

# HUMAN ECOLOGY

COLLEGE OF HUMAN ECOLOGY, CORNELL UNIVERSITY

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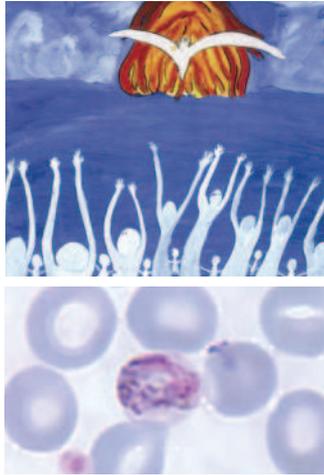
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MARCH 2005/VOLUME 32, NUMBER 3



HEALTHY PEOPLE, FAMILIES, COMMUNITIES



Cornell University  
College of Human Ecology

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COLLEGE OF HUMAN ECOLOGY, CORNELL UNIVERSITY

COURTESY OF SHEILA DANKO



## HEALTHY PEOPLE, FAMILIES, COMMUNITIES

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Warmth and productivity at work

Volume 32, Number 3  
March 2005

The New York State College of Human Ecology at Cornell University  
Lisa Staiano-Coico, Ph.D.  
Rebecca Q. and James C. Morgan Dean

Cornell's College of Human Ecology publishes this magazine to illustrate how its programs address complex societal issues to improve the human condition. This mission of human improvement is accomplished through faculty initiatives in research, outreach, and teaching—with an emphasis on an ecological perspective, collaborative projects, and multidisciplinary curricula within and across five academic units: the Department of Design and Environmental Analysis; the Department of

Human Development; the Department of Policy Analysis and Management; the Department of Textiles and Apparel; and the Division of Nutritional Sciences, a unit shared with the College of Agriculture and Life Sciences. The college includes the Family Life Development Center, Bronfenbrenner Life Course Center, and the Cornell Institute for Policy Research.

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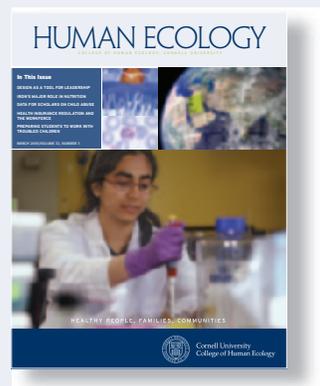
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## Healthy People, Families, Communities



What does it mean to be healthy? The subject of health and even the word itself can be vague. Is a healthy person physically fit? Does he or she have a happy home life? A good job in a comfortable setting? Access to excellent health care and insurance? If any of these components are missing, can a person still be labeled as “healthy”?

Throughout its history, the College of Human Ecology has been dedicated to the betterment of human life. Building and maintaining healthy families and communities is at the core of our mission, a mission we are proud to say is reached through a unique combination of disciplines.

In this issue of *Human Ecology*, you will read about the ways in which iron deficiency is negatively affecting individuals in impoverished communities around the world, especially young children. Our researchers are working to repair the damage caused by this deficiency and to find ways to introduce this essential nutrient into the diet of these people. It is a significant and important undertaking. Still, good health is not only about nutrition or even about one’s physical state. Indeed, a healthy individual is one who is physically, psychologically, and socially healthy. This is our college’s focus.

Whether it is through the design of a workspace or home, the application of complex thinking and broad-based research to the mental health issues of children, or the painstaking collection of an archive on abuse and neglect, our faculty and students are approaching the subject of health in myriad ways. This spring, our college will host a conference on the growing epidemic of childhood obesity and the medical, social, and psychological fallout of that epidemic. Other faculty members’ area of expertise is the health care system and the ways in which access to insurance and to medical personnel affect the lifelong health of individuals and their families. Still others address the topic of green composites and neighborhoods designed with physical activity or the limited mobility of the elderly in mind.

The goal of true health, for ourselves and for those we love, is a common link among all of humankind. In the College of Human Ecology, it is a goal we pursue with passion, knowledge, and a rich diversity of methodology. We are proud to have played a role in the improvement of so many lives, and we look forward to being a part of the health, happiness, and success of communities all around the world for many years to come.

*Lisa Staiano-Coico*

Lisa Staiano-Coico, Ph.D.

*Rebecca Q. and James C. Morgan Dean*

# Design as a Tool for Leadership and Social Change

Design and understanding of the design process can make people better leaders. That is a belief held by Sheila Danko, the J. Thomas Clark Professor of Entrepreneurship and Personal Enterprise in the Department of Design and Environmental Analysis. “Good design, like good leadership, is transformative. Both empower people to reach their own potential and improve the world around them,” she says.

BY CAROLE STONE

Formally trained in architecture and industrial and graphic design, Danko embraces a broad view of design in daily life and encourages her students to do the same. Not merely a product, a noun, or object, design is also a process, a verb, a tool for communicating vision and for engaging people in the process of change, she says. Similar to the way in which a work of art or a piece of music communicates the intentions of its author and envelops the individual in a new view of reality, the designed world around us—from monuments and medical facilities to subway maps and strategic plans—reflects the intentions and values of the people who created it and shapes our world view.

In her research, Danko seeks to uncover the ideas embedded in designs, especially as they relate to social or interpersonal issues. “Design is unique in the arts because it is inherently proactive, synonymous with creative problem-solving, and can directly impact the health and well-being of society,” she states. “This is my work—to move people beyond the notion of design as material artifact toward the concept of design as a tool for leadership and social change.”

Danko’s methodology is a hybrid one, blending the objective perspective of case-study method with the subjective, personal insights of narrative method, or storytelling. This approach enables her to examine design as part of an interrelated system of products, people, and processes revealing the intangible qualities of design, the values behind design decisions, and the nuances of the design process—with its inevitable conflicts, controversies, trade-offs, and reworkings.

“Stories are a powerful method for making sense of the world and understanding our role in it,” she says. “We have embraced the scientific method to such a degree that we have forgotten other ways of knowing and learning. Narrative method provides evidence of how people derive meaning from design. It complements the scientific method with its power to illustrate, to

inform, and ultimately, to invite personal reflection.”

In 1999 Danko began work on a collective research project for which she was a principal investigator, a project to identify and document personal stories of the life-changing impact of interior design in the workplace. “Strategic Stories: Shaping Interior Design for the 21st Century,” was sponsored by FIDER, the Foundation for Interior Design Education and Research. Danko’s collaborators, who did similar field work and analysis, studied the impact of design in a variety of organizations, including Boston Financial, DreamWorks Animation Studio, DuPont Antron, Sprint, and the Environmental Protection Agency.

After conducting lengthy, tape-recorded interviews, Danko returned to Ithaca where her audiotapes were transcribed, verbatim. Then, the analysis began. The team identified major issues and recurring themes, which became the focus of the story writing. An established six-part framework was used for reconstructing the data into several interrelated stories.

“The goal of storytelling is to synthesize complex issues, ambiguous situations, and opposing forces in a contextually relevant way,” Danko explains. “What is unique about our work is that all the stories are true stories about real people and real situations, not hypothetical composites or fictional scenarios.” The stories highlight strategic applications of design, illustrating how decisions are made in the context of human tensions and emotion. While the stories often focus on a single voice, the data collection always includes multiple voices to enhance validity. Many points of view are essential to understand design in its social context, she says.

In 2000 Danko published “Beneath the Surface: A Story of Leadership, Recruitment, and the Hidden Dimensions of Strategic Workplace Design,” in the *Journal of Interior Design*. The story describes a human-resources recruit who interviewed for a job at Boston Financial. The newly designed work space—its interior design, arrangement of individual offices and shared spaces, and choice of furnishings—had an important influence on the recruit’s decision to accept a job offer. During her tour and subsequent interviews this woman discovered that the physical environ-



Everett Brown (Age 6), Ithaca, NY.  
This is my picture of the Girl of Peace. She is standing on the water with her hands behind her. Please you can see the moon, two shooting stars, a comet and a flower. Below in the water a fish and two dolphins jump for joy. She is talking to the animals. Love and nature in a language that you may not understand. Please please help me play for peace on the world. © 2004 www.finechocolate.com for sale on art art



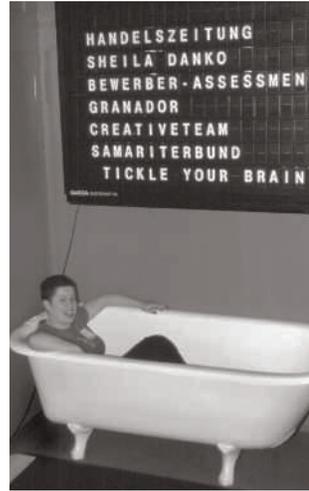
Dede Heston, Ithaca, NY.  
Reservoir, 1996. Galatin silver print, 7 x 11".  
My impulse to photograph comes from a wish to remember. It could be something quirky about a new place, or some story or shape or quality of light that I have noticed. The landscape that presented itself to me in Reservoir was stunning, and the process of photographing it was an exploration.  
For more information about this artwork or to contact the artist, please visit [www.finechocolate.com](http://www.finechocolate.com).

ITHACA TYPE CHOCOLATE

Reproductions of art by adults and children from around the world can be found in Ithaca Fine Chocolate’s “Art Bars.”



Expolite Sables Milk Chocolate with Hazelnuts  
COURTESY OF SHEILA DANKO



BrainStore, an idea factory in Switzerland, uses its office design to shock people out of their complacency.

ment held clues about the people and the corporate culture, Danko explains. "Because the chief administrative officer and the director of organizational development viewed design as a strategic tool to communicate their values and social mission, they were able to articulate some very important things about the corporate culture, which convinced this young woman that she might like to work there," she says.

Danko's work challenges people by asking them about the kind of human beings they want to be. "Values consciousness is a critical part of education," she says. "Leadership development begins with an awareness of self and progresses to an understanding of self in relation to the world. I want my students to lead with their values."

Another strategic story from the Boston Financial project—entitled "The Gift of Purpose" (see page 5)—illustrates how managers can manifest values and communicate vision through the choices they make relative to the workplace. This and the other strategic stories lend insight into the ways in which leaders can use design to advance their organizations.

"A leader is someone who redesigns the world, who re-creates products and processes that fulfill a range of needs. Leaders need to understand how design can help them achieve their goals," Danko says.

She assigns "The Gift of Purpose" as required reading for students in her leadership skills mini-course, *Design: A Vital Part of the Leadership Equation*, which she teaches each year at Cornell's Johnson Graduate School of Management. Danko tells her students, "I want you to learn a new tool for your leadership repertoire—design and the thought processes of designing. It is a tangible means of putting your vision into practice in an organization and in the world."

Her use of stories in the classroom and in the Boston Financial study informed several subsequent case studies that were sponsored by the Robert and Edna Shelley Gates Fund for Leadership through Design. The stories embedded in the office design of Discovery Channel's Latin America Division reveal how conflict between the corporate culture and the existing societal culture of Miami-area employees could be meaningfully resolved, highlighting the

need for leaders to use design in culturally sensitive ways. Another case study, with BrainStore, Ltd, is about a Swiss idea factory whose stories of creative process illustrate how their workplace was designed intentionally to shock, challenge, and communicate their philosophy of creative problem-solving. Clients entering BrainStore are greeted not only by shocking-pink walls, but bathtubs, train-station signboards, and an industrial aesthetic reminiscent of a factory.

Danko's newest project explores how socially responsible entrepreneurs use design—product design, marketing design, and workplace design—to strategically communicate their vision, values, and social mission. The study, "Values-Led Entrepreneurship by Design: Strategic Stories of Growing a Socially Responsible Business," is sponsored by the J. Thomas Clark Professorship.

Ithaca Fine Chocolate's "Art Bar," the first case in this new project, is a good example of design supporting social mission. The core values of this new venture are strategically designed into every aspect of the company—from the fair-trade, organic chocolate suppliers and environmentally friendly packaging design, to a marketing design strategy that supports artists and art education via free art reproductions inside each candy bar. Emerging stories document the nature of the design decisions as they relate to the unique economic and social pressures of running a business with a social conscience. The stories also portray the ways in which the business impacts the lives of individuals, revealing new opportunities for leading social change by design.

Danko is currently investigating several other cases of values-led entrepreneurship—Girls Explore, Ltd., a company designed to provide role models to young girls through a collection of dolls modeled after women explorers and heroines; Share Our Strength, an organization designed to tap into both individual and corporate strength to raise money to end hunger; and the International Children's Art Foundation, designed to support world peace through art that promotes cross-cultural understanding. These stories of design leadership are still unfolding.

Preliminary findings from the cross-case comparisons reveal that those leaders who embrace a

**"This is my work—to move people beyond the notion of design as material artifact toward the concept of design as a tool for leadership and social change."**

**“Stories are a powerful method for making sense of the world and understanding our role in it.”**

## The Gift of Purpose

© 2000, SHEILA DANKO

I AM GRATEFUL TO THE PEOPLE WHO have the courage to follow their heart instead of the crowd. Resisting pressures to conform, they choose instead to reveal a piece of their inner self, to share deeply held personal values and a commitment to their work in a way that touches our lives and our work too. They never do it to change us—but it does—in ways that defy explaining, or maybe needn't be explained. We leave the experience trusting something fundamentally deeper, almost spiritual in meaning. We feel more whole, our lives renewed in purpose.

Karen, a managing partner at a major financial planning firm, has that kind of courage. Her deeply held values about work are right there in her office on public display, full of emotion and passion. Even though her office is largely identical to that of the other execs—same furnishings, same layout, same color scheme—Karen manages to redefine the bottom-line for people each time they walk into her office. Not in words, but in symbols.

As the executive director of Cordia Senior Living, a new start-up company within the larger investment management firm, she has the responsibility to make this new venture a financial success for the stakeholders in the organization. The pressure is real. The firm has been in the housing business for a long time, but this is its first foray into senior housing. Karen was brought in at the executive level and the clock is ticking for her to deliver a senior living product that has high returns for the clients of the firm. Towards that end, this woman is all business. There is a no-nonsense ap-

proach to her carriage, her handshake, and the focused way in which she answers questions. That's what makes her office all the more intriguing.

I first met Karen while interviewing her for a research project examining leadership. When I stepped into her office, my attention was immediately drawn to the side wall where over a dozen framed portraits were hung. Simple, yet compelling black-and-white photographs of elderly people—just their faces. Their expressions spoke of happiness, contentment, longing, and reflection; their eyes seemed to hide a veiled wisdom. I couldn't help feeling I'd met some of them before. I couldn't help but think of my own grandparents after seeing them. Grandpa's face came to me once again. His was a sad face crying out for us not to leave. That haunting memory of our last visit to him at the nursing home. I snapped back from my own memories as Karen began to tell me about these faces on the wall.

“Some of these people are actual residents of Cordia communities,” she said as I continued to stare at the portraits. “I like to have faces of seniors around because I know that one of the challenges of running a very service-oriented business in an investment management environment is that people forget who the main customers is.” She was referring to the fact that the main customers of the organization are typically thought to be the clients who hire this investment firm to manage and grow their money. They are the people who visit and call on a daily basis. “So when I first came here a few years ago,” she continued, “I put these pictures on my wall so I wouldn't lose sight of my real purpose. The comments I received were really pretty interesting.”

I clarified that she had these portraits on the wall in both her old office space and this newly designed space in which we were sitting. “Right, both,” she confirmed, “and it's been the evolution of the comments that has been so revealing to me. When I first came and folks saw these photos in the old office, I received very cynical, snide comments about these pictures. Comments like, ‘How many grandparents can a person have?’ or ‘Who is this motley crew?’ or people just asking ‘What's all this about?’” she recollected. Karen went on to explain that while the photos clearly captivated attention, they were also a source of jokes for many and even discomfort for some people. Her response would always calmly be, “I just think it's important for everybody here to remember who the other customer is.”

My eye moved past the last photo on the wall only to discover a rather whimsical tea service sitting off in the corner, on her back credenza. “And what about the tea set?” I added, “What kinds of comments does that generate?”

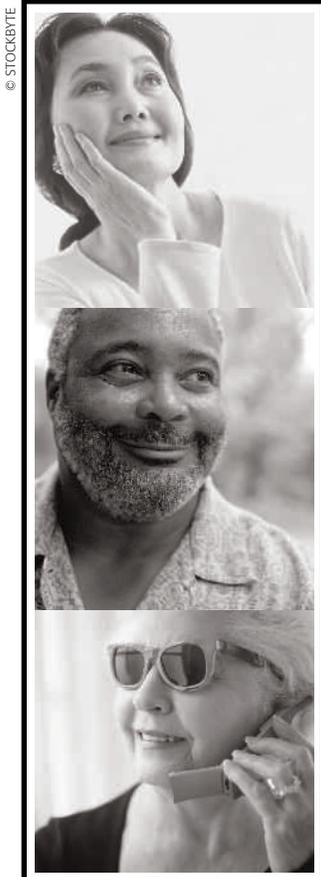
“I brought the tea service in as a symbol to remind me that I'm in the business of hospitality,” she prefaced. “Again, it generated similar snide comments like, ‘Oh, what are you going to do, have tea parties down here, or are you going to get some work done?’ Very questioning, very challenging” she recalled. “But I needed these symbols to remind myself that senior housing is as much a service business as it is a real estate business. When you're embarking on a new business, intellectually knowing it—and really living it—are two very different things.”

“So, I also brought in these books,” she continued as she pointed to three titles very prominently placed next to my guest chair. “*When I am an Old Woman, I Shall Wear Purple* is a book about aging with grace and zest” explained Karen, “and *What Makes a Leader* was a gift given to me from my mentor and is now a guidebook for my team.” The third title, *The Strong Living Program*, she told me referred to an exercise and weight-training program that they are piloting in the Cordia senior communities. “It's important to us that in our communities seniors view themselves as vibrant and are working and striving to stay active.”

Behind Karen as she spoke was a singular statement that read “So much more to experience.” It turned out to be the tag line for the Cordia Senior Living. “That statement represents our competitiveness in the marketplace, that there's more to experience at our communities. It is also our philosophical underpinning. We believe that the senior years are a time when you are still working to reach human potential,” she explained.

And what does “Cordia” mean, I asked. “It's the Latin word for *heart*,” said Karen.

Above the books I noticed a tender lithograph of two hands, one old and one young, in loving embrace. It too had a story behind it. About a year and a half after Karen arrived, she went with several colleagues to an art auction when one of them spotted the lithograph of the hands and insisted that Karen buy it for her office. “That would go so great with the faces,” she was told. Karen bought the piece. Shortly after, Karen was intrigued as people in the company heard about the “hands” artwork



© STOCKBYTE

and came to visit in surprising numbers just to see it, and where it was hung. It seemed no one was making fun of her wall anymore.

Karen had changed offices several times due to the phasing of the renovations for the new space. Each time she moved everything would come down and then everything would go back up. The cynical comments subsided and were gradually replaced with genuine interest. "All of these visual cues, all of these symbols in my office are reminders that there's a whole business that has to be successful in order for the investment management part of the business to be successful, and that we can't ever take that underlying part for granted." She looked at me. "That's really been the message."

"But what really surprised me happened after we moved into the new space," Karen began. "After we moved we weren't supposed to put up any pictures ourselves. We were supposed to wait for the maintenance team to come around and put them up. So for a while the portraits were in piles against this wall. People kept stopping by and asking 'When are the faces going up? We miss the faces.' That was the first clue. As per our instructions, I put a number on the wall and a corresponding number on every photo indicating where each should go. One day, I left to go out of town on a business trip and when I came back, all the photos had all been put up exactly where they were supposed to be. I was delighted. But then the maintenance staff came back later and said 'It's up the way you want, but we really think they would look better if we hung them up this way,' and then they proceeded to describe a different arrangement of the faces on the wall."

"The building maintenance?" I asked surprised. "Yes, the maintenance workers," she said. "So I told them, reorganize it the way you want. And that's the way they are up on the wall now. 'The building maintenance people feel like they have a real sense of ownership of this wall,'" she said with pride. It seems there had gotten to be a whole lot more ownership of Karen's office symbols than she originally intended.

Shortly after the company moved into the new space, Karen related one of the most moving testimonials to the power of her symbols and their impact on the heart of the organization. "One of our biggest business units was holding an investor conference, so we decided to host a fancy reception downstairs on the thirteenth floor. This was really the first time we invited a big group of inves-

tors to our new space since the move-in. We organized the staff to give tours through the new space and to talk about what it meant to us and about who we were as a company. Now, not everyone in the firm was involved in this reception, only that particular business group. In fact, I was sitting here in my office working when I realized, after the first few guided visits, that I was on the tour. My office, it was on the tour."

Karen sat back and reflected for a moment.

"It's been a really interesting lesson for me to watch the evolution of people's reactions and their levels of ownership." Karen was clearly an insightful woman, but even she still seemed in awe of the power of the faces on the wall. "Honestly, when I first brought them in and put them on the wall, they were symbols for me. I knew this new position was going to push me a little bit out of balance, a little bit off center of where I needed to be every day in my own thinking, in my own priorities. So the faces, the tea service, the books, the hands, the tag line—they were really visual cues for me, to remember the real purpose behind my work and to balance that purpose against what it takes to be successful in the larger investment management business." Karen concluded by saying "What I learned is that from my being steadfast in having these cues around—the whole combination of them—people have, over time, really internalized some of the message and made it their own. They've made it part of the company's story, the company's purpose, and are proud to tell it."

A sense of purpose isn't something we typically expect the physical environment to help us achieve in our professional lives. In fact, we seem to expect very little from our physical work environments, dismissing any truly high expectations of the role they might play in our growth as individuals. Instead, we settle for environments that support our work rather than nourish our souls. We create environments that exert only the most benign influence on our activities rather than motivate us to greatness. We construct environments that facilitate process but neglect to build a foundation of shared values. Perhaps we have been expecting too little. Perhaps within a few heartfelt symbols lies the power to breathe renewed meaning into the environments that we inhabit and into the lives of those who have temporarily lost their sense of purpose.

whole-systems view of designing—one that goes well beyond the design of the product to a view of design as tool for aligning vision and values throughout the organization—are the leaders who gain a competitive advantage.

When Danko looks at the faces of students in her undergraduate course *Making a Difference by Design*, she imagines that more of them will become business leaders than will become designers. "I am not interested in turning students into designers but in teaching students how knowledge of design can help them be better doctors, lawyers, and business executives," she says.

Danko is a witness to the power of stories to communicate issues of design and leadership in daily life. "I have seen stories touch deeply rooted passion within individuals, helping them grasp a deeper sense of their own leadership ability and the role of design in supporting them," she says. She is working on a book, *Leadership by Design: Strategic Stories of Design that Makes a Difference*, which she hopes will reposition design as a strategic tool in the minds of chief executive officers and other key decision makers.

"When there is strong leadership—honest, true, values-led leadership—then society improves," Danko explains. "Design can help people become better leaders, both in the sense of leading others and in the sense of leading their own lives. It helps people feel more in line with their values. It helps them move the world in directions they would like to see. By engaging the transformative powers of good design, people can begin to heal the planet and, in so doing, experience a sense of purpose and meaning in life. They will feel more whole, more connected, and live healthier lives."

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## Making Green Composites a Reality

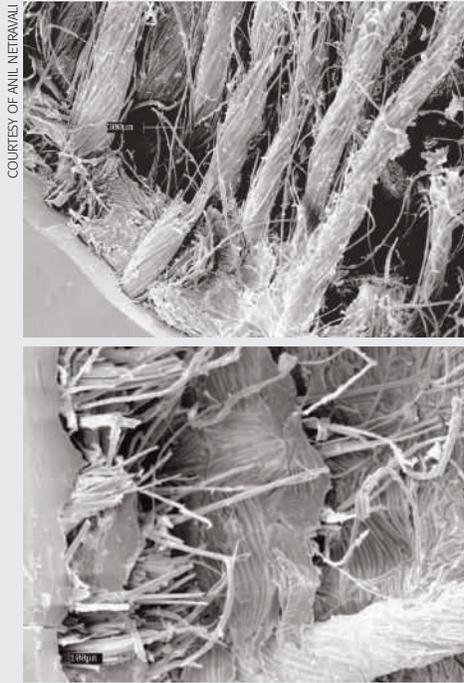
BY METTA WINTER

AUTOMOBILE MANUFACTURERS STAND OUT among American companies eager to adopt green, or environmentally friendly, technologies. Composites made of biodegradable, primarily plant-derived materials are light and can be as strong as conventional plastics. Yet at the same time they provide superior insulation against noise and heat. This makes the green composites particularly desirable for interior door and ceiling panels and panels separating the engine and passenger compartments in vehicles, writes polymer chemist Anil Netravali in an article titled "Composites Get Greener" that appeared in the April 2003 issue of *Materials Today*.

More than a decade of research by Netravali, a professor of fiber science in the Department of Textiles and Apparel, has amply shown the practicality of making fiber-reinforced composites in which both constituent elements—fibers themselves and the resin that binds them together—are fully biodegradable. His goal has been to create composites that are easy to mold on conventional compression molding equipment. They must remain stable, or undegraded, for the desired life of a product's usefulness (10 years for a car, six months for a picnic fork) yet rapidly disintegrate into soil when exposed to the moist, microbial conditions of a landfill. "We are very close," Netravali says.

To achieve qualities of both durability and impermanence, green composites must first be strong. In his research projects, supported by the National Textile Center, Netravali has been successful in strengthening the overall material by incorporating nano composites into the resins. These submicroscopic-size clay particles (the nano scale is based on a nanometer, which is the width of three silicon atoms) add the desirable stiffness and also improve the thermal stability.

"Right now in green composites we have achieved mechanical properties as good as or better than some reinforced plastics," he says, referring to high-performance but non-green composites made



**Fracture surfaces of fabric-reinforced soy protein composites from Netravali's laboratory, imaged with a scanning electron microscope.**

of petroleum-derived resins such as epoxy and polyurethane. In the composites now commonly in use, these resins bond together high-strength fibers, such as graphite and glass, to form materials that do not degrade in nature—but neither can they easily be recycled or reused.

Second to strength is the requirement that green composites be resistant to the amount of moisture in environments in which a particular product is used (office or airplane for the shell of a laptop computer, trout stream for a fishing rod), yet susceptible to it

later when discarded. A compost heap or landfill must be moist to support bacteria, fungi, and other microbes that live there. It is the enzymes excreted by these organisms that react with the plant materials in the composite, causing it to disintegrate.

Currently Netravali is refining the properties of select protein- and starch-based resins that are ideal food for compost-making microbes. He also is refining the technology used to bond them to fiber surfaces.

"These properties can be achieved by certain treatments we're working on, along with properties of the resin and the fiber surface that enhance the bonding," Netravali explains.

Controlling for water absorption is critical. As soon as a green composite absorbs water its dimensions can change, resulting in swelling or warping. If it became soaking wet, the green composite actually could sag.

"Here is the dilemma," Netravali explains. "The moment I make the composite highly water resistant, it can no longer support the microbial attack that turns it into soil, so the biodegradability decreases." It becomes a matter of striking a balance, he says.

In October 2004 Netravali and his research group joined engineers at Nissan Motor Co., Ltd. in a collaborative project to discover how to best adapt the materials that he has developed to meet their engineering requirements. Netravali was contacted by Nissan through the Cornell Center for Materials Research. The university center, in which he is a participating scientist, works to develop partnerships with industry to ensure that technical innovations and inventions move efficiently from the research laboratory into applications in the private sector.

"Nissan wants to make their cars greener by reducing their weight, making them more fuel efficient, and by building them from materials that are recyclable or biodegradable," Netravali explains. "It would be fantastic if I could see parts made from composites developed by my research group inside of their cars!"

# Iron Plays a Major Role in Nutrition



From infant formula to flour, iron-fortified foods are so commonplace on U.S. grocery shelves—and have been since the 1940s—that few Americans realize iron deficiency is one of the most prevalent forms of malnutrition, affecting more than one-fifth of the world population, or 1.4 billion people. Those lives would be changed dramatically by a small quantity of iron, an essential micronutrient.

These statistics have not changed much in two decades.

“There is no excuse for the scientific and public health community to be complacent about iron deficiency,” Stoltzfus insists. “Although many experts agree that in poverty-stricken populations iron deficiency is not being adequately controlled, consensus has not been reached about the public health consequences of the deficiency and which populations deserve primary attention in terms of intervention.”

Iron deficiency is perhaps best known for its association with anemia. It is, in fact, one of the major causes of the disease, which lowers a person’s red blood cell count below normal. Red blood cells carry oxygen to tissues throughout the body. The oxygen is needed for the normal functioning of cells and combines with food to release energy. An anemic person adapts to the decrease in oxygen by becoming less active—hence, the fatigue and weakness that are characteristic of the condition.

In certain parts of the world, primarily in less-developed countries, anemia has a far greater impact. Women of reproductive age and children are most vulnerable to developing iron-deficiency anemia (IDA) because their requirements for iron are high. IDA in pregnant women is associated with perinatal mortality—death of the fetus or newborn baby. Anemia also puts the mother at risk of dying in childbirth, often as a result of postpartum hemorrhaging, which could be prevented if medical services such as transfusions were immediately available. Such help is unlikely in remote parts of the world. Testing of anemic children reveals poor mental and motor performance in infants and toddlers and impaired cognitive function in schoolchildren.



COURTESY OF R. STOLTZFUS

BY CLARE ULRICH

“Enough evidence exists to indicate that iron deficiency adversely affects brain development in babies.”

**A**n estimated 841,000 people died as a result of iron deficiency in 2000, says Rebecca Stoltzfus, associate professor in the Division of Nutritional Sciences. Five thousand of those deaths occurred in the United States.

The statistics she cites are from the Global Burden of Disease 2000 project (GBD 2000), a study sponsored by the World Health Organization and the World Bank in which Stoltzfus participated with more than 100 international researchers who had been enlisted to assess world health conditions. GBD 2000 ranked iron deficiency ninth among the risk factors that contribute to human death and disability. In addition to death, iron deficiency collectively costs sufferers approximately 35 million disability-adjusted life years (years spent in less than full health) each year.



**"I am very interested in doing research that will lead to the right use of resources and effective programs to improve the health of women and children."**

COURTESY OF R. STOLTZFUS



**Professor Rebecca Stoltzfus with research associates observing children's behavior in Nepal.**

"Enough evidence exists to indicate that iron deficiency adversely affects brain development in babies," Stoltzfus says. "Part of my research has been to help determine the extent of those developmental deficits and how important they are for the long-term development, education, and well being of the child."

Stoltzfus's research takes her to impoverished communities in rural Nepal and Tanzania, in eastern Africa, where it is common to find 80 percent of the toddlers afflicted with IDA; by comparison, seven percent of North American children are anemic. A number of factors contribute to this disparity.

Stoltzfus explains that low-birth-weight babies are frequently iron deficient, a condition determined in large part by mothers' health. In some Southeast Asian countries, including Nepal, as many as 60 percent of the women have IDA. When an iron-deficient woman is pregnant there is growing evidence that she is unable to pass on to her fetus adequate amounts of iron, which the fetus needs to accumulate to ensure healthy development during its first six months as an infant. Iron is especially critical for breast-fed infants because breast milk does not contain enough of the nutrient for the developing baby. By the time infants transition from breast milk to solid foods, they have depleted any iron stores they were born with and are dependent on their diet to get the iron and other nutrients they need to sustain the rapid, complex growth that normally occurs between four months and two years of age. If iron-rich foods are not available, an infant's development will be impaired by anemia. The process becomes a vicious cycle in those areas of the world where the bioavailability of iron-rich foods is severely limited.

By contrast, low birth weight has been monitored and controlled in the United States through the Centers for Disease Control and Protection—today less than eight percent of U.S. babies are born annually with low birth weight. The trend is positively correlated with decreasing numbers of anemic children. Iron-fortified infant formulas are plentiful in the United States, and nursing mothers can supplement

## Safe or Sorry?



BY CLARE ULRICH

IN MAY 1992 THE U.S. FOOD AND DRUG Administration (FDA) published its statement of policy on genetically engineered (GE) foods in the *Federal Register*. Since then, the FDA has approved 12 different GE plants for commercial production in the United States, among them corn, soy, canola, potato, tomato, and rice. According to information from Cornell Cooperative Extension's Genetically Engineered Organisms Public Issues Education Project, 60 to 70 percent of foods in U.S. markets contain some GE ingredient(s). But it is impossible for consumers to know which foods contain GE plants because labels are not required. While both the science and business of biotechnology has grown rapidly in 12 years, the 1992 policy remains the FDA's definitive position on GE foods. David Pelletier, associate professor in the Division of Nutritional Sciences, has spent several years scrutinizing it.

"At first I wanted to reassure myself that the policy was sound, despite all the media hype in the late 1990s. I work in the area of nutrition policy but until that time had not focused on genetically engineered foods," he explains. "When I initially read the policy, I had some misgivings. The more I studied the policy, the more misgivings I developed. Eventually I decided that some important issues were not well-addressed in the policy."

Genetic engineering uses molecular biology techniques to introduce new genetic information into the cells of an organism, causing the organism to produce one or more new proteins that bestow new traits on the organism, as designed by the engineers. If it is a food-producing organism, the new proteins will be contained in the food product. Because some of these proteins previously may not have been present

## FDA Policy on Genetically Engineered Foods

in significant amounts in foods, one concern is whether they may have effects on human health when people eat GE foods. Another concern is whether genetic engineering produces unintentional chemical changes.

In a presentation developed to inform the public and scientific community about the FDA policy, Pelletier points out how inadequately the FDA addresses a number of issues related to GE food production and regulation. For example, although the 1992 policy statement acknowledges that in both GE and traditional breeding “the phenotypic [visible] effects of a trait may not always be completely predictable in the new genetic background of the host,” it concludes that foods modified by GE are no different than foods modified by traditional breeding practices.

The FDA policy admits that “it is not possible to establish a complete list of all toxicants that should be considered for each plant species.” Nevertheless, it reassures the public that “the established practices plant breeders employ in selecting and developing new varieties of plants...have proven reliable for ensuring food safety” and that these “well-established practices have successfully identified and eliminated plants that exhibit unexpected, adverse traits prior to commercial use.” The FDA suggests that the same practices could be used to ensure the safety of GE foods. This suggestion, combined with the lack of evidence that any of the current GE foods are harmful, leads the FDA to grant GE foods the presumption of being “generally regarded as safe” (GRAS). As used in this case, GRAS is a legal category, not a scientific conclusion about GE foods. This is the same presumption granted to conventional foods. From a strictly legal perspective, GE foods are not regulated any differently than conventional foods in the current system in place in the United States.

When developing its policy, the FDA and other federal agencies wrestled with a central issue that remains unresolved to this day: are unintended compositional changes and health effects more likely with GE than with conventional breeding? Pelletier cites excerpts from internal FDA memos in which FDA scientists and senior scientific administrators concluded that the processes of genetic engineering and traditional breeding are different and disagreed with the draft policy treating them the same. Four months later when the FDA published its policy, he explains, it had determined that GE foods did not create any new categories of risk and

recommended that oversight focus on the characteristics of the product in a given environment rather than on the process that created the product.

“As the FDA scientists said, the risks associated with GE may be higher or lower—we don’t know which because the critical research has not been done,” Pelletier argues, “but the molecular processes definitely are different from conventional breeding. Inserting genes attached to powerful promoters makes the target genes express constantly, rather than turning on and off as in normal gene expression, and also may affect the expression of nearby genes or functionally linked genes.”

Pelletier explains that there are two key questions at the center of the debate. “First, when we use GE, do we create substantially more chemical compositional changes in the plant or animal than we do with traditional breeding?” he asks. “I think the answer may turn out to be yes, if we apply modern profiling methods to examine this question.”

The more difficult question is whether the compositional changes in specific GE foods have health consequences, Pelletier says. He believes that answering that question will require a longer term, more difficult, and more expensive research program.

“We’re not systematically examining the first question, although we have the tools to do so, because it may raise concerns and disrupt the GE food industry,” he explains. “I’m somewhat sympathetic to that, but I have a hard time accepting the notion that we should purposely NOT test for chemical compositional differences. This is especially worrying. The FDA, the industry, and others have said repeatedly that we should regulate based on the characteristics of the food—rather than the process by which the food is produced—and determine if the food is substantially equivalent in chemical terms. But we have backed away from using our most powerful tools for examining the characteristics of the food.”

In just a decade the United States has become the single largest producer of GE crops. The FDA continues to presume that each new GE food is GRAS, unless limited compositional tests show otherwise. Meanwhile, public concern continues to be voiced about the potential risks of GE foods, including the possibility that GE crops may exhibit compositional changes that are allergenic or toxic to certain segments of the population.

The FDA has not been completely unresponsive to the controversy surrounding GE foods. In 2002 the FDA,

along with the U.S. Department of Agriculture and U.S. Environmental Protection Agency, asked the National Academies (National Academy of Science, National Academy of Engineering, Institute of Medicine, and National Research Council) to convene a committee of scientific experts to outline approaches for assessing or predicting the unintended health effects of GE foods and to compare GE and conventional breeding with regard to their potential for unintended effects. Professor Cutberto Garza, director of Cornell’s Division of Nutritional Sciences, was appointed to this committee. A resulting 235-page guide, *Safety of Genetically Engineered Foods: Approaches to Assessing Unintended Health Effects*, was published in July 2004.

In the preface to the guide, the committee chair states that “the addition of genetic engineering to the repertoire of methods to genetically modify organisms has increased the number and type of substances that can be intentionally introduced into the food supply, as well as the magnitude of these changes.” The committee warns that a simple comparison of the chemical composition of GE foods and those produced by traditional breeding is insufficient. It makes a series of recommendations that include continued pre-market compositional assessments of GE foods and the development of tracking systems for more systematic post-market verification of safety. The guide also advises that new analytical profiling techniques be used on a research basis to examine possible compositional differences among genotypes, while recognizing that the predictive tools currently available for assessing health effects are limited. In essence, the committee advocates a vigorous, multifaceted research program.

The FDA and others must now decide how to respond to these recommendations, including whether any changes in regulatory procedures are appropriate.

“It is important to take a long-term view of GE foods,” says Pelletier, who concurs with many of the findings of the committee. “If genetically engineered food is the way we’re going to feed the planet in the future, then we need to have mechanisms in place to understand and screen out unintended effects.”

breast milk with readily available vitamin supplements. When babies transition to solid foods, iron-fortified foods are easily found in the supermarket. Most experts agree that the chief reasons for low iron deficiency and anemia in the United States are better-nourished mothers, bigger babies at birth, and iron-fortified formulas.

Mothers in countries like Nepal and Tanzania do not have many iron-rich foods in their environment to eat or iron-fortified cereals that they can buy for their infants at the market. Babies are typically fed staple foods from the family pantry, like rice or cornmeal, made into porridges that contain little or no iron.

Attempts to control iron deficiency in less-developed parts of the world have not been highly effective. The same measures that succeeded in the United States are not universally applicable.

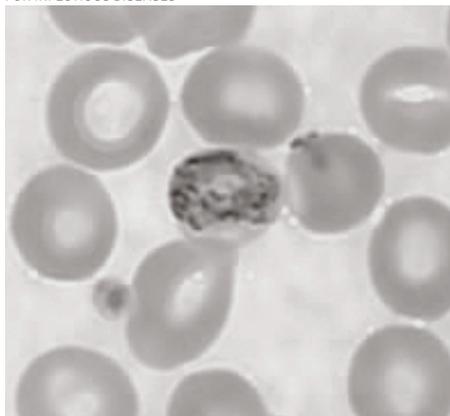
“To combat a problem like anemia in women and children, you have to understand what’s causing the problem in order to put together the right interventions to prevent or treat it,” says Stoltzfus. “You can get the biology right and the program still may fail because of social and behavioral issues. If you care about changing human health, then you must understand the culture you’re working with.”

She explains why infant formula would not work in Tanzania and Nepal: “Formula is prohibitively expensive, and when mothers do use it, they often don’t have the resources to use it safely. They might use contaminated water to mix it up, or they might feed it in bottles that they’re not able to keep clean. Formula actually becomes dangerous because there are many ways that it can be used unhygienically. Mothers also will dilute it to make it last longer, which creates a very bad food for the baby because it is too watered down. We know that breastfeeding is far superior to formula feeding for babies in these communities.”

Iron supplementation may help, but it is not the only answer. While nutrition, specifically iron, is a major component to anemia, it is not the only cause.

“In 10 years of studying anemia, I’ve become convinced that iron deficiency accounts for about half the anemia in the

CENTERS FOR DISEASE CONTROL AND PREVENTION/NATIONAL CENTER FOR INFECTIOUS DISEASES



**Plasmodium malariae gametocytes in thin blood smears.**

world,” says Stoltzfus. Many factors play into anemia—including nutrients like vitamin A or vitamin B12—and illnesses and disease processes, particularly infections. Parasitic infections like malaria or intestinal parasites like hookworm are notorious for contributing to anemia. “It is challenging to try to understand the unique roles nutrition and infection play in anemia, and then to disentangle them,” she says.

In collaboration with colleagues from the Johns Hopkins Bloomberg School of Public Health, Stoltzfus recently completed two randomized studies in Nepal and Tanzania that may supply some answers.

Nepal is part of the Asian subcontinent, where anemia rates are among the highest in the world, and malnutrition is quite severe in women and children.

In Tanzania, malnutrition is not as severe, but parasitic infections such as malaria are transmitted at very high rates. The parasite that causes malaria lives part of its life cycle in a person’s red blood cells, where it multiplies and then moves out to inhabit more red cells. The body reacts with an acute immune response that suppresses the manufacture of new red blood cells. Tanzanian victims are hit doubly hard by malaria and iron deficiency.

Stoltzfus designed the studies to compare and contrast anemia-causing conditions in these different environments in order to determine more effective and specific interventions.

About 600 children in Nepal and 900 in Tanzania participated in the studies. They

ranged in age from 6 to 71 months. The same protocol was used in both studies: children were randomly assigned to receive iron and folic acid (IFA) daily, zinc, IFA plus zinc, or placebo, in the form of identical tablets. Neither the children nor the researchers knew which subjects received which treatment. Trained observers recorded the children’s behavior at play in their homes for three to four hours each day for a year, paying particular attention to active play.

“One of the challenges of working in these environments,” explains Stoltzfus, “was that there were not many university-trained psychologists to employ. We needed to devise ways to measure child development that could be implemented by people with high-school educations and no formal knowledge of psychology. It took considerable training.”

The researchers pilot tested and refined the methods to make sure they would be implemented properly. They used videotapes and role playing to teach the methods. Research trainees were sent out in pairs and instructed to compare their observations to make sure they were recording the children’s behavior in a standardized way.

Work began in 2001. Stoltzfus employed a graduate student at each site who lived there and oversaw the study. A post-doctoral associate trained in human development (Patricia Kariger, who is now in Cornell’s Division of Nutritional Sciences) helped develop the methodologies and provided quality control at both sites. Two senior psychologists—one from South Africa with considerable experience working with rural African populations, and the other from Peru—served as co-investigators.

Data collection took place in 2002 and 2003. Stoltzfus’s research team has begun analyzing the data from Tanzania but is still compiling data from Nepal. Findings thus far are mixed but promising, she says.

Before the program was implemented, 60 percent of the children had significant anemia, and 76 percent had low iron levels. Stunting of growth was evident in 38 percent of the children, and 36 percent were underweight. The anemic children showed delayed motor development and were less likely than their nonanemic counterparts

**Human Ecology graduate student collecting data about Nepalese children in a nutrition study.**

to walk at the developmentally appropriate age. They also were less active—that is, those children who could walk spent less time walking.

Preliminary findings suggest that iron supplements decreased iron-deficiency anemia but did not affect growth retardation. Stoltzfus speculates that other anemia-causing factors, such as malaria and worms, hindered these children's responses to iron.

One broad question that Stoltzfus is seeking to answer is whether iron supplementation can prevent or reverse developmental damage. Her early findings seem promising. Children's motor development improved significantly after they received iron treatments. Babies who received iron supplements learned to walk, on average, about three weeks earlier than non-supplemented children.

Zinc also conferred some benefits. Observers noted that zinc-supplemented babies were carried less by their mothers and spent less time fussing. Both of these findings are consistent with the idea that supplements enable children to become more active in positive ways. "Of course, it's good for mothers to be hugging and carrying their babies," Stoltzfus remarks, "but you expect babies at 6 to 18 months of age to want to explore and to squirm when they want to get down from their mothers' arms. Transitioning to being carried less is a positive development for children of this age."

Stoltzfus is planning a long-term follow-up study of the Tanzanian children who participated in these trials—in collaboration with Kariger and also with Cornell psychologists Rich Canfield and Barbara Strupp, both in the Division of Nutritional Sciences. The researchers plan to return to Tanzania when the children in the original study have reached late-preschool or school-entry ages, in order to assess their school readiness and verbal and social skills.

"Children change so dramatically," Stoltzfus says. "It is important to know whether developmental problems associated with iron deficiency persist with age. If an iron-deficient child remains developmentally altered for the worse through the school years, then iron deficiency may become a more prominent policy issue because of its



COURTESY OF R. STOLTZFUS

**"If you care about changing human health, then you must understand the culture you're working with."**

impact on education and the development of well-functioning societies."

In November 2004 Stoltzfus traveled to Lima, Peru, to present her findings at an international conference attended by donor agencies and public health practitioners from many countries, as well as representatives from UNICEF and the World Health Organization, which provide governments with programmatic guidelines regarding health, based on current research.

"I find the biology and science of my work fascinating, but I am also very interested in doing research that will lead to the right use of resources and effective programs to improve the health of women and children," says Stoltzfus. "I want to know why these women and children are so anemic and why our current programs aren't helping them."

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## Archive Provides Scholars with Data on Child Abuse

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When 150 school children were murdered by terrorists in Russia last September, their brutal and untimely death caused worldwide indignation and mourning. It was a tragic loss of unfulfilled lives. Ten times that many children die each year in the United States, but they rarely are mentioned on the national news—they are victims of abuse and neglect. The real number actually is higher. As many as 50 to 60 percent of incidents go unreported, according to recent studies in Colorado and North Carolina.

BY CLARE ULRICH

Some of the deaths that are officially labeled as accidents, child homicides, and sudden infant death syndrome probably could have been classified as cases of child abuse or neglect if more thorough investigations were conducted or if national standards existed for coding abuse on death certificates.

But the numbers of deaths are small by comparison to the number of children who survive abuse and neglect each year. In 2002, an estimated 896,000 children were found to be victims of maltreatment in the United States. Like the fatalities, more undetected cases undoubtedly occur. It is this population of children that endure the lifelong effects of long- and even short-term abuse and, sometimes, perpetuate the cycle. These children are also the ones who provide researchers with data on the causes and effects of child abuse and neglect, as well as the effectiveness of treatment programs.

John Eckenrode, professor of human development, co-director of Cornell's Family Life Development Center, and an authority on child maltreatment, divides his time among teaching, research, and making research data on child abuse and neglect accessible to scholars in the field.

“When we think about a national strategy to address the problem of child abuse

## Safe and Sound: A Crisis-Prevention Program for Residential Child Care

www.rccp.cornell.edu

BY CLARE ULRICH

"ALL OF OUR WORK is based on the concept espoused by Urie Bronfenbrenner [Cornell professor emeritus of human development] that every child needs one adult who is crazy about him," says Michael Nunno, senior extension associate and principal investigator of the Residential Child Care Project in the Family Life Development Center.

For some children, that adult is not always a parent. Nearly 400,000 children in the United States live in out-of-home residential care facilities. Half of them are there because they have been abused and neglected at home. Their placement in these facilities, however, does not ensure their protection. Research suggests that the incidence of maltreatment in child care facilities actually may be double or triple the number of reported family abuse cases.

"Every child in a facility needs adults who help ensure safety," says Nunno. "The entire facility should be permeated with the language of safety."

That is the goal that Nunno works hard to accomplish. He implements, monitors, and evaluates the Therapeutic Crisis Intervention (TCI) system at facilities that care for aggressive and acting-out children. Developed at Cornell in the early 1980s with grants from New York State and the National Center on Child Abuse and Neglect, TCI assists organizations in adopting crisis prevention and management strategies that reduce their use of intervention tactics that can injure children.

The 18-month TCI program provides a highly structured curriculum that gives child care workers the knowledge and skills to prevent and de-escalate situations in which children become aggressive and to help children when they are at their most destructive. Based on principles established in the Convention of the Rights of the Child, adopted by the United Nations, the program is used

extensively in the United States, Canada, United Kingdom, Ireland, Australia, and Israel. Hundreds of residential child care facilities use TCI, and 4,000 people have become certified TCI trainers.

"One of the things we realized early was that the reason kids were getting abused and hurt in child care facilities was because workers did not know how to deal with them," says Nunno. "Many of the children who enter residential care have been physically, emotionally, or sexually abused, so they come into a facility with a fair amount of pain and inability to cope with their own agitation and aggression. We work to make facilities recognize that they have to be ready for those realities. Their charge is to help these children learn appropriate ways of handling their emotions—not re-abuse them."

TCI is based on the premise that adults' attitudes and responses are key to resolving a child's crisis. It teaches child care staff to interpret children's aggressive behaviors as expressions of needs and to respond not to the behavior but to what is behind the behavior: pain and feelings of frustration.

"Children who have been abused in their families interact with adults in the facility much like they interacted with the adults outside who abused them," Nunno explains. "Many adults working in facilities fall into the trap of responding to a child's anger and aggressiveness with counter-aggression, but this only adds to the conflict cycle. Our program trains staff to stop the conflict cycle."

Most incidents of institutional abuse or neglect are not sadistically motivated but occur out of workers' frustration and inability to handle their own anger at defiant youth who seem impervious to treatment. Lack of knowledge and skills exacerbate the situation. Often counter-aggression on the part of staff is a misguided attempt to gain control.

"Adopting an attitude of control is not

effective if what you want is to get a kid on a developmental path so that she can return to some sense of normalcy in her life and be able to control her emotions and frustrations," Nunno warns. "Trying to get a child to do what you want her to do usually is going to have the complete opposite effect. Instead, you must address the feelings behind the behavior."

Talking to a child about his behavior in psychological language will turn him off, Nunno explains. The child can, instead, be told that his behavior might not be safe. "When you interpret behavior in the language of safety, children open up and start to say things like, 'I'm afraid of doing that' or 'It's too painful for me to try that.' When they talk about their fears, they talk about their pain. That's when an adult can take the first steps toward getting the child to try new ways of interacting. Without that safety, attempting behavior change is not going to work."

Inevitably, even in the most caring and therapeutic environment, a child's behavior may become dangerous to himself or others. While restraint is not a desirable option, because it can lead to injury and sometimes death, it is sometimes necessary. But using restraint is a psychologically complex and subtle interaction. Restraint can compromise a child's dignity and autonomy and, if done for the wrong reasons or in the wrong way, may send a message that bigger, stronger people can make others do what they want. That kind of message encourages rather than discourages aggressive behavior, which is not going to heal a troubled child.

If restraint must be used, the TCI method provides training that has been proven to decrease the number of injuries to children. Developmentally appropriate physical management techniques are taught to ensure the child's aggression is safely contained. Staff members also are trained in how to use acting-out incidents

as opportunities to help children learn and grow.

In addition to training and implementation, TCI includes evaluations on the success of programs. Data on crisis incidents that occurred before and after TCI are contrasted, and pre- and post-implementation interviews with staff members and supervisors are reviewed.

TCI has a consistent record of reducing the number of incidents where restraint is used on children. The program also boosts child care workers' confidence and morale. Staff members report feeling more confident about their ability to manage crises. They also feel better about their coworkers' ability to manage crises and about working in teams where people assist and support one another. Having an institutional framework of policies and procedures to follow reduces staff members' feelings of inadequacy about what to do in crisis situations and increases their confidence in helping children learn to cope. In those instances when restraint is used, fewer injuries to children occur.

On average, children stay in child care facilities for a few months to about a year, says Nunno. He emphasizes that residential facilities have only a small window of opportunity for turning these children's lives around.

"Many of these kids do not trust adults. They've had bad experiences with them. They've had abusive relationships," he says. "Children need to feel a sense of safety in their interactions with adults. If there isn't this sense of safety, these kids aren't going to get better."

**“It is our responsibility to be proactive by thinking of new ways to reach the research community, educate them about the benefits of secondary analysis, and provide technical assistance and user support.”**

and neglect, a number of pieces need to be in place,” he says. “Certainly one of those pieces is development of an adequate research base. Various reviews of the state of child abuse and neglect research have been conducted over the years, including by the National Academy of Sciences. Those reviews are in agreement that knowledge in the field is inadequate and needs improvement and that once knowledge has been generated it is poorly disseminated.”

With initial funding in 1988 from the U.S. Department of Health and Human Services’ Children’s Bureau, Eckenrode helped establish the National Data Archive for Child Abuse and Neglect (NDACAN) in the college’s Family Life Development Center (FLDC). The data archive is part of the FLDC’s research arm.

Most of FLDC’s activities are outreach and extension programs aimed at improving professional and public efforts to understand—and act upon—factors that put families, children, and youth at risk. Preventing childhood and spousal violence; evaluating programs designed to prevent child abuse and neglect; enhancing community-based youth development efforts; improving intergenerational communication about HIV/AIDS; and acquiring, preserving, and disseminating data relevant to the study of child maltreatment—these are among FLDC’s objectives.

NDACAN was established to support the research of scholars investigating child maltreatment by promoting secondary data analysis that advances scientific understanding. The archive acquires and processes original data collected by investigators and the federal government on child maltreatment and makes this information accessible to qualified researchers so that they can conduct their own analyses. It has become the largest of the federal data dissemination efforts in the field of child abuse and neglect.

Typical NDACAN users are academic researchers from a variety of fields—such as psychology, sociology, social work, medicine, nursing—who want easy access to high-quality, well-documented data. The

scope of the data covers all areas of child abuse and neglect research, including causes and effects, prevention, intervention, and treatment.

The main portal to the archive is the web site, which averages 2,500 inquiries per day. NDACAN began using the Internet in 1992 and was among the first in the field to deliver data in portable files—on diskettes and by file-transfer protocol. Most of the archive’s approximately 42 datasets, organized according to subject or investigation, can be ordered through its web site. Several more are being prepared for release in the near future. In addition to the datasets, NDACAN provides free technical support to both contributors and users—from advice on hardware and software configurations to troubleshooting and consultation on data processing and documentation.

The NDACAN web site hosts an electronic mailing list that enables users to share information with and pose questions to researchers, practitioners, and administrators in the field. The list has about 900 subscribers at present. NDACAN also distributes a printed newsletter to more than 3,700 people each year.

“We’re here to support researchers, to help them get their analyses farther along so that they can write papers and get them into the literature,” explains Eckenrode. “The primary products of this activity are publications of various kinds—articles in disciplinary journals, chapters in books, and conference presentations.”

Data submitted to the archive come from a variety of sources, but primarily from researchers who have been funded by the federal government. Eckenrode says that the Children’s Bureau requires its research grantees to archive their data once a project is completed; NDACAN is the facility they use to comply with this requirement if they are doing research on child abuse and neglect. NDACAN also receives voluntary contributions of data from researchers who may not be required to archive their data but whom Eckenrode and his staff have approached, or who have approached NDACAN, about contribut-

ing to the archive. Some of Eckenrode’s research also is contained in the archive.

The other major source of data is the federal government. Federal agencies, particularly the U.S. Department of Health and Human Services, collect data on an ongoing basis from each of the states, which are required to file annual reports on child abuse and neglect, as well as data regarding children in foster care and adopted children. Once the federal government gets these data, it supplies them to NDACAN.

These are large datasets, Eckenrode points out. On any given day, about a half-million children are in foster care in the United States. Add this to the nearly one million victims of child abuse and neglect reported each year, and NDACAN receives, processes, and redistributes hundreds of thousands of federal government records annually.

The subsequent sharing of all this information via NDACAN not only helps to verify original findings and ensure that data are not lost, but it also allows the data to be utilized most fully and to be accessible to the research community. Since research on child maltreatment is often difficult to carry out due to obstacles involving access to high-risk families, children, and confidential records, having disparate research findings available in one place is extremely valuable for researchers.

These same confidentiality issues, however, pose a challenge to NDACAN’s role as a disseminator of data. To protect sensitive information, NDACAN has never placed data from the archive on the Internet for public download or online analysis. Documentation and some summary statistics are available online, but actual case-level data is not.

“The concern is that by combining certain pieces of information, individual research participants could be identified, even if their names and addresses are not in the data files,” explains Eckenrode.

For example, if there was a sexual abuse case in a certain year involving a child of a certain age and gender from a relatively

small county, and the perpetrator had a certain occupation, it might be possible for someone to figure out the identity of the child or the alleged perpetrator if a person had access to other information (for example, newspaper reports).

“We take care to make the chances extremely unlikely that such disclosures could occur,” he says. “We might not give precise birthdays of children, only their age in years, or we might aggregate data from several contiguous small counties to form a larger geographic unit. Archives must take an active role in ensuring that confidential data remains confidential if they wish to continue providing data to researchers for the purpose of secondary analysis.” While the Internet will continue to be NDACAN’s primary source of information dissemination, restrictions will remain on accessing the data.

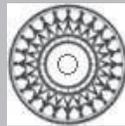
The archive has adopted other precautions in response to contributors’ concerns about the security of their data. Researchers worry that a secondary analyst might publish a set of findings from the data before they do. In response to this, NDACAN recommended to the Children’s Bureau that investigators be given two years of exclusive use before being required to archive their data. Researchers also are concerned about repercussions to their reputations if a secondary analyst uses or publishes data from their study in an irresponsible way. They additionally worry that the publication of findings from the same dataset by different authors will result in a disjointed body of literature that lacks the single, coherent vision of the original investigator.

To ameliorate these concerns, NDACAN created a “Terms of Use Agreement” that removes all liability from the contributor. To ensure that data are handled responsibly, NDACAN staff members offer contributors assistance with preparing studies for archiving and also training in the process of secondary analysis.

“NDACAN is not a passive organization, not just a repository of data,” Eckenrode explains. “It is our responsibility to be proactive by thinking of new ways to reach the

research community, educate them about the benefits of secondary analysis, and provide technical assistance and user support.”

In addition to its careful handling of data and the diverse services it offers, NDACAN organizes a number of conferences and workshops. One of the staff’s favorite programs is NDACAN’s Summer Research Institute, which has met every year since 1993. The week-long workshop offers an intensive experience in secondary data analysis that combines colloquia with hands-on computing sessions.



“Any time a policymaker wants to cite statistics with regard to how many children are maltreated, what kinds of maltreatment occurs, or whether child abuse and neglect is getting better or worse over time, NDACAN is the place with the data.”

“We bring a group of 12 to 15 researchers to the Cornell campus for about four days in the beginning of the summer to work directly with the data we have and to get assistance in using the archive,” he explains. “It’s a labor-intensive activity but fun and very rewarding for us as well as for the participants, who have an opportunity to network and collaborate with other scholars in the field.”

During one recent institute, Eckenrode says, a researcher from Israel met and developed relationships with researchers from across the United States. His presence led to interesting discussions about child maltreatment in an international context.

Currently the NDACAN staff consists of Eckenrode, who works with the archive part-time because of his teaching, research, and administrative responsibilities, and four others. Elliott Smith, research associate, serves as associate director; Michael Dineen as coordinator of technical services; Holly Larrabee-Warner as support and acquisitions specialist; and Andres Arroyo as administrative assistant. Eckenrode hopes to secure federal funding to expand NDACAN staff and services. He would like to hire someone to specialize in working with the larger federal and state datasets and, eventually, to offer customized analyses to make it easier

for users to access and analyze the data.

Although NDACAN is not set up to be an institute that recommends policies, Eckenrode hopes that information about the nature and consequences of child abuse and neglect will serve as the rationale for policy decisions.

“Any time a policymaker wants to cite statistics with regard to how many children are maltreated, what kinds of maltreatment occurs, or whether child abuse and neglect is getting better or worse over time, NDACAN is the place with the data,” he says.

Every year the federal government publishes reports on the size and scope of the child abuse and neglect problem and makes policy recommendations. “Our archive tends to include basic research on children who are maltreated and the effects of maltreatment on those children and families, and this kind of information is often the basis for program and policy recommendations,” Eckenrode explains. “Any enlightened policy needs to have as its core an understanding of the phenomena that is being addressed.”

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# Studying the Effects of Health Insurance Regulation on Workers and Employers



Kosali Simon, an assistant professor of policy analysis and management, begins her courses in health care policy by drawing a circle in the center of the board. “What are we ultimately concerned about here?” she asks students in both the undergraduate course Economics of Health Policy and the graduate course Health Policy. She answers her own question by writing “the health of the population” in the circle.

BY METTA WINTER



As the lecture proceeds, more circles appear; Simon fills them with phrases including “person’s own actions,” “genetic make-up,” and more. The circle titled “medical care” has satellite circles marked with “hospital standards” and “doctor licensure.” The topic “health insurance” also is given a circle of its own, with many smaller circles around it.

While interested in the broad fields of health economics, labor economics, and public finance, Simon, who joined the Cornell faculty in 2001, currently is concentrating on the economics of health insurance policy.

“I use this graphic at the start of health care policy courses because I want students to remember that everything in health policy relates to the ultimate goal of creating a healthy population,” she explains. “The chart also shows that it’s possible to separate all the components that can influence people’s health.” For the rest of the semester Simon and her students systematically examine all of these interacting elements and the hierarchy of issues imbedded within them.

Within the subject of medical care, for example, one of the topics affecting the health of the American population that is most hotly debated—in politics as well as Simon’s classroom—is the consequence of public policy on the price of prescription

## Fragile Families and Child Wellbeing

[www.socialsciences.cornell.edu/evolv\\_fam\\_desc.html](http://www.socialsciences.cornell.edu/evolv_fam_desc.html)

BY METTA WINTER



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AT THE TIME OF THEIR CHILD'S BIRTH, most unmarried couples expect they will marry someday. But by the time these children are three-years-old, only 15 percent of these parents have married. What has thwarted the marital expectations of the vast majority of these young parents? This is one question being researched by Maureen Waller, a new faculty member in the Department of Policy Analysis and Management.

The president's budget proposed \$1.5 billion for U.S. programs aimed at promoting marriage. However, relatively little is known about the factors that encourage and discourage couples from marrying. Identifying the obstacles to marriage is important for policymakers because of the numbers of children involved. Today one-third of American children are born to unmarried parents. Stability of financial support is tenuous for children of unmarried parents. Unlike divorced parents, many unmarried parents who end their relationship do not establish child support and custody agreements, Waller points out.

"Much of what we know about father involvement is based on studies of married or formerly married men, who tend to have different characteristics than unmarried fathers," she says. At present one-third of all children owed child support do not receive it. From a policy point of view, discovering the factors that interfere with unmarried fathers' continued involvement and support of their children is critical.

Waller has access to a uniquely powerful data set with which to explore relationships between unmarried parents. She is one of the collaborators on the national

Fragile Families and Child Wellbeing Study. The study, which surveys new, mostly unwed parents and their children and follows them over a five-year period, is designed to provide new information on the capabilities and relationships of unwed parents, as well as the effects of policies on family formation and child wellbeing.

Data for this longitudinal study, which was funded by the National Institute of Child Health and Human Development (NICHD) and a consortium of government agencies and foundations, is being collected in 20 U.S. cities. When weighted, the sample of parents of 4,898 babies is representative of all births to unmarried parents in American cities with populations over 200,000.

In the paper, "Perceptions of Divorce as a Barrier to Marriage," which is coauthored with H. Elizabeth Peters, Cornell professor of policy analysis and management, Waller draws on three waves of data from the Fragile Families and Child Wellbeing Study and on additional interviews that she conducted as part of her own research study. In the national survey, interviews were conducted with parents in the hospital at the time of their child's birth and again when the children were one, three, and five years of age. Waller conducted additional in-depth interviews with a subset of mothers and fathers who participated in the Oakland, California, study site. In this way she collected qualitative data between the baseline and one-year survey and between the three-year and five-year surveys.

Throughout the interviews parents said that "they avoided marriage when they saw warning signs of divorce in their partners, themselves, or their relationship—including immaturity, economic insecurity, excessive arguments, and abuse," Waller explains.

As a specialist in mixed-methods approaches to research design, Waller compared qualitative and quantitative data from the survey and her own interviews to see if couples in relationships where these warning signs were present were actually more likely to separate or divorce.

"We found that the data bore out these couples' worries," she says. "When we looked at the statistics, we saw that those parents who have a higher predicted probability of divorce are significantly less likely to marry." The parents reported that they thought it would be worse for their children and for themselves if they married then divorced quickly than if they remained unmarried, Waller adds.

Because the interviews included in the national survey and Waller's subset were conducted separately with the father and mother, the availability of this individual data allows Waller to examine whether the view of each member of the couple affects whether they will marry. Her initial analysis of this question will appear in the paper, forthcoming in the *Journal of Marriage and Family*, titled "His and Her Marriage Expectations: Determinants and Consequences," coauthored with Sara McLanahan, a professor of sociology and public affairs and director of the Bendheim-Thoman Center for Research on Child Wellbeing at the Woodrow Wilson School of Public and International Affairs at Princeton University. McLanahan is the principal investigator of the Fragile Families Study.

Waller found in her data analysis that it is the couple's shared expectation to marry that is the strongest predictor of whether, in fact, they marry or separate following their child's birth. "Although men's expectations are somewhat more consequential for union transitions," Waller says, "marriage and relationship stability are more likely when at least one parent expects to marry."

Having children with other partners, women's distrust of men, high levels of conflict, and the absence of shared activities make couples less hopeful about marriage and less likely to marry. Conversely, couples are more likely to marry when fathers have higher human capital and less likely to separate when mothers are employed, indicating the potential importance of education and employment programs for these parents.

Waller is continuing to analyze data from the Fragile Families and Child Wellbeing Study in a new project titled "Early Relationships Between Unmarried Fathers and Their Children." In this project she will ascertain knowledge about how fathers do or do not stay involved with their children in the large proportion of families that are currently being formed outside of marriage. The study is supported by a U.S. Department of Agriculture Hatch grant awarded by the Cornell University Agricultural Experiment Station.

Waller also is a member of a working group of researchers, led by Peters, who are studying the Evolving Family, the first theme project sponsored by Cornell's Institute for Social Sciences Research.

drugs. Examining what goes into the price of prescription drugs leads to a discussion of patents, an essential incentive for pharmaceutical companies to invest in research and drug development. Since the goal is to create the most number of new pharmaceuticals in the most affordable way, how long, she asks the class, should those patents extend? In that discussion she exposes an inherent conflict—a reasonably long patent is required as an effective incentive, but the longer the patent life, the higher the price of the drug.

In this way, within a single topic Simon shows students how complexities abound in the realm of public policy making. Any policies aimed solely at reducing the price of drugs can have grave consequences for the future, she points out. One example that she uses includes medications developed to treat HIV-positive individuals and those with active AIDS. If the government were to eliminate patents and allow the production of generic AIDS drugs, there would be a huge health benefit for people who cannot now afford the expensive medications, she explains. But the potential loss to future generations of Americans is huge

Examining the effects of health insurance regulations and institutions on labor market and health outcomes has compelled Simon since graduate school at the University of Maryland. As a native of Sri Lanka, she was struck by the uniqueness of the health insurance system in the United States, she explains. In most other countries, health insurance is provided as a right of citizenship, whereas in the United States it comes as a benefit of employment for the majority of the non-elderly. It is a particularly interesting phenomenon to study because of the plethora of policies that aim to influence health insurance, Simon points out.

She began her studies of the health insurance system by examining the consequences of attempts to regulate the private insurance markets in small firms in the United States. Her results appear in two journal articles: “Adverse Selection in Health Insurance Markets: Evidence from State Small-Group Health Insurance Reforms” will appear soon in the *Journal of Public Economics*, and “Labor Market Consequences of State Health Insurance Reforms,” written jointly with Professor Robert Kaestner of

insurance reform legislation did not result in more Americans having health insurance. In fact, they found a 2.3 percentage point decrease in private insurance coverage among employees in small firms with fewer than 25 employees. In addition, health insurance premiums increased between 4 and 6 percent in small firms.

What surprised the researchers about their findings is that these laws did not create large problems. “There had been extreme predictions of doom—that the insurance market would unravel,” Simon says. “The good news is that it did not happen.”

In another study conducted with Kaestner, Simon investigated the consequences of minimum wage regulations on the availability of health insurance benefits. Their findings were reported in an article titled “Do Minimum-Wage Hikes Reduce Non-wage Job Attributes? Evidence on Fringe Benefits and Working Conditions” that appeared in *Industrial Labor Relations Review* (October 2004). Using Current Population Survey data for 1979–2000, they found no discernible effect of the minimum wage on fringe benefit generosity for low-skill workers, Simon explains.

In another paper titled “Displaced Workers and Employer-Provided Health Insurance: Evidence of a Wage/Fringe Benefit Tradeoff?” in the *International Journal of Health Care Finance and Economics*, Simon reported results of a study about persons who moved from jobs that offered health insurance to ones without insurance. Her analysis focused on whether people would receive increases in wages to compensate for loss of health insurance and vice versa.

Simon found that the option for making such a tradeoff does not exist. “Jobs seem to come in two types: those strong in both benefits and wages and those weak in both,” she says.

While high-income workers expect health insurance as a benefit of employment, this is rarely the case for those who are paid low wages. Much of Simon’s current research interest focuses on public policy created to redress this inequity. The State Children’s Health Insurance Program (SCHIP) is one such federal policy intended

“While there are tools provided by disciplines such as economics that allow a problem to be analyzed, that does not mean everyone comes to the same conclusion.”

if pharmaceutical companies stop creating new drugs.

Since AIDS occurs worldwide, Simon requires her students to consider the implications of international policy overriding patents for drugs that are sold abroad. This experience shows students how a debate about intellectual property rights has major consequences for the availability of AIDS drugs, she notes.

“I want students to realize that while there are tools provided by disciplines such as economics that allow a problem to be analyzed, that does not mean everyone comes to the same conclusion,” says Simon. Nor does it mean that what analysts conclude actually will happen. For these reasons, she explains, rigorous research is imperative.

the Institute for Government and Public Affairs at the University of Illinois at Chicago, appeared in *Industrial Labor Relations Review* (October 2002).

The question that Simon investigated was whether laws passed in the wake of former President Clinton’s failed health care reform were effective in making health insurance more available to all Americans equally. Between 1990 and 1997 nearly all states passed laws regulating the issuance, content, and pricing of private group health insurance plans offered to employees of small businesses—who are the workers least likely to be insured.

Using population data gathered from individual and establishment-level surveys, Simon found that in sharp contrast to the lawmakers’ intent, small-group health

**"Policy is an evolving process. It is the responsibility of policy makers to be diligent in determining the efficacy of policies that they implement."**

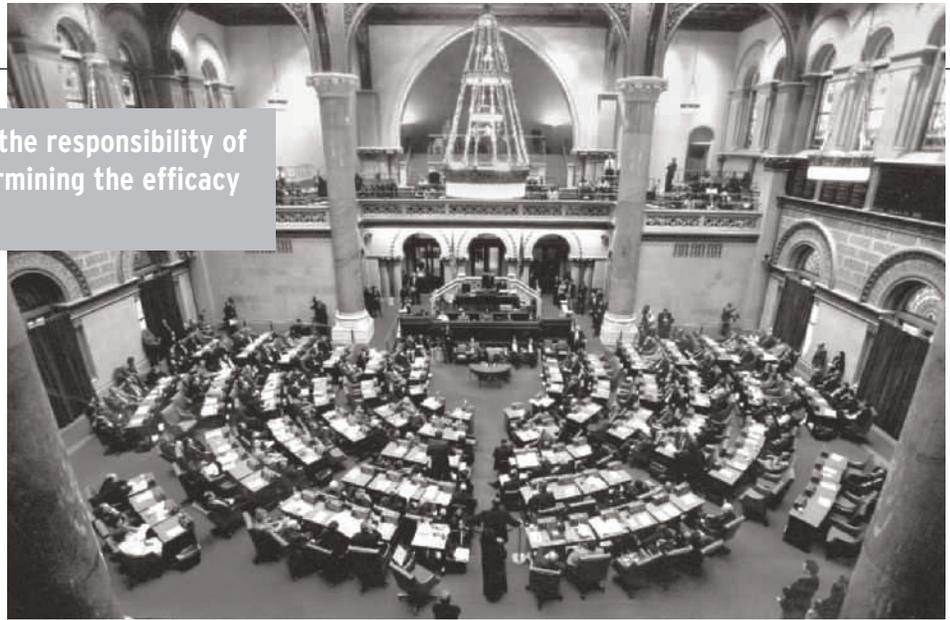
to provide free or heavily subsidized health insurance for children living in families that are 200 percent or more below the poverty level. (Each state administers a program specific to its residents. In New York State the program is known as Child Health Plus.)

In a recent paper, "The Effect of SCHIP Expansions on Health Insurance Decisions by Employers"—written jointly with Jessica Vistnes and Phil Cooper of the Agency for Health Care Research and Quality and Tom Buchmueller of the University of California, Irvine—Simon reports employer reaction. In states that were expanding children's programs, she found that employers raised the premiums that employees pay for family plans but did not raise premiums for individual plans.

While Simon and her co-authors did not find evidence that employers were dropping family coverage altogether, they determined that an increase in premiums discouraged workers from buying family insurance plans. Such decisions by employees, in turn, could save employers a great deal of money—if few workers were informed or assertive enough to expect that insurance savings be passed on to them, the total share of the family coverage premiums that employers were required to pay would be less.

Whether the fact that taxpayers are paying for a child's health insurance results in benefits to the worker or the employer depends on how the labor market is functioning, Simon explains. This is one of the topics that she will be studying in future research projects.

In two additional studies Simon looked at other conditions that potentially affect the availability of health insurance for low-wage individuals. The first study focuses on the state of the economy. Simon and John Cawley, an assistant professor of policy analysis and management at Cornell, reported their findings in "The Impact of Macro-economic Conditions on the Health Insurance Coverage of Americans," which will appear soon in the *Journal of Health*



*Economics*. In this study Simon and Cawley examined measures of the macro economy, including the unemployment rate and state rates of per capita income. They found that adult men are most at risk of losing health insurance in difficult economic times, women were less vulnerable, and children were not at all at risk.

Simon and her colleagues found that for women it was welfare reform that most greatly threatened access to health insurance. This finding was reported in a paper recently submitted to *Frontiers in Health Policy Research* titled "How Did Welfare Reform Affect the Health Insurance Coverage of Women and Children?" coauthored with Cawley and graduate student Mathis Schroeder. The researchers determined that passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 resulted in a 7.8 percent increase in the probability that a welfare-eligible woman was uninsured.

Such an unintended consequence of moving women into the work force, resulting in a loss of their health insurance, emphasizes the need for constant evaluation, Simon explains. "Policy is an evolving process," she says. "It is the responsibility of policy makers to be diligent in determining the efficacy of policies that they implement."

Because of her strong program in research and evaluation, Rutgers University invited Simon to join a selected group of social scientists to help New Jersey lawmakers refine legislative reforms for the private insur-

ance market. Her synthesis of the literature was published as a chapter titled "What Have We Learned from Research on Small-Group Insurance Reforms?" in *State Health Insurance Market Reform* (2004, Routledge, New York).

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# Preparing Students to Work with Troubled Children

In all five of Jeffrey Haugaard's courses he emphasizes a single, two-part principle. To be genuinely useful to people in distress, he says, you must command solid, research-based knowledge and you must have the ability to apply it with a "strong sense of humanity" to unique individuals.

BY METTA WINTER

**"Contrary to what the culture would have us believe, there are no simple answers to mental health problems."**

**H**augaard, an associate professor of human development, teaches courses about child development and psychopathology, adolescent behaviors considered to be problematic or deviant, and the functioning of nontraditional and troubled families. His students are young people who will one day be clinical psychologists and physicians, nurses, teachers, and lawyers in family courts. In these and many other professions, Haugaard explains, his students someday will be surrounded by children and adolescents—a quarter of whom, research has shown, will have some type of psychological disorder.

He makes it clear that knowledge of these disorders alone is not enough. As a clinical psychologist with 25 years of experience working with youth in residential and clinical settings, Haugaard wants his students to develop a style of thinking about mental health issues that is different than what most have when they first come into the course.

"Contrary to what the culture would have us believe, there are no simple answers to mental health problems. Complexity is inherent in the subject matter," Haugaard explains. "Students need to learn to think broadly, creatively, and inclusively."

"Some people want you to believe that we can isolate the cause of a particular problem: girls have eating disorders because society wants them to be thin, or a boy's hyperactivity is caused by brain dysfunction," Haugaard tells his students. "That is not true—as a professional who works with young people, you need to look for and try to understand a complicated mix of influences on the development and maintenance of psychological disorders or other problems."

This theme of the complexity of mental health problems underlies Haugaard's teaching and unifies his courses. He warns students that there is no one-size-fits-all approach with such complex disorders. While it may be known that there are a variety of issues that increase the risk of a disorder or other problem developing in a child, each of these issues will have an influence on the development of some children and not others, Haugaard says. Even when the same issues

influence the development of a disorder in two children, their relative influences are likely to be different. If mental health professionals are trained to think that the disorder's cause is a set combination of identified risk factors, then they are not going to attend effectively to the unique characteristics and experiences of each individual.

"In one day as a clinician you might see three children who are anxious, and they all might have different reasons why," he tells his students. "Consequently, the most effective therapy for each of them will need to be different."

One teaching method that Haugaard uses in his largest course, Problematic Behaviors in Adolescence, is to assign novels and movies. He believes that this approach works to increase his student's appreciation of the unique and complex factors from which psychological disorders develop. In this intermediate course students examine a variety of adolescent behaviors considered problematic—from suicide and eating disorders to shyness and risk-taking. Haugaard lectures about the relevant scientific research and then has students read novels and watch movies—such as Judith Guest's *Ordinary People*, Russell Banks's *Rule of the Bone*, and the movie *Pieces of April*, written and directed by Peter Hedges—to appreciate the human side of the struggles that many adolescents experience.

"I want the students to remember that we are not focusing just on disorders but are talking about people who are struggling to live their lives," Haugaard explains. "It is essential to recognize people's humanness and to treat them humanely."

While he builds student understanding of the complex dimensions of mental health issues on the human scale, Haugaard also insists that his students be grounded firmly in researched-based knowledge. He argues that the field of clinical psychology has advanced through an examination of hard data—not through the acceptance of plausible-sounding theories. "I emphasize to students that they must know the research if they are to be effective professionals," Haugaard says. "For example, if the research indicates that medication does not

## Couple Attachment as Physiological Attunement

BY METTA WINTER



FOR 20 YEARS CINDY HAZAN HAS BEEN STUDYING the factors that foster the development of attachment bonds. Her newest data point to physical intimacy as playing a major role.

In a recent study titled "Couple Attachment as Physiological Attunement," Hazan and her research team were investigating whether couples who scored high on a paper-and-pencil measure of attachment showed a different physiological pattern than pairs whose score indicated that they had not developed such deep bonds. In the laboratory, each member of a couple wore a heart monitor and sat facing each other on a small couch, without talking or touching but while maintaining eye contact, for two minutes. The heart rates synchronized in couples that had shown on the self-report measure

to be attached. In addition, this synchronized rate was lower on average than the baseline rate that had been recorded for each person (in isolation) before the paired phase of the experiment began.

In contrast, the heart rates of couples whose answers indicated they were not (yet) attached did not become synchronized or slow down. On the contrary, these individuals appeared to be more physiologically aroused in each other's presence, with their heart rates speeding up beyond their baseline measurements.

"These data provide the first physiological evidence of adult attachment," says Hazan, associate professor of human development.

There are several reasons why Hazan thinks physical intimacy might be central to the development of

emotional attachments at all ages. Across cultures there are only two types of relationships—those between parents and children and those between adult partners (whether homosexual or heterosexual)—that are characterized by routine, "privileged" physical intimacy. Privileged physical intimacy includes not only cuddling and kissing and stroking but—importantly—extended, mutually ventral (belly-to-belly) contact. The hormone oxytocin, which triggers labor and milk let-down, facilitates infant-caregiver bonding. The highest levels of oxytocin in adults (both men and women) occur at the moment of sexual orgasm and may facilitate pair bonding.

"This hormone that makes us feel content and secure in the presence of another person is stimulated by physical contact with them," Hazan explains.

The timing of bond development also is key. Hazan has found consistently that it takes an average of two years for attachment bonds to develop between adult partners. She also has data from records that she has asked couples to keep of their physical contact with each other. The data show that the frequency of physical intimacy, both sexual and nonsexual, is highest during the first year and then gradually decreases, leveling off at about year two in the relationship. When graphed, the timing of the development of the attachment bonds and the frequency of intimate behaviors are mirror images.

"The point at which physical intimacy levels off is the very point when you see signs that there is an attachment bond between the pair. This suggests that physical intimacy fosters bond formation," Hazan says. "We think these results have important implications for the well-documented finding that adult attachment bonds enhance physical health."

work with young children who are depressed or who have enuresis, yet it continues to be prescribed, then the professionals prescribing the drugs are not paying attention to the research and are not acting in the best interests of the children they are treating."

In the more advanced undergraduate course, Child Development and Psychopathology, Haugaard explores the development and process of mental, emotional, and behavioral disorders in children. Students examine what individual studies show about forms of psychopathology that have a profound influence on a person's life—such as mental retardation and autism—as well as the most frequently occurring psychiatric disorders of children and adolescents, including depression and attention-deficit/hyperactivity disorder. To sharpen the critical thinking skills they will need as professionals to deal with children display-

ing these pathologies, students write formal research reviews that are then discussed in class.

So that students will become proficient in identifying high-quality research, Haugaard leads them in class discussions on all aspects of how the study was constructed and carried out—from sample selection and measurement devices to the definitions of dependent and independent variables. The exercise illustrates for them the complexities of research analysis. Then they discuss whether the study results are meaningful.

While Haugaard, who served as director of undergraduate studies for the department for six years, expects his students already to have taken courses in research methods (his courses attract students of many majors from across the university), this course offers essential practice in identifying the hallmarks of excellent research. He challenges the popular assump-

**"Complexity is inherent in the subject matter. Students need to learn to think broadly, creatively, and inclusively."**

“I want the students to remember that we are not focusing just on disorders but are talking about people who are struggling to live their lives.”



tion that only the best research is published. “The facts are that there is good research and there is bad research—both types can get published. I want my students to know how to tell the difference,” he says. His own current research focuses on stalking and intrusive social behaviors. His studies are supported by a U.S. Department of Agriculture Hatch grant from the Cornell University Agricultural Experiment Station.

In the course *Nontraditional Families and Troubled Families*, Haugaard takes a different approach to introduce the complexities of mental health issues. This course explores family systems theory as a method of understanding the behaviors of children and other family members. Students are assigned roles in several families, such as being an adoptive family or a family with a child who has a chronic illness. Students read extensively about what it is like to be in their role (for example, the mother of an adopted child who suddenly expresses an interest in finding his/her birth mother) and then describe to the rest of the class the issues they face. All the students in a particular “family” participate in a “family therapy” session in which two other students are assigned the roles of therapists. (Haugaard advises the

students role-playing the therapists.)

“Within 10 minutes students are acting like a real family,” Haugaard says. “It’s a very powerful moment when a person’s motive is revealed for everyone to see.”

For added depth, Haugaard brings to class guest speakers who have lived the roles that his students take: adoptive parents and physicians who assist the parents of critically ill children.

Haugaard also teaches two other courses. *Children at the Intersection of Law and Psychology* is a graduate course co-taught with Andrea Mooney, a lecturer at Cornell Law School and a specialist in child advocacy. The course pairs law students with Ph.D. students in human ecology to examine hypothetical court cases. In one case, for example, in which a 14-year-old boy in foster care is ordered by a judge to return to his biological mother, the students work to create a legal memorandum that represents the child’s best interest. In developing legal problems for the cases that the students will analyze, Haugaard and Mooney create a mix of human development knowledge that will prove useful in the legal field—knowledge that lawyers can best employ in developing legal strategies for complex cases.

Haugaard and Mooney’s other graduate-level law-related course, *Psychological Expert Testimony in the Courts*, will be taught for the first time this spring. They expect an enrollment of about 20 students, drawing from the college and the law school. With Mooney acting as the judge, students will role play expert witnesses, offering supporting testimony and withstanding cross-examination.

During the 15 years that Haugaard has taught at Cornell, he has developed teaching strategies that are effective in teaching about mental health problems in a range of courses, whether there are 400 undergraduates in a lecture setting or 20 graduate students in a moot courtroom. His students are surprised by how much still is not known about the causes and treatments of mental and emotional disorders, he says. The complex issue-oriented content of his courses is most appreciated by those students who can tolerate a good deal of uncertainty, he explains. “People who work with troubled children and adolescents are like detectives who must be able to consider a wide range of issues in determining how to work with each child, adolescent, or family,” Haugaard says. “It is an extremely complex process.”

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## Elder Abuse Cited as Urgent Problem

# Cornell Gerontology

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A SUBSTANTIAL NUMBER of older persons—from 2 to 10 percent of the elderly population—are physically or mentally abused, and mistreated seniors are three times more likely to die within three years than those who are not abused, report two Cornell University gerontologists in the medical journal *The Lancet* (Vol. 364, Oct. 2, 2004).

Karl Pillemer, professor of human development in the College of Human Ecology, collaborated with Dr. Mark S. Lachs, co-chief of the Division of Geriatrics and Gerontology at the Weill Cornell Medical College in New York City, on a detailed review of the risk factors, screening, clinical manifesta-

tions, diagnosis, and treatment of elder abuse, as reported in more than 50 articles.

“This vastly unrecognized and undertreated problem compromises the quality of life for millions of older people worldwide,” says Pillemer. “A busy physician, who might see 20 to 40 elderly patients a day, might encounter a case of possible elder abuse every day. Because of a lack of time, resources, and a general lack of recognition of the problem, many cases may go undetected and untreated, putting our elderly at heightened risk of physical and mental harm, and even death.”

The Cornell gerontologists call for a multidisciplinary team approach to assess the situation and

develop solutions that are tailored to individual victim’s needs and problems. Lachs and Pillemer assert that helping patients resolve an abusive situation is one of the most gratifying experiences for physicians and other health care professionals.

The research was supported, in part, by a National Institute on Aging Mentoring Award in Patient Oriented Research in Aging and an Edward R. Roybal Center grant.

*Susan S. Lang*

ergo.human.cornell.edu

## Warm Offices Linked to Higher Productivity

COURTESY OF SHEILA DANVO



WARM WORKERS WORK better. Chilly workers not only make more errors, but cooler temperatures could increase a worker’s hourly labor cost by 10 percent, estimates Alan Hedge, professor of design and environmental analysis and director of Cornell’s Human Factors and Ergonomics Laboratory.

When the office temperature in a month-long study increased from 68 to 77 degrees Fahrenheit, workers’ typing errors fell by 44 percent and typing output jumped 150 percent. Hedge’s study was exploring the link between changes in the physical environment and work performance.

“The results of our study also suggest that raising the temperature to a more comfortable thermal zone saves employers about \$2 per worker, per hour,” says Hedge, who presented his findings at the 2004 Eastern Ergonomics Conference and Exposition in New York City.

In the study of work environments, which was conducted at Insurance Office of America’s headquarters in Orlando, Florida, each of nine workstations was equipped with a miniature personal environment-sensor for sampling air temperature every 15 minutes.

The researchers recorded the amount of time that employees keyboarded and the amount of time that they spent making error corrections. Hedge used a new research approach employing software that can synchronize a specific indoor

environmental variable—in this case, temperature—with productivity.

“At 77 degrees Fahrenheit, the workers were keyboarding 100 percent of the time with a 10 percent error rate, but at 68 degrees, their keying rate went down to 54 percent of the time with a 25 percent error rate,” Hedge says. “Temperature is certainly a key variable that can impact performance.”

Hedge will continue to study the impact of indoor environment on worker productivity.

“Our ultimate goal is to have much smarter buildings and better environmental control systems in the workplace that will maximize worker comfort and thereby productivity,” he says.

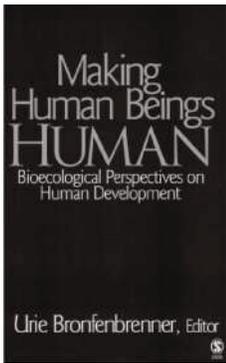
*Susan S. Lang*

Professor Urie Bronfenbrenner, among the world's best-known psychologists, has been publishing articles and books for 60 years about what matters in the development of human beings. He has collected his ideas together in a new book that traces the historical development of his groundbreaking bioecological model of human development and details how it can be applied via programs and policies.

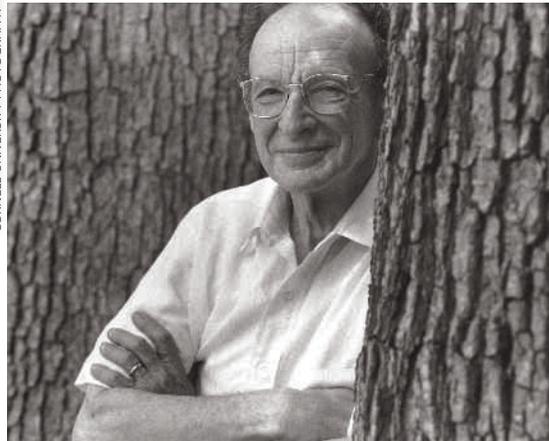
## Renowned Bioecologist Addresses the Future of

# HUMAN DEVELOPMENT

BY SUSAN S. LANG



CORNELL UNIVERSITY PHOTOGRAPHY



**M**aking *Human Beings Human: Bioecological Perspectives on Human Development* (Sage Publications, 2004) is Bronfenbrenner's culminating work and a statement that he hopes will shape the future of his field.

Bronfenbrenner, the Jacob Gould Schurman Professor Emeritus of Human Development and of Psychology at Cornell, is a co-founder of the federal Head Start program and is widely regarded as one of the world's leading scholars in developmental psychology, child-rearing, and human ecology—the interdisciplinary domain he created.

His model of the ecology of human development acknowledges that humans don't develop in isolation but in relation to their family and home, school, community, and society. He extends this model and illustrates the incredible potential it holds for positive development. "...To a greater extent than any other species, human beings create the environments that shape the course of human development," Bronfenbrenner writes in the book's introduction.

"Their actions influence the multiple physical and cultural tiers of the ecology that shapes them, and this agency makes humans—for better or worse—active producers of their own development."

Before Bronfenbrenner, child psychologists studied children, sociologists focused on families, anthropologists considered culture, economists the economic framework of the times, and so on. Bronfenbrenner's groundbreaking concept of the ecology of human development, however, viewed these environments—from the family to current society and the times—as nested settings in which a person develops over time throughout the life course. Since 1979, when Bronfenbrenner published his bioecological theory, he has transformed how many social and behavioral scientists approach the study of human beings and their environments. The theory led to new directions in basic research and to applications in the design of programs and policies affecting the well-being of children and families in the United States and around the world.

Because of the book's emphasis on social context within the bioecological theory—and Bronfenbrenner's role in shaping educational and public policies, for instance, the Head Start program—the book is intended for audiences across disciplines, including psychology, human ecology, human development and family studies, education, and public policy.

The book is divided into two parts; the first primarily presents edited versions of 12 key papers by Bronfenbrenner that reflect the development of his bioecological theory.

The second part of the book details specific ways that Bronfenbrenner's ideas have framed programs and policies promoting positive human development. Covered topics include how children are raised in



modern society, the role of peers in influencing child development, a comparison of child development in the United States with that in the former Soviet Union, as well as the challenges of child development in disadvantaged socioeconomic settings.

In the book's afterword, two of Bronfenbrenner's colleagues in Cornell's Department of Human Development highlight his landmark contributions to the field. "The threats Bronfenbrenner identifies to the realization of human developmental potential spring from society's neglect, its failure to attend to the ways in which economic and social change undermine families and thereby constrain development," write Stephen F. Hamilton, professor and associate director of the Family Life Development Center, and Stephen J. Ceci, the Helen L. Carr Professor of Developmental Psychology. "His calls for attention to deteriorating conditions are always coupled with recommendations for ways to improve those conditions."

Hamilton and Ceci summarize the major themes that Bronfenbrenner conceives in his bioecological model of human development. "Most central is that children must be nurtured and educated to be able to maintain and strengthen their society," they write. "In *Two Worlds of Childhood*, he proposes that societies be judged according to 'the concern of one generation for the next.' Closely linked to this theme is the family's critical function as 'the best way to make human beings human.'"

They end the afterword by addressing Bronfenbrenner's vision for the future of human

development. "This insight about the central role of family being true, the challenge for policy makers and practitioners is to support and complement the family, especially families that are less capable of carrying out this function well, whether because they have too little income or too little time. His observation that every adult who is responsible for the care of a child needs another adult to rely on for encouragement and assistance typifies his deceptively simple wisdom," they write.

**"The threats Bronfenbrenner identifies to the realization of human developmental potential spring from society's neglect, its failure to attend to the ways in which economic and social change undermine families and thereby constrain development."**

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