



Intergroup Schadenfreude: motivating participation in collective violence

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People who identify strongly with their social groups frequently experience pleasure when they observe threatening out-group members' misfortunes: a phenomenon termed intergroup Schadenfreude. Though people are generally averse to harming others, they may learn to overcome this aversion via the consistent pairing of subjective pleasure with out-group pain, thereby lowering the barrier to participating in collective violence. In neuroimaging studies, intergroup Schadenfreude is associated with engagement of ventral striatum (VS), a brain region involved in reinforcement-learning. In these experiments, VS activity predicts increased harm and decreased help toward competitive out-group members. Experiencing this pleasure-pain association in intergroup contexts is particularly pernicious because it can generalize to people who are merely affiliated with a threatening out-group, but have done nothing to provoke harm.

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We reliably divide the world into *us* and *them*. On one hand, we reap numerous material and psychological benefits from being able to identify and cooperate with fellow in-group members [1]. On the other hand, group life produces pressure to conform within groups and intractable conflict between groups. Intergroup conflict has been described as 'one of the greatest problems facing the world today' [2]. By some counts, the last century has seen over 200 million people killed in acts of genocide, war, and other forms of group conflict [3].

How do we reconcile this statistic with rapidly accumulating evidence indicating that people are fundamentally averse to harming one another [4,5,6]? Social psychology has a long and rich tradition of studying how and why good people do bad things. More recent research has

homed in on better understanding collective violence — violence people commit on behalf of their social groups (for a review and theoretical integration, see [7]). This area of inquiry lies at the intersection of two questions: (i) why does acting on behalf of a group sometimes make individuals behave in ways that violates their personal beliefs and moral standards, and (ii) how do people overcome their aversion to doing harm in order to participate in collective violence?

People who identify strongly with their social groups often experience intergroup Schadenfreude — pleasure in response to threatening out-group members' misfortunes. This is arguably a natural if not adaptive response in zero-sum environments: negative outcomes for 'them' indicate positive outcomes for 'us,' and so they elicit pleasure. Experiencing Schadenfreude in response to *observing* out-group members' pain is, however, very different from being responsible for *causing* out-group members' pain (i.e., participating in collective violence). I propose that intergroup Schadenfreude is a natural response that supports the learning of an otherwise repugnant behavior: doing harm to others. If observing out-group members' pain is consistently accompanied by feeling pleasure, people may learn over time to endorse and *do* harm to individual out-group targets. It is especially important to understand this phenomenon as it unfolds in groups. Motivation to do harm in an intergroup (as compared to an interpersonal) context significantly increases opportunities for violence because (i) harm can be justified as being morally necessary in the absence of any personal grievance (e.g., in defense of the in-group and its values) [8], and (ii) the pleasure-pain association generalizes to entire groups; individuals who have done nothing to provoke violence become targets by virtue of their affiliation with a competitive, threatening out-group.

Seeds of intergroup conflict: categorization and competition

The ability to categorize people into social groups is not only advantageous for survival, but also useful for guiding one's own, and predicting others' behavior. Social categorization allows us to generalize our existing knowledge about social groups to novel targets [9]. In contrast to other forms of categorization (e.g., fruits vs vegetables), social categorization is unique in that people also categorize themselves [10]. The process of shifting from an individual ('I' or 'me') to collective ('we' or 'us') self-concept is called social identification. This process includes recognizing both that one belongs to the group and that the group is

a central part of the self (e.g., ‘I don’t just live in America, I am *American*’) [11]. Identification leads people to prefer — and contribute greater resources to — fellow in-group members relative to everyone else [12]. Note that in the absence of conflict, inequitable resource allocation and intergroup bias in general are better explained by in-group favoritism rather than out-group hostility [13].

Despite its centrality to group formation and maintenance, ‘in-group love’ is not sufficient to ignite intergroup conflict. This is why only some groups elicit aggression while most others elicit indifference. Instead, intergroup violence is driven by competition over resources and incompatibility between groups’ goals (e.g., violence against Jews in pre-war Europe, brawling among rival sports fans [14–17]).^a Even when groups are not explicitly engaged in competition, social groups with success-oriented values or access to resources are stereotyped as competitive and thus, sometimes sabotaged (e.g., Asians, professional women; [18]). Competition increases perceptions of threat and shifts the mechanism driving intergroup bias from in-group favoritism to out-group antipathy [19]. Specifically, competition moves people from regarding out-groups with indifference to experiencing emotions such as fear, hatred, and disgust [20,21]. These emotions are often used to justify overt discrimination against out-groups and their members [19]; for example, propaganda demonizing the Jews in Europe and the Tutsi in Rwanda, as well as anti-miscegenation laws in Nazi Germany and Apartheid South Africa.

It is worth highlighting that the effect of competition is not equivalent in interpersonal and intergroup contexts. In explicitly competitive contexts, people act less cooperatively toward groups than they do toward individuals (e.g., they defect more often in the prisoner’s dilemma game [22]) and behave more aggressively in intergroup as compared to interpersonal interactions (e.g., they assign other participants to drink spicier hot sauce when making the decision as a group [23]). Thus, our moral codes may promote equity between individuals and prohibition against harm in interpersonal contexts, but we bring different rules to bear on intergroup interactions [24,25].

Why do groups change individuals’ behavior?

Participation in collective violence requires that people behave in ways that likely conflict with their personal moral standards. Several circumstances enable people to engage in objectionable behavior: when (i) it is possible to reframe and/or justify the action as serving a greater good [26]; (ii) individuals’ sense of personal responsibility is mitigated by obedience to authority [27], anonymity [28,29], or diffusion/displacement of responsibility [30]; and (iii) the salience of individuals’ own moral standards

^a Competition is not the only predictor of intergroup strife. Threat of attack also promotes conflict, as in pre-emptive strikes (e.g., [59]); however, I focus on competition for the purposes of this review.

is low [31]. However, none of these explanations is unique to intergroup contexts. These circumstances could lead individuals in crowds to engage in immoral behavior out of individual self-interest. Furthermore, by many of these accounts, people are not actively choosing to act immorally so much as they are reflexively responding to the pressures exerted by the situation [32].

We recently conducted an fMRI study investigating whether people’s sensitivity to their own moral behaviors is reduced in competitive intergroup contexts. Specifically, we examined whether competing as a member of a group (vs alone) reduced participants’ self-referential neural responses — localized to the medial prefrontal cortex (mPFC) — and facilitated competitor harm. Participants performed a go/no-go task once alone and once with a group. No-go items were related to participants’ and others’ good and bad moral behaviors (e.g., ‘I have stolen food from a shared refrigerator,’ ‘She always holds the door for others,’ which we assessed via pre-test). In the group condition, participants who exhibited reduced mPFC response to first person (vs third person) moral items selected less flattering photos of competitors for publication (our index of harm). There was no relationship between mPFC and harm in the alone condition. These results suggest that, for some people, intergroup competition — above and beyond interpersonal competition — reduces the salience of their own morality, enabling greater harm of competitive out-group members [33].

One crucial condition for acting on behalf of a group in general — and for collective violence in particular — is high identification and coordinated behavior with the in-group [32,34]. Under certain conditions, group identification can crowd out or become ‘fused’ with one’s individual identity, motivating people to act as representatives of the group rather than individual agents [11]. When this occurs, group goals supersede individual goals. In cases where the in-group’s goals require harming the out-group, people do not comply mindlessly. Instead, people who are highly identified with the group deliberately choose to endorse or do harm because they believe it is the right thing to do [8,32]. They do so even at great personal cost; increased identity fusion is correlated with greater willingness to fight and die for the in-group [35]. Nevertheless, people who have adopted the group’s goals and morally justified the commission of harm against out-group targets may still have reservations about being the agents of harm against out-group targets.

Overcoming aversion to doing harm in intergroup contexts

Over the last 60 years, psychologists have posited many explanations for how people overcome their aversion to harming others, including, but not limited to moral disengagement [27,36] and shifting attitudes about violence

to reduce dissonance [37]. These explanations are not unique to intergroup contexts. However, several features of group life facilitate the deployment of these processes. Specifically, dehumanization [38,39] and the disruption of empathy enable moral disengagement and rationalization of out-group harm (e.g., [40]). I focus on the latter, empathic failures, here.

Though it is not often conceptualized as an intergroup emotion, empathy is reliably moderated by group membership and identification. On average, people feel less empathy for out-group relative to in-group members: we term this difference the *intergroup empathy bias* [41,42]. Consistent with behavioral findings, dozens of studies have reported that people show decreased and sometimes absent physiological responses associated with empathy when witnessing out-group relative to in-group members in physical or emotional pain (see [43] for a recent review). This bias matters because the absence of empathy implies a reduction in motivation to engage in pro-social behavior toward those who are suffering.

One key insight, however, is that the absence of empathy is not antipathy: it is callousness. Failures of empathy may allow people to feel indifference toward out-group suffering, but should not promote active harm. For example, people may cross the street to avoid speaking to a homeless man, but they rarely go out of their way to harass him. On the other hand, pleasure in response to others' misfortunes — Schadenfreude — or displeasure in response to others' triumphs — Glückschmerz — are feasible motivators of collective violence.

Several conditions predict the experience of Schadenfreude in interpersonal and intergroup contexts (see [44^{*}] for a review). Here, I focus on the effect of intergroup competition [45]. In order for Schadenfreude to qualify as an intergroup emotion, people must feel it *on behalf of their group*. People only appraise events from an intergroup perspective when they are highly identified with the relevant in-group [46]. For example, college basketball fans' identification with their team predicted greater Schadenfreude in response to a rival player's injury. In turn, the fans' Schadenfreude correlated with greater disappointment in response to news that the injury was not dire [47^{*}]. Another recent experiment reported that soccer fans smiled more intensely, as measured by facial electromyography (EMG), when they watched a rival soccer team miss a penalty kick relative to when they watched their favored team make the goal [48]. In both of these studies, fans appraised rivals' misfortunes from a group perspective; rivals' misfortunes only took on a positive value by virtue of the fact that fans identified with their favored teams.

Crucially, groups do not need to have a long history of rivalry to elicit these emotions. Across several recent experiments, participants reported greater Schadenfreude

and Glückschmerz toward out-group (relative to in-group) members only minutes after being assigned to novel groups in competition for \$1. Comparing responses to in-group and out-group targets against responses to unaffiliated targets revealed that intergroup empathy bias was better characterized by out-group antipathy rather than extraordinary in-group empathy. Making teams independent reduced the intergroup empathy bias; making teams cooperative eliminated it [42]. We have also examined the effect of intergroup competition on Schadenfreude in more subtle social contexts. In the absence of any overt competition, people smiled more (as measured by facial EMG) when stereotypically competitive targets (e.g., an investment banker) experienced negative versus positive events [49]. Together, these results indicate that a target can evoke these malicious emotional responses in the absence of any personal history or direct contact with the perceiver, merely because of their group membership and its associated stereotypes (see also, [50]).

Motivating participation in collective violence: supporting fMRI evidence

Schadenfreude and Glückschmerz are natural responses in zero-sum contexts; if 'they' are unhappy, 'we' are pleased. These emotions emerge even among arbitrary competitive groups with no prior history of animus. These findings suggest that once a group is marked as competitive, Schadenfreude and Glückschmerz follow: no learning is required. That said, many emotions serve important group survival functions, including stimulating group-promoting behavior. For example, guilt is a crucial emotion in groups because it encourages cooperation and inhibits defection [51]. Given that group survival may require some members to harm out-groups on behalf of the in-group, one intriguing possibility is that Schadenfreude serves the function of motivating participation in collective violence by teaching people to overcome the aversion to harming others (i.e., out-group members).

There are now several fMRI studies that have investigated interpersonal Schadenfreude and related phenomena, all of which find that greater Schadenfreude is associated with increased ventral striatum (VS) engagement (e.g., [52,53]). This finding replicates in intergroup contexts, in which participants identify with one of two competitive groups but have not been the direct targets of competitive behavior. In one study, Boston Red Sox and New York Yankees (archrival) fans reported pleasure and exhibited activity in VS when watching rivals fail to score (even against a lower ranked team, the Baltimore Orioles; [54^{**}]). In another study, these findings extend to individuals merely associated with the rival team: soccer fans exhibited VS activity when watching a rival team's *fan* receive a painful electric shock [55^{**}].

There are several regions of the brain that support encoding and representing subjective value, but VS is associated

specifically with reinforcement-learning (i.e., learning stimulus–value associations and acquiring predictive value representation) in the service of maximizing positive outcomes [56]. Thus, these data implicate not only the VS's valuation function (i.e., evaluating out-group harm as positive), but also its motivation function (i.e., learning to select behaviors that harm the out-group and associated individuals).

I propose that the capacity for collective violence may have developed, in part, by appropriating basic reinforcement-learning processes and associated neural circuitry in order to overcome harm aversion. In support of this proposal, greater VS response to a rival's suffering — in the context of the baseball and soccer studies described above — predicted an increased desire to harm rival team fans [54**] and a decreased willingness to relieve a rival fan's pain (by accepting a proportion of the pain for oneself) [55**]. Thus, not only does the motivational signal associated with Schadenfreude predict intergroup harm, the harm generalizes to individuals merely associated with the teams under consideration.

Caveats and future directions

It is important to note that this proposal does not assume that collective violence is explained entirely by VS activity. Participation in collective violence is a multiply determined phenomenon with many causes and consequences. Intergroup competition, group identification (or fusion), and moral justifications are all crucial preconditions for collective violence. Rather, I suggest that the motivation to do harm on behalf of one's group may be internalized via basic learning processes and generalized to innocent targets. These findings fit well with research indicating that committing one violent act on another's command increases the probability of committing a second violent act of one's own volition [57].^b

Future research will need to employ a continuous, repeated-trial design to test directly whether people are learning to do harm from Schadenfreude. Specifically, does Schadenfreude at time t increase aggression on behalf of the group at time $t + 1$? Does it do so even in the absence of a prior desire to do harm? Future studies will also have to test the generalizability of these predictions in groups entrenched in material or ideological conflict (e.g., among newly initiated gang members, or Arab and Israeli youth). Another interesting possibility is that increases in willingness to harm out-group members will predict increased identification with the in-group. In other words, the pleasure of witnessing and doing out-group

^b It is also important to note that institutional violence has decreased dramatically over the course of the last century, and particularly within the last several decades. Furthermore, recent statistics indicate that many more people are killed in interpersonal than in intergroup conflicts [6]. These statistics do not, however, negate the importance of understanding and reducing intergroup violence.

harm may further reinforce group identification, creating a self-perpetuating cycle of collective violence [7]. In line with this, Littman [58**] finds that ex-combatants in Uganda and Liberia who were abducted by the Lord's Resistance Army (LRA) as youths and forced to harm loved ones on its behalf, are more highly identified with the LRA than abducted youths who were not forced to harm loved ones. Ultimately, a better understanding of all the mechanisms promoting collective violence will inform best practices for defusing it.

Authors notes

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Conflict of interest statement

Nothing declared.

References

- Allport GW: *The nature of prejudice*. Reading, MA: Addison Wesley; 1954, .
- Cohen TR, Insko CA: **War and peace: possible approaches to reducing intergroup conflict**. *Perspect Psychol Sci* 2008, **3**:87-93.
- Woolf LM, Hulsizer MR: **Hate groups for dummies: how to build a successful hate group**. *Human Soc* 2004, **28**:40-62.
- Crockett MJ, Kurth-Nelson Z, Siegel JZ, Dayan P, Dolan RJ: **Harm to others outweighs harm to self in moral decision making**. *Proc Natl Acad Sci* 2014, **111**:17320-17325.
Contrary to evidence that people are more self-than other-interested, this experiment reveals that people are willing to pay more money to prevent others' relative to their own pain (i.e., painful electric shocks).
- Cushman F, Gray K, Gaffey A, Mendes WB: **Simulating murder: the aversion to harmful action**. *Emotion* 2012, **12**:2-7.
- Pinker S: *The Better Angels of Our Nature: The Decline of Violence in History and Its Causes*. UK: Penguin; 2011, .
- Littman R, Paluck EL: **The cycle of violence: understanding individual participation in collective violence**. *Adv Political Psychol* 2014. in press.
This review integrates research across the psychological sciences to examine paradox of collective violence. The authors review evidence from social and moral psychology, military history, and public health in support of a model in which group identification motivates participation in collective violence, and collective violence, in turn, increases group identification.
- Fiske AP, Rai TS: *Virtuous Violence: Hurting and Killing to Create, Sustain, End, and Honor Social Relationships*. Cambridge University Press; 2014.
- Bruner JS: **On perceptual readiness**. *Psychol Rev* 1957, **64**:123-152.
- Tajfel H, Turner J: **An integrative theory of intergroup conflict**. In *The Social Psychology of Intergroup Relations*. Edited by Austin WG, Worschel S. Pacific Grove, CA: Brooks/Cole Publishing; 1979:33-47.
- Ellemers N: **The group self**. *Science* 2012, **336**:848-852.
- Hewstone M, Rubin M, Willis H: **Intergroup bias**. *Annu Rev Psychol* 2002, **53**:575-604.

13. Brewer MB: **The psychology of prejudice: ingroup love and out-group hate?** *J Social Issues* 1999, **55**:429-444.
14. Campbell DT: **Ethnocentric and other altruistic motives.** *Nebraska Symposium on Motivation*, vol. 13. 1965:283-311.
15. Fiske ST, Ruscher JB: **Negative interdependence and prejudice: whence the affect?** In *Affect, Cognition, and Stereotyping: Interactive Processes in Group Perception*. Edited by Mackie DM, Hamilton DL. San Diego, CA: Academic Press; 1993:239-268.
16. Sherif M, Harvey OJ, White BJ, Hood WR, Sherif CW: *Intergroup Cooperation and Competition: The Robbers Cave Experiment*. Norman, OK: University Book Exchange; 1961, .
17. Sidanius J, Pratto F: *Social Dominance: An Intergroup Theory of Social Hierarchy and Oppression*. New York, NY: Cambridge University Press; 1999, .
18. Fiske ST, Cuddy AJC, Glick P, Xu J: **A model of (often mixed) stereotype content: competence and warmth respectively follow from perceived status and competition.** *J Personal Social Psychol* 2002, **82**:878-902.
19. Brewer MB: **In-group identification and intergroup conflict: when does in-group love become out-group hate?** In *Social Identity, Inter-group Conflict, and Conflict Reduction*. Edited by Ashmore RD, Jussim L, Wilder D. New York: Oxford University Press; 2000.
20. Cuddy AJC, Fiske ST, Glick P: **The BIAS map: behaviors from intergroup affect and stereotypes.** *J Personal Social Psychol* 2007, **92**:631-648.
21. Mackie D, Hamilton D: *Affect, Cognition, and Stereotyping*. San Diego, CA: Academic; 1993, .
22. Insko CA, Wildschut T, Cohen TR: **Interindividual–intergroup discontinuity in the prisoner’s dilemma game: how common fate, proximity, and similarity affect intergroup competition.** *Organ Behav Human Decision Process* 2013, **120**:168-180.
23. Meier BP, Hinsz VB: **A comparison of human aggression committed by groups and individuals: an interindividual–intergroup discontinuity.** *J Exp Social Psychol* 2004, **40**:551-559.
24. Cohen TR, Montoya RM, Insko CA: **Group morality and intergroup relations: cross-cultural and experimental evidence.** *Personal Social Psychol Bull* 2006, **32**:1559-1572.
25. Rhodes M, Chalik L: **Social categories as markers of intrinsic interpersonal obligations.** *Psychol Sci* 2013, **24**:999-1006.
26. Pinter B, Wildschut T: **Self-interest masquerading as ingroup beneficence: an altruistic rationalization explanation of the interindividual–intergroup discontinuity effect.** *Small Group Res* 2012, **43**:105-123.
27. Milgram S: **Some conditions of obedience and disobedience to authority.** *Hum Relat* 1965, **18**:57-76.
28. Diener E: **Deindividuation, self-awareness and disinhibition.** *J Personal Social Psychol* 1979, **37**:116-171.
29. Festinger L, Pepitone A, Newcomb T: **Some consequences of deindividuation in a group.** *J Abnormal Social Psychol* 1952, **47**:382-389.
30. Bandura A: **Moral disengagement in the perpetration of inhumanities.** *Personal Social Psychol Rev* 1999, **3**:193-209.
31. Prentice-Dunn S, Rogers RW: **Deindividuation and the self-regulation of behavior.** In *The Psychology of Group Influence*, 2nd ed.. Edited by Paulus PB. Hillsdale, NJ: Erlbaum; 1989:86-109.
32. Reicher S, Haslam SA, Rath R: **Making a virtue of evil: a five-step social identity model of the development of collective hate.** *Social Personal Psychol Compass* 2008, **2**:1313-1344.
33. Cikara M, Jenkins AC, Dufour N, Saxe R: **Reduced self-referential neural response during intergroup competition predicts competitor harm.** *NeuroImage* 2014, **96**:36-43.
34. Cikara M, Paluck EL: **When going along gets you nowhere and the upside of conflict behaviors.** *Social Personal Psychol Compass* 2013, **7**:559-571.
35. Swann WB, Gomez A, Huici C, Morales JF, Hixon JG: **Identity fusion and self-sacrifice: arousal as a catalyst of pro-group fighting, dying, and helping behavior.** *J Personal Social Psychol* 2010, **99**:824-841.
36. Opatow S: **Hate, conflict, and moral exclusion.** In *The Psychology of Hate*. Edited by Sternberg RJ. Washington, DC: American Psychological Association; 2005:121-153.
37. Festinger L: *A theory of cognitive dissonance*. Evanston, IL: Row, Peterson; 1957, .
38. Haslam N, Loughnan S: **Dehumanization and inhumanization.** *Annu Rev Psychol* 2014, **65**:399-423.
39. Kelman HG: **Violence without moral restraint: reflections on the dehumanization of victims and victimizers.** *J Social Issues* 1973, **29**:25-61.
40. Hammack PL: **Narrative and the cultural psychology of identity.** *Personal Social Psychol Rev* 2008, **12**:222-247.
41. Cikara M, Bruneau EG, Saxe R: **Us and them: intergroup failures of empathy.** *Curr Direct Psychol Sci* 2011, **20**:149-153.
42. Cikara M, Bruneau EG, Van Bavel JJ, Saxe R: **Their pain gives us pleasure: how intergroup dynamics shape empathic failures and counter-empathic responses.** *J Exp Social Psychol* 2014, **55**:110-125.
43. Cikara M, Van Bavel JJ: **The neuroscience of intergroup relations: an integrative review.** *Perspect Psychol Sci* 2014, **9**:245-274.
44. Smith RH, Powell CAJ, Combs DJY, Schurtz RD: **Exploring the when and why of Schadenfreude.** *Social Personal Psychol Compass* 2009, **3**:530-546.
- This paper offers a comprehensive review of the conditions under which people are most likely to experience Schadenfreude, both in response to individuals’ as well as groups’ misfortunes.
45. Cikara M, Fiske ST: **Their pain, our pleasure: stereotype content and Schadenfreude.** *Anna New York Acad Sci* 2013, **1299**:52-59.
46. Mackie DM, Devos T, Smith ER: **Intergroup emotions: explaining offensive action tendencies in an intergroup context.** *J Personal Social Psychol* 2000, **79**:602.
47. Hoogland CE, Schurtz DR, Cooper CM, Combs DJ, Brown EG, Smith RH: **The joy of pain and the pain of joy: in-group identification predicts schadenfreude and gluckschmerz following rival groups’ fortunes.** *Motivation Emotion* 2014:1-22.
- In a series of 4 behavioral studies, fans’ identification with their favored team predicted greater Schadenfreude in response to a rival (but not non-rival) group member’s injury. Schadenfreude, in turn, predicted greater disappointment in hearing the injury was not serious. Severity of the injury and level of physical pain did not moderate the effect.
48. Boecker L, Likowski KU, Pauli P, Weyers P: **The face of schadenfreude: differentiation of joy and schadenfreude by electromyography.** *Cogn Emotion* 2014:1-9. (ahead-of-print).
49. Cikara M, Fiske ST: **Stereotypes and Schadenfreude: behavioral and physiological markers of pleasure at others’ misfortunes.** *Social Psychol Personal Sci* 2012, **3**:63-71.
50. Cikara M, Fiske ST: **Bounded empathy: neural responses to out-group targets’ (mis)fortunes.** *J Cogn Neurosci* 2011, **23**:3791-3803.
51. Spoor JR, Kelly JR: **The evolutionary significance of affect in groups: communication and group bonding.** *Group Processes Intergroup Relat* 2004, **7**:398-412.
52. Singer T, Seymour B, O’Doherty JP, Stephan KE, Dolan RJ, Frith CD: **Empathic neural responses are modulated by the perceived fairness of others.** *Nature* 2006, **439**:466-469.
53. Takahashi H, Kato M, Matsuura M, Mobbs D, Suhara T, Okubo Y: **When your gain is my pain and your pain is my gain: neural correlates of envy and Schadenfreude.** *Science* 2009, **323**:937-939.
54. Cikara M, Botvinick MM, Fiske ST: **Us versus them: social identity shapes neural responses to intergroup competition and harm.** *Psychol Sci* 2011, **22**:306-313.
- In this fMRI study, highly identified baseball fans watched plays in which their favored and rival teams succeeded and failed to score against each

other and a 3rd team. Subjective ratings of pleasure when watching the favored team score and rival team fail correlated with VS activity, which predicted participants' self-reported willingness to harm rival fans, controlling for general tendencies toward aggression (1–2 weeks later).

55. Hein G, Silani G, Preuschoff K, Batson CD, Singer T: **Neural responses to in-group and out-group members' suffering predict individual differences in costly helping.** *Neuron* 2010, **68**:149-160.

In this fMRI study, soccer fans watched fellow and rival fans receive electric shocks. Greater VS activity in response to rival fan's receiving shocks predicted decreased willingness to engage in costly helping (i.e., taking some of the shock in order to reduce the rival fan's pain).

56. O'Doherty JP: **Reward representations and reward-related learning in the human brain: insights from neuroimaging.** *Curr Opin Neurobiol* 2004, **14**:769-776.

57. Martens A, Kosloff S, Jackson LE: **Evidence that initial obedient killing fuels subsequent volitional killing beyond effects of practice.** *Social Psychol Personal Sci* 2010, **1**:268-273.

58. Littman R: **Does violence increase group identification? Evidence from ex-combatants in Uganda and Liberia.** 2014, manuscript in preparation.

This study capitalizes on the LRA's seemingly random abduction of children (e.g., militants may kidnap one child but leave a sibling) to determine whether being assigned to commit violence on behalf of a group increases identification with that group later in life.

59. De Dreu CKW, Shalvi S, Greer LL, Van Kleef GA, Handgraaf MJ: **Oxytocin motivates non-cooperation in intergroup conflict to protect vulnerable in-group members.** *PLoS ONE* 2012, **7**:e46751.