Impact of effort exertion on cognitive flexibility and stability

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Abstract

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Efficient task execution requires attention to task requirements while inhibiting distractors (cognitive stability) and adapting to changes (flexibility). Previous studies have shown that individuals differ in their application of stable versus flexible processing modes. Our study examined the impact of prior effort exertion on flexibility/stability trade-off.

Participants performed a stability-flexibility paradigm, with pupil recording, before and after effort and no-effort manipulations were induced using different tasks. We analyzed the resulting change in preferences for stability/flexibility (voluntary switch rate).

We found that the no-effort condition evoked a higher voluntary switch rate than baseline or after effort exertion. Participants in the effort condition also showed higher response times and lower accuracy across trials. Pupil data shows that after effort exertion participants exert less effort in spontaneous switches and repeats. Additionally, the relationship between switch cost (on forced-switch trials) and spontaneous switching rate increased after effort exertion. These results suggest that stability/flexibility preferences can vary with prior effort exertion.