

HD Strategic Plan 2.0

June 2019



UNDERSTANDING
THE GROWING PERSON IN
A CHANGING WORLD

PREFACE

The Department of Human Development conducted strategic planning in the Fall of 2017. Intensive data-gathering, discussion, and in-depth evaluation of the strengths and challenges faced by the department resulted in a comprehensive strategic plan that tackles critical aspects of departmental functioning. We have since accomplished many of our top priorities, goals, and action plans:

- We have identified five guiding principles that define who we are as a department and direct our research, student-training, and hiring: a) Interdisciplinarity; b) Life-span perspective; c) Cultural diversity; d) Multiple approaches, methods, and levels of analysis; and e) Integrative basic and translational research to answer questions of real-world relevance.
- We have restructured the department, consolidating six research areas into three mutually influential core areas: Cognition in Context, Health and Well-being, and Law and Human Development.
- Our faculty have continued to demonstrate excellence, receiving major awards such as the Grawemeyer Award, G. Stanley Hall Award, APS William James Award, APS James McKeen Cattell Award, the Thorndike Award, APS Rising Star designation, Guggenheim Fellowship, and SUNY Chancellor awards for research excellence, service and leadership, and outstanding teaching and advising, and being elected to prestigious professional organizations such as the National Academies of Sciences, Engineering, and Medicine and the American Academy of Arts and Sciences.
- In accordance with our hiring plan, we have hired four outstanding Assistant Professors, all of whom were our first choices. These new hires have strengthened our scholarship in the core areas and enhanced our interdisciplinary focus.
- We have successfully completed an external review of the department, which clearly announced our status at the top ranked HD department in the US.
- We have received 8 new federal grants on which our faculty serve as PIs or Co-PIs, in the total amount of \$3,166,658.
- We have strengthened our community, promoting a culture of transparency, trust, and equity, and have forged new collaborations across Cornell units and campuses as well as beyond Cornell.

In the midst of the many accomplishments, we successfully moved out of MVR into our temporary (2-year) surge space while maintaining our excellence in research and teaching.

With the many positive changes taking place and with one-quarter of our faculty newly-hired in the past two years, now is a perfect time to pause, self-reflect, and think about our next steps. The broad goals and priorities set forth in our strategic plan will continue to direct our research, education, and outreach activities. In the meantime, additional concrete priorities need to be developed in light of where we are now and where we are going. These priorities will sustain our status as the leader and trendsetter in the field. Furthermore, excellent suggestions have been provided by the external review team and the Provost Council for HD to develop a more coherent and focused strategic plan that outlines the ways in which the department will achieve success in the near-, medium-, and long-term. These considerations motivated this strategic planning 2.0, which was initiated in February 2019. During this semester, extensive discussions were carried out among the faculty in small groups and as a whole, followed by a department retreat on May 13th. The strategic plan 2.0 was subsequently developed and the final version was approved by the faculty in June 2019.

HUMAN DEVELOPMENT AS AN INTERDISCIPLINARY ENTITY

Human Development is the field of scholarship, teaching, and outreach that focuses on the unfolding organism in its bioecological contexts. The field was established at the turn of the 20th century, in response to challenges faced by children, families, and the society at the time. **It started out as “an interdisciplinary attack upon developmental problems”¹,** with systematic and organized studies involving scientists from such diverse disciplines as biology, physiology, embryology, philosophy, psychology, sociology, anthropology, animal behavior, and public health. Several influential interdisciplinary organizations were subsequently created that led scientific research on every aspect of the developmental process. One of those organizations was Cornell’s Department of Child Development and Family Life established in 1925, which later became the Department of Human Development.

To truly understand the growing person as an exceedingly complex and manifold system that transforms over time in a world of constant change, we require diverse approaches, methods, and levels of analysis. Over the years, the field of Human Development has remained interdisciplinary and multidisciplinary and has drawn expertise from many intellectual and scientific sources. Just like cultures that flourish at the intersection of trade routes, Human Development flourishes at the intersection of diverse disciplines. Some of its signal contributions – such as the creation of Head Start or the launch of the child-witness field – were the result of research syntheses across many of the social sciences as well as medicine, nutrition, and law. Human Development is the driver of numerous contributions that could not be accomplished within the confines of any of the traditional social science disciplines. Furthermore, from the very beginning there has been a great emphasis on the public interests and applied values of research findings, which has motivated evidence-based translational research in modern times. Also, the recognition that early life experiences such as poverty have critical long-term consequences for cognitive functioning and well-being later in adulthood has led to a lifespan perspective in human development research. To fully understand many adult outcomes, it is necessary to trace their early roots.

Human Development is thus an interdisciplinary entity that integrates diverse approaches and basic and translational research to advance theories and practices concerning human behavior and adjustment. Despite having originated over a hundred years ago, **the field of Human Development is progressive and forward-thinking in its interdisciplinary and multidisciplinary perspectives.** Scholarship in social sciences has evolved in recent years to be increasingly integrative and interdisciplinary in response to the needs and questions of the contemporary society. Concurrently, many top universities are abandoning the practice of sorting faculty strictly by discipline and are establishing new interdisciplinary departments that are organized around complex real-world issues. This trend is further reflected in government funding priorities moving toward problem-centered cross-disciplinary collaborations, and in the increasing interest in multidisciplinary training among graduate and undergraduate students. Human Development is thus a field of the past, the present, and most of all, the future.

The Department of Human Development at Cornell is proud to be the intellectual leader of this exciting field. The department’s innovation of bringing an interdisciplinary perspective to studying human

¹ Anderson, J. E. (1956). Child Development: An Historical Perspective. *Child Development*, 27, 181-196.

development *in context* was defined by Urie Bronfenbrenner forty years ago, who called for rigorously designed research, both naturalistic and contrived, that "... focuses on the progressive accommodation, throughout the life span, between the growing human organism and the changing environments in which it actually lives and grows..."² Bronfenbrenner's own work has impacted traditional disciplinary programs such as psychology, education, and medicine, and he could not easily have done his work in a traditional disciplinary department. **HD's defining features - interdisciplinarity, lifespan perspective, and integrative basic and translational research - make it distinctively different from any developmental psychology, child development, or applied research programs.** Currently, HD faculty represent the disciplines of psychology, sociology, and political science, and many faculty members are also trained outside their primary disciplines such as in anthropology, gerontology, education, neuroscience, data science, law, and clinical science. The faculty are highly productive in their scholarship, with strong and consistent publication records comparable to those of top disciplinary departments in peer institutions and with broad scholarly contributions beyond their core areas. The faculty are also highly active in forging collaborations, many of which are radical collaborations, with researchers in other Cornell units and in other institutions. They also provide research-based outreach programs within the New York State Cooperative Extension system, fulfilling the land-grant mission of the College of Human Ecology and Cornell University. HD faculty lead and actively promote an interdisciplinary and integrative developmental science to understand the dynamic system of influences on human conditions and to effect change and improvement in the everyday life of the individual, family, and community.

HD has long achieved and continues to maintain the distinction of a first-rate academic program.

Academic Analytics reports have consistently ranked HD as a top department out of the 75 or so Human Development departments in the United States, based on comparative analyses of publication records, federal grants, awards, and scholarly impact of our faculty. Human Development departments around the country are petitioning *U.S. News & World Reports* to include Human Development in the annual rankings, and we anticipate that Cornell HD will emerge as a top 5 department. Indeed, HD houses some of the most productive faculty members in Cornell social sciences. Several members of our faculty hold National Academy memberships, including the National Academy of Education, the American Academy of Arts and Sciences, and the National Academy of Medicine. Members of our faculty have garnered just about every prestigious award in human development and related fields.

HD's excellence in interdisciplinary and integrative research is known not only to its peers in Human Development, but also in its sister fields such as Psychology and Sociology. HD was recently the focus of a feature story in the Association for Psychological Science's monthly magazine, *The Observer*, for exemplifying advanced integrative science. The External Review Committee appraised HD's accomplishments and national eminence: "**Cornell University's HD program has been recognized as a leader in the country since the days of Urie Bronfenbrenner, who pioneered the idea of a department that was cross-disciplinary. HD is ranked number one in the country, and its research is widely heralded as high quality and innovative.**" HD will continue its distinction as a first-rate academic program and its impact will continue to grow in a place like Cornell where disciplinary and interdisciplinary units coexist, collaborate, and work together to advance the social sciences. As the External Review Committee concluded at the completion of the HD program review: "We believe that HD is an incredible asset to the College and the University. We expect that HD will continue to be at the forefront of research in the coming years."

² Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 1977, 513-531



The diversity of HD faculty. The successes of HD are achieved not only through our vision and forward thinking, our high standards for academic excellence, and our commitment to mentoring junior faculty, but also through our active efforts to promote and celebrate diversity.

Mission

Lead interdisciplinary and integrative developmental science to understand the growing person in a changing world

Vision

To advance knowledge in human development for individual, family, and community well-being

Guiding Principles

The guiding principles are inviolable commitments that express who we are as a department. We strive to reflect these values in all aspects of our teaching, research, and extension.

- Interdisciplinarity
- Life-span perspective
- Cultural diversity
- Multiple approaches, methods, and levels of analysis
- Integrative basic and translational research

Core Research Areas

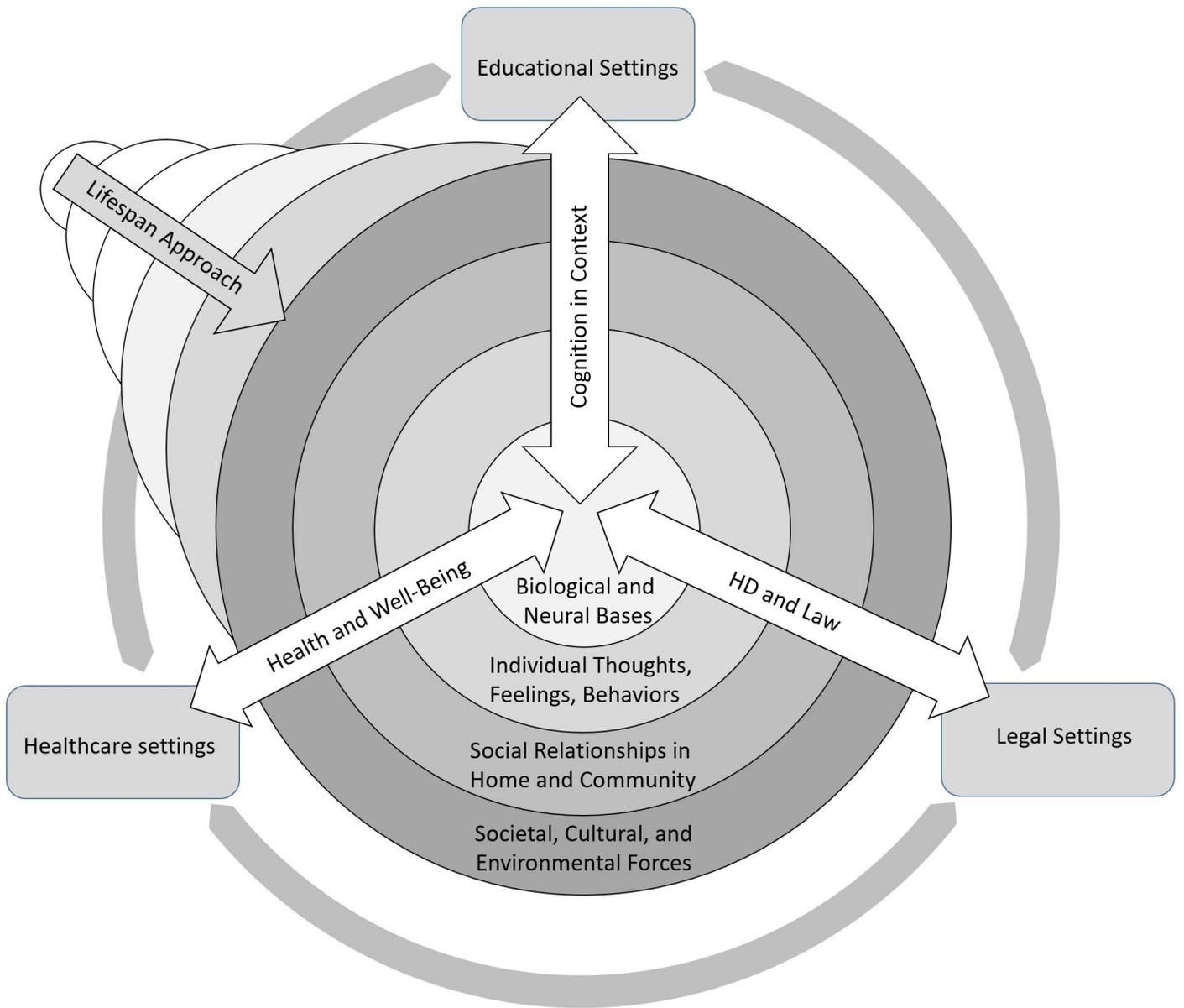
The department encompasses three mutually influential core areas of research: Cognition in Context, Health and Well-Being, and Law and Human Development. HD faculty's interdisciplinary and integrative research in these areas is nationally and internationally known. All these areas are problem-centered and organized around real-world issues, where questions are answered from interdisciplinary perspectives and in diverse approaches and the findings are translated to evidence-based interventions.

The *Cognition in Context* area offers dynamic and rigorous investigations of the developing mind in interaction with a variety of biological, social, and cultural factors. Faculty in this area use the full range of research methods to understand fundamental processes underlying the developing human mind in context and the causes of group disparity in learning and cognition. For example, one question addressed in this area concerns gender disparity in STEM fields. The faculty conduct high-impact work to examine how gender stereotypes develop in early childhood, how they influence girls' and women's career choices, and how they operate in the decision-making of hiring agencies and policymakers. Their findings provide an empirical grounding for strategies and interventions to counter gender stereotypes and facilitate fair practices.

The *Health and Well-Being* area houses leading research on socioemotional functioning and motivation in typical and atypical development across the lifespan. Faculty in this area examine the relation between mental and physical health in response to environmental factors and have produced groundbreaking and policy-shaping work on topics such as childhood poverty, sense of purpose in adolescence, and healthy aging. For example, the faculty are known for their extensive research on the impact of childhood adversity on health status later in life. They examine the neurological, biographical, psychological, and social-environmental mechanisms by which early adversity (such as poverty or maltreatment) predicts adult health outcomes, which helps guide prevention and intervention efforts to facilitate well-being across the life-course.

The *Law and Human Development* area assembles a group of world-class social scientists and legal scholars to study the interplay of law, psychology, and life-span human development. It offers a top-notch PhD-JD dual-degree program widely considered the best and most influential program of its kind in the United States, unique among Ivy League institutions. Faculty in this area have conducted path-breaking developmental research that explains and predicts the workings of the human mind and behavior in legal situations and have developed new theories that apply basic social science principles to the law, including submission of briefs to the United States Supreme Court. For example, the faculty lead research on the vulnerability of human memory. They examine the neurological, cognitive, and motivational causes of false memory and its consequences in legal settings, to inform such important issues as child-eyewitness testimony and jury decision-making through publications and amici briefs.

Together, these three core areas form a coherent and integrated program to tackle important questions about human development across the lifespan in diverse populations.



HD integrative research of human development in context

GOALS, STRATEGIES, AND IMPLEMENTATION

The strategic plan 2.0 focuses on five overarching aspirational goals that articulate the component parts of our vision. We will immediately take specific actions to implement strategies to realize these goals. Given the range and magnitude of these goals, our approach is to develop additional implementation strategies and action plans on an annual basis to achieve the goals over the next five to ten years. We will review progress regularly and update the action plan as we progressively implement the strategic plan 2.0 in the near-, medium-, and long-term.

Goal 1: HD will conduct strategic hiring to maintain and enhance its academic distinction and leadership in its three core research areas and to build on its interdisciplinary strength and methodological rigor.

Because of our interdisciplinary focus, distinguished faculty, and reputation in the field, HD has consistently attracted outstanding and diverse scholars and has been successful in faculty recruitment and retention in competition with disciplinary departments in peer institutions. HD faculty are unified in their chief hiring priority: to hire the best scholars who best fit the department. In 2018, we recruited four Assistant Professors who are among the very best of their cohort; we outcompeted disciplinary departments for these four outstanding young scholars. The addition of these new faculty has reinforced the department's intellectual critical mass, with two of the faculty members being in the Health and Well-Being area and two in the Cognition in Context area. The new faculty have further extended our existing interdisciplinary and methodological strengths.

In further pursuit of this goal of strategic hiring, we will continue to prioritize faculty hiring and scholarship in our three core areas, with an emphasis on the following cutting-edge methodologies that have been made possible by technological advances in recent decades:

- Data science – “Big data” analysis and interpretation to support cutting-edge research in human development (e.g., a data scientist who studies aging and health)
- Neuroscience – Translation of brain science to address real-world challenges in human development (e.g., a neuroscientist who studies children's eyewitness testimony)

These focused searches reflect the high-status and high-priority developments of our field. They build on existing HD faculty expertise in human neuroscience and data science approaches and further add to the critical intellectual mass in our three core areas. They will be essential for us to maintain HD's leadership position in interdisciplinary and integrative research in these core areas. We initiated these searches in Fall 2018 and plan to resume the searches in Fall 2019.

As additional faculty lines become available, focused faculty hiring will be prioritized in the areas of Health and Well-Being (with a focus on aging and health) and Law and Human Development (with a focus on developmental implications for witness credibility, criminal behavior, and legal decision-making), as these areas need re-invigoration following faculty retirement.

In accordance with the HD Futures Committee's recommendation (December 2015) and in keeping with our vision, we will continue to prioritize faculty hiring in interdisciplinary scholarship, targeting individuals whose program of research cuts across two or more core areas of existing HD scholarship – for example, a cognitive developmentalist who is interested in children and the law, or an emotion researcher who is interested in cognitive processes of decision-making. Because these hires will work at the intersection of two or more areas, it is important that they be individuals who value integration with faculty in areas beyond their primary one. They will help to facilitate across-area collaboration and program coherence.

Currently, one-third of HD faculty are from underrepresented groups and more than half of the faculty are women. We will continue to actively recruit, support, and retain diverse, top-tier faculty to build a strong, inclusive, and intellectually vibrant community. Our multifaceted efforts to achieve even greater diversity will be further extended to visiting scholars, post-doctoral fellows, graduate students, and staff. In addition, in response to the University's call for internationalization, we will actively engage international scholars and students in our academic activities.

Goal 2: HD will continue to foster and promote intellectually rewarding collaborations to enhance research and education.

HD faculty are outward-oriented in their scholarship, frequently collaborating with scholars from other fields across campus and across institutions outside of Cornell. The interdisciplinary environment of the department provides a natural setting that encourages faculty members to collaborate with those outside of their own discipline. According to a HD faculty survey conducted in fall 2017, the departments and colleges at Cornell where HD faculty have had collaborations include PAM, DEA, Nutritional Science, Information Science, Psychology, Sociology, Economics, Communication, Computer Science, Statistical Science, Neurobiology & Behavior, Microbiology, Bioengineering, Mathematics, Electrical and Computer Engineering, Business School, Law school, College of Veterinary Medicine, and Weill Cornell Medicine. Our new faculty have also been active in developing collaborations, during their first year here, with colleagues in other Cornell units including Government, Psychology, Sociology, History, Weill College, and Johnson Business School.

Many of the HD faculty's cross-campus collaborations are "radical" in nature. For example, Marianella Casasola is collaborating with Erik Andersen in Computer Science on two NSF grant proposals that explore using computer games to teach children and adults computer programming or a foreign language. She is also in the early planning stages with Haym Hirsch, in Computer Science and in Information Science, and Keith Greene in Engineering and DEA on exploring children's problem solving across different media. Tamar Kushnir is collaborating with faculty and students in DEA and Engineering on a robotic appliance (not humanoid) that can engage in a collaborative task with children (e.g., 'help' in response to commands with a fort-building task). Corinna Loeckenhoff has maintained a long-standing collaboration with Cary Reid and other clinicians at Weill Cornell to examine the role of socioemotional factors in managing chronic pain in later life. Her recent collaborations include the role of affective goals in pain coping, individual differences in the ability to forecast pain, and ethnic variations in pain management. Steve Ceci and Wendy Williams are collaborating with Michael Macy in Sociology and a particle physicist at the FermiLab in Batavia, Illinois, to conduct a study on the recommendation and evaluation of women candidates in science. Adam Anderson has collaborated with colleagues at Electrical and Computer Engineering to develop touchless sensors for emotion and health monitoring, and with colleagues at Communication to use virtual reality for pain regulation. Valerie Reyna has collaborated with economists such as Ted O'Donoghue and William Schulze on grants and projects in risky decision making. Anthony Ong has been working with Saleh Kalantari and Nancy

Wells in DEA and Cary Reid at Weill Medical to examine the role of positive affect and nearby nature in chronic pain. Many of the HD cross-campus collaborations have generated major grants and publications.

Furthermore, HD faculty have actively participated in collaborative work through many research centers at Cornell, including the Bronfenbrenner Center for Translational Research, Institute for the Social Sciences, Behavioral Economics and Decision Research Center, Cornell Population Program, Center for the Study of Inequality, and Center for Health Equity. In addition, HD faculty have collaborated with colleagues in departments such as Psychology, Sociology, Communication, Information Science, and DEA in mentoring graduate students, undergraduate curriculum development, and co-teaching courses. One of our three areas of graduate concentration was undertaken jointly with the Law School, and Law School faculty are very active members of the HD graduate field. Finally, HD faculty have ongoing collaborations with scholars at external institutions. All these collaborations have taken place “organically,” where ideas lead to collaborations and people gravitate toward other scholars who work on the same problems.

We will continue to foster scientific and educational collaborations with other departments and units with shared academic interests in human development, both internal to Cornell and external with outside institutions. One important effort is to ensure better dissemination and communication of the core questions of developmental science to other units across campus. We launched a departmental colloquium series in fall 2018, with speakers from our own faculty as well as other Cornell units and other institutions. We will more widely advertise the talks across campus and attract members of other units to attend.

We have recently redesigned our department website to better articulate our mission, our diversity, and our faculty scholarship. We will continue to maintain an interactive and up-to-date web presence in order to showcase our research findings, intellectual events, and accomplishments.

We will continue to forge collaborations with other units at the departmental level, through such efforts as co-sponsoring talks, joint graduate student recruitment, serving on each other’s search committees, co-sponsoring visiting scholars, joint training of post-doc fellows, and joint appointments for faculty. We will also identify opportunities for sharing resources across campus (e.g., shared databases, shared servers).

Furthermore, HD will continue to encourage faculty to develop collaborative grants with other units and will provide technical and administrative support in grant writing. HD will also encourage faculty to co-teach large undergraduate courses with other units on emerging cutting-edge topics. One 2000-level course is currently under development by a new faculty member to focus on developmental data science; another 2000-level course is co-taught by HD faculty with faculty from Sociology.

HD faculty will continue to be encouraged to serve on special committees in other departments and fields to bring unique human development perspectives to those units, as well as to invite colleagues from other departments and fields to serve on HD students’ special committees. These efforts will facilitate intellectual collaborations as well as enrich graduate training at Cornell.

We will organize social and intellectual gatherings around questions of interest to multiple units in such formats as a coffee hour or a happy hour, so as to create more opportunities for collaborations to emerge organically.

Goal 3: HD will incentivize and support faculty to continue to compete successfully for research grants.

HD faculty have been active in seeking external grants and have been successful in grant competitions. According to the report of the Cornell Internal Committee for the Review of the Social Sciences, HD was one of the four Cornell social science departments (PSYC, COMM, HD, and AEM) that brought in over \$100,000 per faculty member in federal sponsored research during 2011-2015, and HD was also one of the four departments (HD, CRP, COMM, and AEM) that ranked in the top half relative to peers in federal grant dollars per faculty. As of March 2019, HD faculty have a total of \$4,496,625 active federal grants and another \$12,240,239 pending applications.

To maintain and further increase grant-getting activities and improve the success rate, HD will continue to promote a “grant culture” to encourage faculty to apply for external grants to support their research and graduate students.

The interdisciplinary focus and the integration of basic and translational research have always been a strength that makes HD faculty competitive in obtaining grand funding. HD will continue to value interdisciplinary scholarship and encourage faculty to publish in top disciplinary journals as well as integrative and interdisciplinary publishing outlets so that their work reaches a wide range of audiences.

We will continue to provide efficient and effective administrative support to grant proposals, including collaborative grant proposals across departments and colleges. We will continue our successful collaboration in grant applications with Weill Medical college.

HD will continue to encourage faculty to take advantage of the many resources and seed grants across campus that support pilot work. HD faculty have been successful in getting such supports over the years and, for junior faculty, the fellowship at the Institute for the Social Sciences that provides teaching release has been particularly helpful for them to secure additional time to develop major grant proposals.

HD will continue to encourage faculty to attend seminars and workshops about grant application strategies, and to participate in the college’s incentive programs (e.g., the grant resubmission program) to strengthen their grant applications. Furthermore, we will work with the college to build an infrastructure for searching for funding opportunities and active grant announcements or RFAs from private foundations and government agencies (e.g., NIH, NSF).

We will further encourage faculty to give intellectual feedback on each other’s grant proposals. For junior faculty, their mentoring committees will play an important role in providing feedback on their proposals and guiding them in the application process. For example, two of our new faculty members submitted major grant proposals in their first year: Marlen Gonzalez applied for the competitive NIH Director’s New Innovator Award to examine the neurocognitive signatures as a result of early life experiences, and Bethany Ojalehto applied for a NSF Research Grant to examine cognitive drivers of the development of environmental cognition. Although their proposals were not funded, both faculty members were proactive in seeking immediate feedback from their mentoring committees and other senior faculty in the department and have developed concrete plans to revise and resubmit.

We will consider teaching release and buyout in accordance with university and college guidelines. We will prioritize summer graduate RA support for direct involvement in pilot work leading to a grant proposal. We will further seek changes in policies regarding tuition support and other matching funds for including students on grants. We will also increase opportunities for post-doctoral fellows who play important roles in faculty

grant-getting. In addition, HD will encourage faculty to develop links and collaborations with industry to obtain private funding.

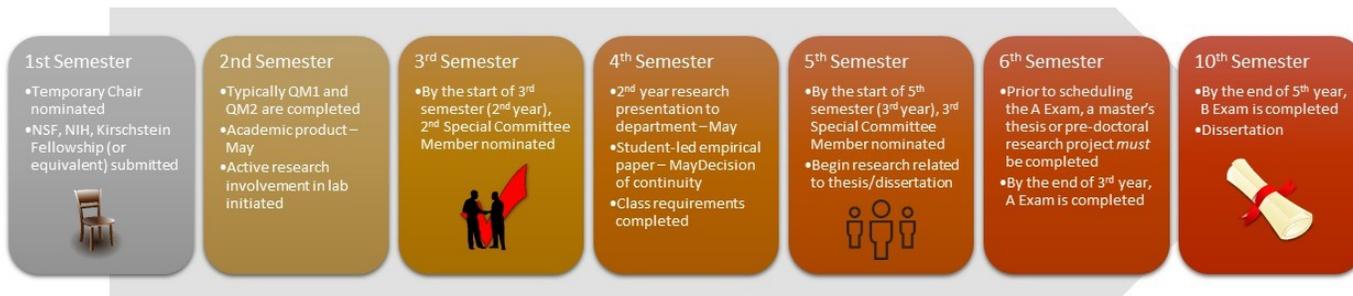
Furthermore, we will organize a working group to develop a question-focused, department-wide center grant or training grant. HD faculty will work together to identify central questions (e.g., youth development and engagement, pain management in old age, the impact of poverty in rural populations, developmental data science) in connection with existing faculty expertise across the three HD core areas, as well as current areas of high priority in funding agencies such as NIH and NSF. We will seek mechanisms to support collaborative grant writing (including those from the University central administration and NYS) to help with the process. Faculty members of the working group (across core areas) will take the lead on outlining the “framework” of the proposal and then solicit feedback from the faculty as a whole. HD will provide teaching release for the working group members who are willing to take the lead on developing the center grant or training grant.

Goal 4: HD will continue to improve the rigor and consistency of its doctoral program.

HD maintains an active doctoral program with a strong focus on independent research productivity. In response to the external review team’s recommendations, we have taken many actions over the past one and a half years and will continue to do so to further build a competitive and well-balanced doctoral program.

Key learning outcomes include (1) substantial contributions to the discipline through research accomplishments (i.e., publications, presentations, grants), (2) advanced research skills (i.e., substantive and methodological coursework, research design and academic writing skills as documented in the A-exam), (3) academic citizenship (i.e., teaching evaluations, internal and external service), and (4) ethical and responsible conduct of research (i.e., IRB compliance, research integrity training). To further improve tracking of relevant outcomes, we revised the yearly Student Review Process in Spring 2019 to include an academic writing sample, to allow for more effective tracking of relevant products and activities (especially for outcomes 3 and 4), and to reinstate evaluations from secondary committee members. We will evaluate and track the effectiveness of these changes in the next five to ten years and develop additional strategies to help students achieve the learning outcomes.

Curriculum. Course requirements involve a 1st semester Proseminar, a 2-semester series of quantitative methods (QM) classes as well as two additional advanced-level classes. The comparatively low course load facilitates early engagement in individualized research activities. As seen in the timeline below, a series of rigorous early milestones (1st semester grant proposal, 2nd semester academic product, 2nd year research presentation and empirical paper) sets the stage for the development of a strong independent research program in years 3-5 of the doctoral program. To provide students with the necessary skill-set to succeed in their first year of graduate school, the graduate Proseminar was revised in 2018/19 to include targeted training on grant writing, time management, writing routines, and other academic meta-skills. A second semester of Proseminar will become mandatory for the incoming Fall 2019 cohort. Furthermore, we will implement additional strategies for students to receive training both within and beyond their primary core area, so as to provide them with multidisciplinary perspectives and multiple skill-sets. This will be achieved through, for example, students taking courses outside their primary area, having faculty from another area serve on their committee, encouraging students to collaborate with students and faculty in other HD core areas, and supporting students to work on multiple Cornell campuses.



Admissions trends. The program shows healthy growth with an increase in yearly cohort size from 6 in 2017 to 9 in 2019. Based on the most recent admissions cycle, **our program is appropriately selective (10% of applicants were offered admission) and highly attractive (90% of admitted students accepted our offer).** According to New Student Surveys (since 2015), each incoming PhD student in HD was admitted to at least one other program, with our top competitors being Stanford and University of Michigan. The top reasons for students to choose our program, according to 100% of respondents, were the areas of specialization in our program and the students' desire to work with specific HD faculty. Furthermore, HD has a strong record of successfully leveraging graduate school fellowships to recruit and retain diverse applicants. Since Fall 2019, we have taken a more comprehensive approach to mining national databases (e.g., SACNAS, McNair) and we are now sending personalized invitations to potential applicants from underrepresented groups. We will continue our efforts in attracting the best students to Cornell and will continue to develop and implement effective strategies for recruiting underrepresented minority graduate students. HD will further encourage faculty to co-advise graduate students by admitting students who express research interest at the intersection of different areas.

Job placement. According to the most recent doctoral experience surveys, the majority of PhD candidates envision research careers in academia (78%) or government (33%) but also consider positions in NGOs (22%), and industry (11%). Our most recent placement records (since 2015) indicate that 90% of PhD graduates do indeed take on research positions (80% of them in academia, the remainder in government and NGOs). Others are working in industry or as educational administrators. With respect to long-term outcomes, HD graduates hold faculty positions at Cambridge, Duke, UC Irvine, or Weill Cornell, to name just a few. Based on student feedback, we are currently developing career exploration opportunities for non-academic settings (e.g., via outside speakers and Cornell's BEST program). We will also develop additional strategies to help students prepare for and navigate in the job market. For example, students will have more opportunities to present their work during their course of study and to sharpen their communication skills. HD will continue to create opportunities to foster post-doctoral pipeline and job placement (e.g., finding mentors; identifying funding opportunities). HD will further strengthen cross-area training so as to make our students more competitive for both disciplinary and interdisciplinary jobs.

Community building. Over the past years, a series of efforts have been initiated to further strengthen a sense of departmental community and increase the students' exposure to research conducted outside their laboratory. This includes an annual 'Fall Fest' to welcome incoming students, a 2nd year research presentation forum, a biweekly student-led brownbag series (featuring graduate student presentations), and a monthly colloquium series (featuring local faculty and outside speakers). These activities have greatly enriched departmental interactions and played an important role in introducing the new cohort of Assistant Professors to our student population. Based on faculty and student feedback, the dates for some of the ongoing events will be tweaked in Fall 2019 to further improve attendance. The monthly colloquium series will become bi-weekly. Furthermore, HD will continue to identify mechanisms that strengthen cross-lab interactions and collaborations and develop collaborative research pods.

Masters programs. In addition to the PhD program, the department maintains a one-year research masters program. Enrollments are trending upward (with the most recent cohorts ranging from 10 to 16). Masters students embark on short-term, focused research projects and this often provides valuable mentoring opportunities for more advanced doctoral students. We began tracking placement records for the masters program in Fall 2018 and are pleased to note that two thirds of our recent graduates (since 2015) were subsequently admitted to PhD programs, with the remainder working in government, education, and industry. Based on student feedback and a careful market analysis, the department recently voted to develop a two-year pre-clinical masters program. Spearheaded by faculty in the Health and Well-Being area, the program will focus on coursework and research experiences that prepare students for doctoral programs in clinical science.

Funding sources. Incoming doctoral students are guaranteed 5 years of funding which is covered through teaching and research assistantships along with internal and external fellowships. One important goal for the coming years is to further grow our yearly cohort size by identifying additional funding sources. The aforementioned efforts to improve faculty grant-getting play an important role in this respect. We are currently developing guidelines to prioritize during the admissions process students who would be covered through RA-ships. With respect to student fellowships, the Proseminar now offers a clear timeline and strategies to ensure that all eligible students apply for NSF GRFP and NIH NRSA pre-doctoral fellowships. We are also actively encouraging students to explore additional fellowship opportunities throughout their time in the program. In addition, HD will form a task force on increasing financial support for graduate students and postdocs.

Goal 5: HD will facilitate effective use of the MRI facility across Cornell.

The Decade of the Brain was designated in 1990 by President George H. W. Bush to “enhance public awareness of the benefits to be derived from brain research.”³ In that same year, Ogawa and colleagues (1990) discovered the blood oxygenation level-dependent contrast technique to map in vivo brain activity in human and nonhuman animals with functional magnetic resonance imaging (fMRI).⁴ Since then, many peer institutions, such as Harvard, Stanford, Yale, UC Berkeley, and Princeton, have made substantial intellectual strides by bringing human neuroscience into the social sciences through the use of fMRI. In comparison to our peers, Cornell has lagged behind. Indeed, each of those peer institutions has more human neuroscientists in their psychology department alone than what Cornell has across the entire Ithaca campus.

Human neuroscience is inherently interdisciplinary. The College of Human Ecology and the Department of Human Development have served as the intellectual leaders in bringing human neuroscience to the Ithaca campus. The Cornell Magnetic Resonance Imaging Facility (CMRIF) was established in 2012, initially supported primarily by CHE and the Department of Biomedical Engineering, along with support from other colleges. Although housed in CHE, it is a university resource. Its primary users include HD faculty as well as faculty in the College of Veterinary Medicine.

HD currently has 6 CMRIF users, to varying degrees, and the Department of Psychology has 1 CMRIF user who uses fMRI to supplement her primary research program. To date, most of the studies using the CMRIF

³ Project on the decade of the Brain (n.d.) Retrieved from: <https://www.loc.gov/loc/brain>

⁴ Ogawa S, Lee T-M, Kay AR, Tank DW. Brain magnetic resonance imaging with contrast dependent on blood oxygenation. Proc Natl Acad Sci USA. 1990, 87:9868–9872.

have been conducted by HD faculty. Only one study from Psychology has been completed, none from Neurobiology and Behavior, none from Biomedical Engineering, and, to our knowledge, there are no plans to hire a specialist in human neuroscience in any of these departments.

To build human neuroscience at Cornell and facilitate effective use of the MRI facility, HD has devised the following action plans:

Action 1: HD will work toward establishing a Consortium for Translational Human Neuroscience.

Human neuroscience, appropriately emphasized in the social sciences at Cornell, should be able to support CMRIF, as is the case in our peer institutions. Cornell has a unique opportunity to develop its own brand of ecological human neuroscience given the ecological movement that began here, which is regarded as one of the greatest contributions that Cornell has ever made to social sciences. Built on the work of the intellectual giants of human ecology like James Gibson, Eleanor Gibson, Ulric Neisser, and Urie Bronfenbrenner, HD faculty have extended research from sparse artificial measures within small groups of people to focusing more on real-world experiments that have the possibility for real-world translation.

Using existing intellectual and physical resources, the Consortium for Translational Human Neuroscience will start with zero budget. The work conducted by the Consortium faculty will aim at developing a brand consistent with the rich ecological history of Cornell, and will focus on increasing the translation of findings from the highly artificial environment of the brain scanner to how people across the lifespan think, feel, and behave in daily life. Like most of academic human neuroscience, the work will be of a highly theoretical nature. Moreover, by crafting a special focus on examining the developing human brain in its complex ecological context, from the influence of external social and physical environments to bodily composition, genetics and internal microbiota, the work will have real-world translational impact and is likely to attract funding to further support the Consortium. Such a conceptual and unique brand-building effort around human neuroscience has already been started in HD.

Although we cannot determine the hiring priorities of other departments and units, we can inspire them through collaborations and visibility to join in human neuroscience. By establishing the Consortium for Translational Human Neuroscience as a human neuroscience hub, we can develop problem-focused working groups across the campus that will connect with CMRIF and funding priorities at NIH and NSF. For example, HD faculty have initiated collaborations with CMRIF, SUNY Upstate Center of Excellence for Alzheimer's Disease, and SUNY Binghamton for research thematically focused around healthy and pathological aging and have submitted and prepared 2 R01 grants. HD neuroscience faculty have been active grant writers and will keep up the grant-writing activity. Once a few R01 grants are in place, efforts will be invested into a center grant for the new **Consortium** and a training grant for CMRIF. In addition, HD will aim at increasing the number of postdoctoral fellows as part of the strategic initiative. Postdoctoral fellows will contribute to the intellectual environment of the **Consortium** and ease the shortage of human neuroscientists at Cornell. They come with the appropriate computational expertise to execute fMRI studies and will serve as an important link between graduate students and faculty to provide an additional source of mentorship for our graduate students.

Action 2: HD will support the MRI Users Advisory Committee (MUAC).

In February 2019, CHE created a new MRI Users Advisory Committee (MUAC) to support open communication between CMRIF staff and users, solve problems related to both technical and usage issues, and strategize how to increase access for all potential users at Cornell. The Committee has user

representations from CHE, the College of Arts and Sciences, and the College of Veterinary Medicine. Although only in place for a short period of time, MUAC has been extremely helpful in connecting users, stakeholders, and administrative, financial, and technical supports to make CMRIF sustainable and put it back on track for success.

As a result of these efforts, a large-scale study was initiated at CMRIF to examine behavioral, neural, and cerebrovascular predictors of dementia, which has already resulted in two NIH R01 grant applications. CMRIF has increased from near zero hours of human scanning during the beginning of this fiscal year to about 60% usage, even with the same user base. This is the “typical” level of usage at our peer institutions. Furthermore, the improved streamlined access to CMRIF has attracted new users from current Cornell faculty.

HD will continue to provide MUAC with intellectual and administrative supports to increase access to and the functionality of the CMRIF. Efforts will also be made to identify resources to provide users with assistance and consultation on data analysis.

Action 3: HD will facilitate a change of culture about human neuroscience at Cornell.

CMRIF is not a liability but an incredible asset for strengthening Cornell social sciences. HD is committed to raising the awareness of the importance of human neuroscience and of the role of CMRIF as a foundational core facility in Cornell social sciences and in the potential Program in Neuroscience, proposed during the social science review over the past academic year.

An integrative neuroscience program that supports work from optogenetics in mice to genetic and environmental influences on human neural networks would move us towards the status quo at other institutions. A human neuroscience program should remain an integral component of social sciences to build their linkage to biology, to broaden their methodological focus beyond secondary data analysis of survey data, and to more fully embrace experimental and neuroscientific methods, as is routinely done even in industry. For example, human neuroscience has been adopted by Nielsen Consumer Neuroscience in Nestle Corporation’s Department of Nutrition in Brain Development.

HD will continue its effort to increase the visibility and impact of human neuroscience research at Cornell. As a successful example, Dr. Marlen Gonzalez, a new HD Assistant Professor, has initiated a campus-wide neuroscience forum, *the Integrative Neuroscience Salon*, where experienced and burgeoning neuroscientists discuss the latest innovations, their own work, and the translational implications of both human and non-human neuroscience models. The regular participants include faculty, postdoctoral researchers, staff, graduate and undergraduate students from Neurobiology and Behavior, Psychology, and HD. HD has provided financial support to the Salon. More actions will be taken, including the establishment of the Consortium for Translational Human Neuroscience, sponsoring talks and visiting scholars, and disseminating HD faculty’s research across campus.