NEURAL EFFECTS OF AUTONOMOUS CHOICE ON APPETITIVE SELF-REGULATION DURING THE TRANSITION TO COLLEGE

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INTRODUCTION & METHODS

BACKGROUND

- Learning to resist appetitive temptations (e.g. food, alcohol) is a critical part of healthy development¹.
- Cognitive reappraisal can be used to reduce appetitive motivations, such as food craving²⁻⁴.
- Self-regulation is typically studied using paradigms in which participants engage in regulation in reponse to external instructions and less is known about self-initiated (autonomous) self-regulation.
- Self-determination theory posits that autonomy promotes intrinsic motivation and goal pursuit⁵.
- Autonomous self-regulation (choosing to exert control, rather than regulating in response to

PARTICIPANTS

– N = 116 (73 females), incoming college freshmen (ages 18-19)

AUTONOMY MANIPULATION

- Writing exercise about a recent choice that demonstrated taking ownership of one's life

REGULATION OF CRAVING-CHOICE TASK

– 90 trials – look = 20%, regulate = 20%, choose = 60%



an external cue) may facilitate self-regulation⁶⁻⁷ and track more closely with real-world outcomes (e.g. engagement in health-risking behaviors).

- Autonomous self-regulation may also be particularly important during periods with substantial changes in external regulatory scaffolding, such as during the transition to college.
- Choice is a primary method for supporting autonomy, but is not always helpful⁸.

RESULTS

BEHAVIORAL ANALYSIS

HOW FREQUENTLY DO PARTICIPANTS CHOOSE TO REGULATE THEIR CRAVINGS?



DOES PERCEIVED DIFFICULTY & INTRINSIC MOTIVATION DIFFER AS A FUNCTION OF CHOICE?

intrinsic motivation *difficulty b = -0.28, SE = 0.10 t(111) = 2.66, p = .009 1 2 3 4 5rating

DOES CHOICE FACILITATE MORE EFFECTIVE GOAL PURSUIT?MODEL 1task craving ~ 1 + goal * choice + baseline craving + trial +(1 + goal + baseline craving | participant)

DO EFFECTS OF GOAL AND CHOICE DIFFER AS A FUNCTION OF DIFFICULTY OF GOAL PURSUIT?MODEL 2task craving \sim + goal * choice * task difficulty

MAIN EFFECT OF GOAL

N = 115, p < .001, k = 70 (cFWE corrected p < .05), voxel size = 2mm³



ARE TASK EFFECTS MODERATED BY INTRINSIC MOTIVATION?

MODEL 3 task craving ~ + goal * choice * task difficulty * intrinsic motivation



MAIN EFFECT OF CHOICE N = 115, p < .005, k = 155 (cFWE corrected p < .05), voxel size = 2mm³



MVPA ANALYSES

Classified yes- versus no-choice using a logistic regression classifier with LOSO cross-validation

WHOLE-BRAIN: accuracy = 56%, SE = 3%, p = .020; sensitivity = 84%, specificity = 27%, AUC = 56%

CONCLUSIONS & FUTURE DIRECTIONS

- Choice was distinguishable neurally in univariate analyses, but not strongly in multivariate analyses
- Behaviorally, the effect of choice on goal pursuit was moderated by perceived trial difficulty and individual differences in intrinsic motivation

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- Follow up MVPA & specification curve analyses to test the robustness of the observed effects

- Investigate relationships with health-risking behaviors and other variables of interest

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