Research in Our Schools

Duke University | School Research Partnership Office

Research Studies 2008-2009

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Introduction

Overview:

The Duke University School Research Partnership Office (SRP Office) facilitates collaboration between Duke researchers and area school districts to create and maintain mutually beneficial relationships.

The SRP Office strives to serve as a portal between Duke and area school districts and to assist researchers in getting their studies placed in local schools. This function streamlines processes to maximize the benefits of the research conducted for school districts, schools, students and Duke researchers. Researchers include faculty and students from Duke University, Duke University Medical Center and other organizations collaborating with Duke on specific research projects.

Some of the services of the SRP Office:

- Facilitate the planning and placement of school-based research projects.
- Promote research collaborations between schools and Duke researchers by awarding grants and fellowships to faculty and graduate students.
- Disseminate research findings via an annual research conference, annual research summaries and other print or online publications.

Services for Duke researchers:

- Provide information about research protocols for area public schools (and nonpublic and other schools with which the SRP Office works).
- Consult on the best way to present research projects to schools to maximize mutual benefit for the researcher and the school and to increase the likelihood that the proposal will be supported.
- Provide assistance with proposal submissions to area school districts.
- Assist researchers in identifying schools in which to place their studies after a proposal has been approved by the school system.

Services for school districts:

- Oversee the annual Duke University School Research Fellowship grant to address priorities and research questions of schools.
- Hold an annual half-day research conference to present and discuss research findings of interest to school representatives and Duke researchers.
- Provide school districts with an annual summary of research projects and findings.
- Identify experts among Duke faculty and researchers to provide consultation to schools and school districts, upon request.
- Disseminate research findings via print and online publications.

History:

The Duke University School Research Partnership Office (SRP Office) was established in 2006 with support from the Office of the Provost and the Center for Child and Family Policy.

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I. Developing and Evaluating Programs to Enhance Student Performance

The AAKOMA Project

Dr. Alfiee M. Breland-Noble, director of The AAKOMA (African American Knowledge Optimized for Mindfully-Healthy Adolescents) Project study team, is conducting a *community-engaged* study for the improvement of mental health treatment engagement by depressed African-American adolescents and families. The aims of the research study include: (1) developing an in-depth understanding of African-Americans' perceptions of barriers to engagement in psychiatric treatment and research via focus groups; (2) developing and piloting test materials for training clinicians to conduct a new intervention, *Improving Readiness to Change for African American Adolescents and Families;* and (3) conducting a pilot trial of *Improving Readiness to Change for African-American Adolescents and Families.*

Study families were recruited via a network of community partners including our senior community liaison, H. Kathy Poole, and with encouragement from Eunice Sanders, Executive Director of Durham Public Schools (DPS) Student Services. With extensive community and DPS support, the study team completed phase 1 in March 2009. Overall, The AAKOMA Project team recruited 130 individuals and enrolled 33 African-American adolescents (age 11-17) and 24 adults. Adolescent participants included individuals who demonstrated signs of depression, had already received a clinical diagnosis from a licensed professional, or were at risk for depression. The parents of these adolescents, as well as other individuals who came into contact with them (e.g., school mental health professionals, clergy, school administrators, etc.), also were recruited for the project.

We completed separate adult and youth focus groups and stratified the youth by age (i.e., younger adolescents vs. older adolescents). Subsequent to the completion of the focus groups, we conducted confirmatory follow-up interviews with randomly selected individuals to gain additional information and to validate the information obtained in the focus groups. The data generated in this phase of the study has provided the foundation for our development of a manualized intervention protocol designed to increase the numbers of African-American adolescents and families who utilize mental health treatment.

Positive outcomes for DPS families related to the first phase of the study include:

1. The development of a resource sheet listing culturally competent mental health clinicians in the Triangle.
2. Ongoing seminars held in local schools, churches and community centers attended by DPS and other local families.
3. Local media appearances in which AAKOMA team members and community volunteers have shared information regarding recognizing the signs and symptoms of adolescent depression.
4. Dr. Breland-Noble and the project team's serving as a resource for DPS families by making referrals to local mental health clinicians.
5. The development of adult and youth advisory boards including students and staff from DPS.

Special thanks are extended to The AAKOMA Project core team: **Michelle Roley, Antoinette Burriss, Dr. Otima Doyle, H. Kathy Poole, The AAKOMA Project adult and youth advisory boards and the many families and individuals who have openly supported this work. Dr. Breland-Noble is funded by awards from the National Institute of Mental Health (NIMH) and National Center for Minority Health and Health Disparities (NCMHD).**

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Project AIM (Adult Identity Mentoring)

Project AIM (Adult Identity Mentoring), developed by Leslie Clark and colleagues (Clark et al., 2005), is a brief, evidence-based, culturally-sensitive, structured intervention to help middle school students avoid risky behaviors by focusing on positive academic, personal and career aspirations. This intervention works by helping students to elaborate their personal goals and to obtain the skills they need to reach those goals. Students discover for themselves that some behaviors, such as substance use, are incompatible with their goals, while others, such as attending school and putting effort into their classes, will help them attain their goals.

The AIM curriculum involves 12 45-minute sessions, typically delivered twice per week, and is fully flexible in how it is delivered: it can be delivered via classroom activities that can be seamlessly integrated into a health, vocation-oriented, CIS, AVID, other elective, or additional class curriculum or in an after-school or community setting. It involves student participation, role-playing and discussion and, thus, is active and fun, as well as a valuable, skills-based learning experience for students.

Duke University's Transdisciplinary Prevention Research Center (TPRC) has been studying the effectiveness of Project AIM for reducing risky behaviors (particularly alcohol and substance use), enhancing students' academic achievement and preventing school dropout. Our evaluations indicate that middle school students exposed to AIM show a range of benefits, including significant reductions in risky behaviors and a stronger orientation toward academic achievement.

Project AIM will be implemented in four local middle schools with approximately 600 sixth graders during 2009.

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Promoting Positive Youth Development: A Comprehensive After-School Program for Middle School Youth at Risk of Dropping Out

A public middle school in North Carolina collaborated with its two feeder high schools, as well as with parents and other community resources, to provide a comprehensive after-school program that has "rigor, relevance and relationships" to students who are reluctant learners. The main goal was to increase positive behaviors of students, such as academic achievement, career identification, making positive choices, addressing peer pressure and developing concrete steps for future higher education and career planning.

Specific objectives for this initiative were based on factors in middle school students' lives that have proved to be most highly correlated with high school educational attainment: pro-social behavior and academic achievement.

These objectives fall into six categories:

1) rigorous academic preparation;
2) reduction in risky behaviors;
3) increased pro-social skills development in the form of goal-setting, communicating with peers, identifying potential pitfalls and consequences of unhealthy decisions, and clearer career identification;
4) recreation and physical activity opportunities;
5) collaboration with high schools, universities and local community members; and
6) increased parental involvement.

The after-school program activities were based on these objectives.

One hundred twenty sixth- through eighth- grade middle school students participated in this initiative. They have the following characteristics: scored a 1, 2 or low 3 on end-of-grade reading and math exams; a history of suspensions and discipline referrals; a history of grade retention; and parents who gave permission for participation in the after-school program. Twenty high school students, approximately 10 from each high school, were identified as High School Peer Mentors for inclusion in this initiative; the mentors have the following characteristics: a GPA of 2.5 or higher; considered by their teachers and other school staff members as being good role models for middle school youth; and interested in being tutors, mentors and leaders.

Preliminary results indicate that high school mentors were key to the improved academic achievement and positive future orientation of the middle school students. Results also show that there are many ways to involve parents, older students, feeder high schools, local universities and communities for the purpose of helping middle school students positively transition to high school and ultimately graduate from high school.

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From Pictures to Words: Pre-reading Children's Print Exposure during Shared Reading

Reading to young children is "the single most important activity for building the knowledge required for eventual success in reading" (Anderson et al., 2003). Until recently, the common belief is that shared book reading increases children's print exposure, which then translates into a larger sight vocabulary. We tested this hypothesis by monitoring young children's eye gaze during shared storybook reading.

We invited 4- to 6-year-old children to our lab, where a research assistant read several typical picture books with them. Children's eye movements were monitored by a video camera. We also varied the reading style – verbatim or dialogical. In addition, children's emergent literacy skills and reading skills were assessed.

First, we found that pre-reading children spent less than 10 percent of the time looking at print words (which occupied over 20 percent of the pages). There was no systematic relationship between what they heard and which word they looked at. In other words, there is virtually no opportunity for print exposure. Second, a sight vocabulary may be a cause, rather than an effect, of print-bound visual attention. Children in our sample who knew a few words (but far from being able to read) paid significantly more attention to print. These children are more likely to benefit from print exposure during shared book reading.

Our findings show that young children are actively trying to make sense of the storybook. Pre-readers naturally focus on illustrations, but emerging readers begin to visually explore texts. For pre-K and K teachers, our data suggest that pre-readers can be very engaged during shared book reading but still pay no attention to print words. Proactive strategies such as asking print-related questions may help to focus their attention to texts.

We are looking to replicate and expand this study and, particularly, to investigate the potential causal role of the sight vocabulary. If confirmed, this would suggest that building an initial sight vocabulary may be important for children to benefit from shared storybook reading in class and at home.

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A Randomized Trial of Two Promising Computer-Based Interventions for Students with Attention Difficulties

Although attention difficulties have been shown to compromise students' academic achievement in multiple studies, research examining whether attention is a skill that can be improved with training is limited. The present study was a randomized-controlled trial at five Durham elementary schools to evaluate the impact of two computer-based interventions – Computerized Attention Training (CAT) and Computer Assisted Instruction (CAI) – on attention and academic achievement in 77 first graders identified by their teachers as highly inattentive.

Students receiving either intervention were more likely than controls to show a moderate decline in teacher-rated attention problems during first grade, and students receiving CAI also showed gains in reading fluency and teacher ratings of their academic skills and productivity. Intervention effects on WJ-III academic achievement were not evident. Differences between intervention and control participants had dissipated midway through second grade largely because attention problems declined among control participants. Attention difficulties were associated with lower reading achievement in first but not second grade; the opposite pattern was suggested for math. Attention problems that persisted into second grade were associated with compromised academic performance in multiple domains. Overall, results point to the ongoing need to develop more effective methods to help students with persistent attention problems perform better in school.

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The North Carolina Child and Family Support Team Initiative

The North Carolina Child and Family Support Team (CFST) initiative, developed by former Governor Mike Easley, was designed to improve academic performance in 100 school districts that have large populations of at-risk students. The initiative, begun in 2006, allocated funds to create 100 teams made up of licensed school social workers and licensed school nurses to work with parents using a child-and-family team model. Seven of those schools are in Durham County.

The development of the model was influenced by Durham's efforts to create a system of care for all children. The theory is that these CFST nurses and social workers, who are being hired in addition to existing nurses and social workers, will use child-and-family teams to engage with the highest risk families to help those families access the services they need to help their children succeed.

The Center for Child and Family Policy at Duke University is evaluating the CFST program. The evaluation will use the North Carolina Education Research Data Center (NCERDC); information from a Web-based case management system that tracks individual student referrals, parent contacts, case plans, team meetings and intervention outcomes; and responses to school, agency, parent and student surveys conducted once a year. The case management system not only has information on each child served by the program, but also contains rich systematic information on parent engagement, as well as detailed information on child-and-family team meetings, service planning, barriers to service and intervention outcomes.

The results of the evaluation will be made available to state and local leaders. We believe that this information will help local and state leaders work together to improve outcomes for all children in our public schools.

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The Kindergarten Home Visit Project: A Kindergarten Transition Intervention Study

This study examined the effect of the Kindergarten Home Visit Project, a novel universal intervention program designed to enhance the transition to kindergarten for children and families by providing teachers with the training and support they need to conduct a home visit for each of their students at the beginning of the school year. Forty-four kindergarten teachers from 19 schools and 928 children and their families participated in the project. Teachers were blocked within schools and randomly assigned to intervention or control conditions. Intervention teachers successfully completed home visits for 98 percent of their students.

After controlling for child and teacher demographic factors, multilevel modeling with children nested within classrooms and schools revealed that random assignment to receive a home visit had a significant positive impact on classroom work habits by students and teacher-child relationship warmth at the end of kindergarten. Assignment to home visiting was also associated with positive child outcomes for girls, specifically including: higher academic achievement, academic motivation, work habits, social skills and better conduct. Impact on boys was non-significant. The effect of home visiting on child outcomes was mediated by an intervening effect on academic motivation for girls during the fall. Positive effects of assignment to intervention were also demonstrated for children from non-English-speaking homes. These children demonstrated higher academic motivation and better work habits. In addition, both non-English-speaking parents and their teachers reported reduced adverse effects of language barriers on home-school collaboration. The intervention was also found to have a positive effect on teacher attitudes and beliefs. Teachers who conducted home visits reported an increased understanding of the diverse needs and cultural differences of families, a greater willingness to reach out to parents and a more positive connection to students and their families. These findings suggest that home visiting is beneficial to teachers, students and families and that home visiting should be continued and expanded as a kindergarten transition practice in the schools.

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Organization Time Management and Planning Study for Children with ADHD

The purpose of this study is to evaluate and compare treatment programs for children with ADHD who have problems with organizational skills. Both treatments include 20 clinic sessions involving parents and children over a 12-week period, for which families are compensated. Teacher consultation is provided to encourage implementation of organizational strategies and systems at school. All children who participate receive treatment, although 20 percent serve as wait-list controls for two to three months before starting. We will evaluate the effects of the treatments on students' academic performance, homework behaviors, attitude toward school, and family relationships at the end of treatment and at one- and six-month follow-ups.

Children in grades three through five who meet study criteria for ADHD and have organizational difficulties at school or home are eligible to participate. Children do not need to be previously diagnosed and may be medicated or not. Teacher participation is required for the child to participate.

We are completing our third year of a five-year NIMH award (through 2010) and plan to recruit approximately 25 more students across area districts next year. We have approval to conduct this study in Durham Public Schools, and have worked with 21 students from this district to date.

This study provides direct services to children with academic performance problems and their teachers. Results may help to increase the number of treatment options available for young children with ADHD.

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II. Teacher Characteristics, Retention and Professional Development

Are Teacher Absences Worth Worrying About in the U.S.?

Using detailed data from North Carolina, we examine the frequency, incidence and consequences of teacher absences in public schools, as well as the impact of an absence disincentive policy. The incidence of teacher absences is regressive: schools in the poorest quartile averaged almost one extra sick day per teacher than schools in the highest income quartile, and schools with persistently high rates of teacher absence were much more likely to serve low-income than high-income students. In regression models incorporating teacher fixed effects, absences are associated with lower student achievement in elementary grades. Finally, we present evidence that the demand for discretionary absences is price-elastic. Our estimates suggest that a policy intervention that simultaneously raised teacher base salaries and broadened financial penalties for absences could both raise teachers' expected income and lower districts' expected costs.

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Teacher Mobility – Enemy of Equity?

Previous studies have documented (using a variety of indicators) that the teachers assigned to schools enrolling low-income students are, on average, less well-qualified than those teachers assigned to more affluent schools. This study explores the role of teacher mobility in contributing to this persistent dimension of inequality.

Using detailed administrative data from the North Carolina Education Research Data Center (NCERDC), the study examines patterns of teacher mobility and attrition in North Carolina, noting the effect of mobility both within and across school districts. It presents a competing-risk model of teacher movement designed to assess the influences of teacher characteristics, district teaching salaries, nonteaching salaries, nonpecuniary aspects of schools and several policies designed to encourage teachers to work in hard-to-staff schools.

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The Professional Development Initiative to Help North Carolina Enhance its System of Professional Development for PreK-12 Teachers

In late 2003, with the support of the North Carolina Education Cabinet, the Z. Smith Reynolds Foundation launched the Professional Development Initiative (PDI) to help the state enhance its system of professional development for preK-12 teachers. The effort supplemented previous work on professional development in North Carolina and beyond with new research and additional stakeholder input.

The Professional Development Initiative's implementation work group developed a *Proposal for Action* that outlined specific components of an enhanced professional development system and strategies for implementing those components. The *Proposal for Action* is available at <www.pubpol.duke.edu/centers/child/publications/reports/PDI-Proposal%20for%20Action.pdf>.

The cornerstone of the PDI was the creation of an online resource center for professional development, North Carolina's first online directory of professional development providers and opportunities for preK-12 teachers. It is available at <www.learnnc.org/pddir/>.

The initiative also produced a "funding map" of sources and uses of funds for professional development. This effort revealed that (in 2002-2003) North Carolina school districts and charter schools spent nearly $66.5 million dollars in local, state and federal funds on professional development activities. By highlighting these expenditures, the goal was to increase policymakers' and other stakeholders' understanding of the extent and sources of funds for professional development, and to encourage greater emphasis on the quality of professional development offerings and data collection about the offerings.

The PDI was instrumental in drafting and getting passed legislation establishing the Department of Public Instruction's Office of Professional Development.

The Z. Smith Reynold's Foundation's formal involvement with the PDI concluded at the end of 2008. The Center for Child and Family Policy and LEARN-NC continue to work on expanding and institutionalizing the online resource center in conjunction with the N.C. Department of Public Instruction.

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Internationalizing Teacher Education at Duke University: A Case Study

This pilot study was conducted in direct response to the changing demographics of public school classrooms and the need to prepare culturally competent teachers. The study examined how student teachers perceive other cultures and cultural differences, how beliefs and attitudes about other cultures change over the course of the student teaching internship, and what interventions are effective in promoting intercultural competency.

In fall 2006, 14 Duke undergraduate student teachers responded to presurvey questions regarding their perceptions about other cultures and completed the Intercultural Development Inventory (IDI). Following the administration of the inventory and questionnaire, participants received instruction in intercultural competency skills and participated in an immersion experience.

During spring 2007, the student teachers focused on the practical application of intercultural competency skills in public school classrooms in collaboration with their mentors in the Durham Public Schools. During the last week of class, the teachers took the IDI again and answered post-survey questions.

Based on multiple measures of intercultural competence, an Intercultural Competence Score (ICC) (Deardorff and Deardorff, 2007) was calculated for each student teacher. In addition, a group IDI profile was generated. As a group, the scores reflected overall growth in intercultural competence, with individual profile scores revealing mixed results.

Implications of the research will include dissemination of recommended strategies to school systems in an effort to promote intercultural competency skills of beginning and experienced educators.

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Beginning Teacher Retention

This research study reports on factors related to beginning teacher retention and attrition. First- and second-year teachers were surveyed about their satisfaction with mentoring, school climate and principal leadership and the relationship of these areas to anticipated career plans.

Findings indicate that principal leadership and climate were related to teachers' decisions to remain in the profession, in the district and at the school. We also examined a number of other characteristics and retention outcomes. Age was significantly related to intentions to stay in education, with older teachers being less likely to consider leaving the school district and school site than younger teachers. However, first-year teachers were more likely to report their intentions to remain in the school district and at their school site than second-year teachers were. In regression models, school climate and, in particular, perception that school is a safe and trusting environment, emerged as the strongest retention predictor. We also found that the majority of beginning teachers in the study had already considered leaving the profession. Notably, salary was the most frequently indicated cause for beginning teachers' wanting to exit the field.

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III. School Environment

School Nutrition and Activity Promotion among Durham Public Schools Employees

The purpose of this study is to gain a greater understanding of the current health status of Durham Public Schools (DPS) employees and learn about the desired characteristics of a workplace wellness program for school employees.

In partnership with DPS and the Durham County Health Department, we conducted a survey with both open-ended and forced rank questions among 26 members of the DPS Teacher Advisory Council (TAC). TAC members were asked to comment on questions related to how a wellness program would be received and to rank what they thought would be most popular among teachers in their school.

Subsequently, employees (n=1,379) from 53 different DPS worksites were given an anonymous survey conducted via e-mail. The survey asked participants to report their height and weight and to complete standardized self-report measures of fruit and vegetable intake, fat intake and physical activity. In addition, questions were included to assess employees' perception about how supportive their organizational and physical environments were toward adoption of healthy eating and physical activity.

The TAC survey found strong support for on-site classes held after school to help employees wishing to improve diet or physical activity, a "buddy system" with other teachers/employees to support healthy lifestyles, health education materials (e.g., exercise videos, healthy eating tips), and stronger administrative support. An aspect of friendly competition, tangible incentives (e.g., gift certificates, gym discounts, rewards for reaching goals, etc.), and support via e-mail messages were suggested as ways to increase participation.

In the employee survey, DPS employees reported lower levels of daily servings of fruits and vegetables, and 11 percent of employees reported getting more than 35 percent of calories from fat. Only 45 percent consumed less than 30 percent of calories from fat, a recommended level for a low-fat diet. Using the IPAQ to assess leisure time physical activity, about 47 percent reported achieving a high level sufficient for promotion of health.

Participants' perceptions of their work environment in terms of support of physical activity or healthy dietary practices showed that more than 80 percent

reported the following: no fitness facilities for employees, leaving campus during lunch for short walks cannot be easily accomplished, their workplace is not within walking or bicycling distance to home, their workplace does not encourage regular physical activity, their workplace does not provide information or resources encouraging physical activity, their workplace is not within walking distance of healthy restaurants/grocery stores, nutritional value of meals served at their workplace is not provided or accessible, and their workplace does not have nutrition or exercise classes available for employees. Approximately 77 percent reported that there is a limited variety of healthy meal options for employees at their worksite, and 72 percent reported that there are so many food options at work that it is difficult to limit intake of unhealthy foods.

These responses indicate that employees perceive their work environment to have many barriers that make it difficult to be active and maintain a healthy weight. They also suggest interventions are needed and that there is room for improving the workplace environment. Our group is involved with DPS employees in planning an intervention pilot study to help improve physical activity and diet.

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IV. Race, Ethnicity and Culture

The Academic Achievement Gap in Grades 3 to 8

Using data from North Carolina public school students in grades three to eight, we examine achievement gaps between white students and students from other racial and ethnic groups. We focus on successive cohorts of students who stay in the state's public schools for all six years, and study both differences in means and in quantiles. Our results on achievement gaps between black and white students are consistent with those from other longitudinal studies: the gaps are sizable, are robust to controls for measures of socioeconomic status and show no monotonic trend between third and eighth grade. In contrast, both Hispanic and Asian students tend to gain on whites as they progress through these grades. Looking beyond simple mean differences, we find that the racial gaps in math between low-performing students have tended to shrink as students progress through school, while racial gaps between high-performing students have widened for black and American Indian students.

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School Segregation under Color-blind Jurisprudence: The Case of North Carolina

Using detailed administrative data for the public K-12 schools in North Carolina (from the North Carolina Education Research Data Center), we measure racial segregation in the public schools of North Carolina. With data for the 2005-2006 school year, we update previously published calculations that measure segregation in terms of unevenness in racial enrollment patterns both between schools and within schools.

We find that classroom segregation generally increased between 2000-2001 and 2005-2006, continuing, albeit at a slightly slower rate, the trend of increases we observed over the preceding six years. Segregation increased sharply in Charlotte-Mecklenburg, which introduced a new choice plan in 2002. Over the same period, racial and economic disparities in teacher quality widened in that district. Finally, we compare our basic measure to two alternative measures of segregation.

Investigators: **Charles T. Clotfelter, Ph.D.; Helen F. Ladd, Ph.D.; and Jacob L. Vigdor, Ph.D., Terry Sanford Institute of Public Policy**

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Parent Behavior and Child Adjustment Across Cultures

The purpose of this study is to understand how parents' discipline strategies and other parenting practices, attitudes and beliefs affect children's development within diverse cultural contexts. The research being conducted in Durham is part of a larger study being conducted in nine countries (China, Columbia, Italy, Kenya, Jordan, the Philippines, Sweden, Thailand and the United States). We have recruited more than 300 children (average age = 8 years) and their mothers and fathers (whenever possible) from Durham, N.C., primarily through Durham Public Schools. The sample equally represents girls and boys and African-American, European-American, and Hispanic students. We have interviewed children, mothers and fathers separately in their homes using a team of at least two interviewers conducting the separate interviews simultaneously. Each interview takes between 1 ½ and two hours. We will soon begin contacting families to re-interview them a year after their initial interviews to assess changes over time in parenting practices and children's adjustment. Findings from this study will advance our understanding of how parenting affects children's adjustment in diverse cultural contexts and will have the potential to influence interventions designed to prevent children's behavioral and emotional problems.

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Changing Contours of the North Carolina Public Schools: The Influence of Immigration on Enrollments of Non-Hispanic White Students

A confluence of forces is reconfiguring the student population of U.S. public schools in ways that present major policy challenges. One of these forces is the marked trend toward higher proportions of poor students in public schools; the second is the increasing flow of immigrant Hispanic families with children of school age, particularly to areas that were not traditional destinations in the past. Researchers, policymakers and the public share a belief that school composition is a major factor differentiating the quality of school experiences and learning outcomes for students. This view contributes to another important source of change in the composition of school populations: the withdrawal of white and more affluent families in reaction to perceived reallocation of educational resources toward limited-English-speakers, and a general devaluation of social capital in schools. Our study focuses on North Carolina, which between 2000 and 2006 experienced an increase of over 66 percent in the school-age population of Hispanic origin. We use longitudinal administrative data to ask: *what is the relative impact of immigration on enrollment shifts over time, within and across schools in North Carolina?*

We address three main questions:

- *Have white enrollments in N.C. public schools declined over the past 10 years in response to increasing enrollment of students of Hispanic ethnicity?* In addressing this question, we will control for population growth of each group, as well as for the prevalence of other minority groups in schools and districts.
- *Are white enrollments more responsive to changes in Hispanic enrollments by ethnicity or by immigrant status?* With this question we explore the influence of the perceived loss of school social capital and re-direction of resources toward students with limited English proficiency (LEP).
- *Are white enrollments sensitive to the level of segregation of Hispanic students among schools within districts?* Recent evidence suggests that Hispanic-white segregation in North Carolina schools has surpassed levels of black-white segregation; we explore the extent to which this trend contributes to shifting within-district enrollments.

Using cross-sectional time series data for individual schools for the period 1997-2007, we estimate exponential growth models of annual changes in white enrollments. These models take into account population growth by race and ethnicity, school segregation by race and LEP status, and other school characteristics that also may exert influence on enrollments over time.

Investigators: **Clara G. Muschkin, Ph.D., Center for Child and Family Policy; Audrey N. Beck, Ph.D., Princeton University**

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V. Educational Policy Influences on Student Outcomes

Would Higher Salaries Keep Teachers in High-Poverty Schools? Evidence from a Policy Intervention in North Carolina

For a three-year time period beginning in 2001, North Carolina awarded an annual bonus of $1,800 to certified math, science and special education teachers working in public secondary schools with either high poverty rates or low test scores. Using longitudinal data on teachers, we estimate hazard models that identify the impact of this differential pay by comparing turnover patterns before and after the program's implementation, across eligible and ineligible categories of teachers, and across eligible and barely-ineligible schools. Results suggest that this bonus payment was sufficient to reduce mean turnover rates of the targeted teachers by 17 percent. Experienced teachers exhibited the strongest response to the program. Finally, the effect of the program may have been at least partly undermined by the state's failure to fully educate teachers regarding the eligibility criteria. Our estimates most likely underpredict the potential outcome of a program of permanent salary differentials operating under complete information.

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