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Dear Dr. Stern:

We are hereby submitting our manuscript entitled “Deep Predictive Learning as a Model for Human Learning” for publication in *Science*.

This paper presents a significant advance in understanding how the neocortex learns, based on the idea that canonical circuits between the neocortex and thalamus drive alternating phases of prediction and bottom-up outcomes, and the resulting prediction errors (as temporal differences) can drive powerful learning. Critically, we show for the first time that learning based solely on predicting raw visual inputs can generate higher-level abstract categorical representations of 3D objects, which previously has required explicit human-labeled training. Thus, we argue that this work brings us significantly closer to a fully plausible and powerful computational framework for understanding learning in the neocortex, while building on the recent excitement about advances in deep neural network learning algorithms (which we directly evaluate in comparison to our biologically-based model).

Thank you for considering our work.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. O'Reilly', with a long horizontal stroke extending to the right.

Randall O'Reilly