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Taking one for the team: Physiological trajectories of painful intergroup retaliation

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ABSTRACT

Retaliating against a threatening outgroup offers group members specific rewards, such as restored group esteem, a reduction in anger, and a sense of gratification. Because retaliation is rewarding, group members may appraise an attack on the outgroup to be beneficial, even if it feels physically painful. We hypothesized that group members would be more willing to endure pain to retaliate against a threatening outgroup, and that appraising the painful retaliation as rewarding would down-regulate their physiological stress response to pain. Participants were manipulated to feel threatened by a rival group and then completed the cold-pressor. During the cold-pressor, participants either retaliated against the outgroup or not. Results showed that retaliation inhibited physiological responses to pain, alleviated intergroup anger, and felt less aversive. We propose that these responses are caused by a cognitive reappraisal of pain, where painful retaliation is expected to be rewarding instead of threatening.

1. Introduction

Making painful sacrifices for one's group during intergroup violence is common—rioters risk physical assault, fire hoses, and pepper spray while opposing law enforcement; infantrymen expose themselves to open fire when attacking enemies; and gang members retaliate against rival groups, fully aware that the confrontation could end in injury or death. While many factors are involved in intergroup violence, one variable that may drive angry group members to make painful sacrifices for their group is the satisfaction felt from harming their target. Group members may cognitively appraise the painful confrontation as rewarding, which may, in turn, decrease their physical experience of pain. The current study tests a novel hypothesis that when retaliating against a threatening outgroup, group members *choose to endure more pain* and actually *feel less of it.*

1.1. Retaliation

Identifying with a social group offers many benefits, one of which is a source of self-esteem for group members [3, 48]. However, outgroups can damage group member esteem through threats that undermine the group's reputation, honor, or identity [47]. Social identity threats hurt at both the group and the personal level [44], and one way to restore damaged esteem is to respond aggressively in retaliation [7, 12]. In addition to damaged esteem, outgroup threats also cause group-level anger and a motivation to approach, confront, or attack the outgroup in retaliation (i.e., approach motivation; [34, 35]). Research demonstrates that after successfully retaliating, intergroup anger and the motivation to approach the outgroup discharge [35]. The process by which retaliation alleviates intergroup anger and approach motivation is referred to as the regulatory function of intergroup anger [35].

In addition to a reduction in anger and restored esteem, acts of aggression toward the outgroup feel satisfying [35, 36]. Using fMRI data, Chester and DeWall [10] demonstrated that the nucleus accumbens was more active during retaliatory aggression vs. non-retaliatory aggression, suggesting that retaliatory behavior was rewarding. Studies also show that group members report feeling satisfied after witnessing an outgroup's misfortune [9, 13, 21, 29], or when retaliating against a threatening outgroup [35, 36].

Retaliation, then, offers significant emotional rewards, including restored group esteem, reductions in anger, and feelings of satisfaction. It is unclear, however, if these rewards drive group members to endure more extreme, risky, or harmful conditions when attacking the outgroup. Particularly, research has not yet empirically tested how much physical pain group members are willing to endure when retaliating against a rival outgroup. The current experiment will test this

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hypothesis for the first time while considering a mechanism that could inhibit the pain experienced from retaliation: cognitive appraisal.

1.2. Cognitive appraisal

Physical pain is extremely distressing to humans, causing intense physiological stress responses (e.g., sympathetic nervous system and hypothalamic-pituitary-adrenal [HPA] axis activation) and pain avoidant-behaviors (e.g., withdrawal). These responses facilitate an effective response to danger [26]. Even though humans are biologically programmed to avoid pain, group members continue to endure pain to attack hated groups [11]. One possible explanation for this behavior is that the emotional rewards earned during the attack (reduction in anger, increased satisfaction) cause group members to appraise the pain as rewarding, making them more willing to "take one for the team".

Cognitive appraisal is a top-down process that describes how a stimulus is interpreted [5]. An individual can perceive the same stimulus to be harmful or beneficial, altering the trajectory of their physiological stress response [28]. For example, Speisman et al. [45] demonstrated that cognitively appraising a stressful stimulus as less aversive decreased one's autonomic stress response to it. In their experiment, participants watched video footage of adolescent boys undergoing a painful ritualistic procedure (subincision) that, normally, is highly disturbing and causes significant physiological stress for the viewer. However, in one condition the video soundtrack emphasized that the ritual was a positive and prideful experience for the boys and deemphasized the painful nature of the procedure. Appraising the ritual as beneficial, versus threatening, led to significantly lower skin conductance. Other research shows that reappraisal decreases diastolic blood pressure when being verbally harassed [46], decreases startle response magnitude and corrugator activation while viewing unpleasant images [22], and that reappraisal is overall an effective method of regulating negative emotion in response to aversive events [18]. Because attacking the outgroup relieves anger and feels gratifying, group members may expect painful retaliation to be rewarding. Reappraising the painful confrontation as beneficial instead of harmful would then down-regulate the physiological stress response to pain and decrease the subjective experience of pain during retaliation.

1.3. The current study

The current study tested if the expected rewards derived from retaliation alter a group member's pain endurance and their physiological response to it. In a between-groups experimental design, participants were told that they would be participating in a competition against a rival university and that the goal of the competition was for one's own university to have the most points at the end of the semester. All participants were manipulated to feel threatened by the rival university and were then randomly assigned to one of two conditions. In the *retaliation* condition, participants could subtract points from the rival university by completing a painful task (the cold-pressor; [33]). In the *non-retaliation* condition, participants completed the cold-pressor but knew that it would not subtract points from the rival team. We predicted that compared to non-retaliation, retaliation participants would (H1) choose to endure the painful task for longer, (H2) show lower physiological stress in response to the painful task (lower skin conductance and lower cortisol concentration), and (H3) report that the painful task was less painful. We also predicted that retaliation participants would (H4) show a greater decrease in intergroup anger and approach motivation after the painful task, and (H5) report more satisfaction with the painful task.

2. Method

2.1. Participants

The Institutional Review Board at Texas Tech University approved this experiment, and all participants provided informed consent before participation. Seventy-four introductory psychology students (26 males, 48 females, M_{age} = 19.32, SD_{age} = 3.07) participated in the study for course credit. The ethnic breakdown was Black/African American (14.6%), Asian/Pacific Islander (6.8%), White/European American/Caucasian (59.2%), Hispanic/Latino (22.3%), Native American/Alaska Native (0%), Multi-racial (0%), and other (2.9%). The cold-pressor task typically causes large effects for stress (see [6, 31]), but to err on the side of caution we predicted a medium effect size (f = 0.35) and desired 90% power to detect our effect. For that reason, we aimed to collect 68 participants for this study, and we chose to stop data collection at the end of the semester. By the end of the semester we had collected data from 74 participants.

2.2. Materials and methods

2.2.1. Preparation

On the day of the study, we asked participants to refrain from activities that affect salivary cortisol levels (e.g., smoking, drinking caffeine). To control for the circadian rhythm of cortisol, participants were scheduled to come to the lab between 11:30 am and 3:45 pm. Before each experimental session, the experimenter prepared an ice bath for the cold-pressor task by mixing water and ice together in a 17 l plastic bin using a 1:1 ratio (2840 ml of water, 2840 ml of ice cubes). The ice water was deep enough so that an individual's hand would be completely immersed in the water when held flat on the bottom of the bin. Following previous research (e.g., [23, 50]), the experimenter confirmed that the water temperature was 4 °C using a thermometer. A new ice bath was prepared for each participant to maintain the same water temperature across participants.

When participants arrived, they completed the consent form and were asked to rinse out their mouths with water and wash their hands with warm water and soap. Once seated in the room, the participant's palm was cleaned using a sterile gauze pad and distilled water. To measure skin conductance, two electrodes were attached to the palm of the participant's non-dominant hand. Skin conductance was recorded via BioPac Systems Inc. MP150 EDA module and disposable electrodes (EL 507's), and data collection was controlled via the BioPac Systems AcqKnowledge 4.4 software. After waiting ten minutes from when they rinsed out their mouths, and after electrodes were fixed to the participants' skin, participants provided a 0.5 ml baseline saliva sample via the passive drool method. The experimenter then recorded a 5-s baseline of skin conductance. Finally, participants were seated at the computer to begin the competition portion of the study.

2.2.2. Cover story

Participants were then told that for the competition they would be competing against a lab at a rival university for points, and that the university with the most points at the end of the semester would win the competition. They were told that the competition had been underway for several weeks, and that each student who participates has the chance to contribute to his or her team's standing by completing a task that would be described later.

2.2.3. Threat manipulation

All participants were then shown an electronic message board that displayed competitive comments ostensibly written by the participants from the rival team. In reality, the comments were created by the researchers and were designed to be insulting to participants and their university (adapted from [41]). It was intended that the comments made participants angry and motivated to retaliate against the rivals