flagged for poor task performance. ROIs included left and right dorsolateral prefrontal cortex, anterior cingulate cortex, anterior insula, inferior frontal gyrus (IFG), and pre-supplementary motor area (pre-SMA). Separate linear mixed-effects models were conducted to assess the relationship between ACEs and BOLD signaling in ROIs while controlling for demographics (age, sex assigned at birth, race, ethnicity, household income, parental education), internalizing scores, and random effects of subject and MRI model.
Results: Greater ACEs was associated with reduced BOLD response in the opercular region of the right IFG (b= -0.002, *p*= .02) and left (b= -0.002, *p*= .01) and right pre-SMA (b= -0.002, *p*= .01). Family conflict was related to altered activation patterns in the left pre-SMA, where youth with lower family conflict demonstrated a more robust negative relationship (b=.001, *p*= .04). ACEs were not a significant predictor in other ROIs, and the relationship between ACEs and BOLD response did not significantly differ across time. Follow-up brain-behavior correlations showed that in youth with lower ACEs, there was a negative correlation between increased activation in the pre-SMA and less impulsive behaviors.
Conclusions: Preadolescents with ACE history show blunted activation in regions underlying inhibitory control, which may increase the risk for future poorer inhibitory control with downstream implications for behavioral/health outcomes. Further, results demonstrate preliminary evidence for the family environment's contributions to brain health. Future work is needed to examine other resiliency factors that may modulate the impact of ACE exposure during childhood and adolescence. Further, clinical scientists should continue to examine the relationship between ACEs and neural and behavioral correlates of inhibitory control across adolescent development, as risk-taking behaviors progress.

Categories: Neuroimaging
Keyword 1: childhood maltreatment
Keyword 2: brain development
Keyword 3: inhibitory control
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48 Should I Stay or Should I Go? Neural Circuits Underlying Decisions to Explore or Exploit

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Objective: Adaptive decision-making is necessary to sustain functional independence. Maladaptive decisions are among the most prevalent features of psychological and neurological disorders. One crucial aspect of decision-making involves arbitrating between exploring new avenues with risky but potentially lucrative outcomes or exploiting prior knowledge and endorsing predictable outcomes. Balancing this dichotomy creates a behavioral tension that shapes all decisions and is termed the exploration-exploitation trade-off. This trade-off has been linked to reward and affective drives and associated neural circuitry as well as neuropsychological dysfunction. However, the neural mechanisms underlying the exploration-exploitation trade-off are still uncertain, due to the scarcity of literature and the heterogeneity of paradigms. This study aimed to systematically quantify and disambiguate neuroanatomical correlates of the exploration-exploitation trade-off in a normative adult sample. These findings provide a necessary starting point for future investigations of this fundamental aspect of decision-making across clinical populations, with potential implications for assessment and intervention.
Participants and Methods: We used the effect-location method of meta-analysis to analyze data from 10 functional neuroimaging studies investigating the exploration-exploitation trade-off in non-clinical samples. We analyzed the location and frequency of significant neural activations across studies for both explorative and exploitative decisions and characterized them as core and non-core regions. Core activations were defined as those reported in over 50% of studies. Secondary and tertiary activations were defined as those reported in 40% and 30% of studies, respectively. The present review was conducted in accordance with the guidelines of the 2009 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.
Results: The results revealed that explorative and exploitative choice behaviours differed

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markedly with respect to associated patterns of task-related brain activity. Exploration was associated with activity in brain regions implicated in externally directed, goal-based attentional processing and reward-related uncertainty, mainly tapping bilateral parietal and frontal circuitry, with relatively high consistency across studies. A core explorative network was revealed, consisting of activity in the frontal polar cortex, the dorsal anterior cingulate cortex, the bilateral medial frontal gyrus, the bilateral precuneus, and the bilateral intraparietal sulcus. Secondary and tertiary regions were also detected, including the bilateral anterior insula, the left precentral gyrus, the bilateral superior frontal gyrus, the right inferior frontal gyrus, the left supplementary motor area, the bilateral superior parietal lobule, and the bilateral thalamus. Exploitation was associated with brain regions implicated in internally directed processes including reward valuation, motivation, and memory. Core exploitative activations included the ventromedial prefrontal cortex, the bilateral anterior cingulate cortex, and the bilateral orbitofrontal cortex. Secondary and tertiary activations included the bilateral hippocampus, the left middle temporal gyrus, the bilateral angular gyrus, the left posterior cingulate cortex, the left superior frontal gyrus, and the bilateral superior temporal gyrus.
Conclusions: The exploration-exploitation trade-off provides a novel paradigmatic approach to study adaptive and maladaptive decision-making behaviour in humans. Our findings support the neural dichotomization of exploration and exploitation and illuminate potential neural networks underlying this fundamental feature of decision-making. Understanding these mechanistic networks opens a new avenue of inquiry into decision-making deficits in clinical populations, including neurodegenerative, neurodevelopmental, and neuropsychiatric syndromes.

Categories: Neuroimaging
Keyword 1: decision-making
Keyword 2: neuroimaging: functional
Keyword 3: cognitive neuroscience
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49 Cerebral hemodynamic during motor imagery of self-feeding with chopsticks: Differences between dominant and non-dominant hand

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Objective: Motor imagery is defined as a dynamic state during which a subject mentally simulates a given action without overt movements. Our aim was to use near-infrared spectroscopy to investigate differences in cerebral hemodynamic during motor imagery of self-feeding with chopsticks using the dominant or non-dominant hand.
Participants and Methods: Twenty healthy right-handed people participated in this study. The motor imagery task involved eating sliced cucumber pickles using chopsticks with the dominant (right) or non-dominant (left) hand. Activation of regions of interest (pre-supplementary motor area, supplementary motor area, pre-motor area, pre-frontal cortex, and sensorimotor cortex was assessed.
Results: Motor imagery vividness of the dominant hand tended to be significantly higher than that of the non-dominant hand. The time of peak oxygenated hemoglobin was significantly earlier in the right pre-frontal cortex than in the supplementary motor area and left pre-motor area. Hemodynamic correlations were detected in more regions of interest during dominant-hand motor imagery than during non-dominant-hand motor imagery.
Conclusions: Hemodynamic might be affected by differences in motor imagery vividness caused by variations in motor manipulation.

Categories: Neuroimaging
Keyword 1: brain function
Keyword 2: cerebral blood flow
Keyword 3: neuroimaging: functional connectivity
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50 Therapy and Medication Use Moderating Neural Alterations Underlying Social Cognition Performance in Youth with Autism and Psychosis

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