COLLABORATION. Two minds are better than one. It’s one of the reasons the College of Health and Human Sciences (HHS) was created in 2010. Purdue University is a place primed for discovery and innovation, and the idea was to bring together researchers in science and social science to address some of life’s grand challenges. Today, over 200 HHS faculty are pushing boundaries and working across disciplines to explore seven strategic research themes that have implications for daily life. We invite you to see what we’re up to!
LIFESPAN DEVELOPMENT

Research examines issues related to human health and well-being across the lifespan, and in contexts such as school and family. Work focuses on biological, physical, cognitive and psychosocial development during a number of critical periods including prenatal, infancy, early childhood, adolescence and throughout adulthood.

THE SOCIAL SIDE OF AGING

More than 70 percent of Americans 65 and older live with two or more chronic medical conditions, or multimorbidity, which can increase their risk for disability and early death. However, some people with multimorbidity have a reasonably high quality of life and remain active. What are the key differences between these people and the ones who become disabled or cognitively impaired?

With a $1.2 million grant from the National Institute of Aging, Elliot Friedman is studying the role of psychological factors in determining why some older adults living with two or more chronic medical conditions, such as diabetes or heart disease, are more likely than others to succumb to the effects of aging.

“We now have a fair amount of evidence that social and psychosocial experiences can affect your likelihood of getting multiple diseases,” says Friedman, associate professor in HUMAN DEVELOPMENT AND FAMILY STUDIES. “It’s important to understand the role of these non-medical factors in the onset and consequences of age-related diseases.”

THE SCIENCE OF LEARNING

In Jeffrey Karpicke’s classroom, you can bet that his students know a thing or two about good study techniques. Karpicke, the James V. Bradley Associate Professor of PSYCHOLOGICAL SCIENCES, examines the cognitive science of learning, particularly the importance of retrieval processes for learning.

Supported by the National Science Foundation and the Institute of Education Sciences, his research has shown that practicing retrieval is a highly effective method for improving long-term learning. Karpicke says he views instruction on how to learn as equally important, if not more important, than instruction about specific content or topics.

Work is underway to develop computer-based programs for K-12 and college students that guide them to practice retrieval while they are learning.

EARLY INTERVENTION FOR STUTTERING

The majority of children who stutter eventually grow out of it, but for those who don’t, early intervention can be beneficial. Anne Smith and Christine Weber-Fox, both professors in SPEECH, LANGUAGE, AND HEARING SCIENCES, lead the Purdue Stuttering Project and seek to understand why some children grow out of stuttering.

Their findings will be used to develop a speech therapy screening tool to better identify which preschool children are not likely to recover and should receive therapy immediately.

“Speech therapy resources are not necessary for every young child who stutters, but the ‘let’s wait and see’ approach is missing children who could benefit from early intervention,” Smith says.

This latest study is funded by a $3 million grant from the National Institutes of Health. Smith and Weber-Fox have worked together since 1990 and have found that brain functions for speech and language are different in both adults and young children who stutter.
People with Parkinson’s disease experience difficulty communicating due to a quiet voice and mumbled speech. Jessica Huber, professor in SPEECH, LANGUAGE, AND HEARING SCIENCES, teamed with biomedical engineers to create a device that would help these patients talk more loudly and clearly in real-world conversations. SpeechVive is a wireless, behind-the-ear device that provides a stream of noise (similar to background chatter at a party) while the person wearing the device is speaking, prompting the wearer to naturally talk louder and more clearly. Thanks to the efforts of Huber and her collaborators, the SpeechVive device is currently in production. “It is extremely important that we, as researchers, translate our findings into practice, whether that is through for-profit or nonprofit commercialization,” Huber says.

Bariatric surgery has become a popular weight-loss option, with more than 200,000 surgeries performed in the U.S. in 2011. Nana Gletsu Miller, assistant professor in NUTRITION SCIENCE, studies the impact of weight-loss surgery on overall health. Bariatric patients are prone to nutritional deficiencies, especially iron, vitamin D, some B vitamins, calcium, zinc and copper. Fatigue, anemia, hair loss and neurological problems can result. “Bariatric patients develop nutritional problems we haven’t seen in this country in decades,” she says. “Our research on this population can be applied to other populations at risk, since poor nutrition occurs in many parts of the world.” Gletsu Miller is working to help post-surgical patients maintain their weight loss over the long term while encouraging better nutritional health.
THE MECHANICS OF GOOD BALANCE
Falls are the leading cause of accidental death among the elderly and the third-leading accidental killer among all age groups. For Shirley Rietdyk, associate professor in HEALTH AND KINESIOLOGY, falls are the focus of her research. She studies the interaction of neural, muscular and mechanical systems in mobility, posture and balance.

“Up to 53 percent of falls are caused by tripping,” Rietdyk explains. “Why people fail to step over an obstacle they knew was there is largely unknown. Understanding this failure and developing therapies to prevent it will be instrumental in decreasing the likelihood of falls.”

In the Biomechanics Laboratory, Rietdyk and her research team look for clues as to how the nervous system incorporates visual and sensory information to coordinate muscle activity for safe, balanced movement. Their goals are to identify key factors that lead to falls and to develop interventions to prevent fall-related injuries.

ONLINE TOOLS SUPPORT BREAST-FEEDING
Breast-feeding is a public health priority because it provides tremendous health benefits for the child and mother. Although 75 percent of babies born in the U.S. are breast-fed at birth, only 15 percent are being breast-fed exclusively by the time they are 6 months old.

Azza Ahmed, associate professor in NURSING, believes that number can be increased through effective interventions that promote and sustain breast-feeding. Through a collaborative effort, she helped develop an interactive, Web-based breast-feeding monitoring system, LACTOR, that new mothers can use once they return home.

“By keeping their breast-feeding diary through LACTOR, new mothers can monitor how they are doing and strive for breast-feeding success,” Ahmed says.

The tool makes efficient use of clinicians’ time and keeps the lactation consultant updated on the mother’s progress or difficulties so she can provide assistance if needed.

PROMOTION OF HEALTH AND WELLNESS
Research explores the biological, psychological, behavioral, social, environmental and policy factors that promote health and wellness. Studies are conducted at the individual, health system and population levels.
No two people are alike, and our individual differences not only make us unique but also can help explain and predict behavior. It’s those differences in personality and how they contribute to antisocial behavior and substance use that interest Professor Don Lynam in Psychological Sciences. His research explores which personality traits are most important to specific outcomes, how early in development these traits become important, and the processes by which these traits have their effects on behavior. "If we know which traits place individuals at risk, then we can develop more specific interventions aimed at those traits," Lynam says, "and ultimately target interventions to the individuals most in need of them."

His findings show sensation-seeking may be key in predicting experimentation with drugs but not for predicting regular to heavy drug use or antisocial behavior. However, interpersonal antagonism seems to be an important predictor of heavier drug use and also antisocial behavior.

Do social relationships in shared physical activity play a role in well-being and adaptation to adversity? Meghan McDonough, associate professor in Health and Kinesiology, is examining this question in her research with breast cancer survivors, individuals with Parkinson’s disease, underserved children, overweight women, and Special Olympics participants. One concept she has examined is post-traumatic growth, whereby positive outcomes derive from negative experiences.

A key finding from her work with breast cancer survivors is that when survivors of a shared traumatic experience have supportive social relationships in group physical activity, post-traumatic growth improves. "If you see another person who’s been through what you’re going through moving on and modeling positive behavior, then you’re much more likely to adopt that behavior yourself," she says.
Parkinson’s disease has long been linked to a variety of possible environmental causes, and people whose occupations involve contact with pesticides appear to have an increased risk of developing the disease. In fact, only about 10 percent of Parkinson’s disease cases can be directly linked to inheritance, according to Jason Cannon, assistant professor in HEALTH SCIENCES. Funded by a career development award from the National Institutes of Health and the Showalter Trust, Cannon is developing new models to test interactions between environmental and genetic factors and also to test potential treatments. His team hopes to identify multifactorial causes, examining the critical role of environmental factors such as pesticides and dietary factors that may act on genetically predisposed individuals.

"If we can improve medical imaging to observe specific changes in living human brain chemistry and observe these changes over the long run, it will help create a better understanding of this neurodegenerative disease and improve diagnostic and therapeutic tools," she says.

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SOCIAL RELATIONSHIPS AND CULTURE

Research focuses on the nature, implications, and intersections of social relationships and culture. Studies involving social relationships include family and nonfamily relationships. Work also examines various cultures and communities including education, ethnicity and social class, inequalities, disparities, workplaces, tourism, and organizations.

PARENTING PERSPECTIVES

From the moment of birth, human beings are social creatures. Relationships within a family unit provide a foundation and context for our emotional, social and cognitive achievements. German Posada’s research focuses on the development of child-mother attachment relationships from birth through age 8.

“Child-parent attachment relationships are linked to developmental outcomes and later close relationships,” says Posada, associate professor in HUMAN DEVELOPMENT AND FAMILY STUDIES. “We need to understand the processes involved in constructing effective parent-child relationships and how they impact future developmental trajectories.”

By observing child-mother interactions in different cultural and social settings, Posada and his team gather information on the interactions that support children becoming confident in the availability of important people in their lives and also in exploring their environment. These findings can inform intervention programs aimed at improving the quality of care for children.

BREAKING UP IS HARD TO DO

Why is it difficult for young people to leave an abusive or controlling relationship? “Fear of a relationship ending keeps people in relationships,” explains Ximena Arriaga, associate professor in PSYCHOLOGICAL SCIENCES. “People are afraid they will be worse off if it ends.” She studies relationship commitment, partner aggression and domestic violence policy. She found a disconnect between how they actually felt once the relationship was over and how they had anticipated feeling months earlier. For most, they were much happier than they thought they would be.

Arriaga is also looking at what psychological factors cause a person to preserve a hurtful relationship at the expense of their well-being, and at what point they shift toward wanting to end the relationship.
THE DYNAMIC RELATIONSHIPS BETWEEN WORK, FAMILY AND LEISURE IS STUDIED, ALONG WITH ITS IMPACT ON HEALTH AND QUALITY OF LIFE. RESEARCH ASSESS INDIVIDUAL, FAMILY, COMMUNITY AND ORGANIZATIONAL FACTORS AFFECTING WELL-BEING, SAFETY, PRODUCTIVITY AND OPTIMAL BUSINESS SOLUTIONS.

TOURISM AND THE SMALL BUSINESS

Does tourism contribute to community sustainability and quality of life? Jonathon Day, associate professor in HOSPITALITY AND TOURISM MANAGEMENT, has studied small tourism businesses across Indiana and the way they contribute to their destination communities.

His findings show that small tourism businesses contribute to sustainability and the triple bottom line: environment, culture and society, and the economy.

“These small businesses encourage visitors to see local attractions, employ local people, source local products, and reduce waste and energy consumption whenever possible,” Day says. “The result is that their local communities are stronger and more vibrant places to live and visit.”

When asked why they pursued sustainable business practices, respondents said it was the right thing to do, it helped their business and it reduced costs. It seems you can do well while doing good for Indiana.

INSURING THE POOR

Despite facing large risks, people living in poor households usually do not purchase insurance, although it is a key risk-management tool. Jonathan Bauchet, assistant professor in CONSUMER SCIENCE, is among a growing number of researchers taking a closer look at the financial life of those living in poverty.

His recent research focuses on their attitudes about purchasing insurance, and saving and borrowing money.

“We used to think these households were too poor to save and couldn’t afford loans or insurance,” Bauchet says. “But research in the last decade shows that’s not the case at all. These families actually need to have access to a complete set of appropriate financial services because being poor means that their income is not only very low but also highly irregular.”

In particular, Bauchet has examined the demand for life microinsurance in Mexico and how providers can improve selling techniques. Microinsurance is so-named because of its low premiums and payouts, specifically designed for poor households.

His interest in the area of finance among impoverished households derives from his time spent as a development worker in Haiti. “I see my research as an effort to inform policy in order to increase its positive impacts on poor people’s lives,” he says.
The Center for Families strengthens the capacity of families to provide a nurturing environment by serving as a catalyst for research, outreach and education that supports families. It facilitates collaboration among professionals, policymakers, employers, and human service professionals regarding the vital roles of children and families in society.

The center impacts the lives of thousands of families by working directly with those organizations that serve families every day. State and local policymakers learn about new research on families and children — and the impact an issue or policy may have on families. Employers gain insight on how to help their employees balance their work and home lives. Emerging research on families and health is shared to promote understanding of family processes on individual health and well-being.

In 2000, the Center for Families (CFF) created the Military Family Research Institute (MFRI) to focus on helping military families. Through research and outreach programs aimed at civilian and military groups, MFRI works to improve quality of life for military families. Each year, the institute addresses a variety of needs through grants, educational materials, youth camps, a resource library, training workshops and conferences, and public policy work. MFRI also collaborates with the Department of Defense, USDA, and others to conduct high-level research on and for military families.

“Through the Center for Families and the Military Family Research Institute, Purdue University can exert greater influence on our state and nation to ensure that families — our most universal and fundamental social institution — receive the support they need to do their work,” says Shelley MacDermid Wadsworth, CFF and MFRI director.

Ingestive Behavior Research Center

Dietary approaches to manage body weight are often unsuccessful, in large part because they fail to address issues such as hunger, satiety and the desire to eat that can compromise diet compliance. The Ingestive Behavior Research Center (IBRC) is addressing this problem by investigating the environmental and biological controls of food and fluid intake. Interdisciplinary research at the center explores the neural, genetic, metabolic, hormonal, cognitive, cultural and sensory factors that affect what we eat, how those nutrients are utilized, and the resulting energy balance.

A better understanding of these issues should aid in dietary management of body weight.

Comprised of more than 55 faculty from 14 departments, IBRC is an integrative and collaborative environment that provides a rich training ground for graduate students.

“The center is thriving and often identified as a model for growing a center of excellence on campus,” says Rick Mattes, distinguished professor of Nutrition Science and director of IBRC.

IBRC hosts an international symposium every two years to showcase its research and a science-in-residence program to bring leading ingestive behavior researchers to campus for extended training and interaction.
Noncommunicable diseases such as heart disease, cancer and diabetes are responsible for the death of 18 million women worldwide each year. Launched in 2012, the Women’s Global Health Institute (WGHI) is focused on improving women’s health across the life span, particularly in the areas of bone health, women’s cancers, wellness and neurodegenerative disorders.

“Every woman has the right to health,” says Connie Weaver, WGHI director and distinguished professor and head of Nutrition Science. “We want to help women all over the world, including those in developing countries where medical facilities or infrastructure is lacking, address health problems.”

The institute brings together more than 60 researchers across campus and builds on the University’s strengths in nutrition, disease prevention, basic medical and social sciences, and biomedical technologies. This innovative environment distinguishes WGHI from other women’s advocacy centers by integrating research and training and focusing on prevention and early detection. Proactive approaches include:

- Developing technology to aid clinicians in early diagnosis and detection
- Measuring the effectiveness of therapies and drug design and delivery after disease onset
- Understanding behaviors that promote a healthy lifestyle
- Researching biomarkers for pre-disease conditions in at-risk populations
- Researching biomarkers for pre-disease conditions in at-risk populations

The institute also provides an environment where students can engage in learning and training opportunities that will better prepare them for careers related to women’s health.

For more information on each of these research facilities, visit www.purdue.edu/hhs/research.
One of the hallmarks of a Purdue education are the many hands-on learning opportunities available. Within the College of Health and Human Sciences, that is especially true. Across all nine academic units, students learn by doing. One of the most immersive learning experiences offered is undergraduate research.

Students work on faculty-mentored research projects and may even have the opportunity to present their research at conferences or be chosen for publication in the Journal of Purdue Undergraduate Research.

Here’s what some of our students are working on:

- Linguistic analysis of American Sign Language
- Diagnosis and assessment of eating disorders
- Ostracism and the pain of rejection
- Vitamin D prevention of breast cancer
- Efficacy of including quality improvement projects into nursing clinical coursework at the junior level
- Attitude-biased information processing using the eye tracker
- Genetic effects of radiation exposure
- Early autism identification using standardized developmental assessments
- Links between childhood and adult psychopathology
- Nursing students’ perception of adoption
- Effects of speech therapy and medical treatments on speech in people with Parkinson’s disease
- Analysis of the stimulant ingredients in energy drinks and their effect on the human body
- Planning community efforts in enrollment of underserved persons for preventive and primary care
- Gene tic effects of radiation exposure
- Early autism identification using standardized developmental assessments
- Links between childhood and adult psychopathology
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