was 3.27. Both groups had an average current GPA of 3.18. However, Group A showed an average improvement of 8% in grades, while Group B averaged a 3% increase in performance (See Table 5).

Male students from SSI backgrounds (Group C) reported an average high school GPA of 3.14, and had an average ‘overall GPA’ of 3.19, while males from co-ed schools (Group D) had an average GPA of 3.0, and the average ‘overall GPA’ was 2.93. Average current GPA was very close, with Group C reporting an average of 2.79, and Group D an average of 2.8.



Group C averaged a 40% decrease in performance, while Group D averaged 12% worse (See Table 3).

For male participants, data showed a moderate positive correlation ( $r = .38$ ) between amount of time spent in SSI and change in academic performance, meaning the more time spent in SSI, the more significant the decrease in academic performance overall. This is inconsistent with hypothesized results, and previous findings.

However, for female participants, results showed a strong positive correlation ( $r=.65$ ) between the amount of time spent in SSI and change in academic performance. This would mean that the more time spent in SSI, the more significant decrease in academic performance in the first year at a co-ed college. This is consistent with the current school of thought that same-sex learning environments are conducive to better academic performance for girls.

## Chapter 5

### Summary, Conclusions, and Recommendation

#### *Summary*

It would appear that overall, female respondents tend to be doing slightly better in their first year of college, while male respondents tending to be doing significantly worse, especially males from SSI backgrounds, who averaged a 40% decrease in GPA. When change in GPA and amount of time in SSI were compared, there was a positive correlation for both males and females, meaning that both groups showed a decrease in performance since they got to college, and the difference was greater when the amount of time in SSI was greater. This result was inconsistent with the majority of research as it pertains to males, but consistent with current research for females.

The first component necessary to prove the research hypothesis was that girls who learned in same-sex environments for the longest period of time should have better GPA's as high school seniors than girls who attended co-ed school K-12. The results of this study showed the opposite, in that girls who had been in SSI environments averaged .03 GPA points lower than CE girls. The second component was that the girls who were in same-sex environments would have the most significant decreases in GPA upon entry to a co-ed college, while girls who have been in co-ed settings previously will do just as well or better than before with respect to GPA. This was in fact confirmed in this case, as indicated by the significant correlation between amount of time in SSI and decrease in academic performance.

The third component of the hypothesis was that boys who attended co-ed schools for the longest period of time will have higher high school GPA's than boys who

attended all-boys schools in the K-12 setting, which was not found in this research. The fourth and final component was that boys from CE environments will continue to do better than their SSI counterparts upon entering Rowan University. This was also contrary to the hypothesized results, as males from SSI backgrounds did significantly worse upon entering the CE college environment.

### *Conclusions*

There are a number of reasons for which a student's grades may change during their first year of college, so it is hard to rule out the numerous extraneous variables that might influence academic performance during freshman year. However, despite these extraneous variables, the SAT test is known to be statistically significant in predicting freshman GPA, so there is something to be said for the ability to control for these variables enough make significant comparisons of performance from senior year of high school to freshman year of college. It is also, a statistical assumption that a correlation does not and cannot imply causation, but only warrant further investigation. In addition to the outside factors that may influence grade change, there are quite a few other limitations to this study. This was a survey that utilized a small population of students from one school, the majority of whom were Caucasian Liberal Arts majors who live within 100 miles of Rowan University. Therefore, there is little basis for generalizing these findings to other universities.

Despite the limitations, it would appear that there is a very significant drop in academic performance for girls who are transitioning from having spent time in all-girls settings before college, in keeping with the popular school of thought that girls learn best in single-sex environments. However, this drop is moderately significant for males as

well, which goes against the common consensus that boys do better in co-ed environments.

### *Recommendation*

The main recommendation based on this research would be investigation as to why male students tend to be doing so significantly worse in school than they did in high school. It would seem as though there must be some sort of outside influence, possibly a combination of many factors, which would cause such a marked decrease in performance. These could be anything from depression and homesickness to excessive partying, or general difficulty in adjusting to college life. Whatever the reason, it is certainly worth exploring.

In addition, it seems to be ever the more important to continue to investigate as to what the best possible learning environment is for both boys and girls, and begin to implement new classroom strategies based on the findings of such investigations. If enough studies concur that girls learn best when they are in a classroom without boys, regardless of the reason, it should be a priority to arrange classes in order to achieve the best possible outcomes. However, if the present majority is correct, the situation creates a catch-22, as the male population (present data excluded) seems to benefit more from co-ed environments. If both of these theories are correct, it would seem appropriate to research further as to why this phenomenon is occurring, and if there is a way to compromise and create academic policy that enables both girls and boys to learn in the best possible environment. Additionally, most of the focus tends to be on implementing these sorts of policies in k-12 school districts, but if indeed the research continues to show these patterns carrying over into college, an attempt should be made to alter the

classroom composition at all levels of study, from kindergarten through the college level, if it is the best way to ensure academic success.



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## Appendix A

### Freshman Survey

*Adapted from the "CIRP Freshman Survey (2011)"*

Listed below are questions for this section of the survey. Please provide a response for every question. If you are given the option to decline to answer a question, then declining to answer is considered a response.

1. What is your sex?

- a) Male
- b) Female

2. How old are you?

- a) 18
- b) 19
- c) 20
- d) Over 20

3. Is English your native language?

- a) Yes
- b) No

4. In what year did you graduate from high school?

- a) 2007 or before
- b) 2008
- c) 2009
- d) 2010

5. Are you currently enrolled as full-time or part-time?

- a) Full-time
- b) Part-time

6. Approximately how many miles is Rowan from your permanent residence?
- a) 5 or less
  - b) 6-10
  - c) 11-50
  - d) 51-100
  - e) 101-500
  - f) over 500
7. What was your average grade in MATH your senior year of high school?
- a) A
  - b) B
  - c) C
  - d) D
  - e) F
8. What was your average grade in ENGLISH your senior year of high school?
- a) A
  - b) B
  - c) C
  - d) D
  - e) F
9. What was your score on the SAT Math? [**Free Response**]
10. What was your score on the SAT Verbal? [**Free Response**]
11. What was your graduating high school class rank? Please provide your rank, and the total number of students in your class. (Ex: 25 out of 100) [**Free Response**]
12. What is your current GPA? [**Free Response**]
13. Where do you currently live (during the school year)?
- a) College Dorm
  - b) Private Apartment/House
  - c) Other Campus Housing
  - d) With Family/parents

14. Have you ever had, or do you feel you need tutoring or extra help in either of these subjects? Mark all that apply, and leave blank if none apply.

- a) English
- b) Math

15. How would you describe the racial composition of your high school?

- a) Mostly or All-White
- b) Roughly Half White and Half Non-White
- c) Mostly or all Non-White

16. Please choose the religion that best describes you.

- a) Christian
- b) Jewish
- c) Buddhist
- d) Other
- e) Not Religious

17. Please indicate your race/ethnicity.

- a) White/Caucasian
- b) African American/Black
- c) Asian American/Asian
- d) Puerto Rican
- e) Other

18. Please select the option that best describes the high school you attended.

- a) Public
- b) Private, Religious
- c) Private, Not Religious

19. Please mark ALL answers that describe why you went to the type of school in the previous question.

- a) I chose/liked the school
- b) All of my friends go there
- c) My parents chose/liked the school
- d) It has a good reputation
- e) It matched my religious beliefs

20. Please choose the option that best describes your high school classes:

- a) All co-ed classes
- b) All single-sex classes
- c) Mixed

21. If you answered "all single-sex classes" or "mixed," please indicate the number of single-sex classes you had per year, and for how many years. (Ex: 3 per year, for 12 years) [**Free response**]

22. If you've had single-sex classes, please choose the option that best describes your opinion (if you have only had co-ed classes, leave blank).

- a) I liked having single-sex classes, and feel they helped my grades.
- b) I liked having single-sex classes, but feel they hurt my grades.
- c) I don't think it mattered.
- d) I didn't like having single-sex classes, but feel they helped my grades.
- e) I didn't like having single-sex classes, and feel they hurt my grades.

23. What is your major? [**Free Response**]

24. Please mark ALL answers that describe factors that influenced your decision to come to Rowan. (Please mark ALL)

- a) I liked the size of the school
- b) I liked the campus
- c) My parents/family wanted me to
- d) Number of friends at Rowan
- e) Price of tuition
- f) Athletics
- g) Academic reputation
- h) Social reputation



25. Would/did you consider going to an all-male or all-female university?

- a) Yes
- b) No

26. If you answered "yes" to the previous question, do you think you made the right decision by coming to Rowan?

- a) Yes
- b) No

27. Please indicate all of the activities that you spent more than an hour each day doing during SENIOR YEAR:

- a) Competitive Sports
- b) Facebook/Twitter
- c) Intramural Sports
- d) Partying
- e) Playing Video/Computer Games
- f) Religious Activities
- g) Socializing with Friends
- h) Studying/Homework
- i) Volunteer Work
- j) Watching TV/Movies
- k) Working (for pay)

28. Please indicate all of the activities that you spent more than an hour each day doing during LAST SEMESTER:

- a) Competitive Sports
- b) Facebook/Twitter
- c) Intramural Sports
- d) Partying
- e) Playing Video/Computer Games
- f) Religious Activities
- g) Socializing with Friends
- h) Studying/Homework
- i) Volunteer Work
- j) Watching TV/Movies
- k) Working (for pay)

29. Please choose the option that best describes your opinion about your ACADEMIC experiences so far at Rowan:

- a) Very Positive
- b) Somewhat Positive
- c) Neutral
- d) Somewhat Negative
- e) Very Negative

30. Please choose the option that best describes your opinion about your SOCIAL experiences so far at Rowan:

- a) Very Positive
- b) Somewhat Negative
- c) Neutral
- d) Somewhat Negative
- e) Very Negative