Abstract
Educational authorities have questioned whether middle schools (6-8 grade) provide the best learning environment for students compared to other grade configurations. The limited available research suggests that students in middle schools (e.g., 6th-8th grade) have lower academic achievement than students in K-8 or K-12 schools (Coladarci & Hancock, 2002; Rockoff & Lockwood, 2010). The current study compared schoolwide passing rates on state-mandated Reading and Mathematics achievement tests for 7th and 8th grade students from 406 public schools in Virginia. Pass rates for 7th grade students in middle schools were compared to pass rates of 7th grade students in elementary (e.g., K-7th grade) schools. Pass rates for 8th grade students in middle schools were compared to 8th graders placed in high schools (e.g., 8th-12th grade). Results indicated that 7th grade students in middle schools had lower pass rates for Reading and Math SOLs than 7th graders in elementary schools. Eighth graders in middle schools had higher SOL pass rates when compared to 8th graders placed in high schools. These results support previous research that suggests that grade configuration may have a significant impact on student academic achievement.

Study Question
How do standardized test pass rates in conventional middle schools compare to the pass rates in schools with other grade configurations?

Participants
Participants in this study were derived from 406 public schools in Virginia that contained 7th and/or 8th grades. Academic achievement was measured by schoolwide end-of-year Standards of Learning (SOL) passing rates for 7th and 8th grade students in Reading and Mathematics, which were obtained from state records for each school. Seventh and 8th grade students (typically take SOL tests that correspond with their grade level (e.g., 7th grade Reading), though some students that are either advanced or behind may take a different test. Individual student test scores were not available; therefore, this study used schools as the primary unit of analysis.

Demographic information was also obtained from public school records.

Methods
Schools with fewer than 30 students enrolled in either grade were omitted from analyses. Schools were sorted into three grade configuration groups: elementary (e.g. K-8th grade), middle (e.g. 6th-8th grade), and high school (e.g. 7th-12th grade). Analyses were conducted separately by grade. Seventh grade students in middle schools were compared to 7th graders in elementary schools, and 8th grade students in middle schools were compared to 8th graders in high schools. The number of elementary schools that contained 8th graders and high schools that contained 7th graders were too few to include in the analyses.

Results
Separate analyses were conducted for 7th and 8th grade students. Multivariate analyses of covariance (MANCOVA) compared school groups on pass rates for Reading and Mathematics, controlling for four school demographic variables: school size, urbanicity (census population density of the school attendance zone), student poverty (percentage of students eligible for free or reduced-price meals), and percentage of minority students.

Discussion
Our findings indicate that grade configuration is associated with standardized test performance for middle grade students, with different results for 7th and 8th graders. Seventh grade students placed in middle schools had lower pass rates for both Reading and Mathematics in comparison to those placed in elementary schools. In contrast, 8th grade students in middle schools had higher pass rates for Reading and Mathematics in comparison to 8th graders in high schools. Future studies should examine what school factors (e.g., school climate, teacher experience, academic expectations, curriculum mismatch) might account for different rates of achievement.

Additionally, longitudinal study is needed to determine whether individual student test performance changes during middle school, and whether recent placement in a new school affects test performance. Previous research (Rockoff & Lockwood, 2010) found that the transition to middle school caused a decline in math and reading achievement. Eighth graders in high schools might be affected by their adjustment to a new school or there may be other factors such as differential teacher assignment that affects their test performance.

This study has some notable limitations. First, individual test scores could not be obtained, which would have allowed us to control for individual student characteristics. There may be differential test-taking patterns across schools. Although the majority of 7th and 8th graders take standardized tests intended for their grade level, students that are either advanced or behind academically may take a different exam. Second, these results are correlational in nature; therefore, a causal relationship between grade configuration and academic achievement cannot be inferred.

Overall, these findings contribute new evidence to the debate over the use of middle school grade configurations. The state requirement for accreditation is to achieve passing rates of 75% in reading and 70% in mathematics. Because many schools have passing rates close to the cut-offs, the group differences found in this study are practical and compelling to school administrators.

References available upon request.

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