Hierarchical Task

Title	Hierarchical Task
Domain	Self-Regulation
Type	Behavioral
Duration (min)	24
Description	In this task, subjects are presented with 18 stimuli composed of three dimensions: 3 shapes, 3 orientations and 2 colored borders. Subjects had to learn one of three key responses for each of the 18 stimuli. In the "flat" condition, the 18:3 mapping was arbitrary, requiring subjects to individually learn each of the 18 associations. In a hierarchical condition, the colored borders indicated whether "orientation" or "shape" determined the response. This simplifies performance if subjects learn this hierarchical structure.
OSF Link	https://osf.io/br2c9/
Adult/Child	adult
Computerized	
Identified	1
Identified Description	The hierarchical rule task putatively measures subjects' ability to discover and use higher-order structure in their environment. The hierarchical rule task requires that participants respond to stimuli by pressing one of three keys. The stimuli are structured such that they are composed of three separate features: identity, orientation, and border color. In a "flat" condition, the keys are randomly associated with the shapes so that the participant must learn each association independently. In a "hierarchical" condition, the stimulus-response mappings are instead structured, such that participants can use a rule based on the combination of the three features (e.g. if the border is red, response based on the orientation). Original work by Badre et al. (2010) contrasted these two conditions and showed that anterior regions of the frontal cortex supported the discovery of abstract rules. Follow up work with by Frank and Badre (2012) extended this work by modeling individuals as learners who differentially bias their attention to hierarchical structure. This "attention to hierarchy" was associated with signal change in frontal cortex, supporting the view that this region is associated with discovery of higher-order structure in the environment.
Identified	

Supporting Documentation	
Identified PMCID, PUBMED ID, or CITATION	Text Citation: Frank, M. J., & Badre, D. (2012). Mechanisms of hierarchical reinforcement learning in corticostriatal circuits 1: Computational analysis. Cerebral Cortex , 22(3), 509–526.
Measured	
Measured Description	
Measured Supporting Documentation	
Measured PMCID, PUBMED ID, or CITATION	
Influenced	
Influenced Description	
Influenced Supporting Documentation	
Influenced PMCID, PUBMED ID, or CITATION	
Outcome (Validated vs Invalidated)	
Outcome	
Outcome Description	
Outcome Supporting Documentation	
Outcome PMCID, PUBMED ID, or CITATION	
Owner	Teon Brooks Send email to Teon