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NEW LEADERS LAUNCH PROSPECTIVE PSYCHOLOGY

Award-winning researchers to explore the Science of Propection, our mental representations of the future

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PHILADELPHIA – The Positive Psychology Center of the University of Pennsylvania and the John Templeton Foundation (www.templeton.org) have announced the recipients of the Templeton Science of Propection Awards. The project will grant \$2.3 million in award funding to 18 new research projects that will advance research to expand the scientific understanding of propection, or the mental representation of possible futures.

The winning projects will help us understand how to measure propection, the mechanisms of propection, applications of propection, and how propection can be improved. Researchers on winning projects come from an array of disciplines including but not limited to neuroscience, linguistics, animal behavior, social psychology, and developmental psychology; together they can expand prospective psychology as a field, not only through their current projects but through future collaborative scientific inquiry.

The Prospective Psychology Project was established in 2012 by Professor Martin E. P. Seligman, Director of the Penn Positive Psychology Center, with a \$3.5 million grant from the John Templeton Foundation. In 2013, the project announced the Templeton Science of Propection Awards competition to advance the scientific understanding of propection. Seligman founded the quickly-growing field of Positive Psychology in 1998 based on the simple yet radical notion that what is good in life is as worthy of scientific study as what is disabling in life.

“What if vision is not registration of the present, but a hallucination of the future? What if memory is not a file drawer of photographs, but a hope chest of possibilities? What if emotion is not agitation from the now, but guidance for the future? What if knowing a person is not about the last crossroad they faced, but what they will do at the next one? What if the mind is not a storehouse of knowledge, but an engine of prediction? What if we are not *Homo sapiens*, but *Homo Prospectus*?”

Seligman recruited an expert Steering Committee to help guide the Awards competition and select the winners. The Steering Committee includes Thalia Wheatley, Associate Professor of Psychological and Brain Sciences at Dartmouth College; Roy F. Baumeister, Eppes Eminent Scholar and Professor of Psychology at Florida State University; Randy Buckner, Professor of Psychology and Neuroscience at Harvard University, Professor at Harvard Medical School, and Director for Psychiatric Neuroimaging Research at Massachusetts General Hospital; Laurie Santos, Associate Professor of Psychology at Yale University and Director of the Comparative

Cognition Laboratory; Jonathan Schooler, Professor of Psychology at the University of California at Santa Barbara; Barry Schwartz, Professor of Psychology at Swarthmore College, and Chandra Sripada, Professor, Department of Psychiatry and Department of Philosophy at University of Michigan.

The 18 winning proposals – some collaborative, representing 29 researchers in all – were selected by the Steering Committee after a competitive process with more than 250 submissions. The Awards represent the highest standards of scientific excellence and identify the winning researchers as future leaders in the new field of Prospective Psychology.

2014 Templeton Science of Propection Awards:

- \$145,000 to Jessica Andrews-Hanna and Joanna Arch from the University of Colorado Boulder to study how to promote adaptive propection by broadly characterizing how prospective thinking functions in daily life, and assessing the neurocognitive mechanisms that define and distinguish adaptive prospective thinking from its less adaptive forms. In order to understand propection from the perspective of both brain and behavior, they develop a mobile smartphone application to establish normative estimates of prospective thinking in daily life, and then examine how prospective thinking dynamically unfolds across large-scale brain systems.
- \$95,000 to Fiery Cushman from Harvard University to test how we make predictions about future social situations – what is known as social inference. Cushman will test whether there are distinct neural populations supporting predictions and update errors within regions supporting social inference, if these populations track information about multiple possible future events, how information flows from one region to another in social inference tasks, and how the information encoded in these regions constrains computations performed elsewhere in the brain. This project moves beyond the “where” of social propection, providing a new model of “how.”
- \$145,000 to Evelina Fedorenko from Massachusetts General Hospital and Elinor Amit from Harvard University to advance and evaluate the *distinct modalities of propection hypothesis*. According to this hypothesis, propection about the near/likely future relies on visual imagery, whereas propection about the distal/unlikely future relies on inner speech. Fedorenko and Amit will examine the responses of visual and language brain regions to propection about different kinds of events in order to shed light on the mechanisms that underlie bias towards a particular representational modality for propection about future events differing in key ways.
- \$95,000 to Karin Foerde from New York University and Daphna Shohamy from Columbia University to establish the specific role of dopamine in propection and to determine the cognitive and neural mechanisms through which dopamine influences propection. What role does motivation have in engaging in prospective cognition, and does dopamine drive this process? Foerde and Shohamy will test the role of dopamine

using Parkinson's disease as a model, comparing prospection under low and high dopamine states.

- \$135,000 to Simona Ghetti from the University of California, Davis to examine the development of episodic prospection and its consequences. Ghetti will compare differences in children, adolescent, and young adult age groups, and investigate whether documented differences are due to limitations in their knowledge about possible future events, or their ability to episodically simulate alternative outcomes to personal events. She will also examine the effects of episodic prospection on persistence in challenging tasks – an achievement-related behavior – to test whether this ability confers unique adaptive advantages.
- \$145,000 to Igor Grossman from the University of Waterloo and Kathleen Vohs from the University of Minnesota to examine whether inducing disconnection produces outcomes linked to accurate forecasting: intensity bias and wise reasoning. Grossman and Vohs predict that training people to think about themselves in the third person will weaken intensity bias and stimulate wise reasoning. Their research will identify how to improve prospection by determining why some prospections bring about better realized futures than others.
- \$145,000 to Benjamin Hayden from the University of Rochester to study the psychology of future-oriented decisions in rhesus monkeys. Hayden's research will shed light on whether rhesus monkeys value potentially useful information about future decisions, whether they will precommit to beneficial long-term strategies, and whether they will give up current rewards for the possibility of larger future awards.
- \$150,000 to Abigail Marsh from Georgetown University to study prospective altruism in unrelated, altruistic stem cell donors. Stem cell registries link patients with blood cancers and related disorders to altruistic stem cell donors, but up to half of registry members do not agree to donate when contacted a year or more after registering. Marsh predicts that this may represent a failure of prospective altruism: registrants who opt out fail to prospect accurately about their future altruistic behavior. In her project, Marsh will assess prospective and other factors in order to identify ways to reduce future failures of prospective altruism among stem cell donors.
- \$100,000 to Samuel McClure and Anthony Wagner from Stanford University to examine how psychological stress influences the cognitive and neural mechanisms underlying prospection. How often do people engage in prospective planning, and does acute psychological stress restrict the complexity and temporal scope of prospection during planning? McClure and Wagner will also establish a novel approach to measuring prospection by developing an immersive virtual navigation paradigm and the use of advanced multivariate fMRI analyses.
- \$100,000 to David Rand from Yale University to identify interventions that decrease future discounting and promote willingness to delay gratification when it is beneficial to do so. Rand's research aims to determine whether we see our future selves as other

people, and what can be done to increase cooperation with this “other” person (the future self). This project will also examine the effect of recasting the act of helping one’s future self as a public good with consequences for others, rather than a mere personal responsibility. Together, the answers to these questions can advance our understanding of what individual, cultural, and institutional practices can shape intertemporal choice, promote future-orientation, and better align people’s present-day decisions with their future goals and desires.

- \$150,000 to Jonathan Smallwood from the University of York to explore whether a primary benefit of naturally occurring future thought arises through the capacity to generate creative and original thought that is necessary to navigate the complex social environments in which they exist. Through the use of experience sampling as well as the tools of cognitive neuroscience, Smallwood aims to determine the unique phenomenological features of prospection that delineate the experience as a distinct class of human thought, the psychological attributes that determine the unique capacities that future thinking brings, and the underlying neural mechanisms that support this core aspect of cognition.
- \$150,000 to Bethany Teachman from the University of Virginia to use an adapted Cognitive Bias Modification (CBM) program to train prospection to favor the generation of healthy, positive (relative to extremely negative) representations of possible future states. Teachman’s research aims to improve prospection with a web-based intervention that will train people to expect and visualize reasonably positive future outcomes by resolving the emotional ambiguity in scenarios that set up uncertainty about one’s future state.
- \$145,000 to Leaf Van Boven from the University of Colorado Boulder and Eugene Caruso from the University of Chicago to develop and test a comprehensive theory of the phenomenological foundations of psychological distance. In their research, Van Boven and Caruso aim to examine whether mere attention to future events and the fluency experienced when considering future events reduces psychological distance of those events. They also aim to examine whether adopting mindsets of prospection rather than retrospection intensifies the experiences associated with psychological distance, thereby reducing psychological distance. Virtual reality techniques will be used to support new theoretical development as well as to develop interventions that reduce the psychological distance of personally important events to help people better plan for and anticipate the future.
- \$145,000 to Matthijs van der Meer from the University of Waterloo to develop a working model of what factors determine the content of prospective episodes, how prospection is translated into action, and what properties of the underlying neural circuits are responsible for its generation. To address challenges in human studies, van der Meer will study prospection in an animal model: rats solving spatial navigation problems, as they not only replay previous trajectories, but also mentally construct novel paths towards

desired goals. van der Meer will record neural activity from the rat hippocampus as they navigate shortcut mazes to test whether constructed trajectories can span never-experienced shortcuts, as well as to examine the influence of different factors on the content of constructed trajectories, distinguishing behavioral relevance from novelty and hardwired spatial structure.

- \$150,000 to Felix Warneken from Harvard University to investigate how prospection expands human potential for prosocial behavior – our tendency to act on behalf of others. Can prosocial behavior be increased by helping humans transcend benefits that may come from the here and now in order provide opportunities for larger, more long-term social benefits? Warneken will investigate this from a developmental psychological approach in order to witness the birth of prospection, and assess its effects on prosocial behavior.
- \$145,000 to Phillip Wolff and Eugene Agichtein from Emory University, and Bridget Copley from Université Paris 8 to analyze – using language – why future-oriented thinking is associated with a range of positive psychological and health outcomes. Through the development of techniques for the automatic extraction of future-oriented language, the current research examines how properties of causation – particularly the properties of internal and external control, intentionality, and obligation – may give rise to the positive benefits of future-orientation. This project will also examine how future-orientation can be affected by the occurrence of major events (e.g. mass shootings), as well as how future-oriented language may change over time.
- \$145,000 to Liane Young , Brendan Gaesser, and Elizabeth Kensinger from Boston College to illuminate the cognitive and neural mechanisms by which prospection can be used to foster prosociality in adults. Their research will investigate the mechanisms by which episodic simulation can be used to facilitate empathy for people in need. Does the quality of episodic representation mediate the empathic effect of episodic simulation, is this empathic effect independent from the ability to consider others' thoughts and feelings, and how can episodic processes be leveraged to apply to actual people in need? Together, by answering these questions, this project will lay the foundation for research at the intersection of prospection, memory, and moral psychology.
- \$14,000 to Margaret (Peggy) Kern from the University of Pennsylvania and the University of Melbourne, and George Vaillant from Massachusetts General Hospital to investigate the extent to which prospective belief in the afterlife is related to one's behaviors, attitudes, character, and physical health. Kern and Vaillant will use data from the Harvard Grant Study – one of the longest continuous cohort studies in social science – to perform sophisticated analyses to understand predictors and outcomes associated with different prospective beliefs and perspectives. By zooming out across time, the bigger picture of how lives unfold across time is revealed, in a manner that is impossible with short-term or cross-sectional studies.

For more information about the Prospective Psychology Project and the Templeton Science of Propection Awards, please contact Jeanette Elstein at elsteinj@sas.upenn.edu, or (215) 746-4953.

Please visit our website, www.prospectivepsych.org for more information about the Prospective Psychology Project!