

September 15, 2016

Selection Committee
Sloan Research Fellowships
Alfred P. Sloan Foundation

Dear Selection Committee,

I am writing to most enthusiastically nominate Dr. Celeste Kidd for the Sloan Research Fellowship. Celeste was a graduate student in the Brain and Cognitive Sciences Ph.D. program at the University of Rochester, and she began a tenure-track faculty position in the department on July 1, 2014 after a brief stint as a visiting research fellow at Stanford and a visiting scientist at MIT. I should say at the outset that it is extremely unusual for my department to hire one of our own PhD students, but Celeste was just too good to let get away. So we were delighted to recruit Celeste to our faculty over multiple other top institutions. Celeste is an amazingly creative and productive scientist in the domain of developmental cognitive science and is poised to become one of the world's leaders in the field of cognitive development. She is an excellent candidate for the Sloan Research Fellowship and I urge you to support her career.

In broad strokes, Celeste's research focuses on understanding how young children acquire an understanding of their environment, and elucidating the cognitive strategies that children use to seek information and to make decisions. These are questions of fundamental importance to understanding cognitive development, which also have important implications for education and for approaches to treating developmental disorders such as autism. In my mind, there are a couple of defining characteristics that make Celeste's research program really special. First, she has a remarkable ability to see novel approaches to addressing important standing questions in the field. An excellent example of this is her revisitation of the classic "marshmallow" study (Kidd et al. 2013, *Cognition*), which received considerable national and international attention (including a Top 100 science story of 2012 by Discover magazine). In this type of study, kids are given the choice between one marshmallow now or waiting some time for an opportunity to have two marshmallows, and previous work showed that the ability of kids to wait correlates well with later performance and success in school and life. In her study, Celeste showed that the amount of time that kids are willing to wait is strongly influenced by how much they trust the experimenter who makes the offer, and that this can be manipulated by just a few well-controlled interactions over a short period of time. This study provides fundamental new insights into an old finding, and has important practical social implications.

The second characteristic that makes Celeste's research special is her ability to combine clever experimental approaches with rigorous computational and theoretical methods that allow her to provide a more sophisticated level of description of kids' behavior. That is, Celeste has the tools to evaluate whether a particular cognitive strategy exhibited by young children is rational, in a computational sense, or not. An excellent example of this is her influential "Goldilocks effect" study (Kidd et al. 2012, *PLoS One*). This study showed that young kids pay more attention to information of moderate complexity, and Celeste's computational modelling work showed that this represents an optimal learning strategy despite being somewhat counterintuitive. In addition,

Celeste has been collaborating with Dr. Ben Hayden to examine whether non-human primates exhibit similar strategies for allocating attention, and these comparisons between humans and animals will be able to establish the generality of such information-seeking strategies (Kidd and Hayden 2015, *Neuron*). She has also applied computational approaches to understand the mechanisms underlying the evolution of human-level intelligence (Piantadosi and Kidd 2016, *PNAS*), which received considerable national and international attention including a feature in *The New Yorker* last week. I think that Celeste's approach to combining experimental and computational studies will allow her to break fundamental new ground in understanding cognitive development. Her quantitative approach to characterizing children's behavior using rational decision-making frameworks also has tremendous potential to provide new behavioral markers of disorders such as autism and ADHD.

A third compelling feature of Celeste's research is that she connects her developmental models of attention and learning to diverse theoretical and applied domains, including education, neuroscience, and robotics. She was recently awarded a grant from the Human Frontiers Science Program for a collaboration

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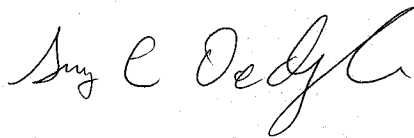
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to study curiosity using a combination of behavioral, computational, and biological approaches. As part of this collaboration, Celeste is working to implement variations of her child-inspired computational models of curiosity in robots in order to make them capable of more flexible and independent learning.

Celeste's track record thus far is reflective of her exceptional creativity and drive. Despite having just received her PhD in 2013, Celeste already has an enviable publication record that includes 21 peer-reviewed publications, with many more under review. Celeste's accomplishments have not gone unnoticed by others in the field. She received the Computational Modeling Prize from the Cognitive Science Society in 2010, the Robert J. Glushko Dissertation Award in 2014, and a Google Faculty Research Award in Human-Computer Interaction in 2016. She was also a Finalist for the NIH Director's Early Independence Award and is currently a Finalist for the Jacobs Foundation Early Career Award.

In closing, I enthusiastically nominate Celeste Kidd for the Sloan Research Fellowship, and I believe that she is a future superstar in the field of cognitive development. I urge you to support her nascent career, and I am confident that she will add to the long list of Sloan Fellows who have gone on to become giants in their disciplines. I can attest that Celeste is fully qualified to receive this award, and that my department will administer the award and support his activities fully. Please contact me if I can provide any additional information.

Sincerely,



Gregory C. DeAngelis, George Eastman Professor and Chair
Dept. of Brain and Cognitive Sciences, University of Rochester