

**Abstract Title Page**  
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**Title:**

Instructional Innovation, School Choice, and Student Achievement

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**Abstract Body**  
*Limit 5 pages single spaced.*

**Background/context:**

*Description of prior research and/or its intellectual context and/or its policy context.*

With few exceptions, much of the research on different schools of choice has neglected school structure and processes as they relate not only to student outcomes but the three key aspects of schools that the choice movement intends to improve—autonomy, innovation, and accountability (see Gill et al., 2007; Lubienski, 2003). Central to advocates' argument for choice is that these aspects of reform will produce changes in organizational innovations that promote learning, curriculum, and instruction, which in turn will lead to better student outcomes (Chubb & Moe, 1990; Walberg & Bast, 2003). Moreover, the argument goes, practices and conditions related to autonomy, innovation, and accountability will differ across schools (and school types), thus responding to parental and community preferences and further promoting student achievement (Walberg, forthcoming). Notwithstanding this foundational claim of school choice advocates, research supporting or refuting it is either nonexistent or mixed.

By contrast, institutional theory predicts that school choice will not result in widespread innovation and different school organizational forms. Rather, powerful “institutional rules” held by public opinion, important constituents, and the laws and regulations (Meyer & Rowan, 1977; DiMaggio & Powell, 1983) contribute to conformity and congruency between schools of choice and traditional public schools in terms of teaching and learning. According to institutional theorists, the bureaucratic, rational network of schooling has resulted in a system of categories or rules, called “ritual classifications,” that define the actions of schools, teachers, students. Over time these ritual classifications become institutionalized and accepted as the norm for what constitutes a legitimate school and schooling activities (Bidwell & Kasarda, 1980). To legitimize themselves within the broader community, school compliance to ritual classifications is important—more important, according to institutional theorists, than maximizing efficiency. Strong evidence to support for this theory is limited as well.

**Purpose/objective/research question/focus of study:**

*Description of what the research focused on and why.*

To address these theoretical perspectives, we address the following research questions: Are schools of choice (i.e., charter, magnet, and private schools) more innovative than traditional public schools (TPS)? What innovative practices contribute to greater student achievement?

There is limited empirical research about innovation in various types of schools of choice, although viable choice policies tend to assume clear differentiation amongst schools. Innovation can be conceptualized in many ways and takes place at multiple levels of the school organization (see Lubienski, 2003). Schools can innovate in terms of the roles and responsibility of teachers and principals, governance, school structure, instructional strategies and practices, amongst others. In this paper we first explore conceptually, multiple levels and types of innovation and describe the nature and prevalence of various innovations across school types. A

review of the literature, both conceptually and empirically suggested salient types of innovation that are closest to teaching and learning, and were measured in the NWEA surveys of principals and teachers. We examine how schools of choice, autonomy, authority, and other school characteristics are related to innovation. Our measures of innovation include scales for *differing practices from other schools* (2 items,  $\alpha = 0.79$ ), *non-traditional curricular practices* (4 items,  $\alpha = 0.54$ ), *collaborative and investigative curricular practices* (6 items,  $\alpha = 0.64$ ), *added school requirements* (8 items,  $\alpha = 0.67$ ), *structuring of teacher communities* (7 items,  $\alpha = 0.60$ ), and *extended learning time* (5 items,  $\alpha = 0.47$ ).

### **Setting:**

*Specific description of where the research took place.*

The data come from surveys of principals and teachers in charter, magnet, private, and regular public schools. The schools are located in urban, suburban, and rural contexts across 24 states. The schools all participate in the Northwest Evaluation Association (NWEA) assessment program and student achievement data in mathematics, reading, and language usage come from NWEA assessments.

NWEA administers state-aligned, computerized adaptive assessments in *both the fall and spring* of each academic year in reading, language usage, and mathematics. These assessments reference a single, cross-grade, and equal-interval scale developed using Item Response Theory methodology (Hambleton, 1989; Ingebo, 1997; Lord, 1980). The RIT scale is based on strong measurement theory, and is designed to measure student growth in achievement over time. NWEA research provides evidence that the scales have been extremely stable over twenty years (Kingsbury, 2003; Northwest Evaluation Association, 2002, 2003).

### **Population/Participants/Subjects:**

*Description of participants in the study: who (or what) how many, key features (or characteristics).*

The teacher sample includes 6,175 teachers in 283 schools completed surveys in the spring of 2008, with a response rate of 74 percent. The principal data come from a sample of 354 principals and assistant principals in the same schools, with a response rate of 78 percent. Surveys were collected from principals and teachers in a sample of matched pairs of choice schools and regular public schools. All charter, magnet, and private schools in the NWEA were invited to participate in the study. Traditional public schools were matched to schools of choice based upon grade range, racial-ethnic and socioeconomic composition, initial achievement scores, and proximity. The final sample includes 115 charter schools, 33 magnet schools, 17 private schools, and 118 traditional public schools. Within these 283 schools our analyses focus on a student sample of over 22,000 students across all grade levels.

Student achievement data come from the NWEA assessments in reading, language usage, and mathematics and also includes student demographic characteristics. The longitudinal nature of the achievement data allow for analyzing both achievement status and growth.

**Intervention/Program/Practice:**

*Specific description of the intervention, including what it was, how it was administered, and its duration.*

Charter, magnet, and private schools and traditional public schools; instructional innovation practices and behaviors measured by the teacher and principal surveys.

**Research Design:**

*Description of research design (e.g., qualitative case study, quasi-experimental design, secondary analysis, analytic essay, randomized field trial).*

Statistical Survey, Quasi-experimental, Statistical Modeling

**Data Collection and Analysis:**

*Description of plan for collecting and analyzing data, including description of data.*

Analyzing the effects of school choice requires accounting for problems of self-selection into choice schools (Hoxby & Murarka, 2008). Schools of choice may serve different types of students as families and students can self-select into them. Although our data do not permit analyses based on a randomized design (e.g., winners and losers of school lotteries), we have large enough samples and a number of observable characteristics to implement quasi-experimental designs relying on propensity score matching. We matched choice schools with regular public schools using several observables in administrative data before administering surveys. In addition, we examine how the in-school conditions in the different school types mediate the effects of school type on students' achievement growth.

We estimate a series of three-level, hierarchical linear models to estimate achievement growth nested within students, teachers, and schools (Raudenbush and Bryk, 2002; Singer and Willett, 2003). At level 1, student achievement (whether reading, language usage, or mathematics) is represented by an individual growth trajectory:

$$\Delta Achievement_{ikj} = \pi_{0kj} + \pi_{1kj}(\text{Student Characteristics})_{ikj} + \varepsilon_{ikj}$$

where  $\Delta Achievement_{ikj}$  is the observed achievement gains of student  $i$  between the fall and spring administrations in teacher  $k$  in school  $j$ ;  $\pi_{0kj}$  is the mean gain in achievement across students within teacher  $k$  and school  $j$ , conditioned on student background characteristics (i.e., race-ethnicity, gender, free/reduced lunch status, and grade level). We will assume a simple error structure for  $\varepsilon_{ikj}$ , i.e., that it is independently and normally distributed with a mean of 0 and constant variance.

We assume that the average achievement gains vary across teachers, represented by the following level-2 equations:

$$\pi_{0j} = \beta_{00kj} + \beta_{01kj}(\text{Teacher Demographics and Qualifications})_{ikj} + \beta_{02kj}(\text{Instructional innovations})_{ikj} + r_{0ikj}$$

where  $\beta_{00kj}$  represents the mean achievement gain in teachers or classrooms within school  $j$ . Teachers' characteristics include race-ethnicity, gender, years of experience, and highest degree earned). Instructional innovations include measures of differing practices from other schools, non-traditional curricular practices, and collaborative and investigative curricular practices.

In addition, we assume that the teacher or classroom gains in achievement vary across schools, represented by the following level-3 equations:

$$\beta_{00kj} = \gamma_{000} + \gamma_{001}(\text{School Type})_{kj} + \gamma_{002}(\text{School organizational innovations})_{kj} + \gamma_{003}(\text{Other school-level characteristics})_{kj} + u_{00j},$$

where  $\gamma_{000}$  represents the mean achievement gain across schools. School type consists of dummy measures for charter, magnet, private compared with the matched traditional public schools. School organizational innovations include measures of added school requirements, structuring of teacher communities, and extended learning time. Other school characteristics include school demographics and other measures of school context.

### **Findings/Results:**

*Description of main findings with specific details.*

Preliminary results indicate there are some innovations that differ across school types. For example, compared with traditional public schools, teachers in private, magnet, and charter schools were more likely to report that their curriculum and teacher methods differed from other schools in their area. In addition, teachers in charter and magnet schools were more likely to rely on instruction that engaged students in collaborative and investigative curriculum practices compared with teachers in traditional public schools. Principals in charter and private schools were more likely to report that their schools added additional requirements than their counterparts in traditional public schools. Moreover, charter school principals reported that they used strategies to structure teacher learning communities more than principals in traditional public schools.

Some of these observed differences among school types were related to student achievement gains. Compared with traditional public schools in models with grade level dummies only, achievement gains in mathematics, reading, and language use were larger in charter schools, with no differences for private or magnet schools. Including the innovation measures reduced the positive charter school estimate to non significance in the math and reading models, but not in language. In addition, the measure for added school requirements was positive and significant in mathematics. The extended learning time scale had positive associations in the reading and language use models.

**Conclusions:**

*Description of conclusions and recommendations of author(s) based on findings and over study. (To support the theme of 2009 conference, authors are asked to describe how their conclusions and recommendations might inform one or more of the above noted decisions—curriculum, teaching and teaching quality, school organization, and education policy.)*

Our findings reveal some innovative practices differ across school types, and some relationships of our innovation measures to student achievement gains. Charter schools tend to add school requirements such as requiring parent involvement and parents signing off on homework than traditional public schools. The measure for added school requirements not only differed significantly between charter and traditional public schools, but it was also associated with greater mathematics achievement gains. This finding suggests that research examining specific innovative practices of schools provides a promising avenue to understand differences among school types, whether charter, magnet, private, or traditional public schools.

**Appendixes**  
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**Appendix A. References**

*References are to be in APA format. (See APA style examples at the end of the document.)*

- Bidwell, C. E., & Kasarda, J. D. (1980). Conceptualizing and measuring the effects of school and schooling. *American Journal of Education*, 88: 401-430.
- Chubb, J., & Moe, T. (1990). *Politics markets & America's schools*. Washington, DC: Brookings
- DiMaggio, P.J., & Powell, W.W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review* 48(2), 147-160.
- Gill, B. P., Timpane, P. M., Ross, K. E., Brewer, D. J., & Booker, K. (2007). *Rhetoric versus reality: What we know and what we need to know about vouchers and charter schools*. Santa Monica, CA: RAND.
- Hambleton, R. K. (1989). Principles and selected applications of Item Response Theory. In R. L. Linn (Ed.), *Educational measurement, 3rd edition* (pp. 147-200). New York: American Council on Education, Macmillan Publishing Company.
- Hausman, C., & Goldring, E. B. (2001). Teachers' ratings of effective principal leadership: A comparison of magnet and nonmagnet schools. *Journal of School Leadership*, 11, 399-423.
- Hoxby, C. M., & Murarka, S. (2008). Methods of assessing achievement of students in charter schools. In M. Berends, M. Springer & H. J. Walberg (Eds.), *Charter school outcomes* (pp. 7-37). Mahweh, NJ: Lawrence Erlbaum Associates/Taylor & Francis Group.
- Ingebo, G. (1997). *Probability in the measure of achievement*. Chicago: MESA Press.
- Kingsbury, G. G. (2003). *A long-term study of the stability of item parameter estimates*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.
- Lord, F. M. (1980). *Applications of Item Response Theory to practical testing problems*. Hillsdale, NJ: Erlbaum.
- Lubienski, C. (2003). Innovation in education markets: Theory and evidence on the impact of competition and choice in charter schools. *American Educational Research Journal*, 40(2), 395-443.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology* 83: 340-363.

- Northwest Evaluation Association. (2002). *RIT Scale Norm*. Portland, OR: Author.
- Northwest Evaluation Association. (2003). *Technical Manual*. Portland, OR: Author.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical Linear Models: Applications and data analysis methods*. Thousand Oaks, CA: Sage Publications.
- Singer, J.D. & Willett, J.B. (2003). *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Oxford University Press.
- Walberg, H. J. (Forthcoming). *How students learn and what to do about it*. Stanford, CA: Hoover Institution Press.
- Walberg, H. J., & Bast, J. L. (2003). *Education and capitalism: How overcoming our fear of markets and economics can improve America's schools*. Stanford, CA: Hoover Institution Press.



**Appendix B. Tables and Figures**  
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Table 1

Achievement Growth Per Month in Math, Reading, and Language Usage

Effect	Math		Reading		Language Usage	
	Estimate	Error	Estimate	Error	Estimate	Error
Differing practices from other schools	-0.046	0.047	0.003	0.014	-0.003	0.015
Non-traditional curricular practices	0.023	0.046	-0.019	0.044	0.031	0.047
Collaborative & investigative curricular practices	-0.046	0.048	0.026	0.046	-0.020	0.049
Added school requirements	0.261	0.046**	0.133	0.120	0.183	0.129
Structuring of teacher communities	-0.018	0.130	-0.079	0.120	-0.071	0.132
Extended learning time	0.088	0.117	0.189	0.109*	0.314	0.114***
Charter	-0.014	0.089	0.095	0.082	0.194	0.052*
Magnet	-0.111	0.076	-0.122	0.071	0.026	0.082
Private	-0.097	0.118	-0.180	0.110	-0.198	0.105*
N	28,524		28,020		22,027	

\*p<.10 \*\*p<0.05 \*\*\*p<.01

Note: All models include level 1 controls for student race-ethnicity, English Language Learner status, special education status, free-reduced price lunch status, and grade level dummies; level 2 controls for teacher race-ethnicity, highest degree earned, gender, and years of experience; and level 3 controls for school size, percent free-reduced price lunch students, student race-ethnicity, and percent students Limited English Proficient.

## APA Reference Style Examples

### *Sample Citation: Journal Article*

Hypericum Depression Trial Study Group. (2002). Effect of Hypericum perforatum (St John's Wort) in major depressive disorder: A randomized controlled trial. *JAMA*, 287, 1807–1814.

### *Sample Citation: Newsletter/Newspaper Article*

Brown, L. S. (1993, Spring). My research with oranges. *The Psychology Department Newsletter*, 3, 2.

### *Sample Citation: Book*

American Psychiatric Association. (1990). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

Booth, W. C., Colomb, G. G., & Williams, J. M. (1995). *The craft of research*. Chicago: University of Chicago Press.

### *Sample Citation: Chapter or Section in a Book*

Stephan, W. G. (1985). Intergroup relations. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (3rd ed., Vol. 2, pp. 599–658). New York: Random House.

### *Sample Citation: Web Page*

Dewey, R. A. (2004). *APA Style Resources by Russ Dewey*. Retrieved September 8, 2004, from <http://www.psywww.com/resource/apacrib.htm>