

# The Reward of Others' Pain: The Morality of Schadenfreude and Neural Correlates of Latent Preferences for Out-Group Harm

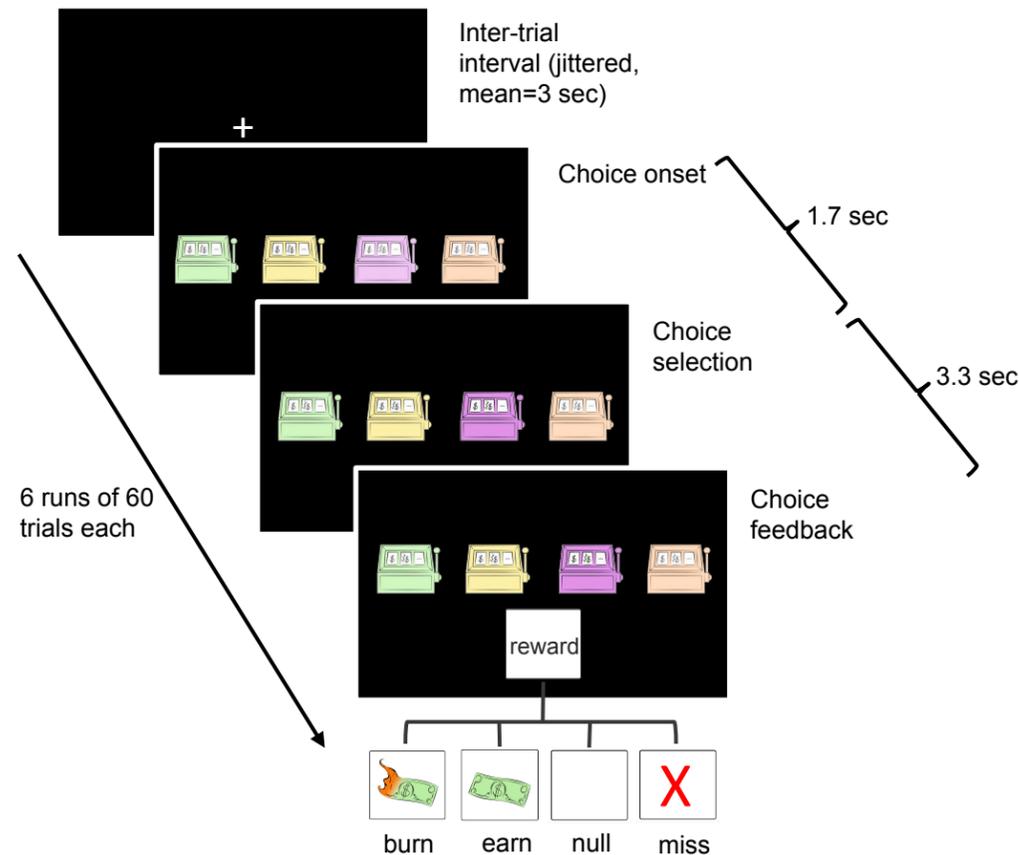
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## Abstract

Divisions between social groups often produce violent conflict. Yet we know relatively little about the **neural mechanisms underlying intergroup harm**. There is also minimal interdisciplinary work addressing how our neuroscience knowledge should impact our **moral evaluation of inherent yet “ugly” emotions like schadenfreude (pleasure in another’s misfortune)**. To explore these questions, this thesis brings experimental work in dialogue with normative claims. I investigated the brain regions involved in preferences for two kinds of rewards: a benign one that benefits the participant’s political in-group, and a spiteful one that does the same and also harms the political out-group. We used functional magnetic resonance imaging to assess neural activity while participants made choices to pursue these rewards. After modeling their behavior with a reinforcement learning algorithm, we found that **ventral striatum activity significantly tracked reward prediction error**. Past experiments indicate that schadenfreude also recruits regions from the subcortical reward circuitry. This convergence of evidence suggests that schadenfreude potentially elicits a positive reward signal that disposes a person to aggress against those whose misfortune she enjoyed—passive pleasure in another’s pain can subsequently facilitate first-person harm. In light of this, I argue that **schadenfreude has morally bad consequences and can also be morally ill-fitted**.

## Behavioral Task



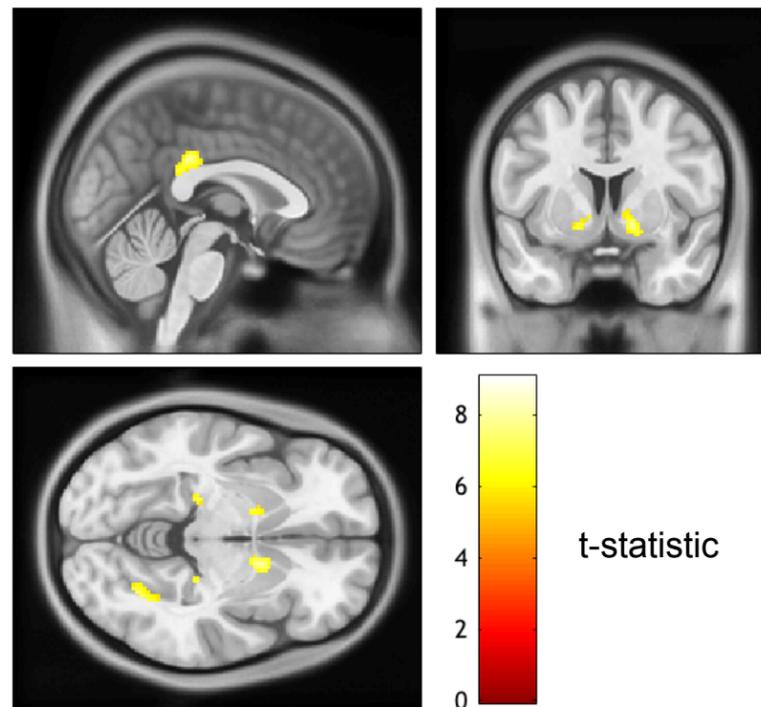
**4-armed bandit task:** On each trial, the participant chose one of four slot machines and received immediate feedback about reward outcome.

### 3 possible outcomes:

- Earn dollar (adds money to bonus pool for others who share participant’s political party)
- Burn dollar (adds money to bonus pool for others who share participant’s political party AND subtracts money from bonus pool of opposing political party)
- Null (no reward)

## Neuroimaging Results

- 49 participants, 39 after exclusion
- Earn vs. Burn contrast: no significant voxels
- Latent preference parameter showed variance across the sample in preference for earns
- Using parameters from the computational model of behavior to analyze fMRI BOLD time series: Parametric modulator analysis showed that ventral striatum BOLD activity significantly tracks trial-by-trial, participant-specific reward prediction error



## Moral Philosophy of Schadenfreude

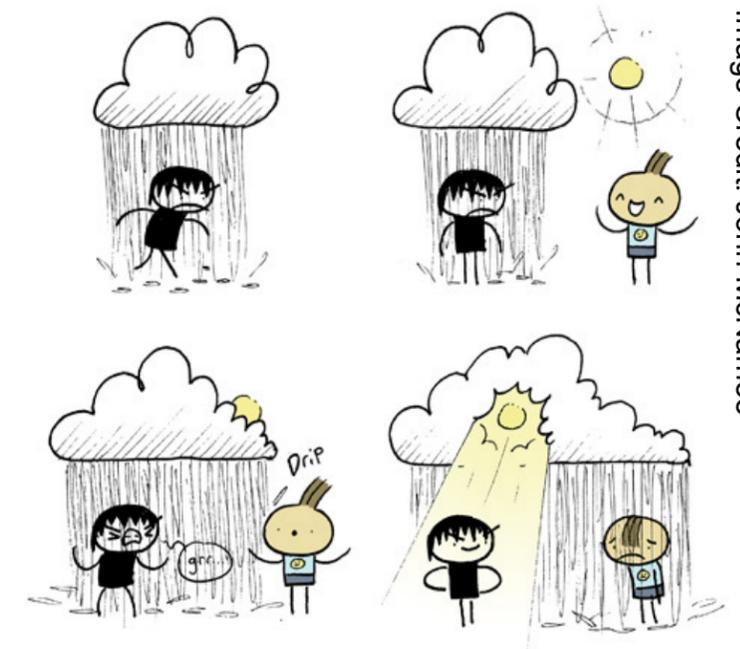


Image Credit: John McNamee

- Evidence from neuroscience suggests that schadenfreude potentially involves a positive reward signal, which may lead to an inclination to first-person harm (which our experiment shows also involves the reward system)
- This is a morally bad consequence even if schadenfreude is well-fitted for the situation.
- Justice-based defenses of schadenfreude fail, because oftentimes the misfortune is not true justice (disproportionate, karmic, not corrective).