to show that single-sex schooling increases divorce (6), but they ignore the results in the same work showing positive educational outcomes of single-sex schools.

The literature shows that, in contrast to the claims of Halpern et al., systematic analyses of the impacts of single-sex schools have found significant positive effects on educational outcomes, whereas equally systematic investigations of the impacts of single-sex schools on sex-typed behaviors and sexism are not yet available.

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**Single-Sex Education: Unequal to Segregation**

IN THEIR EDUCATION FORUM "THE PSYCHO-SCIENCE of single-sex schooling" (23 September, p. 1706), D. F. Halpern et al. evaluate school success solely by standardized test scores. They make no attempt to do or cite research that measures parameters such as self-confidence, self-reliance, and leadership qualities. These are the attributes that parents look to single-sex schooling to foster in their children.

The authors also cite divorce statistics in a survey done of adults who went through single-sex schooling in the United Kingdom. Are these data applicable to our American experience? How are they relevant in a time when divorce is so common? Is "not getting divorced" a positive social value? In whose judgment? Is "not getting divorced" in and of itself a sign of responsible, educated adult behavior?

Halpern et al. reason that studies of stereotyping caused by single-type schools for racial and ethnic minorities are applicable to single-sex schools. However, gender is balanced numerically and cuts across race, income, region, and education. Given the extreme prejudice that blacks and Hispanics have faced historically, it is inappropriate to equate the experience of same-gender schools with same-race schools.

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**Response**

WE APPRECIATE THE LETTER WRITERS’ responses to our Education Forum and reply to their concerns in turn. The Letters by Kalkus and by Park et al. argue that we neglected to cite certain studies showing the benefits of single-sex education. Our conclusion was based on several large research reviews and data syntheses of thousands of extant studies. Aggregated findings provide more meaningful evidence than any single selected report.

The U.S. Department of Education's review (1) included the cohorts studied by two of Kalkus's references—Riordan (2) and Gibb et al. (3)—in arriving at its conclusion of "equivocal" evidence for differences between single-sex and coeducational outcomes. Thus, unlike the tobacco industry's response to data on smoking and health, we cite multiple comprehensive reviews that fail to find an association between single-sex education and educational benefits. Kalkus also cites a paper on stress responses by Taylor et al. (4) as a rationale for separating boys and girls and teaching them differently. This study is largely theoretical, whereas recent research finds no difference between boys' and girls' levels of the stress hormone cortisol (5); no difference between the levels of α-amylase, a salivary enzyme whose release is triggered by the central sympathetic nervous system (6); nor any difference in the balance of sympathetic and parasympathetic control of heart rate variability, another measure of stress response (7). When found, sex differences in children's neurobehavorial measures tend to be small, with much more variance within each sex than difference between them, making such group differences unsuitable for sorting students into different schools or classrooms.

Contrary to Kalkus's assertion, studies of young children are relevant. Single-sex classrooms are being established in U.S. kindergartens (8) and pre-kindergartens (e.g., Princeton Academy). Peers influence children at all ages (9). Furthermore, a recent meta-analysis found support for the intergroup contact hypothesis—that is, segregation of groups promotes stereotyping and prejudice toward the other group, whereas intergroup contact reduces such stereotyping and prejudice, among children, adolescents, and adults (10).

Regarding Kalkus's points about aggression, a recent longitudinal study found that adolescent boys were less aggressive in schools characterized by high levels of cross-gender interactions (11). Similarly, a large analysis of gender "dosage" reported that the lower the proportion of girls in a classroom, the more disruption and violence (12). These studies thus agree with findings on younger children that male aggression is associated with the proportion of boys in the group.

Sexism and stereotyping may be found in both coeducational and single-sex class-
rooms (13). However, the most efficient and effective solution lies not in segregating boys and girls, but in fostering a favorable school climate that encourages mutual respect and positive, productive gender interactions, a conclusion supported by a recent social policy report from the Society for Research on Child Development (14).

We thank Park et al. for pointing us to their working paper (15), which exploits randomization school assignment to assess single-sex versus coeducational outcomes in South Korea. However, because their study does not directly assess demographic variables and includes only two coarse measures of school quality, it is impossible to determine whether the different college outcomes are due to gender composition or to other differences between types of schools. In fact, the study found that boys' advantage could be attributed exclusively to the higher proportion of male faculty in all-boys schools, which the authors note can be implemented in coeducational schools. Furthermore, another analysis of the same randomized population (16), found that girls from single-sex schools were significantly less likely to be admitted to the nation's premier university than girls from coeducational schools, a puzzling finding given that Park et al. report that these single-sex educated girls earned better national university entrance exam scores. Another recent study involving semirandomized assignment of students in Trinidad and Tobago (17) found that most students performed no better in single-sex schools, compared with coeducational schools, and that girls in single-sex schools took fewer science courses and more traditionally female subjects than boys in coeducational schools.

We agree with Park et al. that systematic reviews have yet to address the potential harm of single-sex schooling in increasing gender stereotyping and sexism. However, we cited several individual studies demonstrating the negative effects on children when adults use attributes such as gender to organize the learning environment and also provide evidence for negative gender intensification when children are limited to same-sex peer interactions. We also note that increased gender stereotyping was a prominent finding in a study of the failed California experiment to implement single-sex public schooling (18). In addition, although the UK study addressing men's divorce rates did find a benefit of single-sex schooling on girls' self-concept in math and science, this did not translate into greater female participation in STEM careers or even overall labor market participation (19), suggesting that the all-girls' environment, which other research indicates may foster a "pernicious" sexism (13), does not buffer against real-world sexism.

Ford and Palaima reject the analogy between gender segregation and racial segregation. We stand by our argument. Over 50 years of psychological research has shown that people who are sorted into groups based on either biological (e.g., eye color, sex, or skin color) or arbitrary (e.g., shirt color) traits develop favoritism toward the in-group and stereotypes of the out-group (20). We also note that, similar to children of color, girls were historically denied an education equal to boys, and that women, like racial minorities, have been subject to intrinsic bias in hiring and promotion, which is exacerbated in gender-segregated workplaces (21). Racial segregation was legal in U.S. schools until social scientists and others testified in court regarding its harmful consequences and worked to change the law.

Palaima is wrong in his assertion that we examined only "standardized test scores." The U.S. Department of Education review we cited (1) examined a wide range of outcome variables in addition to school achievement, including self-concept, delinquency, attitudes toward school, school completion, choice of college major, eating disorders, career aspirations, attitudes toward women, and opportunities for leadership roles.

We do not advocate value judgments regarding divorce. However, data showing...
that men in their 40s were more likely to be divorced if they attended single-sex schools than if they attended coeducational schools (18) provide support for the theory that when girls and boys work and play cooperatively in structured, supportive environments, they develop the skills needed for working and living together. In light of compelling counterarguments to the critiques offered in the preceding letters, we reaffirm the conclusions in our original article.

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