Title: The regulatory balance between internally- and externally-oriented attentional systems is impacted by retrieval of negative autobiographical memories

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Abstract: 2.12

Whether intentional or spontaneously evoked, autobiographical memory retrieval can occasionally trigger a state of rumination. Rumination is a hallmark symptom of depression, and there is therefore great interest in understanding the brain mechanisms that underlie the tendency for one’s attention to get stuck in an internally-oriented state, as well as the cognitive control processes that facilitate its reorientation back to the external world. We examined the dynamics of brain activity across large-scale networks as individuals dynamically toggled their attentional focus between internal content (autobiographical memories) and external content (visual stimuli). Participants were cued to retrieve either negative or neutral valence autobiographical memories in order to induce an internally-oriented brain state characterized by the engagement of the default-mode-network (DMN). Compared to neutral autobiographical memory retrieval, negative autobiographical memory retrieval lead to greater tendency for inefficient transitions toward an externally-oriented brain state characterized by inadequate engagement of the dorsal-attention-network (DAN), known to support externally-directed attention. The difference was greatest during the early phase of a working memory task (WM), indicating poorer engagement of this externally-oriented attentional network after having recently retrieved a negative autobiographical memory. Importantly, this difference disappeared in later timecourses of the WM task demonstrating that the lingering consequences of negative retrieval were time-limited and could eventually be overcome as individuals adapted to the demands of the WM task. The DMN was more engaged during the retrieval of negatively-valenced autobiographical memories compared to retrieval of neutral memories, but this network was suppressed to a comparable degree during the WM task. These findings contribute to our understanding of how ruminative states may linger and diminish one’s attention to the external world, an issue that could be exacerbated in people with depression.