




OCCASIONAL PAPER NO. 41

Grade-span Configurations: The (Limited) Evidence Regarding Effects on Academic Achievement

Theodore Coladarci
Julie Hancock

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Grade span, or grade configuration, is the range of grades that a school comprises. In Bangor, where the first author’s children attended school, students begin their education career at a k-3 school, proceed to a 4-5 school, then a 6-8 school, and finally to the 9-12 high school. There are many alternatives to the Bangor profile, of course. Table 1 shows the configurations, involving selected grades, for public schools across the country. For example, the 6th grade most often is found in a p/k-6 school (41.49%), although the 6-8 configuration is not uncommon (25.34%). Roughly half of 8th-grade schools are configured either 6-8 (35.23%) or p/k-8 (19.12%), with a sizable number evenly divided between 7-12 (11.67%) and 7-8 (11.66) configurations. Finally, a 12th grade typically is situated in a 9-12 school (66.48%), with 7-12 (16.46%) and p/k-12 (7.82%) accounting for the remaining schools having a 12th grade.

However configured, a school’s grade span is an important issue to various factions concerned with public education. And these groups do not always take the same position on this

Table 1.
Number of U.S. Regular Public Schools by Grade Span, for Selected Grades (1999-2000)

Schools with Grade 6			Schools with Grade 8			Schools with Grade 12		
grade span	%	(n)	grade span	%	(n)	grade span	%	(n)
p/k – 6	41.49	(13,721)	6 – 8	35.23	(8,381)	9 – 12	66.48	(11,216)
6 – 8	25.34	(8,381)	p/k – 8	19.12	(4,551)	7 – 12	16.46	(2,776)
p/k – 8	13.76	(4,551)	7 – 12	11.67	(2,776)	p/k – 12	7.82	(1,319)
5 – 8	4.12	(1,363)	7 – 8	11.66	(2,773)	other	9.24	(1,559)
other	15.29	(5,058)	5 – 8	5.73	(1,363)			
			other	16.59	(3,948)			
total	100.00	(33,074)	total	100.00	(23,792)	total	100.00	(16,870)

Note. “p/k” denotes a grade span that begins with either pre-kindergarten or kindergarten.

Source: U.S. Department of Education, National Center for Education Statistics Common Core of Data (CCD), School Survey, 1999-2000. Table constructed by authors based on information compiled 4-25-02 by Mark Kolanowski, National Center for Education Statistics (Request 944220).

issue. For example, many proponents of middle-level education favor the educational separation of young adolescents to best accommodate their developmental needs and characteristics (e.g., Jenkins & McEwin, 1992). According to such thought, a 5-8 or 6-8 configuration is more desirable than, say, a k-8 configuration. Rural educators, in contrast, often decry such grade fragmentation because of its association with school consolidation, school closures, and the threaten survival of rural communities (e.g., DeYoung, Howley, Theobald, 1995). Finally, budget-minded school board members and legislators typically raise a basic cost-benefit question: For a fixed allocation of dollars, which configuration of grades is likely to produce the best academic results?

Our focus is on the relationship between grade span and *academic achievement*. To be sure, there are other considerations that influence decisions regarding the configuration of grades in a school or district, such as those related to fiscal constraints, political tensions, or geographical realities. We do not mean to impugn their importance by not addressing these considerations here. But what ultimately matters—or should matter—to educators, policymakers, business persons, and the general public is how much students learn. This is particularly true in the present era of educational reform, in which student performance on standards-aligned achievement assessments has become the veritable bottom line.

So, what *is* known about the effects of grade span on academic achievement? For example, is the average achievement of sixth graders comparable in p/k-8, p/k-6, or 6-8 schools? Is it better to situate the eighth grade in, say, a p/k-8 or a 6-8 school?

Limitations of Existing Research

Unfortunately, research bearing on this general question is rather limited. For example, many accounts of grade-span effects are, in fact, descriptive cases of a particular school that had changed its grade configuration for one reason or another. The “Northwest Sampler” compiled by Paglin and Fager (1997) is an engaging example of such accounts. But as provocative as a descriptive case study may be, it is not designed to demonstrate the *effects* of something—like

grade configuration—and we simply are asking too much of such accounts if we turn to them for this purpose. More technical methods are required, such as statistical procedures that attempt to take into account, or control for, important confounding factors. However, grade-span researchers often have not employed such methods (Calhoun, 1983). There are some illustrative exceptions, fortunately, and it is to these that we now turn.

Studies with Statistical Controls

In his study of 18 schools in New York City, Moore (1984) found that both 7th and 8th grade reading achievement was higher for students in k-8 schools than in schools having a 6-8 configuration. The k-8 and 6-8 schools were similar in terms of ethnicity and socioeconomic status. Further, Moore statistically controlled for the 6th grade achievement of these students. This means that the achievement disadvantage associated with 6-8 schools did not merely reflect a pre-existing achievement deficit for these 7th and 8th graders. Better attendance, more positive attitudes toward school, and higher self-esteem also were reported for 7th and 8th graders in k-8 schools.

Although based on urban schools, Moore's findings are consistent with those reported by Franklin and Glascock (1998) in their study of over 700 rural schools in Louisiana. These researchers found that 6th and 7th graders in k-6, k-7, and k-12 schools performed significantly higher on the state achievement test than students in 6-8 and 7-9 schools. The former students also had significantly fewer absences and suspensions. Further, students in the 10th grade had significantly higher test scores, and fewer behavior problems, in k-12 schools than in 7-12, 8-12, or 9-12 schools (although no significant differences were found for 11th grade students.) The statistical analysis took into account school size and community socioeconomic status.

The k-12 advantage with respect to 10th grade achievement was echoed, if faintly, by results obtained by Bickel, Howley, Williams, and Glascock (2001, October 8), who examined 10th grade scores on the Texas Assessment of Academic Skills for roughly 1,000 Texas schools. Equipped with a cornucopia of control variables (e.g., demographics, school size, expenditures),

Bickel et al. reported a slight but statistically significant advantage for k-12 schools when compared to all other configurations containing the 10th grade. This difference held for reading, writing, and mathematics alike.

Further convergence of these results is found in the work of Wihry, Coladarci, and Meadow (1992). With a sample of 163 Maine schools, these researchers examined the influence of grade span on eighth-grade student performance on the Maine Educational Assessment. Statistically controlling for school-level socioeconomic status, per-capita income in the community, and parent educational attainment, Wihry et al. found that 8th grade total achievement was significantly higher in k-8, k-9, and 3-8 schools than in schools configured around the middle grades (4-8, 5-8, 6-8) or those having a junior/senior high school configuration (6-12, 7-12, 8-12).

An interesting twist to this pattern of results was reported by Becker (1987). In his study of 6th grade achievement in 330 Pennsylvanian schools, Becker found that the grade-span effect on academic achievement depended on the student's socioeconomic status. That is, although there was an overall achievement advantage to locating 6th graders in an elementary (k-6, 1-6, 2-6, 3-6) versus a middle (e.g., 6-8) configuration, the advantage was most evident among students low in socioeconomic status. This "interaction" between grade-span configuration and socioeconomic status prevailed across content areas (mathematics, reading, science, and social studies), and it held after Becker controlled for such factors as instructional practices, tracking and ability grouping, and enrollment per grade.

A Note of Caution

Their convergence notwithstanding, these results should be treated with considerable caution. Although the studies above were generally well designed, they nonetheless are few in number. Further, achievement effects have been examined mostly at the middle-level grades. And although these researchers attempted to take into account important confounding influences (e.g., socioeconomic status), there doubtless are other factors that, if considered, would change

the results—perhaps markedly. To use an admittedly tiresome refrain, more research clearly is needed!

That said, we do find the consistency of grade-span results noteworthy. In short, these results generally suggest that achievement in the middle grades is higher in schools having an elementary-wide configuration than a middle-grades configuration. If these results stand up to subsequent research, then the important question is, “Why?” For example, *why* would 8th grade achievement be higher in k-8 schools than in 6-8 schools, or *why* would 6th grade achievement be higher in k-6 schools than in 6-8 schools? We believe that the answer, in part, may lie in the continuity of experience that wider grade spans afford.

Continuity of Experience

In the face of multiple grade spans, students naturally must make the transition from one school to the next. A student will experience the usual novelties associated with grade advancement, such as a more challenging curriculum and, perhaps, some different faces in class. But additional changes accompany the transition to a new school: a different facility, unfamiliar teachers and administrators, new constellations of friendships and classmates, different expectations for student conduct, and so on. While there is not a plethora of research on this topic, the evidence suggests that transition effects are largely negative. For example, Simmons and Blythe (1989) reported a decline in performance, motivation, and self-esteem following a transition from one school to another. Similar results have been obtained by others (e.g., see National Middle School Association [NMSA] Research Summary #8, n.d.).

In a k-8 configuration, absence of school-to-school transitions and greater continuity of experience arguably may be behind the higher achievement that has been reported for middle-grade students attending such schools (e.g., Franklin & Glascock, 1998; Moore, 1984; Wihry et al., 1992). And it perhaps is responsible for the better attendance, more positive attitudes toward school, and higher self-esteem that Moore (1984) reported for these students. A similar argument would explain why a 6th grader would be advantaged in a k-6 school versus a 6-8 school. But

these are mere conjectures on our part, and they are subject to confirmation or refutation by future research.

Implications

What, then, is a school system to do? The available research cannot answer this question with any degree of certainty, but the pattern of findings raises two important caveats regarding the relationship between grade configuration and academic outcomes. First, the segregation of adolescents in middle-grade schools does not necessarily translate into higher achievement. Indeed, the available evidence suggests just the opposite. With one exception (Becker, 1987), however, the research we summarized did not take into consideration the instructional environment of the school, and no study examined the social, interpersonal dimensions of school life. Once grade-span researchers devote more attention to these matters, we suspect that a school's configuration of grades will be less important than the results above may suggest, at least in terms of academic achievement. In this sense, we are sympathetic to the position of the National Middle School Association: "Effective programs and practices, not grade configuration, determine the quality of schools" (NMSA Research Summary #1, n.d.).

Second, where grade fragmentation is a reality—whether by choice or decree—steps should be taken to lessen the adverse effects, on students, of school-to-school transitions. We agree with Paglin and Fager (1997, p. 9) that a school system with multiple grade spans should have in place "articulation and transition activities" among its units. Teachers and students alike should have an informed view of the instructional and social world of the next school in line. This, too, is an important direction for future research. Is the adverse grade-span effect on academic achievement softened in multi-unit systems having articulation and transition activities compared to multi-unit systems that do not? We expect that it would be, just as we expect that the achievement advantage of a k-8 school is diminished where there is little dialogue among its teachers regarding school vision, grade-specific learning goals, assessment practices, and the like.

One should not infer from our closing caveats that grade configuration ultimately may not matter—that this structural feature of schools, in and of itself, may be unrelated to academic outcomes. Rather, our point simply is that researchers must continue to disentangle grade span from its corollaries. Following the lead of Becker (1987), researchers also should explore the possible interactions between grade span and other considerations.

The configuration of grades, in and of itself, probably does matter. The challenge for us is to become smarter about *how* and *why*.

References

- Becker, H. J. (1987). *Addressing the needs of different groups of early adolescents: Effects of varying school and classroom organizational practices on students from different social backgrounds and abilities* (Report No. 16.)/ Baltimore, MD: Center for Research on Elementary and Middle Schools, The John Hopkins University. (ERIC Document Reproduction Service No. ED291506)
- Bickel, R., Howley, C., Williams, T., Glascock, C. (2001, October 8). High school size, achievement equity, and cost: Robust interaction effects and tentative results. *Educational Policy Analysis Archives*, 9(40). Retrieved October 8, 2001 from <http://epaa.asu.edu/epaa/v9n40.html>
- Calhoun, F. S. (1983). *Organization of the middle grades: A summary of research*. Arlington, VA: Educational Research Service.
- DeYoung, A. J., Howley, C., Theobald, P. (1995). The cultural contradictions of middle schooling for rural community survival. *Journal of Research in Rural Education*, 11, 24-35.
- Franklin, B. J., Glascock, C. H. (1998). The relationship between grade configuration and student performance in rural schools. *Journal of Research in Rural Education*, 14, 149-153.
- Jenkins, D. M. & McEwin, C. K. (1992). Which school for the fifth grade? Programs and practices in three grade organizations. *Middle School Journal*, 23, 8-12.
- Moore, D. W. (1984). *Impact on school grade-organization patterns of seventh and eighth grade students in K-8 junior high schools*. Paper presented at the annual meeting of New England Educational Research Organization, Rockport, ME. (ERIC Document Reproduction Service No. ED24534)
- NMSA Research Summary #1: Grade configuration. (n.d.) Retrieved July 6, 2001 from <http://www.nmsa.org/services/research/ressum1.htm>
- NMSA Research Summary #8: Grade 5 in the middle school. (n.d.) Retrieved July 6, 2001 from <http://www.nmsa.org/services/research/ressum8.htm>

Paglin, C., & Fager, J. (1997). *Grade configuration: Who goes where?* Portland, OR: Northwest Regional Education Laboratory.

Simmons, R. O., & Blyth, D. A. (1987). *Moving into adolescence*. New York: Aldine De Gruyter.

Wihry, D. F., Coladarci, T., Meadow, C. (1992). Grade span and eighth-grade academic achievement: evidence from a predominantly rural state. *Journal of Research in Rural Education*, 8, 58-70.