Reflections on the Role of Gender: How Classroom Gender Composition Influences Students' Self-esteem

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ABSTRACT

Self-esteem development is widely considered to be an important outcome of both single-sex and coeducational school education. However, research supporting single-sex or coeducational schools revealed inconclusive findings towards the effects on students' self-esteem. By using the meta-analysis method, the present study aimed to synthesize prior studies by collecting and analyzing data from 6 pieces of literature that include 14 effects with 9463 participants. The results indicated that there is no significant difference in students' self-esteem between single-sex and coeducational schools. The results also showed that the age group of the students play a moderating role in the association between self-esteem and classroom gender composition, while gender does not.

Keywords: Classroom gender composition Self-esteem Meta-analysis Single-sex school

1. INTRODUCTION

Self-esteem is generally the evaluation that the individual makes and customarily maintains with regard to himself, expressed as an attitude of approval or disapproval [1]. Positive regard for the self has long been viewed as an essential component of mental health [2] as well as adolescent development [3]. Young people with low self-esteem are more likely to be involved in social problems like drugs, alcohol, and general delinquency [4]. Consequently, the successful development of a positive sense of self may help raise healthy outcomes or promote youth's Individual development.

The current study compared students' self-esteem in coeducational (CE) and single-sex (SS) schools taking classroom gender composition and age into account. Coeducational schools refer to those having girls and boys being taught together in a classroom. On the contrary, single-sex schools educate boys and girls separately based on biological classification [5]. The two school types of contrast in the classroom gender composition, which refers to peer students' gender. Prior research on which school setting can better benefits students' self-esteem yielded conflicting conclusions. The main claims for coeducational schools are related to personal and social development. Coeducational advocators argue that CE schools are happier and more natural social environment, therefore they can better prepare students for cross-gender interactions and integrations into society [6, 7, 8]. In contrast, proponents of single-sex schools have proposed that coeducation schools may be detrimental for girls [9], for girls in the coeducational environment are likely to suffer from pervasive gender discrimination and sex-role stereotyping. Consequently, it is found that girls in single-sex schools outperformed their coeducational counterparts in a myriad of aspects [10]. There is also research showed that the effects of classroom gender composition are negligible, that no significant difference is found between students in single-sex and coeducational school settings [11].

1.1. Self-Esteem Crisis in Classroom

According to a meta-analysis made by Kling and his team [12], the findings in coeducational schools are consistent that males present higher global self-esteem than girls, and the gap would grow wider after adolescence. Nevertheless, scholars have not agreed on

how to explain the gender difference. One common explanation is that in traditional gender roles, the expected masculine qualities, such as self-confidence, correspond with high self-esteem. While for girls, displaying high self-confidence is traditionally seen as a violation of gender norms for females [13].

Moreover, studies found that girls' self-esteem is dampened in most school settings [14]. Belenky and her coauthors [15] claim that educators constantly fail to conform with girls' learning styles and thus disadvantage female students despite their intelligence or creative abilities. Sills [14] noted that girls develop self-esteem when their ways of learning and knowing are valued and their contributions respected. On the other hand, teachers' unconscious different treatment of girls and boys in class may contribute to girls' lower self-esteem [16]. Therefore, female students need a learning environment conducive to developing their self-esteem [11].

Another argument is the influence theory that focuses on peer interaction in mixed- gender groups. According to Charlesworth and LaFreniere [17], girls are more likely to influence others to use polite suggestions, whereas boys use direct demands. It may imbalance unsupervised mixed-gender groups, where boys are more likely to get valuable resources.

Notably, the potential explanations all attribute to the sociocultural environment rather than biology. The influence theory, in particular, reveals different behavior patterns of boys and girls in mixed-gender peer groups, which align with the coeducational circumstances. More studies looked into the different implications of classroom gender composition, while the findings are inconclusive.

Research made before the 1980s primarily focused on catholic single-sex schools and did not distinguish genders. Those studies all claimed that school types would not affect the self-esteem level of students [18]. Since the 1990s, many single-sex schools have experienced major changes in the discipline and curriculum and more scholars have found that the class gender composition may intersect with other factors on self-esteem [19]. As mentioned above, self-esteem is likely to improve when students have the opportunity to learn in an environment that is specifically conducive to their gender [11]. Hence, more research started to emphasize the importance of studying gender differences on this topic and include gender as a moderating variable.

1.2. Gender Differences in Self-Esteem

Advocates for coeducational schools argued that during the transition from single-sex catholic schools to coeducational schools, both genders significantly improved their self-esteem [10]. However, more recent studies raised different conclusions.

The most common argument was that there is no significant difference between single-sex and coed schools on self-esteem level, with or without controls for prior ability or socioeconomic status [11, 19, 20]. Brutsaert and Bracke [20] indicated that it is rather the gender composition of teachers and the pupil population itself that exerts an influence, especially for boys. LePore and Warren [19] concluded the difference between two school types became less pronounced after the transformation in single-sex schools in 1990s. Even if there is any different effect in self-esteem, the advantage is for boys only.

For female students specifically, Garcia [11] also concluded that school types have no effects on self-esteem, even after controlling for the demographic variable of race. Contrarily, Cribb and Haase [21] suggested that single-sex peer interaction positively influences female students' self-esteem based on internalization theory. This theory suggests that internalizing social standards on female bodies significantly reduces girls' self-esteem. Cribb and Haase [21] used a quantitative method to show that the magnitude of such influence in coeducational schools is double that within single-sex schools.

Though the research findings remain inconclusive, it shows that girls and boys may have different experiences when they are in single-sex environments. Hence, this research considers gender as a moderating variable to the effect of classroom gender composition.

1.3. Age-Group Differences in Self-Esteem

Prior research also found that gender differences in self-esteem are more pronounced after adolescence [12]. One common explanation is boys' and girls' different physical changes of puberty. When puberty starts, boys have more muscle, while girls gain more body fat [22]. It makes boys closer to their ideal image, whereas girls grow apart from the cultural standards for females, which emphasize a thinner body. Therefore, boys and girls start to develop different levels of body esteem. Based on a strong relationship between body esteem and general self-esteem levels [12], it is hypothesized that growing age facilitates a wider gender gap in their general self-esteem.

In addition, self-esteem issues are found more serious for secondary school students, because they are more likely to attribute failures to internal factors than before [23]. Based on internalization theory mentioned above, girls have more depressive symptoms than boys during adolescence [18]. Therefore, the current research also considers age as a moderator to study both genders' self-esteem. The students' ages are grouped according to educational stages, i.e., elementary school, middle school and high school.

1.4 The design of study

In the meta-analysis to follow, this study uses sufficient numbers of effect sizes to illustrate the following differences. First, the current study tested whether there is a difference in self-esteem between single-sex schools and coeducational schools. Second, it is tested that whether gender and age group would moderate the association between classroom gender composition and self-esteem. These two research questions form a moderation model (Fig. 1 & 2). Based on the literature review, the present study proposed the following hypotheses:

Hypothesis 1: There is a difference in self-esteem between single-sex schools and coeducational schools.

Hypothesis 2: Gender would moderate the association between classroom gender composition and self-esteem.

Hypothesis 3: Age group would moderate the association between classroom gender composition and self-esteem.
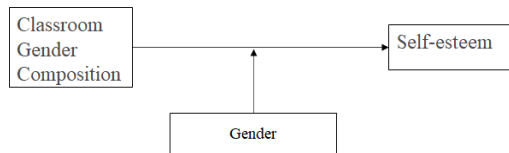

Figure 1 Conceptual model linking classroom gender composition self-esteem, and gender
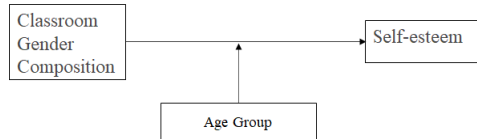

Figure 2 Conceptual model linking classroom gender composition self-esteem, and age group

2. METHOD

2.1 Sample of Studies

This research followed a three-step procedure to select the studies included in the meta-analysis [24]. The first step was a review of articles and research papers in English. A computerized search of Psych Extra, Psyc Info, and Psyc Articles databases was conducted. In the next step, the researchers used the following search parameters to collect articles (keywords, abstracts, titles, et al.): gender context or gender composition or school grades or school gender or classroom gender composition and global self-esteem or self-esteem. Finally, in the third step of the search procedure, the researchers explored whether any additional studies could be found by reviewing Chinese-language literatures devoted to psychology and education. Chinese-language periodicals were chosen because all authors had access to this literature and are fluent in the language.

2.2 Inclusion and Exclusion Criteria

The search discussed above yielded a total of 48 studies. The following selection criteria was then applied to those studies. First, this essay only considered studies that presented a quantitative measure of the difference in self-esteem between single-sex schools and coeducational schools. A total of 27 studies did not meet this first selection criterion and were eliminated from the analysis. Next, the research only included studies if they used self-report scales that demonstrated adequate reliability, such as measures of self-esteem (e.g., Rosenberg's self-esteem inventory [1]). This resulted in the elimination of 9 studies. With respect to classroom gender composition, this research included studies containing information about the school's gender composition and age information. This resulted in the elimination of 3 studies. A total of 6 of the original 48 studies met the selection criteria and were included in the analysis. Taken together, the included studies had 14 effects with 9463 participants.

2.3 Statistical Methods

The last two authors independently coded each article for relevant information, including sample size, sample selection, effect size. Effect size was computed by subtracting the standard deviation of self-esteem in coeducational schools from the standard deviation of self-esteem in single-sex schools. For each study included in the analysis, the researchers coded for the key moderators (i.e., measures of gender and age group, e.g., 1=elementary school, 2=middle school, 3=high school). The next step was to review the coded data and articles, as well as discussed and resolved any discrepancies to help eliminate errors in coding. The type of self-esteem measurement used in the previous study was also coded. Table 1 provides a detailed overview of the studies included in the meta-analysis.

Table1 The Subjects of the Studies Included in the Meta-Analysis

Study	Subgroup	N(SS)	N(CE)	Conclusion	ES (LL/UL)
Brutsaert and	Grade 6 boys	1130	1695	SS	0.16 (0.04/0.28)
Bracke (1994)	Grade 6 girls	965	1447	ND	− 0.04 (− 0.17/0.09)
Garcia (1998)	Grade 12 Black girls	185	89	ND	− 0.54 (− 0.93/− 0.16)
	Grade 12 White girls	105	108	ND	0.04 (− 0.38/0.47)
	Grade 12 Asian girls	37	50	ND	− 0.27 (− 0.09/0.30)
LePore and	boys	160	184	SS	0.17 (− 0.14/0.49)
Warren (1997)					
	girls	140	161	ND	− 0.06 (− 0.40/0.28)
Marsh (1991)	boys & girls	972	145	ND	− 0.10 (− 0.27/0.07)
Marsh et al. (1988)	Grade 3 boys	68	102	CE	− 0.76 (− 1.25/− 0.26)
Victoria et al. (2016)	Middle school girls	106	106	SS	0.33 (did not report)

Note：

　　ND = no significant difference reported but no effect size available nor an indicator of the direction of nonsignificant effect.

　　CE = direction of effect shows an advantage for a mixed-sex (coeducational) school. SS= direction of effect shows an advantage for a single-sex school.

　　N(SS/CE) = number of single sex/coeducational school population

3. RESULTS AND DISCUSSION

This essay presents the results of the meta-analysis in three steps. First, it presents a general estimation of the effect size obtained in the multilevel model and in the random-effects model. Next, the study analyzes the potential influence of publication bias, which helps determine the robustness of the obtained effect size. Finally, in further multilevel models, the essay shows the results of our moderator analyses.

3.1 Overall Effect

Table 2 illustrates the overall effect of the relationship

between self-esteem and classroom gender composition. Hypothesis 1 anticipated that students' self-esteem in single-sex schools would differ from coeducational schools. To examine this hypothesis, this research conducted a meta-analysis of the above seven pieces of literature. As Table 2 shows, classroom gender composition has no significant effect on students' self-esteem, $p=0.334>0.05$. This means that there is no difference in self-esteem between students in single-sex schools and those in coeducational schools. As expected, this effect was heterogeneous, Q (df =13) =69.63, $p<0.01$.

Table 2 Overall Effect Size Obtained Using Three-Level Meta-Analysis

Effects	Estimate	SE	95% *CI* LL	UL	*p*
Fixed effects					
Overall effect	0.014	0.022	-0.029	0.057	0.532
Random effects					
Between-study variance	-0.056	0.058	-0.169	0.057	0.334

3.2 Publication Bias

Before examining the influence of moderators, it was examined to what extent obtained effect may be influenced by publication bias. The study analyzed the robustness of the obtained effect size by examining whether it was influenced by publication bias. First, a funnel plot [25] with several nonparametric techniques helps to estimate possible bias. An inspection of the funnel plot (see Figure 3) does not suggest asymmetry.

This pattern indicates a lack of publication bias (although such an interpretation is based on a qualitative judgment rather than strict statistical rules). And next, to assist with the interpretation of the funnel plot, prior researchers conducting meta-analyses often include statistical analysis. In the present study Egger's regression intercept test was used [26]. Based on the random effects model, assessing funnel plot asymmetry, and Begg and Mazumdar's [27] rank correlation test (nonsignificant ps=0.06 and 0.12 respectively), no evidence of publication bias is shown.
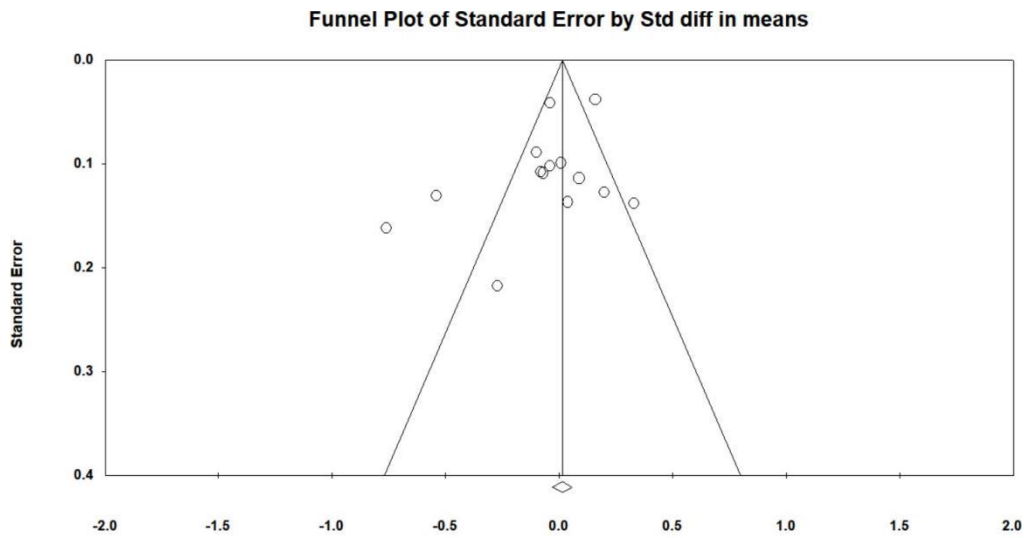
Funnel Plot of Standard Error by Std diff in means

Figure 3. A funnel plot assessing the possible publication bias.

3.3 Moderator Analysis

This section studies two moderators which are the gender (1=female, 2=male) and age group (1=elementary school, 2=middle school, 3=high school). Hypothesis 2 presumed that gender would moderate the association between classroom gender composition and self-esteem. The results do not indicate significant differences in overall research, p=0.362>0.05. It can be concluded that students of different genders do not vary in their self-esteem. In Hypothesis 3, the study expected the age group to moderate the association between classroom gender composition and self-esteem. The results indicate significant differences in overall research, p=0.001<0.05. It can be concluded that students from different age groups vary in their self-esteem, regardless of school type. Especially in elementary school, single-sex school students' self-esteem is much lower than in coeducational schools.

4. CONCLUSION

This paper examines the impact of classroom gender composition on girls' and boys' self-esteem. In general, the results confirm no difference in students' self-esteem between single-sex schools and coeducational schools. However, more people can realize that it is necessary to

improve students' self-esteem through family, school, and social initiatives, especially those in adolescence. In addition, based on the research findings of different age groups, it is of great academic meaning to emphasize the significance of gender background rather than biological differences. This research did not include the effect of pre-existing factors. If future research could control the SES of families and the academic performance of students, the effect of gender composition would be more convictive. Another omitted variable in the current study is that schools may have discrepant gender equity awareness. This current research focuses only on global self-esteem; however, there are different domains of self-esteem. Future researchers can study the implication of gender composition on sub-dimensions of self-esteem.

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