

## **A Root Cause of Violence: Justice-Seeking (Revenge) As Compulsive/Addictive Disorder with A Brain-Biological and Genetic Basis**

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### **Research Citations**

**U.S. Department of Justice/National Drug Intelligence Center, “Philadelphia/Camden High Intensity Drug Trafficking Area Drug Market Analysis” (2007)** (“Violent crime in the [Philadelphia/Camden] region is increasing and has emerged as the principal threat to the safety and well-being of citizens within the area... [But the] majority of the homicides are not predicated on drug activity; more often than not, they are *the result of interpersonal disputes.*” (emphasis added))

**Dominique J.-F.de Quervain et al, The Neural Basis of Altruistic Punishment, *Science* 27 August 2004, 305; 1254-58** (In 2004, Swiss researchers discover that the dorsal striatum—the part of the human brain that processes rewards such as the pleasure derived from desserts, desire, and narcotics—is also activated when humans inflict punishments upon wrongdoers. Using positron emission tomography, the scientists were able to observe the brains of human subjects during games in which they could use money units they needed to win a game to punish other players who violated their trust. Study subjects who believed they were administering effective (as opposed to symbolic) punishment experienced increased activation in the caudate nucleus portion of the dorsal striatum and willingly expended a greater portion of their money units on punishment. In other words, they were willing to pay to get justice even if it might cost them the game because in getting even they experienced the same pleasure they received from eating a rich dessert, having sex or taking narcotics.

**Tania Singer, et al., Empathic Neural Responses Are Modulated By The Perceived Fairness Of Others, *Nature* 2006 January 26; 439, 466-69** (In 2006, British researchers using brain imaging techniques confirm the findings of the Swiss researchers that the pleasure centers of the brain that control reward processing are activated when a punishment deemed to be just is meted out—but learn further that this phenomenon is *more pronounced in males than females—and that, for males, the empathy centers of the brain, which allow humans to empathize with others, remained dull.* Here we begin to see why males are far more involved than females in justice-seeking activities (fighting, criminal justice, warfare, etc.), and are far more willing to risk everything, including their own lives, to experience these activities. Biologically speaking, men derive more pleasure from it and have a greatly reduced ability to empathize with the wrongdoer. The researchers also concluded that their study supports “the hypothesis that humans derive satisfaction simply from seeing justice administered.”)

**Strobel, A., et al, Beyond Revenge: Neural and Genetic Bases of Altruistic Punishment, *NeuroImage*, 54(1), 671-680 (2011)** (In 2011, German researchers using both brain imaging and genetic testing techniques find that human subjects in an economic exchange game willingly punished wrongdoers who had cheated other players just as harshly as they if they had been cheated-on themselves. The researchers leading this study also observed activation of the nucleus accumbens—the region of the brain strongly implicated in narcotics addiction—*when study subjects were personally involved in the administration of punishment*. They also found that a genetic variation between study subjects of dopamine processing impacted nucleus accumbens activation, suggesting that *people with different genetic makeups may experience the pleasure of justice-seeking differently*. Dopamine is a neurotransmitter that helps control the brain's pleasure and reward centers.

**Dreber, A, et al, Winners Don't Punish, *Nature* 452: 348-50 (2008)**(In 2008, researchers at Harvard University performed a study in which groups of human subjects were given the option of choosing cooperation, defection, or costly punishment as strategies to maximize their average payoff during economic cooperation games. After multiple rounds of the game with both the study subjects and a control group that had only the option of cooperation or defection, the researchers found that the groups that utilized the option of costly punishment increased the amount of cooperation within the game—*but not the average payoff for the utilizing the punishment option*. To the contrary, the groups that obtained the highest total payoff during the game—the winners of the game—did not engage in costly punishment at all. This led the researchers to conclude that: “winners don't punish” and that punishment is maladaptive in such situations.)

**Conclusion:** Overlaying the above studies, one can begin to see that even though “winners don't punish” (and, conversely, that “only losers punish”), many individuals, particularly males, seek justice in the form of revenge against perceived wrongdoers despite the high personal cost because of the narcotics-like brain-biological pleasure derived from punishing perceived wrongdoers. We also can begin to see that for particular individuals who may have genetic variations in dopamine processing, the pleasure (and compulsion) to punish may be greater. This leads to the hypothesis of a “vulnerable brain”—a brain that is perhaps vulnerable both to substance abuse and justice-seeking, leading to enhanced antisocial/violent/criminal behavior. We are left to wonder whether punishing these individuals with confinement only exacerbates their condition and cravings for justice, and whether a better strategy for reducing crime and increasing public safety would be to develop effective interventions that help reduce or control the justice-seeking compulsion—such as 12-step programs (the 9-step “Nonjustice System” proposed by Kimmel in *Suing for Peace* (Hampton Roads 2005) or pharmacological interventions).