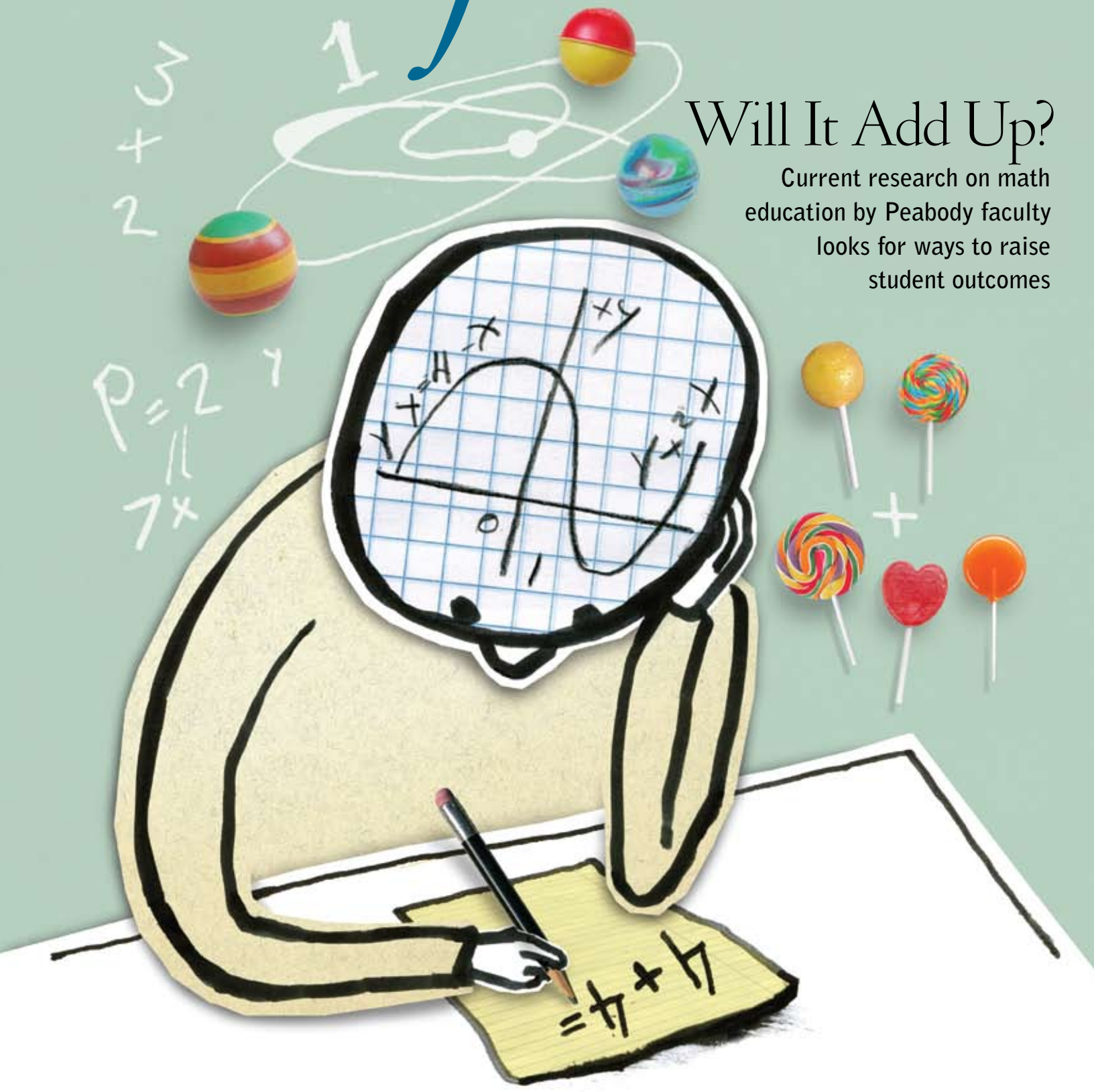
PEABODY

reflector

Will It Add Up?

Current research on math education by Peabody faculty looks for ways to raise student outcomes



The Peabody Journal of Education

DANIEL DUBOIS

The Peabody Journal of Education (PJE), America's second longest running publication devoted exclusively to educational research, practice and policy, is committed to providing information and reasoned opinion that will enhance understanding and practice among institutions and individuals concerned with human learning and development.

PJE publishes quarterly issues on topics related to formal institutions catering to the students in early childhood, preschool, primary, secondary, post-secondary and tertiary education.

Interests include education matters of both a domestic and an international nature including those that are linked to the social and organizational contexts in which formal and informal education takes place.

Recent issue topics have included:

International Education
Single Best Idea for Improving K-12 Education
Policy, Politics and Organization of School Choice
Media, Democracy and the Politics of Education

Print & Online Subscription Rates

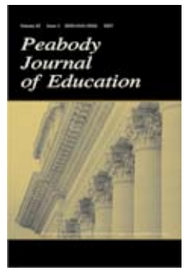
Institutional - $462
Personal - $58

For more information and to subscribe,
visit us online at *http://peabody.vanderbilt.edu/pje.xml*

VANDERBILT UNIVERSITY Peabody College

"For over one hundred years, the Peabody Journal of Education *has served the public by supplying cutting edge research and policy analysis on all issues of education."*

JAMES GUTHRIE
Editor



Visit Peabody College's Web site at
http://peabody.vanderbilt.edu/

Bonnie Arant Ertelt, Editor
Donna Pritchett, Art Director
Jenni Ohnstad, Designer
Lew Harris, Assistant Editor

Craig Boerner, Kurt Brobeck, Ashley Crownover, Lisa DuBois, Melanie Moran, Jim Patterson, Lisa Robbins, Contributors

Camilla Persson Benbow, Patricia and Rodes Hart Dean of Education and Human Development

Timothy Caboni, Associate Dean for External Relations and Professional Education

Kerry McCartney, Associate Dean for Development and Alumni Relations

On the cover: Illustration by Roger Chouinard. Read more about Peabody research on math education beginning on p. 10.

The Peabody Reflector is published biannually by Vanderbilt's Peabody College of education and human development in cooperation with the Vanderbilt Office of DAR Communications. The magazine is mailed free of charge to all Peabody alumni, parents of current Peabody students, and to friends of Peabody who make an annual gift of $25 or more to the College. Correspondence, including letters to the editor and Class Notes submissions, should be mailed to: **The Peabody Reflector**, Office of DAR Communications, VU Station B #357703, 2301 Vanderbilt Place, Nashville, TN 37235-7703 or by email to **reflector@vanderbilt.edu**.

PEABODY *reflector*

FEATURES

DEPARTMENTS


DAN LOFTIN

On March 13, the National Mathematics Advisory Panel released its final report on mathematics education in U.S. pre-K–12 schools. As vice chair of the panel, I was pleased to wrap up a two-year odyssey that revealed a range of issues surrounding the teaching and learning of this critical discipline. You can explore the panel's report in detail on the Web at: *www.ed.gov/about/bdscomm/list/mathpanel/index.html*.

Much ink has been spilled in recent years about the challenges to America's primacy in science, technology, engineering and mathematics (STEM), with cause. The success or failure of math education in the U.S. does indeed have implications for our global competitiveness and the sustainability of the workforce. There is a strong correlation between taking coursework in higher mathematics and college access, graduation and future earnings. Algebra, in particular, serves as the "gateway to later achievement." As we think about how to improve math education, we need to keep students at the forefront of the discussion.

A genuine commitment to learners must ensure that all students receive the needed preparation for algebra, as the panel urged, through a streamlined curriculum and clearly defined topics. We have to start early in our children's academic careers if we are to capture the benefits that come from simultaneously developing a strong conceptual understanding, fluency with procedures, and greater skill in automatically recalling math facts.

We also highlighted the importance of effort. A large part of the problem has to do with the misconception that when it comes to math, students either have talent or they do not. Parents, teachers and society at large all reinforce this myth, and it must be dismantled. When it comes to math, as with so many other things in life, effort counts.

Colleges of education, too, have critical roles to play in strengthening math education. Excellence in teaching, of course, is paramount. But, so too is research. Our panel observed a lack of empirical research about how to train, evaluate and retain effective math teachers, as well as about what works in classroom practice. We strongly recommend that the U.S. should build its capacity to conduct research that can guide education policy and classroom practices.

This issue of The Peabody Reflector examines several of the research strands in math education underway at Peabody College. Some of this work directly informed the recommendations of the National Math Panel. I am confident that Peabody is playing a leadership role in math education, as it does in everything we undertake.

As always, I am grateful for the support of Peabody alumni, parents and friends in enabling the college to bring expertise to bear on issues of such importance to our society—and to its many learners.

Camilla Benbow
Patricia and Rodes Hart Dean of Education and Human Development

Equity and Excellence

I have just read the Peabody Reflector, Fall 2007 issue. It is well done, and I give you high marks. As a three-time graduate and a former employee as bursar and vice president for administration, it is always of special interest to read what is going on.

I especially appreciated on page 20 the article "Rethinking Equity." It, of course, refers back to page 12 and 13 and to what Milner and Benbow had to say about the relationship between excellence and equity. Too long, I think, we have concentrated on excellence without equity even if they should be parallel to each other. We have defined equity too often in a setting where we concentrated only on excellence for the upper level rather than taking students from where they are to where they are capable of being.

E. Bruce Heilman, BS'51, MA'52, PhD'61
Chancellor
University of Richmond
Richmond, Va.

Parents v. Seattle

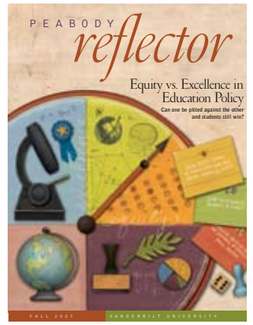
The answer Professor Carol Swain gave to the question posed in the Fall issue of the Peabody Reflector—"Is the Supreme Court Ruling in Parents v. Seattle a setback for racial diversity in schools?—is a *non sequitur*. She argues the indisputable point that we should give more attention to improving the education of minority students in segregated schools. But there is no question that the Supreme Court's decision reduces the prospects that students of different races and ethnicities will have the opportunity to learn with and from students different from themselves. As a brief filed by over 500 social scientists in the Seattle case attests, students of all races who attend racially integrated schools are advantaged both in their cognitive development and in the acquisition of the dispositions and skills they need to be successful in our increasingly diverse society.

Willis Hawley
Professor of Education and Public Policy,
University of Maryland, College Park
Dean of Peabody College 1980–1989

People First Language

I just read some of the articles in the Peabody Reflector, Fall 2007. My comment is in regard to the article on page 29. I was taken aback when I read (in the 1st paragraph) the following: "the developmentally delayed." This is not "people first" language. I encourage you to ensure in future articles that you use "people first" language when referencing "people with developmental delays." Thank you.

Eileen Van Soest, MA'72
Sioux Falls, S.D.



Issue Accolades

I just reviewed the Fall 2007 Peabody Reflector. The content was impressive and thoroughly engaging. I received an undergraduate degree in political science from VU in 1989, and I graduated with a master's degree in public policy from Peabody in 1990. I was also a standout on the Commodore football team. See my profile at: *www.RenfordReese.com*.

Keep up the good work.

Renford Reese
Associate Professor of Political Science, California Polytechnic
Pomona, Calif.

WILL & DENI MCINTYRE

Terry Grier, EdD'03, is the winner of this year's Distinguished Alumni Award given by Peabody College. Grier, most recently the superintendent of 71,000-student Guilford County, N.C., Schools, is taking the helm of the San Diego Unified School District, the second largest school district in California. Grier has garnered national attention for his work with drop-out prevention.

Zeppos becomes Vanderbilt's eighth chancellor

Nicholas S. Zeppos, was chosen March 1 as the university's eighth chancellor.

JOHN RUSSELL

The unanimous election of Zeppos, who has served as Vanderbilt's chief academic officer since 2002 and its interim chancellor since last summer, was announced following the final session of the Board of Trust's March meeting. Zeppos was chosen as chancellor after a national search.

"We were seeking a person who could manage, lead and inspire; who is committed to Vanderbilt's central missions of education, research and service; and who has a passion for excellence and success in everything that we do. We sought someone who will value and promote the life of the mind in all corners of the university, who can effectively represent Vanderbilt locally and nationally, and who can promote a culture of philanthropy to sustain Vanderbilt's growth," said Dennis C. Bottorff, chair of a nine-member search committee.

"Our search identified the person who uniquely possesses these qualities, and he is Nick Zeppos."

"We are delighted that the search committee landed on one of Vanderbilt's own to lead the university," said Camilla Benbow, Patricia and Rodes Hart Dean of Education and Human Development. "As provost, Nick Zeppos has been very supportive of Peabody's research and academic programs, as well as our outreach efforts to the education and policy-making communities. We look forward to what the future holds with Nick as Chancellor."

Since 2002, Zeppos has overseen the university's undergraduate, graduate and professional education programs as well as research in liberal arts and sciences, engineering, music, education, business, law and divinity. As provost and vice chancellor, he chaired Vanderbilt's budgeting, capital planning council and led all fundraising and alumni relations efforts across the institution and oversaw the dean of students and dean of admissions.

Zeppos joined the Vanderbilt faculty in 1987 as an assistant professor in the law school, where he was recognized with five teaching awards. He subsequently served as an associate dean and then as associate provost before being named provost and vice chancellor for academic affairs in 2002.

From 1982 to 1987, Zeppos practiced law in Washington, D.C., at the United States Department of Justice and at Wilmer, Cutler & Pickering. He has written widely on legislation, administrative law and professional responsibility and is a nationally recognized scholar in these fields. He served as chair for the Scholars Committee, advising the U.S. Senate and the American Bar Association on the confirmation of Justice Stephen Breyer, and as chair of the Rules Advisory Committee of the United States Court of Appeals for the Sixth Circuit.

Zeppos is a 1979 *magna cum laude* graduate of the University of Wisconsin Law School, where he served as editor-in-chief of the Wisconsin Law Review and was selected as the outstanding graduate of his class, and a 1976 Phi Beta Kappa graduate of the University of Wisconsin, where he studied history.

He is married to Lydia Ann Howarth, a graduate of the University of Chicago and Lawrence University, who is a writer and editor. They have two sons, Benjamin, 21, and Nicholas, 18.

"This great university has come so far, so fast," said Martha Ingram, chairman of the Board of Trust, "and the principal reason is Nick's enormous intellect, his great vision, and his tireless commitment to Vanderbilt's students, faculty, staff and alumni."

For more information: *www.vanderbilt.edu/chancellor*

STEVE GREEN

Christopher Loss, assistant professor of public policy and higher education, won an AREA award for his dissertation at their conference in March.

Two Peabody education researchers win top dissertation awards

Peabody education researcher Christopher Loss has won the American Education Research Association (AERA), Division J (Post-Secondary Education) Dissertation of the Year Award.

Loss completed the winning dissertation, "From Democracy to Diversity: The Politics of American Higher Education in the Twentieth Century," at the University of Virginia in 2007. Prior to coming to Vanderbilt in 2008, Loss was a research fellow in the Governance Studies Program at The Brookings Institution in Washington, D.C.

Loss is assistant professor of public policy and higher education at Peabody. He specializes in 20th century American history with an emphasis on the social, political and policy history of American higher education.

Marisa Cannata, a post-doctoral fellow at Peabody, was awarded the AERA, Division L (Education Policy and Politics) Outstanding Dissertation of the Year Award.

Her dissertation, "Where to Teach? Developing a More Comprehensive Framework to Understand Teacher Career Decision," was completed at Michigan State University in 2007.

Cannata is a research associate at the National Center on School Choice at Peabody and part of a National Science Foundation-funded project on new middle

school mathematics teachers' induction experiences. She focuses on issues of teacher quality, including teachers' career decisions, work experiences, professional community and hiring, and considers how teacher qualifications and work experiences vary between charter and traditional public schools.

Farran wins Heard Distinguished Professor Award

Dale Farran, whose passion is improving early childhood education with a focus on issues of poverty and disabilities and their effects on the development of young children, was named this year's winner of the Alexander Heard Distinguished Service Professor Award for a scholar whose work has and will continue to have wide influence in the solution of contemporary social problems.

STEVE GREEN

Farran

Farran, who was director of the Susan Gray School for five years, has been named Professional of the Year by the Mayor's Advisory Council on Disabilities and has coordinated and led the Tennessee Pre-K Summer Institute. In 2002 she and colleague Mark Lipsey were awarded a four-year longitudinal grant to compare the effects of pre-kindergarten curriculum models in a randomized control trial. The Preschool Curriculum Evaluation Research project (PCER) is a national evaluation of early childhood curriculum models; Vanderbilt is one of the 7 sites funded. Farran and Lipsey are also evaluating an Early Reading First program implemented in a rural county in Tennessee. In 2005 they were awarded, along with the University of California at Berkeley, a "scale up" project from the Institute of Education Sciences involving a pre-kindergarten mathematics curriculum. This curriculum is being implemented in Metro Nashville Public Schools and Metro Action Committee Head Start (see article p. 17). She was presented the Heard Award at the Spring Faculty Assembly on April 17 in the Student Life Center.

TOMMY LAWSON

Timothy Shriver, Ph.D., chairman of Special Olympics, inspired a diverse audience at the Vanderbilt Kennedy Center Community Celebration Luncheon on April 1. "Who is more transformed, a special athlete or a volunteer who discovers the competencies of an individual with a disability? It's not about them, but about us," Shriver said. The event honored three new and sixteen continuing VKC Community Partner organizations. Pictured from left to right are Pat Levitt, director of VKC; Chancellor Nick Zeppos; Elisabeth Dykens, associate director of VKC; and Shriver. Watch video of the luncheon presentation at: www.vanderbilt.edu/news/releases?id=40314

Peabody Reflector wins CASE awards

The Council for Advancement and Support of Education (CASE) recognized the **Peabody Reflector** in January during their annual District III competition. The magazine won awards in four categories:

Grand Award for Illustrations, "Teacher Bound by the Test" by Jon Krause, illustrator, Summer '07 issue.

Award of Excellence for Illustrations, "EdD Ringmaster" by Sara Tyson, illustrator, Fall '06 issue.

Special Merit Award for Improvement in Design, Jenni Ohnstad, designer, and Donna Pritchett, art director.

Special Merit Award for Magazine Improvement.

In addition, Jon Krause's cover illustration for the Summer '07 issue was featured in the 3x3 illustration directory, **Illo08.**

NEIL BRAKE

Peabody elementary education students listen to a lecture at the Peabody Library.

Kids learn more when mom is listening

Kids may roll their eyes when their mother asks them about their school day, but answering her may actually help them learn. New research reveals that children learn the solution to a problem best when they explain it to their mom.

"We knew that children learn well with their moms or with a peer, but we did not know if that was because they were getting feedback and help," Bethany Rittle-Johnson, the study's lead author and assistant professor of psychology at Peabody, said. "In this study, we just had the children's mothers listen, without providing any assistance. We've found that by simply listening, a mother helps her child learn."

Rittle-Johnson believes the new finding can help parents better assist their children with their schoolwork, even when they are not sure of the answer themselves.

"The basic idea is that it is really effective to try to get kids to explain things themselves instead of just telling them the answer," she said. "Explaining their reasoning, to a parent or perhaps to other people they know, will help them understand the problem and apply what they have learned to other situations."

The researchers found that explaining the answer to themselves and to their moms improved the children's ability to solve similar problems later, and that explaining the answer to their moms helped them solve more difficult problems.

The researchers also found that children experience the benefit of explaining a solution at an earlier age than previously thought.

"This is one of the first studies to examine whether or not explanation is useful in helping children under eight apply what they've learned to a modification of a task," Rittle-Johnson said. "We found that even four-year-olds can use explanation to help them learn and to apply what they've learned to other tasks."

The new research was supported by funds from Peabody College. The research is currently in press at the *Journal of Experimental Child Psychology.*

For more on Rittle-Johnson's research, see page 20.

New research shows aggression is processed as a reward

DANIEL DUBOIS

Kennedy

New research from Peabody and Vanderbilt researchers shows for the first time that the brain processes aggression as a reward—much like sex, food and drugs—offering insights into our propensity to fight and our fascination with violent sports like boxing and football. The research was published online in January by the journal *Psychopharmacology.*

"Aggression occurs among virtually all vertebrates and is necessary to get and keep important resources such as mates, territory and food," said Craig Kennedy, professor of special education and pediatrics. "We have found that the 'reward pathway' in the brain becomes engaged in response to an aggressive event and that dopamine is involved."

"It is well known that dopamine is produced in response to rewarding stimuli such as food, sex and drugs of abuse," said Maria Couppis, who conducted the study as her doctoral thesis. "What we have now found is that it also serves as positive reinforcement for aggression."

For the experiments, a pair of mice—one male, one female—was kept in one cage and five "intruder" mice were kept in a separate cage. The female mouse was temporarily removed, and an intruder mouse was introduced in its place, triggering an aggressive response by the "home" male mouse. Aggressive behavior included tail rattle, an aggressive sideways stance, boxing and biting.

The experiments are the first to demonstrate a link between behavior and the activity of dopamine receptors in response to an aggressive event.

"We learned from these experiments that an individual will intentionally seek out an aggressive encounter solely because they experience a rewarding sensation from it," Kennedy said. "This shows for the first time that aggression, on its own, is motivating, and that the well-known positive reinforcer dopamine plays a critical role."

Kennedy is chair of Peabody's special education department. He is also director of the Vanderbilt Kennedy Center for Research of Human Development's Behavior Analysis Clinic.

Couppis conducted her research in affiliation with the Vanderbilt Brain Institute.

Peabody moves to 2nd ranked education school

Peabody College is the second-ranked education school in the nation, according to the latest rankings of graduate and professional schools by *U.S. News & World Report*.

"Peabody's elevation to No. 2 is very gratifying," said Camilla Benbow, the Patricia and Rodes Hart Dean of Education and Human Development at Peabody. "More importantly, it reflects the outstanding efforts of our faculty and students who are inspired to address the thorniest problems in education. We have an obligation to contribute as much as we can to helping all learners be successful, and the new ranking suggests that we are meeting that obligation."

Peabody was ranked the best in the nation for administration/supervision programs, No. 2 for special education, No. 4 for education policy, No. 5 for elementary education, No. 8 for higher education administration, No. 9 for educational psychology and No. 10 for both curriculum/instruction and secondary education.

Book presents strategies to improve student writing

A new book co-authored by Peabody education faculty seeks to reverse the downward trend in the quality of student writing. *Powerful Writing Strategies for All Students* presents a detailed program that teachers can use to help students master writing and improve their self-confidence.

"Writing is discouraging and frustrating for many students, which can lead to an avoidance of writing and contribute to poor overall academic achievement," Karen Harris, one of the book's co-authors and Currey Ingram Professor of Special Education at Peabody, said. "This book offers teachers a guide for giving students the skills and strategies they need to learn how to write while boosting their enthusiasm and confidence in their ability to write independently and well."

The book outlines how to implement a writing instruction approach called Self-Regulated Strategy Development, or SRSD, which was designed by Harris and co-author Steve Graham, also Currey Ingram Professor of Special Education at Peabody. The approach has been developed through 25 years of research and its effectiveness shown in over 40 studies, including randomized field trials.

The tools in the new book have been proven effective for a variety of writing genres—story, creative, narrative, expository and persuasive writing—as well as for general, at-risk and special education students from kindergarten through high school.

Harris and Graham's co-authors are Linda Mason, assistant professor of educational and school psychology and special education at Pennsylvania State University; and Barbara Friedlander, a special education teacher in Montgomery County Public Schools, Potomac, Md. Paul H. Brookes Publishing Co. published the book.

Performance pay for teachers topic of national conference

Initiatives are underway in states and school districts across the nation to offer teachers incentives to improve their performance and by extension, to improve student success. But while millions of dollars are flowing to these projects, a fundamental question remains unanswered: do they work?

Answering that question was the aim of more than 300 education researchers, teachers, policy makers, students and journalists at a national conference in late February hosted by the National Center on Performance Incentives at Peabody.

"We have spent decades debating this issue without learning very much empirically," Matthew Springer, the center's director, said. "The purpose of this conference was to help not only policymakers interested in pay for performance recognize its potential strengths as well as weaknesses, but also to address many of the key conceptual and implementation issues that have dominated the debate."

Due to the intense national interest in this topic, competition for seats at the conference was keen. Originally intended for 100 people at the Wyatt Center (Social-Religious Building), the conference was moved to the Marriott at Vanderbilt to accommodate an additional 200. Even with this extra space, dozens of individuals wishing to register had to be turned away.

JOHN RUSSELL

The National Conference on Performance Incentives held at Peabody in late February garnered so much interest, it was moved to the Marriott at Vanderbilt to accomodate 200 more attendees.

A priority of many attendees, including the U.S. Department of Education's Institute of Education Sciences, which is the center's sponsor, is to ensure that education policy such as rewarding teachers for performance is built upon proven strategies.

"Attendance at this conference is an indicator of the interest in pay for performance policies to shape teacher performance. We know that policy doesn't wait for research, policy is made," Russ Whitehurst, director of the Institute of Education Sciences, said. "The transformation in education that we will see over the next 25 to 50 years will be tremendous if, whenever possible, policy initiatives take place in a context where data can be collected to determine if they are working and for whom. We believe Vanderbilt's Peabody College is the preeminent college of education for many of the research questions in which we are interested."

A final compilation of the papers presented at the conference will be published later this year. For more information on the center and its work, and to read drafts of the papers presented, visit *www.performanceincentives.org.*

For more information on many of these stories, please see *http://peabody.vanderbilt.edu/news_and_events/index.htm.*

To Make + It All Add Up

Reforms to both math education and the education of math teachers are needed to put U.S. students back on top

BY Lisa A. DuBois
ILLUSTRATIONS BY Roger Chouinard

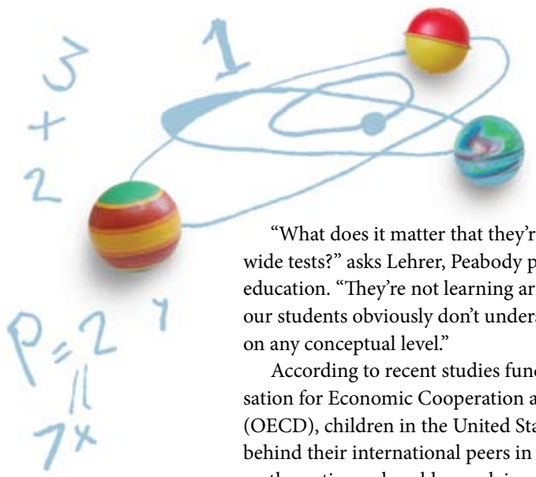
While visiting a class of fifth graders, Rich Lehrer posed a question: "What is 500 minus 499?"

Every hand in the class went up. "One!" the children all shouted in unison.

"OK," Lehrer continued, "what is 500 minus 399?"

Silence.

Not a single student could answer spontaneously. Some could figure it out if given a pencil and paper, but many in the class were stumped. And this was a group of students who were on schedule to meet the basic proficiency standards outlined in No Child Left Behind (NCLB). The truth is, education researchers are encountering these same types of students in classrooms all over the country.



"What does it matter that they're passing statewide tests?" asks Lehrer, Peabody professor of science education. "They're not learning arithmetic. Many of our students obviously don't understand mathematics on any conceptual level."

According to recent studies funded by the Organisation for Economic Cooperation and Development (OECD), children in the United States are falling behind their international peers in measures of mathematics and problem-solving skills just as the world is moving towards more technology-based economies. For this reason, advocates in academic research centers and political think tanks are calling for sweeping reforms both to math education and to the education of math teachers. The good news is that researchers are coming up with innovative solutions to solve the country's math woes at every grade level. The bad news is that those solutions, by and large, which start with major reforms in teacher preservice training and continue through teacher induction and ongoing professional development, are expensive, time-consuming and resource intensive.

Many of our students obviously don't understand mathematics on any conceptual level.

—Rich Lehrer

"We have a long tradition in mathematics education of 'stand and deliver,'" says Thomas Smith, Peabody assistant professor of public policy and education. In other words, a teacher will show students an algorithm and then give them a problem to solve. The students will go to the board, demonstrate how they've applied the algorithm, and the teacher will let them know if they got the right answer. The glitch in this method is that some students skate by on simple memorization and regurgitation. Often, in fact, they make good grades in math, only to later discover they don't have the foundational knowledge to understand more sophisticated concepts and reasoning.

For example, elementary students may know with certainty that 2 times 3 equals 6, and that half of 6 equals 3, but if they don't grasp what it means to manipulate quantities or how fractions represent the relationship between ratios and proportions, then those children, who may have met all the NCLB state-set benchmarks, will struggle when they hit high school algebra.

In addition, because of the decentralized nature of this country's public education system where local school districts determine their own standards, and because of the wide variability of competence among math teachers, "Math instruction has become very uneven from year to year, depending on which teacher an individual child has at any given year of school," says Lynn Fuchs, Nicholas Hobbs Professor of Special Education and Human Development.

Addressing these three factors—an obdurate approach to pedagogy, students matriculating from grade to grade with only a superficial grasp of mathematical concepts, and an education system riddled with gaps in instruction—will require transformative action above and beyond NCLB.

On the one hand, Smith praises NCLB for putting the spotlight on such traditionally low-performing subgroups as low-income children, minorities and children with disabilities, whose uphill battles had for years been marginalized and hidden among aggregate numbers. On the other hand, a major downside to the pressure-packed, end-of-year assessment, he says, is that "the tests set a fairly low standard, push teachers to organize instruction towards getting kids over a fairly low bar, and they don't provide incentive for developing deep, conceptual understanding of important mathematical ideas."

Lighting a Fire with "Hot Math"

A number of Peabody professors are generating new strategies for raising the bar in American math education. Lynn Fuchs and Douglas Fuchs, for example, have developed a program known as "Hot Math" for students who struggle with math, generally, and with math problem solving, specifically. Importantly, though, Hot Math works just as well for students without math difficulties.

Helping children become skillful with word problems remains a trouble spot for many teachers. Hot Math is based on explicit instruction to help students recognize novel problems as belonging to a problem type for which they have learned a solution method. The teacher begins by discussing the underlying meaning of the problem and having students role play the problem. Next, the teacher shows a problem that has already been solved and explains how and why the solution strategy works. Students then team up in pairs to apply those strategies to solve problems that fit that same type, while explaining their work to each other. At the end of the class, students independently take on a new problem of the same type and score their own work against a rubric. Even if they don't get the problem totally correct, they receive credit for using good strategies. As the lessons move forward, students keep track of their own progress, with the goal of trying to get "hot" at math.

The impetus behind Hot Math is that many students, with and without special needs, often have no idea how to transfer or extend strategies learned in class to real life, says Lynn Fuchs. "Traditionally, a teacher will present a problem like: 'John goes to the supermarket. He needs 25 lollipops for his party. Lollipops are only sold in bags of four. How many bags should John buy?' And once the student understands how to work the problem, the teacher presents other problems that really only vary in terms of the quantities and the cover stories," she says. "The dilemma for a large number of children is that when they get to the supermarket in real life they can't apply what they've learned in school, because the supermarket situation is more complicated. When math problems are embedded in these complex situations, it's hard for the children to recognize those problems as ones they can know how to solve."

Hot Math problems tend to be more challenging both for the student and the instructor than the more simple word problems typically taught in school, but randomized control trials conducted in the Metropolitan Nashville Public Schools show that children's word-problem skill in simple and complex contexts is stronger with Hot Math compared to typical classroom instruction. With Hot Math, children feel more successful, can transfer the word-problem skills they learn in school to real-life situations, and perform better on end-of-year, high-stakes assessments.

MEET OUR STUDENTS

Travis Brunner

A Passion for Teaching

STEVE GREEN

When Travis Brunner was a high school senior in New York, he had the opportunity to go into elementary schools every day for two hours to work with a fifth grade teacher. The experience proved to be a turning point.

"I was strong in all subjects, but math was the thing I was most passionate about," says Brunner. As he began working with the elementary students, he discovered another passion.

"What I enjoyed most was pulling out kids individually or in small groups to give them math instruction. I already had the idea that I wanted to get into education, but seeing that my greatest joy was providing math instruction to students was the final determining factor in realizing that I wanted to focus on math education."

After completing his bachelor's degree in mathematics education (secondary education) at The Pennsylvania State University, he moved to Raleigh, N.C., and taught seventh grade pre-algebra for two years before enrolling in Peabody's master's degree program in curriculum and instructional leadership. Even as a graduate student, he finds himself teaching others, working as a teaching assistant for Introduction to Classroom Technologies.

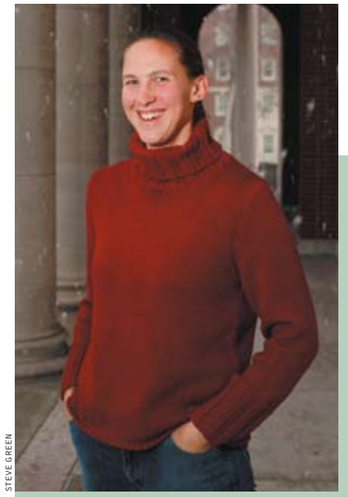
"It's an interesting mix of students," says Brunner. "And it's helped me in numerous ways. For example, the professor I work with wasn't teaching full time in schools prior to this position, so we discuss my perspective from what technologies you can use in a public school, what's available, what's realistic.

"I can also look at the freshmen in the class, and say OK, I know where they're at, because I was there when I was [an undergraduate]. Then, I look at the students with student teaching coming up, and I remember being at that point—you're really focused on how you're going to put this [knowledge to use] in the classroom."

Brunner's empathy with students may eventually lead him to consider a doctorate so that he can train teachers, but for now he wants to go back to teaching math to middle grade learners after earning his M.Ed.

"Just the fact that I've learned a lot more this year, working on my master's, I want to see how it works in the classroom," he says.

—Bonnie Arant Ertelt



STEVE GREEN

MEET OUR STUDENTS

Annie Garrison

A Logical Path

Annie Garrison is a Washington native who, until this year, had lived mostly on the West Coast. She attended high school in Cupertino, Calif., and went on to major in math and computer science at Santa Clara University. She received an M.A. in mathematics at the University of Washington, and afterward taught in private schools in both Washington and California.

But now she's in a different part of the country, heading in a different direction.

"I went to the University of Washington to get my Ph.D. in math, because my undergraduate professors kept saying, 'you're good at math, keep studying it.' I did that, and I didn't get that much pleasure out of it. But I loved being a teaching assistant, so I thought maybe I should be a teacher."

Because she didn't have a teaching credential, she found jobs teaching at a private boarding school for girls and, later, at a co-ed private day school. She soon realized that while she had the math part down cold, she needed to focus on the education side of the equation.

At Peabody, she is studying math curriculum in the Department of Teaching and Learning's Curriculum and Instructional Leadership program. This year she had a practicum with Metropolitan Nashville Public Schools math coordinator, Julie Martin, observing how the school system deals with curriculum issues at the district level. She has also spent time in elementary and early childhood classrooms while working on Dale Farran's Early Math Project (see p. 17). "That has rounded out my math education," she says, "how it all fits together."

The how and why and reasoning behind curriculum is leading Garrison to apply for a Ph.D. again, but this time in math education. "Math is about problem solving and logically deducing and ruling things out, being able to justify your actions," she says. "That is a big part of where math education hopes to go."

It seems also to be where Annie Garrison is going in studying how to write math curricula. "We're learning what you should put into curricula," says Garrison, "all the things that affect how you write it, and how you implement it effectively.

"We're learning that it's very complicated."

—Bonnie Arant Ertelt

A Model for Relating to Math

While Hot Math is grounded in real life, the strategy known as Modeling in Math and Science Education, created by Rich Lehrer and his colleague Leona Schauble, professor of education, helps children understand the real world through the application of math and science. Model-based reasoning uses a mathematical system as an analogy or a representation for something in nature.

For instance, Lehrer and Schauble have designed education units that allow a familiar system to stand in for an unfamiliar system. They usually initiate instruction by engaging children in the design of a physical microcosm—a literal instance of the less familiar system that preserves important features of that microcosm. For example, children in grades one through three use parts found in any hardware store to build working models of how their elbows function. By building, children look more carefully at how their elbows work and encounter the problem of deciding which aspects of the elbow to retain and which can be discarded. First designs are often based on literal similarity and so feature large Styrofoam balls that are purely decorative. Later designs are less decorative and more functional—they work like elbows and do not merely resemble them.

The modeling approach seeks to advance mathematical thinking as well, so that children are encouraged to describe the components of their physical systems mathematically. These mathematical descriptions help children understand the causal structure of natural systems. In the case of the elbow, children describe relations between effort and load to develop a mathematical description of what is more formally known as a third-class lever. In another set of activities students, typically fifth and sixth graders, are challenged to design a sustainable aquatic ecology in a gallon jar, given choices of substrate, plant and animal life. The goal is to mimic the ecology of a pond.

"The jar is more manageable than a pond, but it still has uncertainties and interactions that are very challenging. Often, the jar system crashes, and students have to figure out causes so that their next iteration is more sustainable. Along the way, they typically learn about how interactions among the living and non-living components define an ecology," Lehrer says. Rather advanced mathematical thinking is naturally factored into this approach, as children learn about constructing data and how to represent data in ways that make relations among components, such as dissolved oxygen levels and plant growth, visible and testable. Mathematizing the natural world is essential in nearly all the instruction developed by Lehrer and Schauble. If, for example, students plant a seed and then track the growth of their plant over time, they can develop a graph that is not a straight line, but instead looks more like an S set horizontally on the page.

"Many organisms have growth spurts," says Lehrer. "Growth spurts are somewhat surprising because the rates of change are not constant. Mathematics allows us to track more carefully the form and rate of change—things that you can't see with your eyes. And if we can represent these phenomena in new ways, then we can think about related phenomena with these new ways of seeing. For example, children often begin to wonder if caterpillars grow like plants or they seek to account for why bacterial growth is also described by the same S-curve."

Lehrer and Schauble suggest that as children learn more about mathematics, they can also learn more about science. So after developing mathematics that help describe how organisms grow, new forms of mathematics can help describe how populations of organisms grow. Modeling the growth of populations again involves important mathematical ideas, such as distribution and chance, and mathematics again provides new ways of seeing how natural systems function.

The upshot of this model-based reasoning approach is that it taps into a child's creative juices. "Too often students are given mathematical problems that are so disconnected from important ideas that they're not fun," says Marcy Singer-Gabella, research assistant professor of education. "In the modeling work, Rich sets up these interesting problems and the kids want to solve them. They become intrigued by the mathematics.

"Learning how to structure a learning environment is crucial for teachers who want their kids to be excited about math. That's harder than it sounds. It's the difference between posing a question that is really interesting to solve—one that can take you somewhere—or doing a song and dance around a question to capture kids' attention, but there's nothing inherently interesting in the question itself."

Because so many of the important ideas in mathematics grew out of people trying to comprehend physical systems, Lehrer believes that it may be time for math educators to "go back to the future" and to the origin of those ideas. "Calculus came from trying to understand orbital mechanics," he says. "Now we teach calculus quite apart from that. Yet when students see what questions mathematical systems were invented to address, mathematics becomes less disembodied and more about everyday activity and the everyday world. We can cultivate interest in mathematics and in science when children learn that they can use these forms of thinking to develop some of their own questions and to express some of their own thoughts. Mathematics and science are powerful ways of thinking that should be a matter of routine access for all children, not restricted to a privileged few."

The Hard Equation of Teacher Training

If Hot Math and Modeling in Math Education can transform mathematics into a subject that's more fun for students and more relevant to real life and the real world, it would seem that educators would immediately jump on the bandwagon. Unfortunately, the conversion process is not easy. First, it is hard for teachers to learn both the math and science involved in model-based reasoning and it doesn't scale up quickly from current practices. In other words, they can't refer to a teacher's textbook and immediately become skilled at conveying these concepts.

Too often students are given mathematical problems that are so disconnected from important ideas that they're not fun.

—Marcy Singer-Gabella

Lehrer explains the conundrum this way: "If you let kids ask questions, they will go off in unanticipated directions, and they can develop knowledge that's deep, but not tested—because it's hard to test deep knowledge. The payoff is that kids are interested and excited, but the negative side is they may not know some particular thing that appears on the statewide exam."

Smith argues that these competing forces are placing teachers in a bind. "It's hard to get traction on reform initiatives when high-stakes testing is what teachers are held accountable for," he says, adding that he considers it unfair to press teachers to change their method of instruction, unless researchers can guarantee that these methods will allow students to do at least as well, if not better, on the mandated tests.

JOHN RUSSELL

MEET OUR STUDENTS

Dawson Gray

A Simple Equation

In May 2006, Dawson Gray graduated from Vanderbilt University with a double major in piano performance and mathematics. Currently pursuing a master's degree in education at Peabody, his major focus is secondary education with an emphasis on math. After Gray graduates in May, he will pursue a career as a high school math teacher.

For Gray, math and music have always added up. "I came to Vanderbilt in order to pursue both interests," Gray says. "Because I've always been drawn to music and math, that ruled out any kind of conservatory." Gray started piano study at age five and by age nine was studying with Roland Schneller in the Blair School's precollegiate program at Vanderbilt. At the same time Gray was falling in love with musical notes, he was getting hooked on mathematical numbers. "I always had this thing for numbers, and I realized early in school that I had a real aptitude for it."

During the summer and fall of 2007, Gray helped seventh and eighth grade students make the math-music connection in a class at both the Vanderbilt Summer Academy (VSA) and the Weekend Academy at Vanderbilt University (WAVU), each programmed by Vanderbilt Programs for Talented Youth. Students in both the summer and fall class explored matrices, serialism, tuning systems, compositional techniques and the Fibonacci sequence, as well as other topics, and listened to classical, jazz and rock music. He will teach the class again this summer for VSA.

Gray is philosophical about his reasons for deciding to pursue math instead of music as a career. "I think I have an opportunity in teaching math in a school environment to work with so many more students than I would teaching in a private piano studio. That really made it the more appealing option.

"Also, I feel that pursuing the math end of things gives me the opportunity to keep up the music as well. Pursuing a career in music likely would have forced me to leave the math completely behind. I'm certainly not as involved with music as I once was or would like to be, but I still play frequently."

—Angela Fox

Another obstacle for teachers, particularly those who have been in the field for 10 years or more, is that they didn't learn math this way themselves. They are now being asked to ignore much of what they've gleaned from their experience in the classroom and try out new strategies that may be absolutely foreign and uncomfortable for them—again, without any solid data that it will lead to their students having higher standardized test scores.

Also, the nation's decentralized education system means that certain schools can test drive innovative programs like Hot Math and Modeling in Math and Science Education, while others can't. Bureaucratic policies, notorious for their lack of agility, tend to hamstring new approaches. Smith muses, "Scaling up these kinds of programs has rarely been effective in the United States. We've let a thousand flowers bloom, meaning we encourage experimentation and creativity, but we don't have a workable mechanism for spreading effective practices and programs."

Peabody professors are now conducting research to puzzle out answers to some of these problems. Tom Smith and his colleague Paul Cobb are studying what district- and school-level supports will allow an ambitious reform in mathematics to succeed at scale. Lynn Fuchs and Douglas Fuchs are expanding upon Hot Math to make it applicable to more grade levels. And Marcy Singer-Gabella and Rich Lehrer are partnering on a grant assessing how preservice teachers learn to teach math and science—including what is required for them to use novel approaches, like model-based reasoning, and how preservice teachers' learning may be linked to student achievement.

Ultimately, the point of all these studies, debates and cries for reform is to stimulate children's innate desire to seek answers to provocative questions. In some cases, American education has been allowed to drift away from the rewards that make knowledge worth pursuing for a child. After all, as philosopher Bertrand Russell once put it, "Mathematics, rightly viewed, possesses not only truth, but supreme beauty… as only the greatest art can show."

The Early Math Project

Peabody researchers evaluate a comprehensive math curriculum for the pre-K set

BY Lisa Robbins

PHOTOGRAHY BY John Russell

If you find it hard to imagine four-year-olds discussing their understanding of mathematical concepts with each other, try a visit to Mitzi Riley's classroom. Riley teaches at Buena Vista Elementary Enhanced Option School, in the Metropolitan Nashville Public Schools.

On a recent Friday morning, Riley's pre-K class hums with cheerful energy. They have just played "Blast Off!", counting backwards from 10 as they coiled their bodies in imitation of rockets set to launch. Now the children sit at centers dotted around the room. Riley sits with several students playing a numbers game called "What Card's Missing?" There are 10 cards, each turned upside down, so the children have to use their "x-ray vision" to guess which number Riley has removed from the lineup. At one point, Riley turns to tend a student who walks up with a request. The students at the table continue the game without her, with one child asking another, "What card's missing?" When the second child answers correctly, his partner then asks, "How do you know?"

"Because that's what comes between 6 and 8," the child replies.

"Kiss your brain!" his partner exclaims.

The children's ability to verbalize their reasoning and their willingness to chat about it are striking.

Research has found that, while early reading ability predicts later reading ability, early math learning predicts not only stronger math skills later on, but strong literacy and reading skills as well. In other words, as Douglas Clements and Julie Sarama write in the February 2008 issue of *Teaching Children Mathematics,* "Mathematics is a general cognitive skill."

In their article, Clements and Sarama also cite research showing "that early geometry work leads to higher mathematics achievement, higher writing readiness, and higher IQ scores in the primary grades."

Clements and Sarama, on the faculty of the SUNY-Buffalo, have developed a pre-K math curriculum designed around two core domains, numbers and geometry. Riley's class is part of a four-year research project, led by Peabody education and psychology Professor Dale Farran and her colleague Mark Lipsey, director of the Vanderbilt Institute for Public Policy Studies' Center for Evaluation Research & Methodology, that is evaluating the "scale up" of this new curriculum away from the influence of its developers. Fifty-seven Nashville Head Start and public school classrooms, including the control classrooms, participate in the study. (The developers are leading testing of the curriculum in Boston and Buffalo.)

Mitzi Riley, a pre-K teacher at Nashville's Buena Vista Elementary Enhanced Option School, watches as two of her students play "What Card's Missing?"

"Blast Off!" teaches the pre-K students number skills, one of two core components of the math curriculum (the other being geometry) called Building Blocks that is being evaluated by Peabody's Early Math Project.

This comprehensive pre-K curriculum, called Building Blocks, is the first year of a broader curriculum that extends through second grade. It provides teachers with a year's worth of week-by-week lesson plans, constructed around young children's developmental learning trajectories. For each trajectory, there is a series of activities. The first is dubbed the "whole group" activity, which the teacher does with the entire class. The others include a "small group" activity, led by the teacher during center time; a related hands-on activity that children do on their own in a small group setting; and a computer game specifically designed for the lesson at hand that allows the students to explore individually what they are learning. In addition, every week, parents receive a letter about what the children are learning in class, with suggested at-home activities.

It's user friendly, child friendly and developmentally appropriate.

—Mitzi Riley

"It's a great system of reinforcement," Riley says. "It's user friendly, child friendly and developmentally appropriate. It uses lots of manipulatives. I've really enjoyed it, and the children enjoy it. Our play is our work, and our work is our play."

Farran, too, is enthusiastic about the curriculum's potential.

"The activities are developmentally aligned with how children understand mathematical concepts," Farran says. "It allows them to build on their intuitive understanding of math, and to build on it in a complex way in the future. It asks questions like, 'How did you do that?' and 'What makes you think that?'—encouraging them to explain the concepts for themselves. Kids are delighted to get a chance to talk, and it solidifies their conceptual understanding."

The curriculum is not without significant challenges. The developers use the term TRIAD (Technology-enhanced, Research-based Instruction, Assessment and professional Development) to describe their approach. Farran's research already has found that it will require a high level of teacher skill in classroom management.

For Farran and her researchers, a major challenge in implementing the study was crossing what Farran calls the "enormous digital divide." They obtained supplemental grant money in order to provide two computers per class and to wire classrooms for Internet access. (In some cases, this required wiring whole buildings.) The Building Blocks curriculum comes in traditional printed form and on disc, but its full array of tools works best via its easily updated online version. It offers teachers information about each learning trajectory, descriptions of class activities—complete with videos of children and teachers demonstrating the lessons—links to reference articles, and even the ability to share feedback with the curriculum's developers. In order to take full advantage of these resources, teachers will need to feel comfortable using computers.

Farran and Lipsey's study also includes facilitators charged with helping the teachers to learn and implement the curriculum.

"Last year was our initial training year. You can't expect teachers to do things out of the box, and this is especially complex," Farran says. "This year is our first full implementation year. We have facilitators meeting regularly with teachers."

Farran acknowledges that providing such facilitators in regular circumstances "would require genuine commitment by school districts. You need to be committed to helping teachers transition to this way of teaching. I think that's true of almost any good curriculum."

In the study's third year, researchers will evaluate the sustainability of the curriculum in the classroom when the teachers no longer have assistance from facilitators. Researchers also plan on measuring the math progress of the study's more than 700 children during their kindergarten year, which will not include the Building Blocks curriculum. The study's final year will concentrate on data analysis.

Carol Bilbrey, Ph.D.'03, the research coordinator for the project, has received encouraging feedback from several participating pre-K teachers.

"The thing I really like—and what the teachers tell me—is that it reaches into what the child can understand in the world and can think about in a mathematical way," Bilbrey says. "It's about understanding math concepts, looking for defining features and quantity, comparing quantities and finding relationships among things. It's a pretty new approach to teaching math, and the professional development component is strong. I've had teachers tell me, 'I can't believe the children can think this way.'"

An "a-ha!" moment in Riley's pre-K classroom.

Hockey, Hats and ECE Math

At Peabody College's Susan Gray School, teachers are encouraged to incorporate math into all aspects of their children's daily activities.

"I want our teachers to be conscious of bringing more math into the curriculum," says Ruth Wolery, the school's director. "It's part of everyday life. It can be embedded not only in school, but in everything kids do. Shopping, weights, measures, temperatures—it's everywhere."

Susan Gray School uses a literacy-based curriculum that allows teachers much flexibility in how they introduce math concepts to their preschool classrooms. They use the Curriculum Focal Points developed by the National Council of Teachers of Mathematics as a guide.

"We have a specific math time in the week, but I embed math concepts in other activities, such as art and dramatic play," says Kyle Almgren, who teaches four-year-olds. "The best way for them to learn is to have multiple opportunities to learn."

As an example of how she applies her literacy-based curriculum to teaching math, she points to recent lessons on winter sports.

"I'm a big hockey fan," Almgren says. "One book we read was all about hockey. We talked about the numbers on the uniforms, how many games they had to win, and other ways math is related to the sport."

Early childhood special education is a central to the Susan Gray School's mission, which means teachers like Almgren have children with many different needs and abilities, including their typically developing peers, together in the classrooms. Flexibility is critical.

"You really have to build from where the children are," Almgren says. "For children who aren't at age level, you need to find things that are relevant to them."

Wolery lauds Almgren's creative skill in incorporating math into her classroom activities.

"She's made graphs of the children's favorite cookies," Wolery says. "When they read Caps for Sale, Kyle put together a hat store. They had a store with money, a cash register. They even had credit cards."

—Lisa Robbins

A Perfect Good Explanation

For Peabody researcher Bethany Rittle-Johnson, math provides the backdrop for how explanation powers cognition

BY Ashley Crownover

Learning math may not be the most exciting activity for some kids, but determining how best to teach it has the full attention of Peabody researchers. At the fore of the current interest in mathematics education is the work of Assistant Professor of Psychology Bethany Rittle-Johnson, whose research combines an exploration of cognition—how people understand the world—with an investigation of teaching practices in the classroom.

Self-Explanation

To examine how people acquire the knowledge they need to learn mathematics, Rittle-Johnson focuses on self-explanation—the explanations people give to themselves, as opposed to those that are provided by someone else. "Self-explanation is a very promising way to get people to understand things better," she says. "It's been shown in a large number of studies across a diverse age group that kids learn more if they're explaining things."

Rittle-Johnson's interest in self-explanation began with her work as a graduate student, exploring the relationship between conceptual knowledge—a person's understanding of how things work—and procedural knowledge—a person's understanding of how to solve problems step by step. Psychologists have historically debated which comes first: Do people figure out concepts from procedures, or the other way around? Rittle-Johnson theorized that the two kinds of knowledge might be acquired in a back-and-forth (or iterative) process, with each kind building off the other.

She began to examine the best ways to help develop conceptual and procedural knowledge, and eventually came to focus on self-explanation. "At the core of my research, I'm looking at kids explaining," she says, "but then also at what things matter. What if you put explanation in combination with direct instruction? What if you have kids explaining to somebody else? What if you're having them explain contrasting ways of doing things? These are all different ways of figuring out how to maximize explanation."

Why Math?

Though she was never "math phobic" as a child, Rittle-Johnson admits she "did not start studying how children learn math because I always loved it." Rather, the very nature of the subject makes it perfect for exploring these types of cognitive issues.

"At the core, I'm interested in how people develop both conceptual understanding and problem-solving skills," she says. "Mathematics is an obvious domain where we have to develop both of those kinds of knowledge and integrate them somehow." Further, the use of real-world problems rather than lab-created tests appeals to the practical-minded researcher. "From day one as a psychologist, I wanted to study tasks that people really do. I didn't need to make up a lab task that was weird and convoluted, because there are plenty of math tasks out there that to kids seem weird and convoluted."

The tasks used in Rittle-Johnson's work all fall under the umbrella of algebraic thinking, but at different levels. Children ages four and five are asked to guess what comes next in a repeating pattern, while older children are assessed on their understanding of mathematical equivalence (use of the equal sign), and middle-school students are asked to solve linear equations such as 3x+4=15.

"It strikes people as odd initially that you think about algebraic thinking in a four- or five-year-old," Rittle-Johnson says. "But when you look at the misconceptions and confusion in older students, it appears that they are gaining them from earlier instruction. The hope now is that if you go younger, there are things students could be thinking about that would productively both avoid these misconceptions or at least reduce them, and get students thinking algebraically from a much younger age."

Rittle-Johnson echoes the concern of many researchers about the need for improvement in mathematics in the United States. "Algebra has become a required class for high-school graduation," she points out, "and some people say it's like a requirement to good jobs. Kids really need to succeed at algebra, and they really struggle with it."

Working Toward a Common Goal

Correcting early misconceptions can provide students with a more solid foundation for learning algebra at higher levels, something math education researchers are also interested in.

"Psychologists are interested in learning processes, and math education researchers are interested in the content learned," Rittle-Johnson says, though it's the collaboration between the two that helps to connect research with practice in the classroom. While she relies on her math colleagues' mastery of content and ability to envision what improved instruction might look like, they benefit from her expertise in determining what cognitive strategies work best. "It helps them make choices," she says. "If you can turn to cognitive science literature and say, this idea of having kids self-explain, time and time again people have found it's a really good idea, then that seems like a good thing to try in the classroom."

One project that aims to further this joint work has been proposed by Rittle-Johnson's longtime collaborator Jon Star, a math education researcher at Harvard University. Star intends to conduct teacher professional development that builds on the researchers' prior work on self-explanation. Rittle-Johnson will play a supporting role. "That kind of collaboration is really the only way this range of issues is going to be addressed," she says.

To help further apply her research to the practice of teaching mathematics, Rittle-Johnson acts as a consultant for a software company that is developing a fractions software unit. And she has discovered that even at the local level, her work is having an impact.

"When we went back to one of the classrooms we worked in the year before," she says, "30 percent of students were doing certain things at pretest; the year before, it was zero. That wasn't so great for our study, but it was an indicator that we had changed the teacher's working practices to incorporate these things."

And of course, national interest in Rittle-Johnson's research—one of her studies was examined for the recent report from the National Math Panel—has her looking toward the future. "The fact that I can do work that is theoretically interesting and moves this set of theoretical issues forward, but at the same time really has some possibilities for influencing how kids are going to learn in school," she says, "now that's exciting."

JOHN RUSSELL

Bethany Rittle-Johnson

Shape the Future

"I love Peabody and I want to make a difference for the College. How do I do this?"

Give to the Vanderbilt Fund for Peabody College

JOHN RUSSELL

Peabody junior Kelly Finan has spearheaded a fundraising effort—including gifts from her parents and the athletics program at Vanderbilt—that will soon transform the playground at the Susan Gray School into one that is accessible for all SGS students.

The Vanderbilt Fund for Peabody College (formerly the Annual Fund) helps build community and tradition outside of the classroom. It is reflected in Peabody's rankings and other measures of alumni satisfaction. Did you know…

- that gifts to Peabody allow Dean Camilla Benbow to address the most pressing needs of the College?
- that if 10 people give $100, we could provide an emergency scholarship to a student in need?
- that if 10 people give $50, we could send a Peabody student to a national conference to present research?
- that giving is easy? To make your secure online gift today, go to *www.peabody.vanderbilt.edu/gift.xml*

By becoming a regular Peabody donor, you contribute to the long-term financial strength of your college—and to its reputation as a college that merits the lifelong loyalty of its alumni.

Peabody Campaign Update
Goal: $60 million
Raised to date: $56.2 million

Establish an Endowed Faculty Chair

Professor Paul Cobb, a well-respected researcher in the field of mathematical practices, thinking and learning, received the newly-endowed Peabody Chair in Teaching and Learning on October 12, 2007. The Peabody Chair was made possible by a challenge grant from J.E. "Ed" Reeves, Jr., chairman and chief executive of The Reeves Foundation. Ed is the father of a former Peabody student, Katherine "Mercer" Reeves, BS'92, MEd'93. His gift was matched by two anonymous donors.

STEVE GREEN

Kristine Grinnis (PB'11), a new Peabody Scholar, is an Arkansas native majoring in secondary education and history, Kristine enjoys the wealth of opportunity at Peabody and Vanderbilt, a setting that she says feels like home.

Create a Peabody Scholarship

Annual scholarships create immediate solutions for immediate needs. *Endowed scholarships* are sustaining and grow over time.

Kristine Grinnis is a new Peabody Scholar. Her scholarship donors have chosen to remain anonymous; however, when asked why they decided to create their scholarship at Peabody, they responded:

"…having experienced four years there, [our daughter] cannot imagine why anyone would ever go anywhere else to school. We feel strongly that it is incumbent on those of us who can to support the university financially, both in gratitude for what it has given to us, and in recognition that, in making it possible for those without resources to attend Vanderbilt as well, we are enriching the experience for all…. I guess you could say that we're a Vanderbilt family."

An Endowed Scholarship can be named for you, your family or someone you admire. You will have the opportunity of building a relationship with your student scholar, and your scholarship will be listed in the University's Scholarship Book. Creating an endowed scholarship truly changes a student's life and will also change yours.

Remember Peabody in your will or trust or create a charitable gift annuity (CGA) to receive lifetime income.

Beulah Winchel, BLS'50, grew up on a Kentucky farm and has lived and worked all over the world during her 90-plus years. She invested in the future of education by establishing her *second* $10,000 gift annuity to Peabody College. The annuity provides her with income and also a tax deduction.

"It was hard to resist because it is such a great investment with an income return of 11 percent, and it's for a good cause," Winchel said.

DANIEL DUBOIS

DOUBLE YOUR GIFT

Many employers and companies match their employees' contributions. If your company is one of these, your generosity to Peabody could be doubled or even tripled. To learn if your company matches gifts, visit: *www.matching.vanderbilt.edu*

As a financial supporter of Peabody College, you tell Peabody students that you are proud of the college's reputation as one of the nation's most prestigious colleges of education and human development. Your philanthropy demonstrates an ongoing commitment to the college's mission of creating knowledge, preparing leaders, supporting practice and engaging with our community.

Thank you to all our donors for your generosity and leadership in our campaign. As we draw near to our goal, please find an opportunity to be a part of our success. Gifts—large or small, endowed or annual—are significant and make an impact.

WE'VE MOVED

Peabody Development and Alumni Relations has a new address:

VU Station B #357714
Nashville, TN 37235-7714

You may continue to reach us at
Tel: (615) 322-8500
Fax: (615) 322-0073
E-mail: peabodyalumni@vanderbilt.edu

To make a gift to Peabody, please go to our secure online giving form: www.vanderbilt.edu/alumni/gift.xml

Roundtable

On November 2, 2007, Peabody donors, faculty and staff celebrated the 25th anniversary of the Roundtable Donor Society. Rodes Hart was honored for his time and support of Peabody through 40 years of service to the college. Betsy Wills, A&S'89, PB MEd'02, chaired the event, which honored the following:

Kenneth Anderson
Nashville, Tenn.
Nashville Predators,
Director of Communications
Honored by The Kurz Family

Peggy Bidez
Nashville, Tenn.
Harding Academy,
Fifth Grade Teacher
Honored by Patricia Powers (BS'84) and Matthew Powers

Ellen Brier
Nashville, Tenn.
Vanderbilt's Peabody College,
Assistant Dean
Honored by Karen and Sandy Rose

Sarah Buchanan
(BA'73, MA'75, EdD'06)
Nashville, Tenn.
The Ensworth School,
Associate Head of School
Honored by Edith Bass

Kelly Finan (Class of 2009)
Cumberland, Md.
Vanderbilt's Peabody College,
Junior, Elementary Education
Honored by Carolyn M. Evertson

Brenda Gebhardt
Franklin, Tenn.
Currey Ingram Academy,
Lower School Technology
and Support Teacher
Honored by Cherrie Forte Farnette (BS'67, MA'68)

Charles Lea (EdD'86)
Hendersonville, Tenn.
Volunteer Stage Community
College, Retired
Academic Vice President
Honored by Hal R. Ramer (BS'47)

James McIntyre
Nashville, Tenn.
Father Ryan High School,
President
Honored by Patricia Kyger (BS'59) and Kent Kyger (MD'58)

Jason D. Mitchell
Las Vegas, Nev.
West Chester Friends School,
Teacher
Honored by Tom and Susan Giangiulio

Greg Patterson
Brentwood, Tenn.
Metro Nashville Public
Schools, Director, pre-k
through fourth grade
Honored by Willodene (BA'45, BLS'47, MA'49, EdS'72, PhD'86) and Ray Scott (MA'60, EdS'64, PhD'86)

David Ray
Marietta, Ga.
Private tutor
Honored by William C. Griscom

Tisha Sanders
Nashville, Tenn.
Vanderbilt's Peabody College,
Assistant Clinical
Professor of Education
Honored by Eugene Karl Montoya

John E. Schmick
Latherville, Md.
Gilman School,
Acting Headmaster
Honored by Brian and Mary Jo Rogers

Pearl Sims (EdD'03)
Nashville, Tenn.
Vanderbilt's Peabody College,
Director, Leadership
Development Center
Honored by Paul Novak and Amanda Novak

Visalam A. Subram
Weslaco, Texas
Weslaco Independent School,
District Teacher
Honored by Margaret L. McAllen (BA'57)

Joe Wilson
St. Louis, Mo.
Ladue Chapel Presbyterian Church USA,
Associate Pastor
Honored by Joyce Ann Dodson Trower (BA'52, MA'56)

Thaddeus (Tad) Wert (BE'84, MEd'85)
Nashville, Tenn.
Harpeth Hall School, Math Teacher
Honored by Jere (BS'58) and Al Phillips (BA'57)


1


2


3

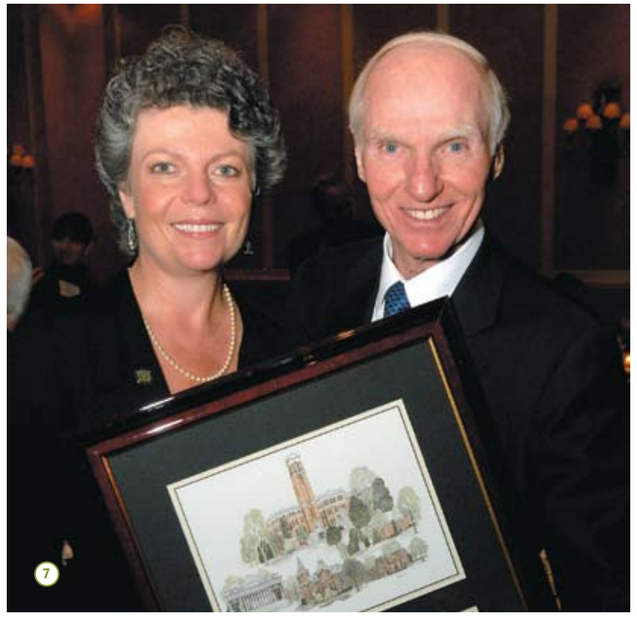

4


5


6

1- Kelly Finan, Carolyn Evertson; 2 - Annette Eskind, Jane Coble, Lisa Campbell, Patti Smallwood; 3 - Leigh Stephens, Jerry Stephens, Marie Nowell, Hal Ramer; 4 - Martha Ingram, Monroe Carell; 5 - Tim Caboni, Lisa Herrington, Leah Morgan, Charley Kurz; 6 - Jean Litterer, Rita Lea, Charles Lea; 7 - Camilla Benbow, Rodes Hart; 8 - Patti Smallwood, Betsy Wills

PHOTOS BY PEYTON HOGE


7


8

Peabody Parents, Alumni and Friends

Mark your calendars *for the Peabody Roundtable Donor Society Annual Dinner Event,* **Thursday, October 2, 2008.**

Start your Parents' Weekend off right—bring your student and help us to celebrate Peabody's accomplishments!

Jane Best, PhD'04

Navigator of Educational Policy

Jane Best, a self-described "political junkie," says she became "addicted" to working in federal and state education politics and policy while serving as a fellow in Vanderbilt's Office of Federal Relations in Washington, D.C.

Taking a semester off from her Peabody Ph.D. studies with the blessings and support of her dissertation chair, Professor James W. Guthrie, she worked in the Federal Relations Office for Assistant Vice Chancellor Jeff Vincent, writing daily briefs on federal and state education policy actions.

"That was a pretty formative time for me," Best says. "I caught the bug of federal and state education policy. I still stay in touch with Jeff and visit him when I travel to D.C."

After earning her doctorate, Best accepted a job as a senior educational policy specialist for the National Conference of State Legislatures in Denver, providing research, technical assistance and opportunities to policymakers throughout the nation.

Best now travels most frequently throughout seven states in the Midwest as a senior policy associate for Learning Point Associates, a nonprofit educational organization headquartered in Naperville, Ill. Learning Point Associates manages one of the 10 federally-funded regional education laboratories (REL-Midwest).

In her work for REL-Midwest, Best travels to state capitals and talks with the governors' education policy advisors, state legislators and state education agencies.

"I try to navigate the political dynamics of those three groups and understand the state's need," Best says. "They are not always on the same page about how best to approach issues. I come in as an outsider to discuss what the hot education topics are in the state, find out what information they might need, offer to bring in outside experts if warranted, and talk to them about what other states are doing to tackle similar challenges."

She still stays in touch with Peabody faculty members. Learning Point Associates sometimes contracts with Peabody researchers to collaborate on studies or serve as outside experts.

"It has been a fulfilling experience to be able to take the friendships and relationships I built at Vanderbilt and have them now in my professional life as well," she says. "When you talk about the one person in your life who made an enormous difference, I would say for me it is Jim Guthrie. He had a relationship with Learning Point Associates long before I came here a couple of years ago. It's great to continue to work with Jim."

—Lew Harris

STEVE GREEN

It has been a fulfilling experience to be able to take the friendships and relationships I built at Vanderbilt and have them now in my professional life as well.

— Jane Best

Zakiya Smith, BS'06

A College Education for All, Despite the Cost

PAMELA LEPOLD

Peabody gives you a firm theoretical base in terms of student development and child and adolescent psychology …and a lot of practical experience.

—Zakiya Smith

Budding educator Zakiya Smith likes her first name. "It means 'intelligent' in Swahili and 'pure' in Arabic," she says.

The name seems highly appropriate. Smith is extremely intelligent, and she has a pure and sincere interest in helping disadvantaged students dare to dream and prepare for college.

Smith graduated from Vanderbilt in 2006 with a double major in secondary education and political science. She then enrolled in Harvard's master's program in education policy and management, earning her degree last spring.

"Peabody gives you a firm theoretical base in terms of student development and child and adolescent psychology," she says. "It also gives you a lot of practical experience. I had two practica before I started student teaching." The Atlanta native was particularly influenced by a class she took from Assistant Professor of Education Rich Milner, who wrestles with issues concerning urban students and inner city schools.

While attending Harvard, Smith worked in the trenches as an intern at East Boston High School, a school with a large immigrant and lower income population. She worked in a federal program called GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs). The program is designed to increase the number of low income students who are prepared to enter and succeed in postsecondary education.

"I did a lot of workshops on college preparation and gave them information about deadlines and helped the kids fill out their FAFSA (Free Application for Federal Student Aid) forms one-on-one," she says.

Currently, Smith is working for the Advisory Committee on Student Financial Assistance in Washington. D.C. The Committee serves as an independent source of advice and counsel to Congress and the Secretary of Education on student financial aid policy.

Smith helped the committee organize a recent seminar, which brought in 20 experts from around the country to grapple with issues regarding affordability of postsecondary education.

"One of the biggest issues is that a lot of students don't have information about going to college early enough to make adequate plans," she says. "I saw this problem in East Boston. They need to know in middle school. If they think they can't afford college while they're still in middle school, they're not going to prepare adequately in high school."

—Lew Harris

CLASS NOTES

Stubborn Spring

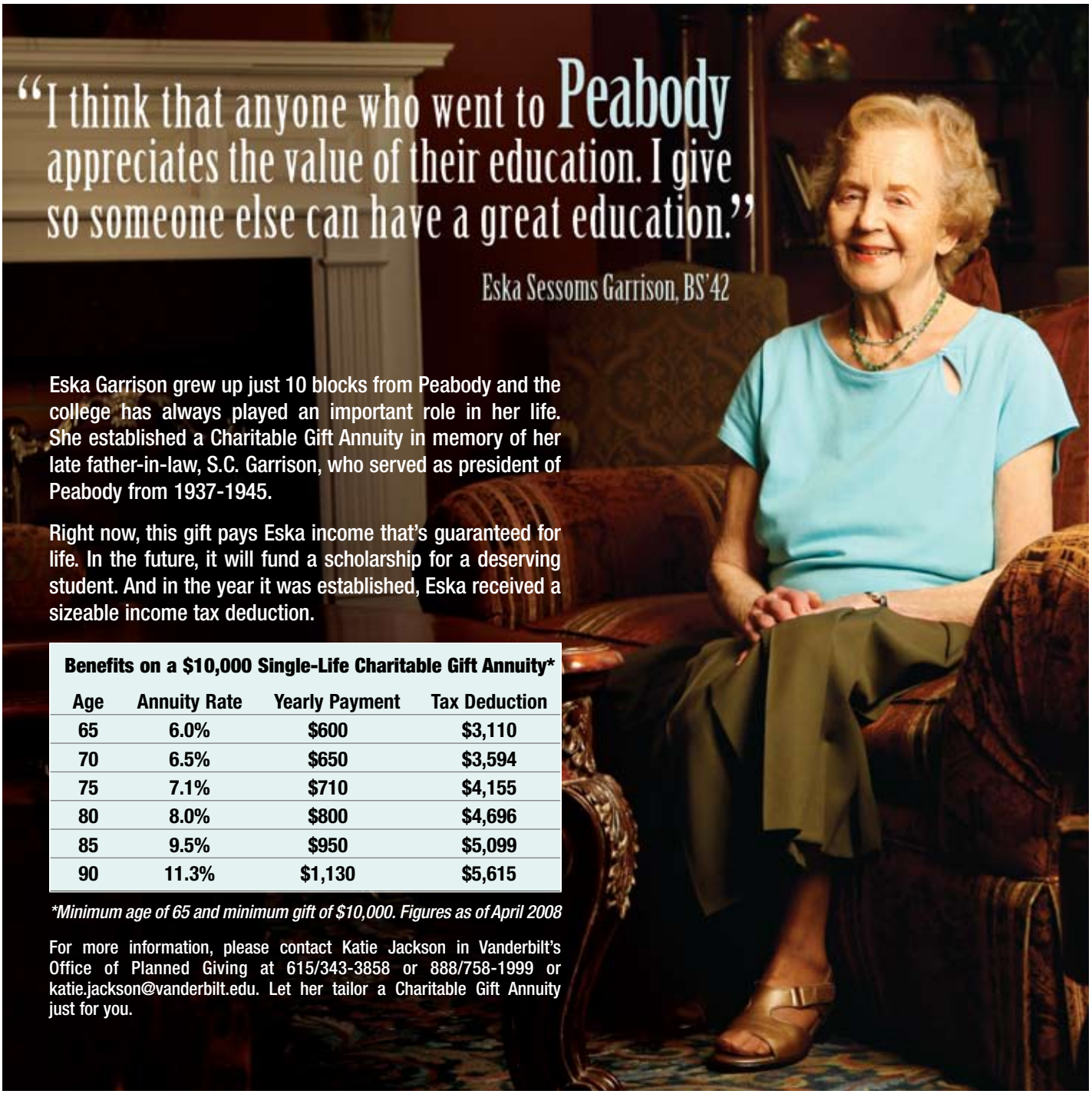
PHOTO BY John Russell

Remember when you could count on at least one good snow during each winter of your Peabody experience? Despite a dearth of snowfall in recent winters, Nashville clouds finally yielded precipitation that covered the campus in white one late February Saturday. It briefly covered this early-flowering 'Okame' cherry tree on the south side of Gillette Hall, but not for long. By Sunday, the cherry was outfitted only in spring finery as warming temperatures erased all trace of winter on campus.

Vanderbilt University
Peabody College
VU Station B 357703
2301 Vanderbilt Place
Nashville, TN 37235-7703

Nonprofit Org.
U.S. Postage
PAID
Nashville, TN
Permit No. 1460

A publication of VANDERBILT PEABODY COLLEGE



Eska Garrison grew up just 10 blocks from Peabody and the college has always played an important role in her life. She established a Charitable Gift Annuity in memory of her late father-in-law, S.C. Garrison, who served as president of Peabody from 1937-1945.

Right now, this gift pays Eska income that's guaranteed for life. In the future, it will fund a scholarship for a deserving student. And in the year it was established, Eska received a sizeable income tax deduction.

Benefits on a $10,000 Single-Life Charitable Gift Annuity*

Age	Annuity Rate	Yearly Payment	Tax Deduction
65	6.0%	$600	$3,110
70	6.5%	$650	$3,594
75	7.1%	$710	$4,155
80	8.0%	$800	$4,696
85	9.5%	$950	$5,099
90	11.3%	$1,130	$5,615

**Minimum age of 65 and minimum gift of $10,000. Figures as of April 2008*

For more information, please contact Katie Jackson in Vanderbilt's Office of Planned Giving at 615/343-3858 or 888/758-1999 or katie.jackson@vanderbilt.edu. Let her tailor a Charitable Gift Annuity just for you.