

Cognitive Control Regions are Increased Amplitude of the Blood Oxygen-Level

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Description

The current investigation sought to determine whether the RT-BOLD effect and the Primary Condition (PC) effect both reflect the same cognitive control processes. In addition, two Go/No-go tasks with varying demands were used to examine RT-BOLD effects to see if RT-related activity is task-dependent, indicating the recruitment of task-specific cognitive processes. Data simulations demonstrated that mean-centered, RT-related activity could be distinguished from primary condition activity. In that scenario, RT-related activity rather than "Time-On-Task" (ToT) reflects periodically engaged processes. Particularly for the perceptual decision task, RT-related activity was mostly distinct from the primary go contrast. As a result, a periodic-engagement account suggests that RT effects may reflect additional cognitive processes that are not captured by the PC contrast. For the two tasks, a distinct set of regions experienced RT-BOLD effects. Occipital and posterior parietal regions that support visual attention showed RT-related activity during the task requiring a perceptual decision. RT-related activity occurred in fronto-parietal regions supporting the maintenance and retrieval of task representations for the task requiring a working memory decision. The results indicate that RT-related activity is a reflection of task-specific processes that are periodically engaged, particularly when performing tasks that are less demanding.

Primary Condition

The ToT account may require such co-occurring PC and RT effects. ToT says that RT-related activity shows how long the process took. As a result, it always results in BOLD increases from baseline, which has significant effects on both RT and PC. However, in the absence of a PC effect, RT-BOLD effects may occur. This would only occur if the actual RT-activity in a region is negatively active on other trials (such as slow RT trials) but is suppressed on some trials (such as fast RT trials). Consistent with previous findings in the literature, RT-related stimulus-evoked activity would still be linearly related to RTs in this scenario, but it would be mean-centered rather than always positive. This kind of RT-related activity, which has a significant RT effect but no PC effect, may be caused by task processes engaging on a regular basis rather than by how long the process has been running.

Individual differences in post-screening reactions to a health screening procedure called bone densitometry were significantly predicted by pre-screening measures based on a cognitive-behavioural theory of health anxiety. Specific illness beliefs (vulnerability, severity/consequences, coping and treatment) and health anxiety measures were among the predictors. Women with very high levels of pre-existing health anxiety did not, whereas women with a low BMD result typically displayed a "minimization" of the severity of the condition. Women with extreme health anxiety were only temporarily reassured by a high BMD result. The findings were in line with the findings of the cognitive-behavioral study of health anxiety. Using functional Near-Infrared Spectroscopy (fNIRS), specific cognitive processes (cognitive control and time perception) and hemodynamic correlates were examined after acute and sustained high-altitude exposure. Eleven male subjects were flown in by helicopter and dropped at an altitude of 4350 meters (14,272 feet), where they remained for four days. On the day of arrival (D0), the second (D2) and fourth (D4) days at high altitude, cognitive tasks, including a conflict task and a temporal bisection task, were performed at sea level the week before ascending to high altitude. At rest and during the conflict task, fNIRS was used to monitor changes in the prefrontal cortex's hemodynamic.

Cognitive-Behavioural Theory

The findings demonstrated that information processing speed and accuracy are affected by high altitude. Participants had twice as many decision errors and slower Reaction Times (RT) during the initial hours of exposure. Hypoxia had no effect on early automatic response activation, cognitive control, post-error adjustment, or the development of a top-down response suppression mechanism. However, temporal judgments were underestimated during prolonged hypoxic exposure, indicating a slower internal clock. After several days of exposure, both the internal clock slowdown and the persistence of a higher number of errors could be consistently explained by a decrease in cortical arousal caused by hypoxia. For success, workplace safety and productivity, many occupations, such as the military, first responders, transport workers and factory shift workers, require optimal physical and cognitive function. Repeated administration of caffeine is an effective strategy for maintaining

physical and cognitive capabilities in these circumstances which may include limited sleep.

When compared to the low hoarding group, high hoarding participants consistently displayed greater cognitive inflexibility across a variety of behavioral and eye-tracking outcomes, such as reaction time, accuracy rate, initial orientation to distractions and viewing time for distractions. However, because performance was not significantly different between participants with high hoarding and those with nature distractions, participants with high hoarding did not exhibit context-dependent deficits based on the types of previous distractors. According to the current findings, there is a widespread and more global lack of cognitive flexibility. Regardless of whether the context of the distractor is specifically related to hoarding, those with hoarding may have a harder time disconnecting from previous stimuli and focusing on the task at hand. The nature of cognitive inflexibility is clarified and its implications and future directions are discussed.

The inability to part with one's possessions is an essential criterion for Hoarding Disorder (HD), but few studies have examined reactions to actual discarding behaviors. The present

investigation sought to determine whether individuals with HD exhibited behavioral and emotional responses to discarding that were distinct from those of non-hoarding Community Controls (CC). The second objective was to investigate the course of distress experienced after discarding. A third objective was to determine whether HD participants responded differently to a Cognitive Restructuring (CR) protocol or a straightforward Thought Listing (TL) instruction. A personal possession and a newly acquired object were the subjects of a decision-making exercise. HD participants reported stronger attachment motives and anticipated distress for a longer period of time than community controls, but their actual discarding behaviour was not significantly different from that of community controls.

In conducting empirical tests of a hypothesized vulnerability process, it is important to establish convergent validity with other markers of vulnerability. This is particularly the case for the vulnerability reflected by extreme responding, as multiple conceptualizations of extreme responding have been proposed. An understanding of the nomological network of extreme responding is needed to advance our understanding of the processes that give rise to these types of responses.