

# HUMAN ECOLOGY

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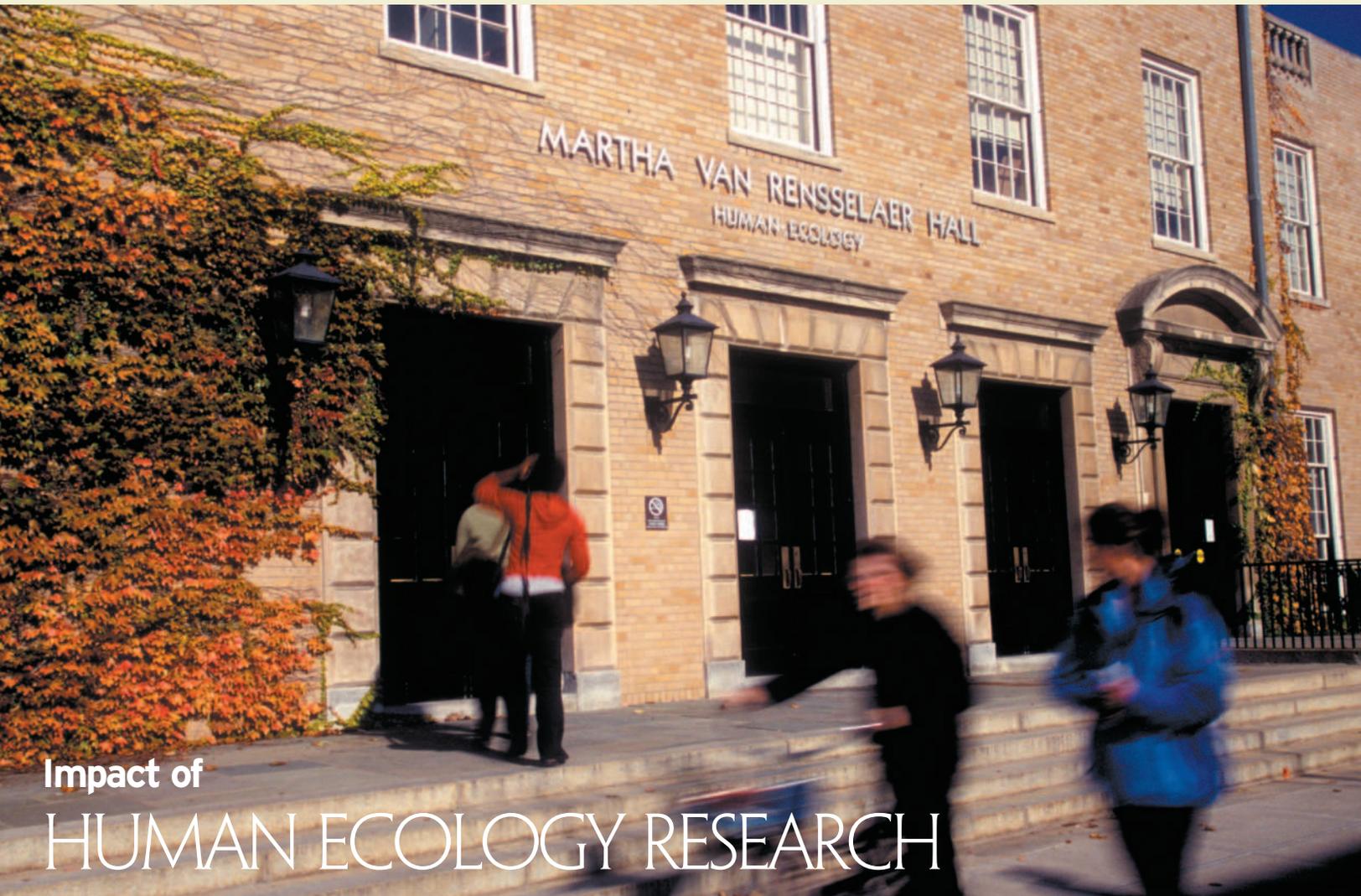
FROM SCHOLARSHIP TO POLICY

MAKING HEALTHY BEHAVIOR EASY

MATERIAL WORLD: ELECTROSPINNING

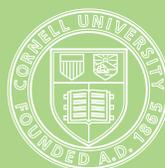
PLUS: THE 2003-2004  
ANNUAL REPORT OF THE  
COLLEGE OF HUMAN ECOLOGY

APRIL 2005/VOLUME 33, NUMBER 1



Impact of

# HUMAN ECOLOGY RESEARCH



Cornell University  
College of Human Ecology

# HUMAN ECOLOGY

COLLEGE OF HUMAN ECOLOGY, CORNELL UNIVERSITY



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## IMPACT OF HUMAN ECOLOGY RESEARCH

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#### Correction:

The photo credit for the images on the inside front cover and page 23 of *Human Ecology*, Volume 32, Number 3, March 2005, should read: Discovery Channel, Latin America. STUDIOS Architecture.

Volume 33, Number 1  
April 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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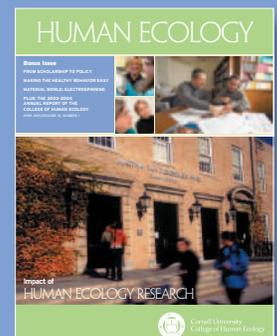
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## Impact of Human Ecology Research

It is my great pleasure to provide you with the 2003–04 annual report of the New York State College of Human Ecology at Cornell University. In my first year as dean, the college has seen great progress toward the improvement of facilities, the recruitment of new faculty, and the strengthening of collaboration among our own departments as well as with other Cornell colleges, including the Weill Cornell Medical College in New York City. All of us here in Human Ecology are optimistic and enthusiastic about the year to come.

I am also delighted that we have been able to “bundle” this year’s annual report with a mini-issue of our own *Human Ecology* magazine. I believe that you will find these articles to be complementary to the annual report, as they highlight issues that have been of particular significance for our college over the last year and that will undoubtedly be in the forefront of our efforts for many years to come. Among these are the growing epidemic of obesity and the health effects of poor nutrition on low-income Americans, sustainability, and the necessity of our faculty to approach their teaching, research, and outreach from a broad, multidisciplinary perspective.

As always, the link that binds our college is research. Research informs our teaching and our outreach, it exposes us to innovative methods for dealing with the problems faced by individuals and families, and it positions us on the cusp of change. The College of Human Ecology has a long history of creating and embracing change. Now, more than ever, we must continue that tradition. We live in the era of genomics, digital technology, and rapid development. It is a time at which our vast world can be made small with the click of a mouse, when resources can be at the tips of our fingers no matter where we are, and when the need to take responsibility for those resources could not be more apparent.

I hope that through this report you will enjoy learning a bit more about the College of Human Ecology and the many ways in which we work to protect the interests and fulfill the needs of people everywhere. We look forward to another year of helping communities across New York State, the United States, and the world to live healthier, happier lives.

*Lisa Staiano-Coico*

Lisa Staiano-Coico, Ph.D.

Rebecca Q. and James C. Morgan Dean

# From Scholarship to Policy

BY DONALD KENKEL, PROFESSOR OF POLICY ANALYSIS AND MANAGEMENT



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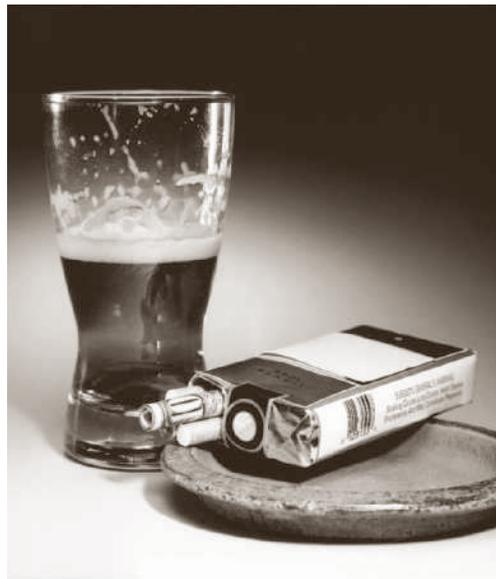
“There is a very constructive tension between the rigor of an academic discipline and the need for policy relevance.”

Like many faculty members in the College of Human Ecology, my doctoral training is in a specific academic discipline—I received my Ph.D. in economics from the University of Chicago. Yet, like all of the departments in the college, my home department of Policy Analysis and Management (PAM) is multidisciplinary. This setting cre-

ates exciting challenges and opportunities for my scholarship. Faculty in PAM are expected not only to contribute to scholarship in their home disciplines but to do so while contributing to the college's mission as a whole by conducting policy-relevant research that responds to human needs.

My doctoral training was excellent preparation for my position on the faculty in Human Ecology. To quote one of my graduate school professors, Gary Becker, "Economic theory is not a game played by clever academicians but is a powerful tool to analyze the real world." Becker has been a skilled user of that tool—in 1992 he was awarded the Nobel Prize in Economics for having extended the domain of economic theory to a much wider range of human behavior than economists had previously considered. In an example important for my research agenda, Becker and his colleague Kevin Murphy proposed a controversial theory, called rational addiction. They argued that the behavior of addicts was purposeful and hence amenable to economic analysis. The theory of rational addiction has stimulated a great deal of research by economists and increasingly is attracting the attention of other social scientists who are interested in addiction.

Early in my career as a health economist, I was struck by the major role that individual choices play in health promotion and disease prevention. Current estimates suggest that almost half of all deaths in the United States can be traced to cigarette smoking, sedentary lifestyles and obesity, and alcohol consumption. The theoretical contributions of Becker and others provide the framework for health economists to study these health behaviors as



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**"For public policy that responds to human needs, empirical health economists must go beyond theoretical predictions and try to quantify the impact of various influences on individual health behaviors."**

examples of consumer decision-making. For public policy that responds to human needs, empirical health economists such as myself must go beyond theoretical predictions and try to quantify the impact of various influences on individual health behaviors.

A simple prediction from the economic theory of the consumer is that consumption of a good will fall when the perceived costs go up. An important part of the perceived costs of smoking are the adverse health consequences, but these were not well known until the 1964 *Surgeon General's Report on Smoking*

*and Health*. The fact that smoking among adults fell from 40 percent in 1964 to under 25 percent today can be seen as validation that the economic theory has at least some relevance for smoking.

But the combination of economic theory and empirical analysis of data can go much further in explaining smoking behavior. For example, since 1964 a striking pattern has developed—although smoking was once widespread across socioeconomic groups, it has become increasingly concentrated among those with less education. In 1997–98, about

34 percent of people with less than a high school education were current smokers, compared to only about 13 percent of college graduates and only 8 percent of those with graduate degrees. My previous research suggests that differences in people's knowledge of the health consequences of smoking can explain only part of the observed differences across schooling categories. In future research, my PAM colleagues Dean Lillard and Alan Mathios and I will study the relationship between schooling and smoking in more detail, paying particular attention to

**“By researching how the interplay of public policy and private markets affects smoking cessation rates, we hope to contribute new insights for the design of public policy to improve the health of all.”**

trends in smoking cessation. Smokers with less schooling may have a harder time quitting because they have been slower to adopt the newer and more effective pharmaceutical smoking cessation products. If so, the introduction and advertising of these products may have had the unintended consequence of increasing health disparities. By researching how the interplay of public policy and private markets affects smoking cessation rates, we hope to contribute new insights for the design of public policy to improve the health of all.

The planned study of schooling and smoking cessation is part of a larger research agenda: I am the principal investigator for a four-year \$1.1 million project funded by the National Institutes of Health on the economics of smoking cessation. Lillard and Mathios are co-principal investigators. This study is an example of the opportunities created by

an interdisciplinary department. Although economics provides the framework for analysis, the project draws heavily on the marketing and consumer sciences background of another PAM colleague, Rosemary Avery. Under her guidance, teams of undergraduate research assistants have created a unique database consisting of all advertisements for smoking cessation products, smoking products, and smoking-related public service announcements that appeared between 1985 and 2002 in 27 popular magazines. Our smoking cessation advertisements (SCADS) archive begins at the time that the first nicotine replacement product was introduced and covers the evolution of the market as new products are introduced and some older products move from prescription to over-the-counter status.

Using our SCADS database, we are studying how manufacturers' decisions to advertise smoking cessation products are affected by government regulations and market competition. Because of the disclosure requirements for direct-to-consumer print advertisements of pharmaceuticals, in some ways smoking cessation product advertisements have been more heavily regulated than cigarette advertisements. The irony is that smoking cessation product advertisements serve some of the same public health goals as anti-smoking public service announcements. For example, in 1996 the Great American Smokeout sponsored by the American Cancer Society included activities in collaboration with a manufacturer of nicotine medications.

By merging our SCADS database with data from consumer surveys, we also will be able to study how smoking-related advertisements affect consumer behavior. First, we

will study whether smokers who are exposed to more smoking cessation advertisements are more likely to attempt to quit. We also can study whether consumers who are exposed to more cigarette advertisements are less likely to attempt to quit. These results will be directly relevant for current policy debates on the regulation of both direct-to-consumer advertisements of pharmaceuticals and cigarette advertisements. Because our data are unique, we hope to contribute to an ongoing debate within the economics profession on the more general role that advertising plays in markets.

Although it is still work in progress, our project on the economics of smoking cessation promises to achieve the twin goals of being policy relevant while making useful contributions to the field of economics. In my earlier work on alcohol control policies, I also succeeded in achieving these twin goals. I have been supported by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) for a series of studies of the economic determinants and consequences of alcohol abuse. Some of the studies focused on what is a very simple proposition from economic theory—that higher taxes should reduce alcohol consumption. My contribution was to help quantify the extent to which higher taxes actually reduced heavy drinking and drunk driving. Based on this research, I became involved with efforts to disseminate social science research findings to policy makers, including a NIAAA-sponsored project on college drinking, a NIAAA-sponsored panel on youth-related alcohol policies, and a National Academy of Sciences project on underage drinking. At the same time, this research helped me establish the record that led to my inclusion in the latest edition of *Who's Who in Economics*.



**Ray Swisher, assistant professor of policy analysis and management, in a Cornell Cooperative Extension videoconference about the influence of communities on family well-being.**

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My research interest in alcohol control policies continues, and I am currently funded by NIAAA for a study of an alcohol tax hike. In October 2002, the state of Alaska substantially increased taxes on beer, wine, and spirits. My study addresses a very basic question: What was the impact of the tax hikes on the prices of alcoholic beverages? As I teach in my undergraduate course Public Sector Economics, in this case economic theory does not provide much guidance on what to expect. Under some market conditions, taxes are predicted to be fully passed through to prices, but many alcoholic-beverage markets in Alaska do not seem to meet these conditions. To answer the empirical question, we conducted telephone surveys of on-premise and off-premise alcohol retail establishments across Alaska, both just before the tax hike and a year after. With the findings, we hope to be able to draw conclusions—relevant to both policy and economic theory—about the role of taxes in alcoholic-beverage markets.

While I have discussed some of the ways that the environment of the College of Human Ecology directly contributes to my scholarship, its indirect effects are more dif-

ficult to specify in language. There is a very constructive tension between the rigor of an academic discipline and the need for policy relevance. Although I am convinced that economics has a great deal to offer to policy analysis, I recognize that it does not have all the answers. I have learned much from Human Ecology colleagues who share my interest in public policy but originate from different academic disciplinary backgrounds. Likewise, I have learned from my students, who are not interested in economics as an academic game but are interested in what it can contribute to their understanding of public policy for their future careers.

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# Making Healthy Behavior Easy

Carol Devine maps the influences on food-choice strategies in busy lives.

BY METTA WINTER



“Time and people’s perception of what they need to accomplish to meet their multiple responsibilities are the themes that run through all the interviews,” says Carol Devine, speaking about her new study, *Work-Family Integration and Diets of Multi-Ethnic Adults*. An associate professor in the Division of Nutritional Sciences who specializes in community nutrition, she is analyzing how people choose the foods they eat.

Devine’s research project—undertaken in collaboration with Carole Bisogni from Cornell’s Division of Nutritional Sciences and Elaine Wethington from the Department of Human Development—focuses on a group of Americans rarely included in academic research: the black, white, and Latino adults who, as defined by their occupational titles, compose the nation’s working poor. The study’s goal is to determine the range of pressures exerted on these low- and moderate-income workers’ food choices and the strategies that they use to feed themselves each day.

“Tell me the first thing you eat or drink in the morning,” study interviewers are asking 60 men and women who work in administrative and office support, sales, production/maintenance, and service sectors in Rochester, New York. From the morning’s first drink of water, juice, coffee, or soft drink to the last snack before bed, interviewers record not only what the subjects eat but also when and where they eat it.

“Grab,” “run,” and “skip” are words that keep appearing in the researchers’ preliminary analysis of the data collected. Grabbing a beverage and a pastry at a convenience store to eat on the run is a common description of breakfast for workers pressed for time in the morning, Devine and her colleagues are finding. Some workers explain that they simply have no time to eat between two back-to-back jobs. Their strategy: skip breakfast altogether.

Devine's findings help explain the human stories behind the national data. In a 1992 National Recreation and Park Association survey of 1,300 Americans, Geoffrey Godbey and Alan Graefe of Pennsylvania State University's Department of Health and Human Development found that 38 percent of respondents said they "always felt rushed." The most rushed of all were working mothers (64 percent) and single mothers (72 percent).

As a result of feeling rushed, many people today expect to fit as many things as they can into a given length of time. Consequently, fewer are eating and more are developing what Godbey called "time-deepening" abilities, meaning they combine eating with driving to work, reading e-mail, watching television, and minding young children.

People's best intentions only add to the pressure. "We are finding that the people in our study work incredibly hard to do the very best they can—as parents and as employees," says Devine. "Sometimes people feel that they must trade nutrition for other goals such as getting a better education, working a second job, or spending time with their children."

As little as a generation ago, food and meals formed the structure of people's lives. There was a defined time for breakfast, lunch, and dinner. "People had certain expectations about when and what they would eat, with whom, and where—with most meals eaten at home. Today people eat just about anywhere, fitting food choices and eating around the other obligations in their lives," Devine explains.

The idea to investigate how the overlapping demands of work and family influence what people eat stemmed from the findings of one of Devine's earlier studies. In "Sandwiching It In: Spillover of Work onto Food Choices and Family Roles in Low- and Moderate-Income Urban Households" (*Social Science and Medicine*, 2003), Devine and her co-authors from the division—research



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**"Sometimes people feel that they must trade nutrition for other goals such as getting a better education, working a second job, or spending time with their children."**

support specialist Margaret Jastran, associate professor Jeffery Sobal, and professor Carole Bisogni—report their analysis of an examination of how worker's jobs relate to their food choices. The researchers reported finding more broad and multifaceted influences than they had expected.

For some participants in the study, "work was a necessary price to pay for future goals and a source of inevitable conflict and guilt that spilled over and compromised personal or family health," the authors explain. Other participants saw work as creating "multiple barriers to meeting food-choice ideals." These people reported lives in which "multiple jobs, inflexible hours, night work, and family demands were associated with limited food choices, a lack of energy and time to prepare family meals, interference in family meals, and guilt about failure to eat according to personal and health ideals."

Preliminary results from Devine's current study appear to echo much of what she and her colleagues found earlier. Some workers had job flexibility or support at home that allowed them to develop effective strategies for managing meals and nutrition in spite of work demands.

"Middle-class or better-paid workers sometimes can buy their way out of the time crunch by using time- and labor-saving alternatives such as prewashed salad greens or precooked meals or by eating out," Devine explains. "Low-wage workers must resort to other strategies, not reliant on money, which all involve trade-offs."

Devine and her research team found a surprising variety of strategies in addition to skipping meals or grabbing snack-type foods on the run. Devine categorizes the strategies as simplifying, any time-any place consumption, and anticipation. Drinking beverages instead of eating solid foods is one way some people simplify eating. Others reported continuously consuming portable foods throughout the day such as eating crackers and peanut butter from the desk drawer or granola bars in the car. Those who use the strategy of anticipation planned ahead, often cooking much of the weekend to have enough meals to last through the next work week.

Each strategy involves a trade-off. Simplifying and any time-any place consumers often forfeit taste or satisfaction along with good nutrition. Anticipators often must forego hobbies or recreational time with their families.



**“One promising way of changing people’s food choices is to change the food environment.”**

In her continuing analysis Devine will investigate how these strategies and their accompanying trade-offs vary by social characteristics. The impact of one obvious characteristic—gender—is clear: men and women alike still see women as the gender that is primarily responsible for feeding children. This is true even though 80 percent of mothers of school-age children today are in the work force (compared with just 10 percent in 1940).

Devine’s three-year project, which is supported by funds from the National Cancer Institute, is midway through its first year. In the second stage of the study, she will use data from the current set of open-ended qualitative interviews to develop a three-day diary study. The data from the diary study will be collected through a random-sample telephone survey involving 50 subjects from the Rochester, New York, metropolitan area. Findings will help determine whether the strategies reported in the first stage of the study hold true and how they relate to nutrient intake.

Already Devine can discern several implications of the research findings. When designing community education programs, nutritionists need to understand how the structure of people’s lives makes it increasingly harder for individuals to make nutrition a priority. “It’s becoming quite clear that talking to people about nutrition by itself isn’t enough anymore,” Devine says. “People are telling us they’re not home at mealtimes, they’re working long hours, and they’re doing so for good reasons.”

Another arena in which Devine’s findings will have sizeable impact is in regulations that govern federal food-assistance programs, she says. Current guidelines for the Thrifty Food Plan, which provides a nutritional basis for food-stamp allocations, were written in 1983 and updated in 1999. The assumption at both times was that people have the time to prepare most meals from scratch from basic ingredients. In September 2004, the U.S. Bureau of Labor Statistics released the first results of the American Time Use Study of 21,000 people

across the country. Study participants reported spending an average of only 53 minutes per day on food preparation.

Quantitative information about where food is purchased and how much time is available to prepare it (and, thus, its cost) are essential to writing effective regulations that can meet the nutritional needs of today’s eligible recipients of food assistance. Many of the recipients are low-income working women who entered or re-entered the workforce in record numbers due to the success of Welfare to Work legislation. Although now employed, their pay is still insufficient to feed nutritionally adequate meals to their children.

Devine is collaborating in a second study with epidemiologist and pediatrician Diana Fernandez, an assistant professor in the Division of Epidemiology, Community and Preventive Medicine at the University of Rochester School of Medicine—a colleague in the first project. In this second collaboration, Images of a Healthy Worksite, the researchers take an interventionist stance.

The first stage of the project will be a qualitative open-ended interview. Subjects will be drawn from the ranks of Eastman Kodak Company, a major employer in Rochester, New York. Data from the interviews will form the basis for developing workplace interventions to prevent obesity and then testing the efficacy of the interventions.

Major employers are keenly interested in preventing obesity, which, along with tobacco, is the second major risk factor for preventable death in the United States, according to the U.S. Centers for Disease Control. Obesity-related illnesses fuel the skyrocketing cost of health insurance, a major benefit that large employers offer their workforces.

In some labor markets, where competition for technical workers is high, employers realize that the food available at the workplace is important to long-term worker satisfaction.

“Many researchers are concluding that one promising way of changing people’s food

choices is to change the food environment. It's not enough to teach people to do the right thing—we've got to make the environment one where it's possible for them to do it," says Devine. "In this study we want to determine ways in which to make the healthy choice the easy choice."

People often know what changes will work best for them. Through interviews with workers, supervisors, occupational health nurses, and food service employees, along with worksite observations and focus groups, Devine and her colleagues will capture ideas and analyze people's attitudes toward proposed food-environment changes. Such changes might include offering healthier foods in vending machines or instituting company-provided subsidies to lower the cost of more nutritious cafeteria entrees.

"There have been limited but intriguing studies showing that changes in the pricing structure result in changes in food choice," Devine says. She and her colleagues have full cooperation of Kodak's food-service management to test changes in recipes and portions as well.

The intervention study at Eastman Kodak also will have a physical activity component, possibly educational messages such as signs, for example, in elevators, noting how many calories are burned when walking the stairs instead of riding. A follow-up, randomized control trial will measure changes in physical activity, food sales, and weight.

"It's exciting to be involved in an intervention that doesn't place the whole burden for change on the individual," Devine says. "These people are overwhelmed enough with the responsibilities of their jobs and their family lives."

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## Material World: Electrospinning

Margaret Frey spins a green alternative for textiles.

BY CLARE ULRICH

**W**hile most people groan at soaring gas prices, Margaret Frey, assistant professor of textiles and apparel, sees opportunity. Aside from fueling our cars, petroleum is the major raw material in manufactured fibers for textiles and in plastics. Rising oil prices make development of more rapidly renewable fiber sources economically attractive. Fibers from rapidly renewable materials are the cornerstone of Frey's research.

Her research group is developing new fibers from cellulose and other renewable resource polymers. These fibers are expected to find end uses in a wide array of applications from everyday apparel to high-tech controlled chemical release and sensor substrates.

**Fiber science graduate students Min Xiao (left) and Chunhui Xiang (right) demonstrate techniques for the electrospinning process as Margaret Frey consults with them.**

Frey uses a technique called electrospinning to transform cellulose, the structural material of plants, into nanofibers too small to see with the naked eye.

Cellulose is the primary component of plant cell walls. “Cellulose is a very abundant, renewable material,” Frey explains. “It’s everywhere on a plant and anywhere on the planet where plants grow.”

Chemically, cellulose is a carbohydrate, composed of carbon, hydrogen, and oxygen. Plants produce cellulose through the process of photosynthesis; cellulose fibers strengthen the stems, roots, and leaves. Raw cotton is about 95 percent pure cellulose. Other pure sources of cellulose include flax, hemp, wood, straw, and jute. Cellulose has been used for centuries to manufacture paper. Derivatives are used to produce a spectrum of products—from natural fabrics like linen, to manufactured fabrics like rayon, to plastics such as the celluloid of film, to explosives.

The chemical structure of cellulose also makes it incredibly versatile. It is a polymer, a substance made of many repeating chemical units. Stringing these basic units together creates new substances with properties that exceed what the individual units possess on their own. Frey clarifies the nature and importance of polymers in the context of cellulose, whose basic molecular unit is glucose, a simple sugar.

“Sugar is a little crystal that we know is water soluble,” she explains. “You can make something out of sugar if you want to. You can make marzipan, for instance, which would have a solid shape but wouldn’t be very strong or have much structural integrity. If we want to create cellulose, we would start with glucose and string together long, long chains of the sugar until we get cellulose. If we continue to string together hundreds or thousands of these sugar molecules, end to end, connected with chemical bonds, we can get cotton—or even a redwood tree.”

As the length of the polymer chain increases, Frey explains, polymer properties improve. “For example, while those basic sugar molecules can be dissolved in water or any number of other things, cellulose won’t dissolve in water. In fact, it’s very resistant to many chemicals. So when you wash a cotton sweater, it doesn’t dissolve. When it rains, the tree doesn’t dissolve. Properties like this make cellulose a useful material.”

**“Cellulose is a very abundant, renewable material. It’s everywhere on a plant and anywhere on the planet where plants grow.”**

Lately, Frey has been submitting cellulose, in the form of cotton balls or batting, to the electrospinning process. Electrospinning isn’t new—it first was used in the late 1930s. Electrospinning on the nanoscale, however, is quite new.

“It’s a fun process,” says Frey. First the fiber chemist uses a solvent to dissolve cellulose. Then the chemist pushes the cellulose solution from a syringe so that it forms a small droplet at the edge of the needle and applies high voltage to the droplet. When the voltage jumps over to a ground, it pulls the polymer with it in the form of a tiny fiber.

“This fiber is smaller than anything we are able to make using the usual fiber-spinning methods,” Frey explains. “The nanofibers collect and become entangled, forming a nonwoven mat that looks something like a dryer sheet. You can see the mat, but you need an electron microscope to see the individual fibers.”

The beauty of electrospinning is that it doesn’t require an expensive laboratory or specialized equipment. The simple apparatus can be set up on a lab table, and it’s relatively inexpensive to construct and operate. The process also doesn’t alter the chemical composition of cellulose.

“We’re not producing any chemical reactions,” Frey explains. “We’re not shortening the polymer chain length in any way. We’re simply using a solvent to dissolve it and then crystallizing it back out. We squeeze the liquid cellulose out of a tiny hole to make it into whatever shape we want it to be, and then we remove the solvent in the system.”

**“Environmental concern motivated me to investigate a different system for processing cellulose. Ethylene diamine appears to be flexible in the range of materials it is able to make. And the process is fairly green because we can recycle nearly 100 percent of the solvent.”**

The challenge has been in finding the right solvent. Because cellulose does not dissolve in water or melt, other solvents are required to liquefy it. Frey has tested a variety of solvents for performance, predictability, and environmental safety. Many of them produce toxic or hazardous side effects, but she has had success with ethylene diamine used in combination with thiocyanate salts. This solvent was first discovered at North Carolina State University by Kazuyuki Hattori, now at Kitami Institute of Technology in Japan.

“For a process to be truly sustainable, it needs to be handled appropriately,” Frey says, explaining that an industrial process requires a closed-loop system so that the solvent is recycled back into the process. She cites the process of making rayon from cellulose, which has been in use for 100 years. It is a nonsustainable process that involves chemical reactions and is extremely polluting, but nothing has been able to match the range of materials the process is able to make.

“Environmental concern motivated me to investigate a different system for processing cellulose,” Frey says. “Ethylene diamine appears to be flexible in the range of materials it is able to make. And the process is fairly green because we can recycle nearly 100 percent of the solvent.”

Now that Frey has determined what she believes is the best solvent, she has been exploring some novel applications of electrospinning. With an undergraduate degree in engineering and a master’s degree in fiber science, both from Cornell, and a doctorate in fiber and polymer science from North Carolina State University, Frey can and does straddle disciplines.

Sensor technology is one application of Frey’s nanofibers that combines engineering, chemistry, and textile expertise. Frey collaborates with Antje Bauemner, associate professor of biological and environmental engineering at Cornell’s College of Engineering, on creating

devices and products that can detect and collect environmental hazards. Frey’s tiny fibers offer thousands of times the surface area as normal fibers, making them capable of far greater sensitivity in detecting pathogens and toxins.

“If you’re working in a food-preparation area, or you want to test a piece of meat to see if it’s contaminated with bacteria, we may be able to put sensors in something as familiar as a paper towel or a swab that can be used to wipe a surface to detect contaminants,” Frey speculates. All the pieces for these sensors exist. Frey’s team has developed the technology to make the fabric, while Bauemner has developed much of the sensing technology.

Frey and Bauemner also are working with Yong Joo, assistant professor of chemical and biomolecular engineering at Cornell, who is designing a sensor that can detect hazardous gasses in the atmosphere.

Industrial applications of the nanoscale electrospinning technology focus on enhancing products. For example, nanofibers offer an improved and cost-effective option for filtration applications. The tiny fibers are much less likely to obstruct air flow, and their increased surface area and small mesh enable them to collect more and finer particles. They also require less power to push air through the filter. Frey has been contacted by several companies interested in cellulose electrospinning.

Protective clothing also is a viable application for Frey’s nanofibers. The U.S. Army is interested in using nanofibers to make uniforms that can resist chemical challenges but are breathable enough to prevent overheating. Fire fighters, agricultural workers, and athletes are just as likely to benefit from this kind of apparel. Frey collaborates with Kay Obendorf, professor of textiles and apparel, on developing this type of versatile clothing.

Frey also is interested in tailoring the

polymer product to absorb pesticides or herbicides into a solid, environmentally friendly form that could be planted with seeds and time-released over the growing season, after which it would biodegrade and return nutrients to the soil. The concept offers a green alternative to spraying chemicals that run off into the water supply and contaminate other systems. Frey works on this project with two colleagues from Cornell's College of Agriculture and Life Sciences—Michael Hoffman, professor of entomology, and Alan Taylor, professor of horticultural studies at the New York State Agricultural Experiment Station in Geneva.

Frey's nanofibers also have biomedical applications. Cornell colleague C. C. Chu, professor of textiles and apparel, has been investigating Frey's technique of electrospinning polymers for the purpose of manufacturing biomaterials that mimic human tissue and might be used, for example, to help close wounds. Nanofibers offer advantages in biomedicine because their small size matches the scale of human cells and tissue. Through a contact she made in graduate school at Cornell, Frey also has supplied the biomedical department at Yale University with electrospun materials on which they have been growing bone tissue.

Finding ways to recycle the huge quantities of fiber that are lost during conventional textile manufacturing is another project in which Frey has long been interested. It's a worthy environmental pursuit—the United States by itself produces 20 million 480-pound bales of fiber a year, about one-fifth of the world's annual production. Large amounts of fiber are lost to scrap or waste during every step of the garment-making process—from weaving and dyeing to cutting and sewing. Some of the waste is sterilized and used to make items like cotton balls and cotton batting. Much of the waste, however, gets discarded.

**"It's exciting to form connections between textile science and other areas of science and technology to devise new ideas and approaches for using textiles and fibers."**

"It seems worthwhile to take something that is basically waste from another process, but very pure from a polymer standpoint, and use it as a feed stock in our process," Frey says. "Once we've mastered making nanofibers, perhaps next we can expand our research so that we're able to apply the same process using waste materials."

In another area of campus, David Wilson, Cornell professor of molecular biology and genetics, is studying the interaction of cellulose with enzymes. In this regard, nanofibers might be useful in environmental remediation and alternative fuel development. Frey sees Wilson's work as another example of the vast potential for collaboration available to her at Cornell.

"It's exciting to form connections between textile science and other areas of science and technology to devise new ideas and approaches for using textiles and fibers," she says. "I learn something new every day through my collaborations at Cornell."

For more information, contact

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**Chemical engineering graduate student Jason Konopack checks a step in the electrospinning process with Margaret Frey.**

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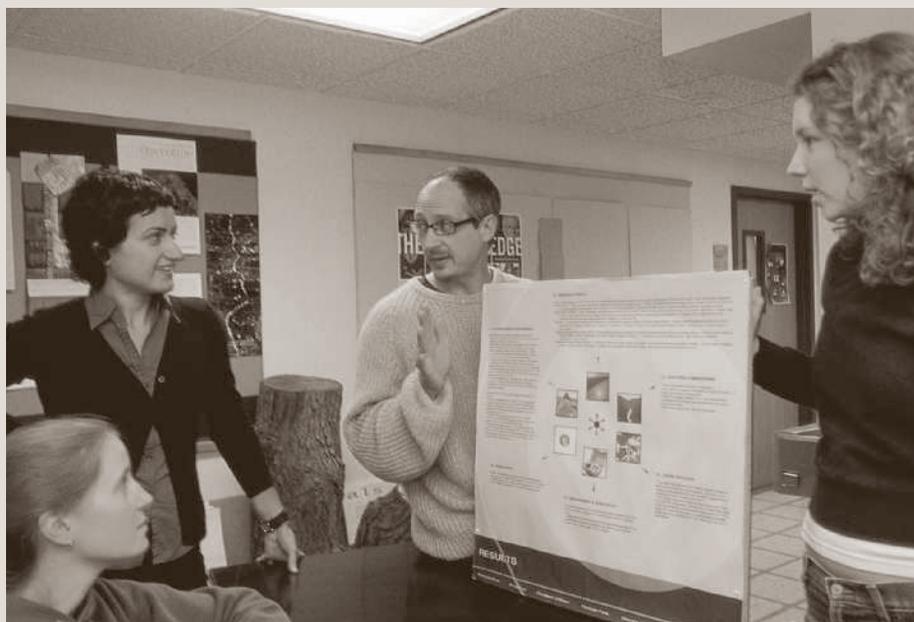
2003-2004 ANNUAL REPORT OF THE  
COLLEGE OF HUMAN ECOLOGY

## Design and Environmental Analysis

New courses in the Department of Design and Environmental Analysis (DEA) that address the broad themes of the environment and health and well-being (Environments and Health, DEA 661 and Poverty over the Life Course and Public Policy, DEA 691) were introduced into the curriculum. The long-term commitment to a service-learning model continues to grow, extending Cornell expertise into the community. This benefits both the community and our students, who have the opportunity to explore and apply concepts, skills, and knowledge introduced in the classroom to solving real-world problems.

Efforts of the DEA faculty to increase externally funded research have resulted in new research programs such as Environment of Childhood Poverty, funded by the MacArthur Foundation; Neighborhood Design and Physical Activity, funded by the Robert Wood Johnson Foundation; Environment, Occupational Stress, and Health Among Urban Bus Drivers, funded by the Swedish Council for Worklife, which provides for the continuation of a six-year longitudinal study; Syracuse Healthy Indoor Environment Living Demonstration (a part of the New York Indoor Environmental Quality Center), funded by the U.S. Department of Housing and Urban Development; and Ecology of Knowledge Networks, funded through the International Workplace Studies Program.

Healthy Indoor Air for America's Homes is a national extension program funded through a cooperative agreement between the U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service and the U.S. Environmental Protection Agency. Its goals are to educate consumers about sources, health risks, and control measures related to common residential indoor-air problems and to help consumers reduce their health risks from these problems. The project is being implemented in most states through the network of more than 3,000 county Cooperative Extension Service offices. In New York State, the program has enabled county extension educators to form partnerships with county health departments to educate communities about childhood lead poisoning and radon in homes.



**Academic Personnel in the College, 1999-2004**

Title	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
<b>Academic Professorial</b>	92	90	94	91	<b>90</b>
Professor	44	45	46	43	<b>45</b>
Associate Professor	40	36	34	30	<b>29</b>
Assistant Professor	8	9	14	18	<b>16</b>
<b>Academic Non-Professorial</b>	97	87	127	104	<b>99</b>
Senior Lecturer	4	5	6	5	<b>7</b>
Lecturer	15	9	19	15	<b>14</b>
Instructor	0	0	1	0	<b>1</b>
Senior Research Associate	11	11	14	11	<b>15</b>
Research Associate	13	18	15	14	<b>16</b>
Senior Extension Associate	19	16	19	16	<b>15</b>
Extension Associate	27	20	34	32	<b>24</b>
Postdoctoral Associate	8	8	19	11	<b>8</b>



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The New York Center for Indoor Environmental Quality is a coalition of 12 New York universities and nonprofit organizations that is funded through the New York Strategically Targeted Academic Research program. The center's mission is to improve the quality of indoor environments and urban systems through education and job creation in New York State. Professor Joseph Laquatra, the outreach team leader, is currently involved in a joint effort with the State University of New York College of Environmental Science and Forestry, Upstate Medical University, and Cornell Cooperative Extension of Onondaga County to implement an asthma-education initiative for limited-resource households in Syracuse.

## Human Development

The undergraduate curriculum in Human Development (HD) provides a comprehensive education in biological, psychological, social, and cultural development from conception to old age, focusing on the processes and mechanisms of growth and change over the life course. This major is an excellent foundation for many careers, such as medicine, clinical psychology, the mental-health professions, law, business, and education. The flexibility of the HD major allows students to focus on a selected area of interest as well as to pursue classes, research, and field experiences that are required for admission to professional programs and careers. Students take part in field placements, internships, independent studies, teaching assistantships, and faculty research that allows development of problem-solving, writing, and critical-thinking skills. Concentrations are offered in cognitive development; biology and human development; social and personality development; and life course, social contexts, and social policy.

Although genomics traditionally has not been a major focus of HD, during the last several years the department has been exploring the possibility that the future advancing edge in its field might well reside in part within the biological and life sciences. To enhance this exploration, the department made several steps toward better integrating human development with the life sciences. New courses on the human brain and mind have been developed. Undergraduate field-

### Undergraduate Enrollment by Major and Degrees Awarded, 1999-2004

Major	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
Design and Environmental Analysis	117	112	110	111	108
Human Development	437	472	477	467	435
Human Biology, Health, and Society	226	213	217	233	228
Nutritional Sciences	154	141	102	74	83
Textiles and Apparel	86	106	131	135	139
Biology and Society	60	41	47	47	41
Policy Analysis and Management	283	301	319	331	316
<b>Total</b>	<b>1,408<sup>1</sup></b>	<b>1,403<sup>2</sup></b>	<b>1,418<sup>3</sup></b>	<b>1,413<sup>4</sup></b>	<b>1,352<sup>5</sup></b>
Bachelor's Degrees Awarded	392	398	379	455	381*

\* August 2003, January 2004, and May 2004

1. Includes 21 double majors; actual student enrollment was 1,387.
2. Includes 30 double majors; actual student enrollment was 1,373.
3. Includes 31 double majors; actual student enrollment was 1,387.
4. Includes 39 double majors; actual student enrollment was 1,374.
5. Includes 8 double majors; actual student enrollment was 1,344.

study internships are organized to deliver education programming on topics related to brain science and the brain and behavior to local middle and high schools. Research continues in areas of the neurobiology of personality and the neural mechanisms that underlie the theory of the mind.

HD faculty members take active roles in the university's social-science initiative, participating in the provost's Social Science Advisory Council and the Institute for the Social Sciences. The department has also initiated a self study to identify concrete steps to be taken to raise the department to the top rank among developmental programs. Departmental efforts include the Cornell Institute for Research on Children (CIRC): Creating and Disseminating Developmental Science to Benefit Children, Science, and Society, which is a five-year, multistate, multischool study of the science-education program funded by the National Science Foundation. The Cornell Institute for Translational Research on Aging, funded by the National Institute on Aging, unites the gerontological and geriatrics resources of the Ithaca campus, Weill Cornell Medical College, and Cornell's Institute for Geriatric Psychiatry in Westchester, New York. Ties are being established to community agencies in New York City for the purposes of planning applied research projects. A research-needs assessment has been conducted, using concept-mapping methods. The Advancing Youth Development Partnership conducts facilitator trainings in New York State to create interagency teams that have helped to educate more than 1,500 youth workers. The ACT for Youth Upstate Center of Excellence has developed a partnership with Cornell Cooperative Extension, the Office of Children and Family Services, and the Association of New York State Youth Bureaus.

### Nutritional Sciences

The Division of Nutritional Sciences (DNS) works to promote health and well-being and is organized around three overlapping topics: nutritional biochemistry; human metabolism; and community and population nutrition. Future development of scholarship will be in nutritional genomics, health disparities, and metabolism. DNS faculty members are participating fully in advancing the university goals in genomics, with seven members currently having active research in nutritional

#### Graduate Student Degrees Awarded, 1999-2004

Major	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
<b>Students Enrolled</b>					
M.A., M.S., M.N.S., M.P.S., M.H.A.	99	67	87	89	85
Ph.D.	102	122	128	138	128
<b>Total</b>	<b>201</b>	<b>189</b>	<b>215</b>	<b>227</b>	<b>213</b>
<b>Degrees Awarded</b>					
M.A., M.S., M.N.S., M.P.S., M.H.A.	44	56	52	36	42
Ph.D.	34	22	16	15	15
<b>Total</b>	<b>78</b>	<b>78</b>	<b>68</b>	<b>51</b>	<b>57</b>

#### Graduate Enrollment by Field, 1999-2004

Major	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
<b>Design and Environmental Analysis</b>					
M.A.	6	1	9	9	11
M.S.	16	16	19	19	17
<b>Total</b>	<b>22</b>	<b>17</b>	<b>28</b>	<b>28</b>	<b>28</b>
<b>Human Development</b>					
M.A./Ph.D.	32	35	33	37	32
<b>Total</b>	<b>32</b>	<b>35</b>	<b>33</b>	<b>37</b>	<b>32</b>
<b>Nutritional Sciences*</b>					
M.S./M.N.S./M.P.S.	22	21	13	13	13
Nondegree dietic interns	0	5	8	5	5
Ph.D.	47	50	63	65	65
<b>Total</b>	<b>69</b>	<b>76</b>	<b>84</b>	<b>83</b>	<b>83</b>
<b>Policy Analysis and Management</b>					
M.S.	5	5	3	3	0
M.H.A./M.P.S.	28	32	31	31	30
Ph.D.	17	19	20	24	22
<b>Total</b>	<b>50</b>	<b>56</b>	<b>54</b>	<b>58</b>	<b>52</b>
<b>Textiles and Apparel</b>					
M.A., M.S., M.P.S.	10	10	12	14	14
Ph.D.	6	6	4	5	5
<b>Total*</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>19</b>	<b>19</b>

\*These figures include the Field of Nutritional Sciences, which is part of both the College of Human Ecology and the College of Agriculture and Life Sciences

## Trends in Research and Outreach Productivity, 1999-2004

Major	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
Book chapters	61	69	63	58	77
Books and monographs	24	29	25	20	23
Exhibitions	5	8	12	11	19
Extension: bulletins; fact sheets; training manuals and materials; technical reports	87	64	101	129	57
Journal articles, refereed	153	174	181	158	206
Journal articles, nonrefereed	12	18	12	20	16
Short notes, letters, abstracts, book reviews	55	58	51	59	70
Total articles	220	250	244	237	292
News Service articles, radio tape releases, newsletters	243	201	237	254	73
Media interviews	136	187	195	130	218
Proceedings	50	30	30	37	43
Research: training manuals and materials; technical reports	39	16	32	25	22
Web pages and other computer-related products; nonprint educational materials (e.g., video)	44	55	76	171	47

genomics. Others are orienting their research in this direction, and two open faculty searches are in support of this initiative. In addition, DNS is participating in the work set out by the Social Science Task Force with international and domestic contributions.

Comprehensive review of the Human Biology, Health, and Society major is underway. New courses were added in epigenetics; community nutrition research; globalization, food security, and nutrition; as well as a current-topics seminar in nutritional biochemistry. The multidisciplinary faculty allows a comprehensive study of human nutrition and a diverse research portfolio with federal, corporate, foundation, and international funding agencies, including the National Science Foundation, the National Institutes of Health, the U.S. Agency for International Development, the U.S. Department of Agriculture, the Wellcome Trust, the Dannon Institute, UNICEF, the World Bank, Mead Johnson, and the African Economic Research Consortium. The opening of the new Human Metabolic Research Facility in the west addition of Martha Van Rensselaer Hall provides new space and facilities for conducting metabolic studies on human subjects. The Cornell Institute for Nutritional Genomics provides a university-wide structure for integrating nutritional genomic research. Investigations are ongoing into the feasibility of a core facility in support of metabolic phenotyping and increased faculty collaborations with the University of Rochester Medical Center and the Weill Cornell Medical College to open opportunities for research in clinical settings with ethnically diverse populations.

Extension faculty members are leading efforts for a coherent, institution-wide response to the obesity epidemic. New faculty programming and applied research efforts are converging on obesity prevention. This includes a focus in Cornell NutritionWorks on building capacity to prevent obesity among nutrition and health professionals, applied research on environmental approaches to obesity prevention in the Program on Breast Cancer and Environmental Risk Factors, and applied research on community capacity building to prevent excess weight gain in pregnant women. Connections between the food system and consumers have been strengthened by the Farm to School and Farmer's Market Nutrition Programs.



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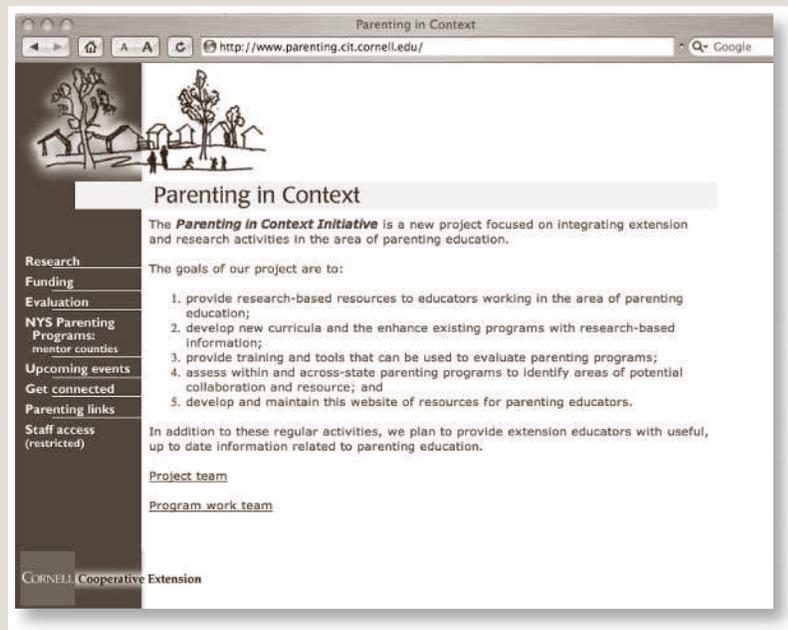
## Policy Analysis and Management

The Department of Policy Analysis and Management was formed with the mission to achieve excellence in research, teaching, and extension/outreach in three areas of competence—family/social welfare, health, and consumer policy. The research profile of this unit continues to grow, with the faculty publishing in major journals in their fields as well as in multidisciplinary journals, with increased recognition of their scholarship. Research is integrated into both teaching and extension/outreach programming.

Research on issues related to obesity, employment, and disability are funded from a variety of external sources. Smoking cessation and issues surrounding alcohol taxes and prices are topics of continuing research. Other faculty members conduct research in parenting, child care quality indicators, and child care choice behavior of consumers as well as on child support, child welfare, and the effects of welfare reform. The Merck Company Foundation has provided funding for a program on pharmaceutical policy issues, and the Economic Research Initiative on the Uninsured has funded investigation of the relationship between insurance coverage and macro-employment measures. Faculty members participate with other leading social scientists at Cornell who are shaping the social science agenda on campus. Health promotion is focal area for research in the department and links efforts in health economics and administration.

As part of the goal to maintain teaching and advising quality, the department set several priorities including: balancing the number of courses in each concentration area across semesters; offering at least two courses in each concentration area each semester; minimizing course scheduling conflicts; and strengthening the management component of the curriculum. Substantial progress was made toward the goal of enhancing experiential and research experience for undergraduate students.

Funded extension and outreach projects increased in 2003–2004, as did the involvement of undergraduate students and faculty members in extension/outreach activities. Undergraduate students have assisted in



projects focused on the economic impact of nonprofit organizations and on cost containment in public education. A student intern was placed with the Healthcare Association of New York State to conduct an economic impact study, and several county extension programs benefited from student involvement in planning and evaluation efforts. The Family Social Welfare area was strengthened by a number of new and continuing programs this year. The Family Resolution Project maintained 32 sites across the state. Collaborations continue with the New York State Office of Temporary Assistance and Disabilities to examine issues of welfare reform and family structure. Adding It Up, First Accounts, and Money 2000 bring together state banking, credit union, government, and extension educators in a statewide network. In the area of health, the department has several active projects: the Food Stamp Education Program Evaluation; a program focusing on food insecurity infrastructure; the New York State Health Department Rural Health Networks; a program initiative in the area of public policy—Obesity and Physical Fitness; and a series of projects working with the Cornell Center for Gerontology focused on planning and research design that includes work with Cornell Weill Medical Center and the Office of the Aging.



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## Textiles and Apparel

The Department of Textiles and Apparel (TXA) completed a program review that rated the program as excellent. The department continues to target goals and priorities including integrating the unique combination of fiber science and apparel design in research, education, and extension; developing research in areas of strength and recognized specialties while new and more risky research areas are encouraged with timely incentives; continuing to seek collaborations outside the department and outside Cornell to support interdisciplinary and multidisciplinary approaches to problem solving; expanding the Ph.D. program to add apparel design as a concentration; continuing review and discussion of curriculum, taking advantage of student views; designing capstone courses; using networks, especially alumni networks, to place students in internships and jobs; continuing extension programming in areas of demonstrated strength; strengthening the established link between outreach and research; and developing an Industry Advisory Board to provide an industry perspective.

Faculty are very productive, working on collaborative and multidisciplinary research. Funding from the National Textile Center supports research to advance the knowledge of biomaterials and develop new biomaterials technology, particularly biologically active and hydrogel-textile hybrid biomaterials, to develop environment-friendly and fully degradable or compostable “green” composites using plant-based fibers and resins, to develop protective clothing that can limit dermal exposure, and to study solvent spinning cellulosic fibers from reclaimed cellulose. Various bioactive compounds are being included in the spinning dopes, and their activity in the spun fibers is under investigation. Multidisciplinary research integrates technology and design, investigating sizing and fit of apparel. In addition, body scan research addresses the development of mathematical models to help apparel firms improve their existing sizing systems to better fit their target market. The Body Scan Research Group has developed a new interactive web site—[www.explore.cornell.edu/bodyscanner](http://www.explore.cornell.edu/bodyscanner). Research in fashion consumption considers how high-fashion apparel might affect the design of low-fashion apparel and non-

fashion products. Components of design and strategy necessary for particular apparel items to achieve a status of desire in the mind of the consumer are explored.

The department has a strong history of integrating across the college's three missions. The electronic text developed for Designers as Entrepreneurs, TXA 332, an on-campus course, was reformatted for delivery to an industry audience. "The Cutting Edge: Guide to the Apparel and Sewn Products Industry" offers six lessons in a web-based format that can easily be printed. The content addresses the needs of small entrepreneurial firms serving specific niches, including product development and life cycle, sourcing materials and labor, intellectual property, and information technology.

### Family Life Development Center

The Family Life Development Center continues to provide leadership in preventing family violence and neglect, emphasizing community-based approaches. It is building capacity to provide leadership in community youth development and in research and evaluation supporting these efforts. Programs include ACT for Youth, the Residential Child Care Program/Therapeutic Crisis Intervention project, the National Data Archive on Child Abuse and Neglect, the Army and Marine military parenting and family education projects, and the Parent HIV/AIDS Education Project.

### Bronfenbrenner Life Course Center

The Bronfenbrenner Life Course Center (BLCC) focuses on research that is conducted within the life course perspective. Research on the life course considers both stability and change in lives as they unfold across time and generations and in historical, social, and cultural contexts. This orientation promotes an ecological model, placing families and individuals in the context of historical, demographic, and social change. The center takes a lifelong view of human development, recognizing that developmental growth continues through adulthood into old age.

The center has a multidisciplinary focus, involving scholars from departments across Cornell. Although specific topics range widely, BLCC affiliates conduct basic, applied,

External Awards by Funding Source Active during 1999-2004	
Funding Source	Grants and Contracts
<b>Federal Sources</b>	
U.S. Department of Health and Human Services	42
U.S. Department of Agriculture*	33
U.S. National Science Foundation	3
U.S. Government other	13
<b>New York State Sources</b>	
New York State Office of Children and Family Services	5
New York State Department of Health	3
New York State other	4
Foundations	24
Corporations	7
Miscellaneous	29

\*Does not include federal formula funds.

Expenditure of Restricted Funds by Academic Function, 1999-2004					
	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
<b>Restricted Gifts</b>					
Research	549,612	647,544	630,703	535,773	202,285
Extension	103,497	131,884	89,682	88,810	70,351
Instruction	319,683	448,945	378,538	369,819	319,072
<b>Grants, Contracts, and Other Restricted Funds</b>					
Research	5,684,248	5,384,565	6,703,782	6,892,061	6,902,315
Extension	3,505,597	4,236,556	4,609,005	3,836,628	4,836,384
Instruction	534,107	451,718	597,297	531,081	536,272

and outreach work on topics employing a life course perspective, focusing on such themes as long-term outcomes (e.g., health, economic) of early experiences; development in the context of historical, demographic, and social change; life course transitions in areas such as family, work, or health; longitudinal assessment and analysis; and social policy. Other research areas are: the interplay between work and family; social networks, social integration, and social support; career pathways; grandparenting; environment and behavior; retirement

and productive aging; health, mental health, and well-being; housing decisions and transitions; care giving throughout the life course; impact of poverty on development and aging; and research methods and measurement.



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**Dedication of the Diane Baillet Meakem Tot Lot.**



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**Alumni donors honoring Dean Brannon at a reception in New York City in March 2004.**

## Alumni Affairs and Development

The Diane Baillet Meakem Tot Lot is now a reality, thanks to the generosity of Diane '61 and Jack '58 Meakem. Nearly 100 Early Childhood Education Center parents and children attended the celebration on October 17, 2003. This new, safe, outdoor wheeled-toy riding area is located at Cornell's Early Childhood Education Center at Martha Van Rensselaer Hall.

Alumni took the leadership in raising funds for the Alumni Metabolic Dining Room in honor of Patsy M. Brannon, Ph.D., dean from 1999–2004. The dining room is located in the metabolic unit of the west addition to Martha Van Rensselaer Hall and is utilized for human nutrition studies.

Alumni reunion gifts have resulted in a named conference room in the Policy Analysis and Management suite and original artwork in the Human Development suite. A gift from Alumna Cynthia B. Green '79 and her husband Lee Cohen has allowed for renovation and furnishing of the PAM conference room, making it substantially more usable for meetings and presentations. New audio-visual equipment also has been installed. Robert Chodock '89 and his spouse, Karen Mitchell, ILR '90, made a gift in celebration of his 20th reunion, enabling the college to purchase two original oil paintings thereby increasing the attractiveness of an otherwise utilitarian environment.

Endowment funds established during the past year include the Henry Ricciuti Lecture Series in Human Development, which provides support that brings influential individuals to campus to expand perspectives regarding the future of the field of human development. The Phyllis Moen Book Acquisitions Fund for Mann Library, which honors the former director of the Brofenbrenner Life Course Center, will be used to purchase library materials including human development and life course studies.

The year brought \$4,907,239 in new gifts and commitments, including \$302,000 in unrestricted funds, \$1,482,239 in current-use restricted gifts, and \$3,125,000 in endowment.

The college endowment has a book value of \$30,700,000 and a market value of \$41,900,000. The book value has increased six-fold since 1994.

## Financial Statement

## Statement of Current Fund Revenues, Expenditures, Other Changes in Dollars for the Year ended June 30, 2004, with Comparative Amounts for the Year Ended June 30, 2003

	Unrestricted			Restricted	2004 Total	2003 Total
	Undesignated	Designated	Total			
<b>Revenues</b>						
Tuition and fees	26,119,839	80,857	26,200,696	—	<b>26,200,696</b>	22,857,576
State appropriations	7,192,535	---	7,192,535	—	<b>7,192,535</b>	9,384,560
Federal appropriations	3,923,587	---	3,923,587	—	<b>3,923,587</b>	4,571,152
Federal grants and contracts	---	1,876,532	1,876,532	10,955,935	<b>12,832,467</b>	11,602,822
State and local grants and contracts	---	601,922	601,922	(725)	<b>601,197</b>	1,103,300
Private grants and contracts	---	728,242	728,242	97,973	<b>826,215</b>	1,259,583
Contributions (gifts)	---	383,711	383,711	141,108	<b>524,819</b>	1,807,454
Interest and dividends	---	66,887	66,887	99,407	<b>166,294</b>	149,724
Sales and services of educational departments	424	2,197,785	2,198,209	20,160	<b>2,218,369</b>	1,856,718
Other sources	79,562	397,106	476,668	450	<b>477,118</b>	12,346
<b>Total revenues</b>	<b>37,315,947</b>	<b>6,333,042</b>	<b>43,648,989</b>	<b>11,314,308</b>	<b>54,963,297</b>	54,605,235
Investment payout	---	775,893	775,893	1,445,347	<b>2,221,240</b>	2,256,523
Capital investments and withdrawals	(3,214,028)	796,000	(2,418,028)	(285,310)	<b>(2,703,338)</b>	(1,658,489)
<b>Total revenues and other additions</b>	<b>34,101,919</b>	<b>7,904,935</b>	<b>42,006,854</b>	<b>12,474,345</b>	<b>54,481,199</b>	55,203,269
<b>Expenses</b>						
Instruction	9,536,343	2,226,059	11,762,402	855,344	<b>12,617,746</b>	11,861,076
Research	3,692,277	(2,331)	3,689,946	6,716,974	<b>10,406,920</b>	10,954,202
Public service	4,249,841	1,718,146	5,967,987	4,909,413	<b>10,877,400</b>	11,010,489
Academic support	562,075	251,168	813,243	25,216	<b>838,459</b>	1,506,133
Student services	2,707,744	74,876	2,782,620	2,144	<b>2,784,764</b>	3,471,246
Student aid	3,639,367	84,961	3,724,328	852,553	<b>4,576,881</b>	4,351,269
Institutional support	6,746,673	305,595	7,052,268	—	<b>7,052,268</b>	9,057,102
Plant operation and maintenance	4,122,914	212,548	4,335,462	989	<b>4,336,451</b>	1,291,745
<b>Total expenses</b>	<b>35,257,234</b>	<b>4,871,022</b>	<b>40,128,256</b>	<b>13,362,633</b>	<b>53,490,889</b>	53,503,262
<b>Total net change</b>	<b>(1,155,315)</b>	<b>3,033,913</b>	<b>1,878,598</b>	<b>(888,288)</b>	<b>990,310</b>	1,700,007
<b>Balances July 1, 2003</b>	<b>1,705,044</b>	<b>9,815,149</b>	<b>11,520,193</b>	<b>3,116,010</b>	<b>14,636,203</b>	12,936,197
<b>Balances June 30, 2004</b>	<b>500,500</b>	<b>12,849,060</b>	<b>13,349,560</b>	<b>2,227,722</b>	<b>15,577,282</b>	14,636,203

\*Beginning with the fiscal year ending June 30, 2003, the categories included in Income from Investments have been modified.



## College of Human Ecology 2003-2004

### College Administration

Patsy M. Brannon, Rebecca Q. and James C. Morgan  
Dean of Human Ecology

Jennifer Gerner, Associate Dean for Academic Affairs

S. Kay Obendorf, Associate Dean for Research

Josephine Swanson, Associate Director, Cornell Cooperative  
Extension, and Assistant Dean for Extension and Outreach

Janet McCue, Director, Mann Library

Barry Lee Brighton, Associate Dean for Administration and  
Facilities

Brenda H. Bricker, Director, Undergraduate Affairs

Darryl Scott, Director, Admissions, Student, and Career Services

Lorraine Johnson, Director, Alumni Affairs and Development

Joanne LaValle, Registrar

### Academic Unit Administration

Franklin Becker, Chair, Design and Environmental Analysis

Cutberto Garza, Director, Division of Nutritional Sciences

Ritch Savin-Williams, Chair, Human Development

Richard Burkhauser, Chair, Policy Analysis and Management

Ann Lemley, Chair, Textiles and Apparel

### Centers

Karl Pillemer, Acting Director, Bronfenbrenner Life Course Center

David Stapleton, Director, Cornell University Institute for  
Policy Research

John Eckenrode, Co-Director, Family Life Development Center

Stephen Hamilton, Co-Director, Family Life Development Center

This 79th annual report of the New York State College of Human Ecology, Cornell University, Ithaca, New York 14853-4401, covers the period from July 1, 2003 through June 30, 2004. This document fulfills the reporting responsibility under the March 2, 1887 Act of Congress establishing agricultural experiment stations and section 5714 of the New York State Education Law.



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