Choosing to regulate: Autonomy alters neural responses during craving regulation

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INTRODUCTION

Background
- Learning to resist appetitive temptations (e.g. food, alcohol) is a crucial part of healthy development.
- Cognitive reappraisal can be used to reduce appetitive motivations, such as food craving.
- Self-regulation is typically studied using paradigms in which participants engage in regulation in response to external instructions and less is known about internally-generated (autonomous) self-regulation.
- Autonomous self-regulation (choosing to exert control, rather than regulating in response to an external cue) may facilitate self-regulation 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.

Research question
- Does level of autonomy affect regulation success and/or regulation-related neural activity?

METHODS

Participants
- N = 30 (15 females)
- All incoming college freshmen, ages 18-19
- Hunger level (1 = not hungry at all, 5 = extremely hungry) – M = 2.60, SD = 0.86

Craving regulation task
- 84 trials – look = 25%, regulate = 25%, choose = 50%
- 2 (look v. regulate) x 2 (high v. low autonomy) within-subject factorial design
- “Look” = “visualize interacting with this food”
- “Regulate” = “visualize the negative health consequences of consumption”
- High autonomy = choose trials
- Low autonomy = look & regulate trials

Food categories
- Barbecued meat, burgers, cheese, chips, chocolate, cookies, donuts, fries, fruit, fruit desserts, ice cream, pasta, pizza, roasted veggies
- Participants selected their top 3 most craved food categories

RESULTS

Main effect of Instruction
- p < .001, k = 100 (AlphaSim corrected cFWE p < .05)

Main effect of Autonomy
- p < .001, k = 100 (AlphaSim corrected cFWE p < .05)

High autonomy regulate > Low autonomy regulate
- p < .005, k = 70 (AlphaSim correction cFWE p < .05, k = 100)

High autonomy instructions > Low autonomy instructions
- p < .001, k = 100 (AlphaSim corrected cFWE p < .05)

Behavioral results
Main effect of Instruction
- Regulation Success x Autonomy

CONCLUSIONS & FUTURE DIRECTIONS

- While regulation success was not affected by level of autonomy, the pattern of neural activity associated with regulation during high autonomy trials was different than that of low autonomy trials.
- Is the phenomenological experience of regulating different when one chooses (versus is instructed) Might this reflect differences in motivation (e.g. intrinsic versus extrinsic)?
- How do the behavioral and neural correlates of regulation relate to real-world health-risking behaviors?
- Is neural activity during high autonomy regulation a better predictor of health-risking behaviors than during low autonomy regulation?

REFERENCES

- p < .005, k = 70 (AlphaSim correction cFWE p < .05, k = 100)