

# Bright Ideas

“As someone involved in the Christian religion, some of this made me squeamish.” — DIVINITY DEAN JAMES HUDNUT-BEUMLER

## Parental Discipline Gets Tough Self-Appraisal

1. ALMOST A THIRD of parents say they don't think their methods of disciplining children are working very well, and many of them report using the same discipline their own parents used. Those findings come in a study authored by Dr. Shari Barkin, chief of the Division of General Pediatrics at the Monroe Carell Jr. Children's Hospital at Vanderbilt.

In a broad cross-sectional survey of parents from 32 states, Puerto Rico and Canada, Barkin found a strong association between the discipline parents experienced as children and the methods they reported using with their own

children. Forty-five percent reported using time-outs, 41.5 percent reported using removal of privileges, 13 percent reported yelling at their children, and 8.5 percent reported the use of spanking “often or always.”

About 31 percent of parents surveyed responded they either “never” or “sometimes” perceived their methods to be effective.

“There was actually an inverse relationship between self-reports of yelling at children and perceived effectiveness of discipline,” Barkin says. “But we strongly suspect that both yelling and spanking might be underreported, because we know when parents perceive their methods are not working, as a third reported, then emotions can quickly escalate.”

More than a third of parents (38 percent) reported using the same methods of discipline they experienced when they were children. But those who reported using the same methods as their parents often considered their approach “ineffective.”

By the time children reached the 6- to 11-year-old age range, parents were about 25 percent less likely to report using time-

outs and spanking as they were with younger children

(ages 2 to 5). When children reached school age, parents reported a heavier use of taking away privileges and yelling. But even in the older age range, perception that the discipline might not be working persisted.

“Discipline is a central issue for parents, yet providers engage parents in limited ways



Barkin

on this topic,” says Barkin. “In this study we altered the manner in which we asked families about discipline. This created a shared dialogue rather than a lecture.”

Barkin's study, titled “Determinants of Discipline Practices: A National Sample from Primary Care Practices,” was published in the January issue of the journal *Clinical Pediatrics*.

## Hang Up and Drive

2. THINK YOU CAN drive safely while talking on your cell phone? Neuroscientists Paul E. Dux and René Marois offer compelling new evidence that your brain can't handle it as well as you may think.

Researchers have long held that a central “bottleneck” exists in the brain that prevents us from doing two things at once. Dux and Marois are the first to

identify the regions of the brain responsible for this bottleneck, by examining patterns of neural activity over time. Their results were published in the Dec. 21 issue of *Neuron*.

“In our everyday lives, we seem to complete so many cognitive tasks effortlessly,” says Dux, a postdoctoral research associate in the Department of Psychology. “However, we experience severe limitations when we try to do even two simple tasks at once, such as pressing a button when a visual stimulus appears and saying a word when a sound is presented.”

“While we are driving, we are bombarded with visual information,” says Marois, associate professor of psychology. “People think they are safe if using a headset with their cell phone while driving, but they're not because they are still doing two cognitively demanding tasks at once.”

Identifying the information bottleneck responsible for this dual-task limitation required use of functional magnetic resonance imaging, or fMRI, an imaging technology that reveals the brain areas active in a given mental task by registering changes in oxygenated blood concentration in these regions.

While fMRI is an excellent tool for identifying a particular area in the brain involved in a given task, it generally provides limited information about how

that area responds over time. To overcome this limitation, Dux and Marois rapidly sampled brain activity using fMRI while subjects were performing two demanding tasks. Evaluation of data produced by this rapid sampling method allowed them to characterize the temporal pattern of activity in specific brain areas.

two tasks at once. “We determined these brain regions responded to tasks irrespective of the senses involved, they were engaged in selecting the appropriate response, and, most important, they showed ‘queuing’ of neural activity—the neural response to the second task was postponed until the response to the first was



The two tasks involved pressing the appropriate computer key in response to hearing one of eight possible sounds and uttering an appropriate syllable in response to seeing one of eight possible images. The results revealed a central bottleneck caused by the inability of the lateral frontal and prefrontal cortex, and also the superior frontal cortex, to process the

completed,” Dux says. “Neural activity seemed to be delayed for the second task when the two tasks were presented nearly simultaneously within 300 milliseconds of each other,” Marois says. “If individuals have a second or more between tasks, we did not see this delay. “This temporal delay is the essence of dual-task interference for tasks that require actions. By

using time-resolved fMRI, we can see its signature in the brain,” he adds. “These findings allow us now to really focus on this set of brain areas and to understand why these areas cannot process two tasks at once.”

The researchers believe their work has implications for people performing complex tasks. “It may be possible to look to the sort of tasks people must do in a very complex environment, such as flying a plane, and find out under what circumstances these tasks may be less vulnerable to dual-task interference,” Dux says.

The research was supported with funding from the National Institute of Mental Health. For the record, neither Marois nor Dux uses his cell phone while driving. “I'm Australian, and it's illegal there, so I'm trained not to,” Dux says. “Even so, I would never do it. Dual-task costs can be up to a second, and that's a long time when you're traveling at 60 miles per hour.”

## Protestants and the Almighty's Dollar

3. DOING SPIRITUALLY inspired work for the Lord usually begins with the tricky job of persuading someone to donate cold hard cash.

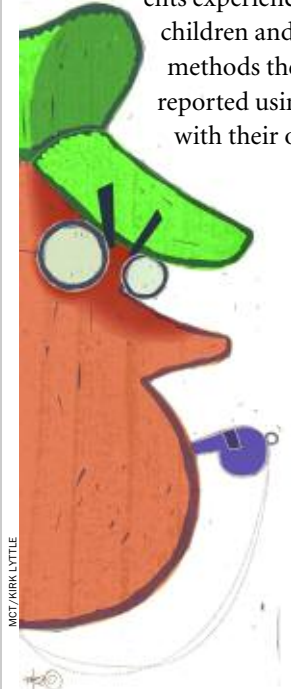
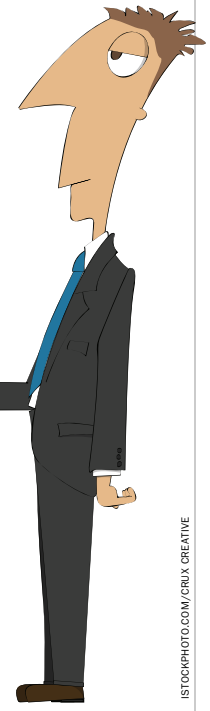
In his new book, *In Pursuit*

of the *Almighty's Dollar: A History of Money and American Protestantism*, James Hudnut-Beumler surveys how American Protestants have gone about collecting and spending money from the 1790s to the present.

Congregants have been persuaded to pay for a choice pew reserved for them during services. They've used dated envelopes so their contributions never missed a week, even if they did. They've been asked to sell Christmas wrapping, cookies and most other products to raise money for the church—even laxatives and lingerie. Sometimes the preacher simply asks for money from the pulpit, occasionally with a significant dollop of guilt doled out to those who resist.

One method in the 1930s involved a mock trial titled “The Church v. John Doe,” where a fictional church member is prosecuted for insufficient giving.

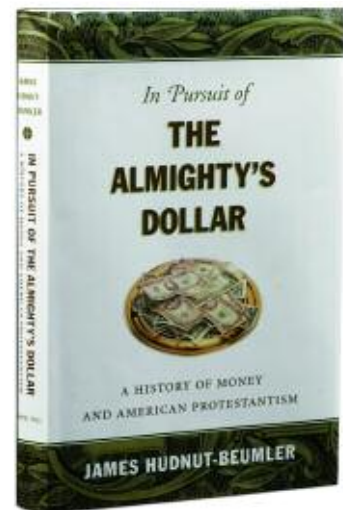
“As someone involved in the Christian religion, some of this made me squeamish,” says Hudnut-Beumler, the Anne Potter Wilson Distinguished Professor of American Religious History and dean of



Vanderbilt Divinity School.

“But stepping back from that as a historian of American religion, I see the undercurrents of mutual anxiety. Religious leaders see that great things can be done in the religious world with money, and also fear what happens if the people don’t pay enough to keep it going. On the other side, people who have money don’t necessarily want to part with it, even when they know it’s for a good cause.”

*In Pursuit of the Almighty’s Dollar* also looks at how that money is spent, with pastoral talent and facilities at the top of the list. Congregations generally build new facilities upon their founding or after a tragedy such as a fire, says Hudnut-Beumler. They usually build or renovate once per generation thereafter—needed or not. “Why do people keep



building and rebuilding when they have a perfectly usable building?” he asks. “I think there is something about building and dedicating a space to God that represents the work of people’s own hands, their best efforts of the moment, which

drives this compulsion.”

Pay for preachers is a particular concern to Hudnut-Beumler, since Vanderbilt Divinity



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School trains many students for careers in the ministry. In the book he says Protestant ministers have been on a “centuries-long slide ... from near the top of colonial-era communities to a tenuous hold on middle-class status today.”

### Colombian Migration Provides Cancer Clues

**4** NEPELAYO CORREA had been researching stomach cancer for more than 20 years when Hurricane Katrina’s floodwaters made their way into his lab at Louisiana State University, destroying decades of work.

“My heart went to the floor,” says Correa. “Most of my work from Colombia, South America, my biopsies, blood and serum were all in the building in the medical school. I was in New Orleans close to 32 years.”

Correa’s work was well known at Vanderbilt, and his colleagues rallied to help the researcher move to Nashville and resume his research here. “His work has had a profound impact and contributed to our understanding of the major cause of gastric cancer,” says Raymond DuBois, director of Vanderbilt-Ingram Cancer Center. “I felt we had to do everything possible to get him back into a laboratory quickly so he could maintain his

research program and regain some momentum.”

At Vanderbilt, Correa has been named the first holder of the Anne Potter Wilson Endowed Chair in Cancer Research. He has begun picking up the pieces of his work on stomach cancer while making several trips back to Colombia, his homeland, to gather new samples. “We still have the patients there and a lot of epidemiological data on them,” says Correa. “We have documentation on the evolution of each patient for 20 years or more.”

Correa’s research focuses on *H. pylori*, the bacteria known to lead to stomach cancer. The population in Colombia is at high risk for developing the disease.

“The infection is spread from person to person in childhood. In many other countries we see very high rates in crowded spaces,” explains Correa. “This is the second leading cause of death from cancer worldwide; 50 percent of the population worldwide has the infection.”

Correa started a cancer registry in Cali, Colombia, in 1964, after a large migration brought



NePelayo Correa (front right) with Vanderbilt colleagues

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thousands of families from other parts of Colombia to the area. He found that a region in the south of the Colombian Andes, Narino, had an exceptionally high incidence of gastric cancer.

The researcher is looking at how the infection leads to stomach cancer for some, while other people infected with *H. pylori* never develop stomach cancer. Correa’s work in Tumaco, Colombia, documents this puzzling trend.

“They have a prevalence of infection just as high as that of the high gastric cancer risk population, starting also very early in childhood, but they do not develop gastric cancer. We are comparing the two populations and exploring the reasons for this intriguing discrepancy. If you understand how this is produced, you can understand how to prevent it.”

Correa is also studying whether antibiotics to kill *H. pylori*, in combination with the dietary supplements vitamin C and beta carotene, may reduce damage to the DNA of cells produced by the infection and, in turn, slow the progression or possibly cure the infection.

### Smart and Smarter

**5** WHO WILL BE the next Albert Einstein? The next Stephen Hawking? The complex mix of factors that creates intellectual leaders includes cognitive abilities, educational opportunities, investigative interests, and old-fashioned hard work, according to a new report.

The report is based on 35 years of research from the Study of Mathematically Precocious Youth, a 50-year study that tracks individuals identified as exceptionally gifted at a young age across their lifespan. Begun at Johns Hopkins University in 1971, the study is now based at Vanderbilt’s Peabody College

of Education and Human Development and is led by Camilla Benbow, Patricia and Rodes Hart Dean of Education and Human Development, and David Lubinski, Peabody professor of psychology. The current report reflects data collected from more than 5,000 study participants. It was published online in December 2006 by the journal *Perspectives on Psychological Science*.

“We found that mathematical gifts and a variety of aptitudes have a significant impact, but that special educational opportunities and commitment can dramatically increase this impact,” Lubinski adds. “These students are intellectually gifted, and those gifts are best fully realized when they have the full

support and understanding of their teachers, their parents and their social network.”

While the students as a whole had exceptional mathematical ability, they were far from homogenous, with a great diversity of talent and interests. These differences have had a direct impact on participants’ future career choices and success, some of which were outside traditional scientific and mathematic fields.

“Exceptional verbal ability is characteristic of participants whose favorite courses, college majors and occupations were in the social sciences and humanities, whereas higher levels of mathematical and spatial abilities characterize participants whose favorite courses, college majors and occupations were in engineering and math or computer science,” the authors write. “Given the ever-increasing importance of quantitative and scientific reasoning skills in modern cultures, when mathematically gifted individuals choose to pursue careers outside engineering and the physical sciences, it should be seen as a contribution to society, not a loss of talent.”

The findings contradict a widely held belief in educational literature that there is an “ability ceiling”—in other words, that differences are moot among the very top students. Lubinski and Benbow compared groups scoring progressively higher on the SAT—from the low- to mid-500s to above 700—at age 12 or 13. By age 33, 50 percent of the top scorers had earned a doctorate, compared to 30 percent of

the group scoring closer to 500. Only 1 percent of the general American population earns a doctorate.

“Individual differences in the top 1 percent do make a difference,” the authors say. “More ability is always better, other things being equal.”

The study identifies another, perhaps obvious, factor of these students’ success—a willingness to work extremely hard. A majority of the highest performers at age 33 indicated a willingness to work more than 65 hours a week.

Though they found no differences in overall ability between the sexes, researchers did find marked differences in types of ability and interests. The report finds female participants more likely to prefer organic subjects and careers, such as the social sciences, biology and medicine, and



Benbow and Lubinski

DANIEL DUBOIS

men more likely to prefer inorganic subjects and career paths, such as engineering and the physical sciences.

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