

From whence comes judgment



“...the idea that humans may be hard-wired for retributive punishment... may not necessarily be the best or most just.”

Every day, juries in courtrooms around the world are charged with the tasks of assessing a defendant’s guilt and recommending appropriate punishment. Despite the ubiquitous nature of these processes in human civilization, relatively little is known about the neural mechanisms underlying so-called “third-party punishment.” In a recent report in the journal *Neuron*, an interdisciplinary team of researchers at Vanderbilt University investigated the neural circuit activation associated with third-party decision-making.

Buckholtz *et al.* presented human subjects with scenarios in which a fictional character named “John” had Responsibility, Diminished Responsibility, or No Responsibility for a crime which ranged in severity from theft to murder. Subjects’ brains were scanned using fMRI while they were presented the scenario and then allowed to decide on an appropriate level of punishment.

Subjects demonstrated a strong behavioral relationship between their chosen level of punishment and the category of the crime, with the most severe levels of punishment dealt to the most heinous crime scenarios. Additionally, a post-scan questionnaire indicated that subjects exhibited a similar relationship between arousal level and the category of the crime.

fMRI scans indicated that brain-region-specific activation was dependent on “John’s” level of criminal responsibility, with the right dorsolateral prefrontal cortex (rDLPFC) and the bilateral anterior intraparietal sulcus (aIPS) being activated more by scenarios in which “John” is Responsible for a crime than when he has either not committed a crime (No Responsibility) or when justifications or excuses mitigate his criminal responsibility (Diminished Responsibility). In contrast, the temporo-parietal junction (TPJ) exhibited greater activation in response to Diminished Responsibility scenarios than Responsibility scenarios. These associations are intriguing given that the rDLPFC is known to be involved in response selection, while the TPJ is known to be involved in processing a person’s awareness of other people’s mental states, such as their intentions and perspectives.

Interestingly, the authors found that fMRI activation intensity in the rDLPFC did not correlate with the level of punishment assigned by the subject. Instead, the right amygdala, posterior cingulate, temporal pole, dorsomedial and ventromedial prefrontal cortex, and inferior gyrus were found to be involved in determining punishment amount independent of responsibility. Furthermore, this result suggests that assignment of punishment involves a well-classified social and affective neural processing circuit.

Overall, this study demonstrates that third-party punishment is not mediated by a single neural circuit. Rather, multiple circuits and brain regions are recruited to perform processing in legal decision-making—circuits and regions that have been shown to be involved in moral judgments and social norm

enforcement behavior (such as the assessment of economic fairness). These findings raise an important issue about legal structure and practice: these data support the idea that humans may be hard-wired for retributive punishment, and may undermine more recent theories that people punish from a consequentialist perspective, suggesting that how people are hard-wired to pursue justice may not necessarily be the best or most just. The high subjectivity of judgment based on an emotional response/circuitry is not conducive of replicable, codified law, which may account for the creation of “precedent” in the legal system. This observation leads one to wonder what influence the establishment of large-scale human cooperation (civilization) had on the evolutionary formation and assignment of neural circuit roles, or vice-a-versa, and what role these processes might have played in the formation of large-scale social and legal norms.

Original Research Article:

JW Buckholtz, CL Asplund, PE Dux, DH Zald, JC Gore, OD Jones and R Marois (2008). The Neural Correlates of Third-Party Punishment. *Neuron*. 60: 930-940.