



Separating boys and girls and increasing weight? Assessing the impacts of single-sex schools through random assignment in Seoul



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ABSTRACT

A growing body of research reports associations of school contexts with adolescents' weight and weight-related behaviors. One interesting, but under-researched, dimension of school context that potentially matters for adolescents' weight is the gender composition. If boys and girls are separated into single-sex schools, they might be less concerned about physical appearance, which may result in increased weight. Utilizing a unique setting in Seoul, Korea where students are randomly assigned to single-sex and coeducational schools within school districts, we estimate causal effects of single-sex schools on weight and weight-related behaviors. Our results show that students attending single-sex schools are more likely to be overweight, and that the effects are more pronounced for girls. We also find that girls in single-sex schools are less likely to engage in strenuous activities than their coeducational counterparts.

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1. Introduction

Schools are venues not only for academic learning but also for “social” learning or socialization through which adolescents learn attitudes, values, and behaviors of others. Schools are important contexts in which adolescents interact with their friends and form adolescent cultures with specific perspectives and preferences that are likely to affect behaviors. Several studies have demonstrated that school contexts influence adolescents' risky behaviors such as smoking, drinking, and other substance use (Kumar et al., 2002; Lovato et al., 2010; West et al., 2004). However, the role of school contexts in influencing weight and weight-related behaviors has received relatively little attention. Moreover, studies that have explored the role of school contexts in influencing adolescents' health behaviors have mostly limited their focus to whether the proportion of students in a school with a certain behavior (e.g., smoking, drinking, or dieting) or a certain characteristic (e.g., overweight) was associated with the behavior or characteristic of an adolescent in that school (e.g., Carrell et al., 2011; Fletcher, 2010; Clark and Lohéac, 2007; Eisenberg et al., 2005).

An important aspect of school contexts that has received little attention regarding adolescents' weight and weight-related behaviors is the gender composition of school – single-sex vs. coeducational schools. Physical attractiveness, popularity, appeal to the opposite sex, and dating are likely to influence adolescents' weight and weight-related behaviors. These have long been considered important components of adolescent culture in coeducational schools (Coleman, 1961), which are the dominant form of schooling in the United States and a number of other countries. Unfortunately, the dominance of coeducational schooling in many countries makes it difficult to ask the following questions: What would happen if boys and girls were separated into single-sex schools? Without opposite-sex peers, would boys and girls feel less pressure and be less concerned about their physical appearance and body size and shape, which may affect their weight-related behaviors and ultimately their weight? There are several countries, including South Korea, New Zealand, and Israel, that have relatively balanced compositions of single-sex and coeducational schools (Wiseman, 2008). These single-sex schools offer an interesting setting in which to examine how the gender composition of a school might affect the weight and weight-related behaviors of adolescents.

There is also growing interest in many countries in single-sex schooling as a way to improve overall academic achievement. For instance, the number of single-sex schools and single-sex

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classrooms within coeducational schools has increased dramatically in the United States after amendment of Title IX of the US Education Act in 2006, which gave school districts more flexibility to provide single-sex education (Doris et al., 2013). Along with this interest in the United States, numerous studies have recently examined the effects of single-sex schools on educational outcomes in various countries (e.g., Doris et al., 2013; Jackson, 2012; Park et al., 2012, 2013; Sullivan et al., 2010). However, little research has explored the impact of single-sex schooling on health and health behaviors, and, in particular on weight and weight-related behaviors, of adolescents.

Our study of the causal effects of single-sex schools on students' overweight and obesity may have important policy implications. The prevalence of childhood overweight and obesity has risen rapidly in many countries. For example, over the last few decades, overweight and obesity rates among American children have increased substantially (Cawley, 2010). Although the overweight and obesity rates in Korea are relatively low compared to those of other OECD countries, they have been increasing steadily. About 4% of the adult population in Korea is obese, and about 30% are overweight (including obese). OECD projections indicate that overweight rates will increase by a further 5% within 10 years (OECD, 2013). In addition, child obesity rates are increasing in Korea. According to statistics released by the Ministry of Education and Science Technology, obesity rates of Korean children have been increasing steadily from 11.2% in 2008 to 14.3% in 2011. At the same time, the proportion of severely obese children is on the rise from 0.8% in 2006 to 1.3% in 2011 (Ahn, 2012). Considering that overweight or obese children are more likely to become overweight or obese adults (Singh et al., 2008) and that overweight and obesity in childhood have negative associations with premature mortality and physical morbidity in adulthood (Reilly and Kelly, 2011), increasing obesity among Korean adolescents raises social and economic concerns, as it is an important risk factor for long-term health outcomes. In addition, there is evidence that obesity is associated with lower self-esteem and maladjustment, and adversely affects concentration in learning, which could result in lower academic achievement and more behavioral problems in school (e.g., Cawley and Spiess, 2008; Levy et al., 2011). For these reasons, identifying potential contributors to overweight and obesity among school-aged children has definite policy relevance in many countries, including Korea.

2. Background

2.1. How do single-sex schools affect students' weight?

In Fig. 1, a diagrammatic representation of the processes by which single-sex schools may affect students' weight is provided. Physical attractiveness and appeal to the opposite sex are important

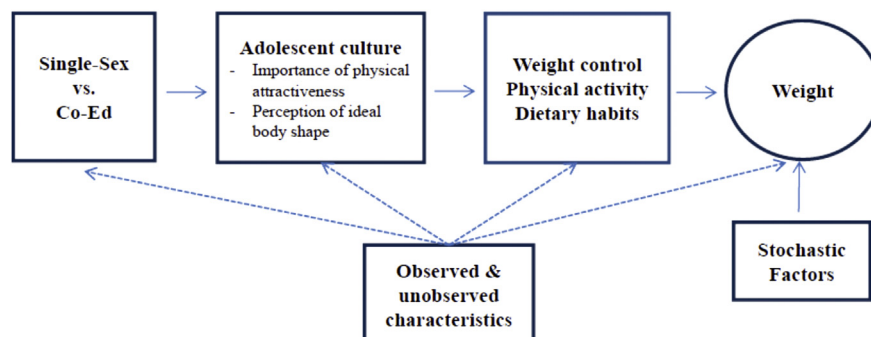


Fig. 1. How do single-sex schools affect students' weight?

components of adolescent culture, and can influence adolescents' weight and weight-related behaviors (Coleman, 1961). The importance of physical attractiveness, norms about ideal body shape and pressure to comply with these norms may vary across schools depending on their gender compositions (Spencer et al., 2012). These differences can influence the degree of engagement in weight-control behaviors, physical activities, and dietary habits. Different behavioral responses between students attending single-sex schools vs. coeducational schools can therefore potentially cause differences in students' weight. In addition, a growing body of literature on social interactions suggests that the gender compositions of schools are important factors that can influence students' health outcomes not only as direct sources of information and role models, but also as channels to multiply these direct differences. In a systematic review of studies that addressed the influences of friends on body weight, Cunningham et al. (2012) reported that the majority of studies concluded that the mean weight of friends was significantly associated with the weight of an adolescent, even after controlling for various demographic and socioeconomic characteristics of individuals and families (e.g., Carrell et al., 2011; Christakis and Fowler, 2007, 2012; Trogdon et al., 2008). Recent studies also found that when their friends engaged in sports, exercise, and fast food consumption, adolescents were more likely to do so, and that adolescents exhibited similar patterns of healthy eating behaviors as their friends (Ali et al., 2011; Bruening et al., 2012). The significant associations of weight and weight-related behaviors of friends with those of an adolescent highlight the possible roles of contexts, in which adolescents interact with and are influenced by peers, in establishing social norms, expectations, and cultures regarding weight and weight-related behaviors.

2.2. Challenge of evaluating the impacts of single-sex schools

The major challenge faced when evaluating the impacts of single-sex schools on any outcomes, including weight and weight-related behaviors, is the selection of students into different types of schools. In most countries students and families select into single-sex vs. coeducational schools. Those students who decide to attend single-sex schools rather than coeducational schools probably differ from those attending coeducational schools in both observed and unobserved characteristics, which makes it difficult to estimate unbiased effects of single-sex schools (Booth and Nolen, 2012a, 2012b). Although the concern about selection bias for single-sex schools has been raised mainly in relation to educational outcomes, selection bias is equally a concern in estimating the effects of single-sex schools on health and health behaviors. In addition to potential bias due to students' selection into single-sex schools, another possible source of bias in estimating the impact of single-sex school is potential differences in school characteristics between single-sex and coeducational schools. Those school

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