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Rethinking Rumination: A Decision-Theoretic Approach Without Negativity Bias

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Abstract

Prior work by Bedder et al. (2023, 2024) modeled rumination as a negativity-biased decision process under uncertainty in a POMDP framework, where excessive sampling results from pessimistic priors and uncertainty about negative experiences. While these models provide valuable insight, they assume that excessive information-seeking is driven primarily by negative affect. We explore an alternative hypothesis: excessive information-seeking may result from optimal inference due to uncertainty and planning depth, independent of negativity bias. Using a POMDP solver with recursive value iteration, we find horizon length and uncertainty influence the persistence of sampling actions without a negative reward bias. This shifts rumination from an affect-driven process to a more generalized preoccupation mechanism consistent with the ICD-11's transdiagnostic conceptualization of preoccupation (Eberle & Maercker, 2022). Unlike prior models with fixed stopping thresholds, our approach may allow preoccupation to emerge dynamically from decision parameters without explicit negativity bias.