

1-1-2003

The effects of rumination on triggered displaced aggression

Angelica M. Bonacci
Iowa State University

Follow this and additional works at: <https://lib.dr.iastate.edu/rtd>

Recommended Citation

Bonacci, Angelica M., "The effects of rumination on triggered displaced aggression" (2003). *Retrospective Theses and Dissertations*. 19906.
<https://lib.dr.iastate.edu/rtd/19906>

This Thesis is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.

The effects of rumination on triggered displaced aggression

by

Angelica M. Bonacci

A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Psychology

Program of Study Committee:

Brad J. Bushman, Major Professor

Craig A. Anderson

Dean C. Adams

Doug G. Bonett

Iowa State University

Ames, Iowa

2003

Copyright © Angelica M. Bonacci, 2003. All rights reserved.

Graduate College
Iowa State University

This is to certify that the master's thesis of
Angelica M. Bonacci
has met the thesis requirements of Iowa State University

Signatures have been redacted for privacy

TABLE OF CONTENTS

LIST OF FIGURES	iv
LIST OF TABLES	v
ABSTRACT	vi
INTRODUCTION	1
Displaced Aggression	1
Triggered Displaced Aggression	3
The General Aggression Model and Triggered Displaced Aggression	7
Triggered Ruminative Aggression	11
Current Study	13
METHODS	16
Participants	16
Design	16
Procedures	16
RESULTS	24
Preliminary Analyses	24
Statistical assumptions	24
Order effects	27
Primary Analyses	27
Sex differences	27
Main effects and interactions	28
Mediation Analyses	30
DISCUSSION	36
A Theoretical Explanation for Rumination Effects	40
Limitations and Future Directions	42
Conclusion	44
REFERENCES	46f

LIST OF FIGURES

Figure 1. The General Aggression Model (Anderson & Bushman, 2002a)	8
Figure 2. Interaction between participant sex and rumination on hot sauce allocation	28
Figure 3. Effects of triggering event and rumination on hot sauce allocation after an initial provocation	29
Figure 4. Effects of triggering event and rumination on hot sauce allocation without an initial provocation	30
Figure 5. Perception of trigger negativity as a mediator between trigger and displaced aggression for provoked participants who ruminated	32
Figure 6. Perception of trigger negativity as a mediator between trigger and displaced aggression for provoked participants who were distracted	33
Figure 7. Perception of trigger negativity as a mediator between trigger and displaced aggression for nonprovoked participants who ruminated	33
Figure 8. Perception of trigger negativity as a mediator between trigger and displaced aggression for nonprovoked participants who were distracted	33
Figure 9. Perception of trigger negativity as a mediator between trigger and displaced aggression for provoked participants who ruminated	34

LIST OF TABLES

Table 1. Descriptive statistics for hot sauce allocation (grams) for the reduced data set	25
Table 2. Descriptive statistics for perceived negativity of the triggering event (standardized score) for the reduced data set	26
Table 3. Variance-covariance matrices used for LISREL mediation analyses	31

ABSTRACT

The current study examined the role of rumination, or self-focused attention on one's thoughts and feelings, on triggered displaced aggression. Ruminating about a provocation is expected to maintain an aggressive internal state, which disposes individuals to act aggressively in ambiguously provoking situations by leading to the interpretation of minor annoyances as provoking, and deserving of an aggressive retaliation. Being distracted from thinking about a provocation is expected to abate a provocation-induced aggressive internal state, thus reducing displaced aggression. In the current study, participants were either provoked by interacting with an insulting experimenter and engaging in a difficult task, or not provoked by interacting with a pleasant experimenter and engaging in an easy task. Participants were then induced to ruminate about their experience, or were distracted from thinking about it. Half of the participants then received a mildly negative evaluation (trigger) from a partner, or a neutral evaluation (no trigger). As expected, provoked participants who ruminated were more aggressive against a triggering target than a nontriggering target. The presence or absence of a triggering event had no effect on provoked participants who were distracted, or nonprovoked participants. Negative perceptions of the triggering event mediated the relationship between trigger and displaced aggression for provoked participants who ruminated, but did not serve as a mediator for other participants. The results of the current study suggest that ruminating about a provocation disposes individuals to interpret mild annoyances as provoking and warranting an aggressive response. When prevented from thinking about a

provocation, individuals do not interpret mild annoyances as provoking enough to warrant an aggressive response.

INTRODUCTION

Carol, a college student, spent several weeks preparing a class presentation. After her presentation, her professor harshly criticizes her performance, suggesting that she was ill-prepared. Carol silently fumes about her professor's comments the rest of the day. When she returns to her apartment that afternoon, she finds that her roommate left dirty dishes in the sink. Carol turns to her roommate, and screams at her for being a slob.

Displaced Aggression

Aggression sometimes follows a straightforward series of steps. That is, an individual is provoked by someone, and in retaliation, inflicts harm against the provoking individual. This type of aggression is defined as *direct aggression*, or aggression directed towards a provoking agent (Geen, 2001). However, the target of aggression is not always a provoking individual. Rather, the target is an innocent person, or a person who has only committed a mildly annoying offense. Aggression that is directed towards individuals other than the provoking agent is defined as displaced aggression (Geen, 2001).

The scientific study of displaced aggression stems from the tenants of the frustration aggression hypothesis developed by Dollard and colleagues (Dollard, Doob, Miller, Mowrer, & Sears, 1939). In brief, the frustration-aggression hypothesis argues that frustration produces an instigation, or disposition, to aggress. Frustration is defined as any act or event that impedes the attainment of a goal. In its most rudimentary form, the frustration-aggression hypothesis argued that aggression is

always preceded by some form of frustration, and aggression is always a consequence of frustration, though contemporary psychologists have rejected the absolutism of this argument (Geen, 2001). Displaced aggression was a corollary to the original frustration-aggression hypothesis. Dollard and colleagues (1939) argued that aggression served to reduce frustration. They argued that when frustrated, individuals are in an aggressive state, and aggression will follow. Displaced aggression is thought to occur because direct aggression against a frustrating agent is not possible, and therefore, as a substitute, aggression is aimed at a seemingly innocuous person.

Though directly aggressing against a provoker (a frustrating agent) seems logical, there are three circumstances when such behavior is impossible or unwise (Miller, 1941). First, the provoking agent may be unavailable. For example, the provoker could leave before retaliation is possible. Second, the provoking agent may be an intangible entity, such as hot temperatures, foul odors, or air pollution (Anderson, Anderson, Door, DeNeve, & Flanagan, 2000; Baron & Bell, 1975; Konecni & Doob, 1972, Rotton, Barry, Frey, & Soler, 1978). Third, direct aggression against a provoker may be unwise because it would prompt subsequent retaliation or punishment. For example, the provoker could have power over the individual, such as a boss. Because aggression is not possible in any of the aforementioned situations, aggression that would be directed towards the aggressor is, instead, directed towards an available and unthreatening target.

The notion of displaced aggression certainly seems intuitively appealing, and applicable to many instances of “real life” aggression, such as the aggression

described in the opening vignette. However, despite its intuitive appeal, interest in experimental research on displaced aggression was not always abundant. Though the formation of the frustration-aggression hypothesis spawned an initial wave of research on displaced aggression, interest waned in the past few decades. Also, content analysis of recent social psychology textbooks suggests a lack of confidence in the reliability of displaced aggression findings (Marcus-Newhall, Pedersen, Carlson, & Miller, 2000). However, a recent meta-analysis by Marcus-Newhall and colleagues (Marcus-Newhall et al., 2000) suggests that displaced aggression is a reliable phenomenon, producing effects that are moderate ($d_+ = +.55$) in size (Cohen, 1988).

Triggered Displaced Aggression

In early studies, displaced aggression was conceptualized as aggression directed towards a nonprovoking agent. In traditional displaced aggression paradigms, participants are initially provoked, and then allowed to aggress against a completely innocent, nonprovoking, third-person. However, such studies fail to capture all instances of displaced aggression. Often times, the target of displaced aggression is not completely innocent. As the opening vignette indicates, the target of displaced aggression might commit a mildly annoying act. This type of displaced aggression is called *triggered* displaced aggression (Dollard, 1938). Triggered displaced aggression involves two phases of provocation. That is, after an initial provocation, the target of displaced aggression commits a minor provocation, called a triggering event, that elicits an aggressive retaliation. Thus, with triggered

displaced aggression, the individual is provoked twice: once by the initial provoking agent (e.g., an insulting professor) and once by the target of aggression (e.g., the messy roommate). Miller and Marcus-Newhall (1997) argue that triggered displaced aggression has more ecological validity than non-triggered displaced aggression because it is more representative of “real life” occurrences of displaced aggression.

An interesting characteristic of triggered displaced aggression is that it seems to violate traditional norms that govern social interactions. According to the *matching rule* (Axelrod, 1982), social interactions often follow a tit-for-tat exchange. In some cases of triggered displaced aggression, individuals do not adhere to the tit-for-tat matching rule (Miller & Marcus-Newhall, 1997). The combination of an initial Time 1 provocation and a Time 2 triggering event synergistically combine to elicit a disjunctively augmented aggressive response directed towards the triggering individual (Miller & Marcus-Newhall, 1997). Miller and Marcus-Newhall (1997) define a disjunctively augmented response as an aggressive response directed towards the triggering target that exceeds what would be expected based on a tit-for-tat exchange. That is, the aggressive response directed towards the triggering target exceeds what is expected based on the intensity of the triggering event.

An important caveat is that the intensity of the triggering event must be minor in comparison to the initial provocation in order to observe a disjunctively augmented aggressive response (Miller & Marcus-Newhall, 1997; Pedersen et al., 2000). Minor triggering events are more ambiguous with respect to provocation and intentionality than are strong triggering events. In the absence of the initial Time 1 provocation, a mild Time 2 triggering event might not be judged as provocative. However, a strong

initial provocation might prime individuals to more readily notice these ambiguous triggering events and perceive them as intentional and provoking (Duncan, 1976; Higgins & King, 1981). Therefore, the aggressive retaliation directed towards the triggering target would exceed that which is expected if the ambiguous trigger occurred in the absence of an initial provocation. In contrast, strong Time 2 triggering events are likely to be less ambiguous with respect to provocation and intentionality than are mild triggering events. Therefore, even in the absence of an initial provocation, strong triggering events are likely perceived as provoking, and the aggressive retaliation is expected.

According to Pedersen and colleagues (Pedersen et al., 2000), one problem with most of the initial work, albeit limited, on triggered displaced aggression is that the intensity of the Time 2 triggering event at least equaled, if not exceeded, the intensity of the initial Time 1 provocation (e.g., Baron & Bell, 1975; Carver & Glass, 1978; Geen & Berkowitz, 1967; & Worchel, 1966). For example, in Worchel's (1966) study, the initial provocation was the announcement of a pop quiz, and the trigger was an aggravating insult. In Baron and Bell's (1975) study, the initial provocation was working in a hot and humid room, and the trigger was an insulting confederate. In both the Worchel (1966) and Baron and Bell (1975) studies, the triggering event was likely just as provoking as the initial provocation. In both cases, the results suggest that the interaction between provocation and trigger did not occur. That is, the level of displaced aggression directed towards the triggering target was a function of the additive, not interactive, combination of the provocation and the triggering events.

Recently, however, two studies have successfully examined the interactive effect between a strong initial provocation and a subsequent mild triggering event (Pedersen et al., 2000). In one study the initial provocation was manipulated by having individuals interact with an insulting (provocation) or pleasant (no provocation) experimenter. At Time 2, participants interacted with a confederate who was either incompetent (trigger) or competent (no trigger). As desired, the triggering event was perceived as less aversive than the initial provocation. As expected, previously provoked participants engaged in more displaced aggression in the presence of a triggering event than in its absence. Without an initial provocation, however, the presence or absence of a triggering event had no effect on displaced aggression — indicating that the triggering event was in fact minor. Furthermore, mediation analyses suggest that negative feelings about the triggering event mediated the relationship between the triggering event and subsequent displaced aggression. Among provoked participants, the minor triggering event generated unpleasant feelings, such as anger. These negative feelings, in turn, prompted an aggressive retaliation against the triggering target.

The results of the Pedersen et al. (2000) studies suggest that an initial provocation disposes individuals to react negatively to events, which under normal circumstances would not produce an aversive state. In turn, this negative reaction to seemingly innocuous events prompts an aggressive retaliation that is excessive based on the low provocation level of the event. Thus, a negative internal state appears to be responsible for displaced aggression effects. The General Aggression Model (GAM, Anderson & Bushman, 2002a) provides a theoretical explanation for

how an initial provocation could produce an internal state that disposes individuals to behave aggressively in the presence of a subsequent minor triggering event.

The General Aggression Model and Triggered Displaced Aggression

According to Anderson and Bushman (2002a), one problem in the aggression domain is that hypotheses are derived based on several microtheories of aggression. Such theories include excitation transfer theory (Zillmann, 1971, 1979), social learning theory (Bandura, 1973), and cognitive neoassociation theory (Berkowitz, 1993), among others. The General Aggression Model (GAM; Anderson & Bushman, 2002a) seeks, in part, to integrate various microtheories of aggression into a single model. The model describes a multi-stage process by which person and situation input variables lead to aggressive behavior in a short-term time frame. They do so by influencing several related internal states, and the outcomes of automatic and controlled appraisal (or decision) processes. Figure 1 presents a schematic of GAM.

Any given aggression episode begins with certain inputs. Some of these inputs are person inputs including personality traits (e.g., trait aggressiveness, hostile attribution biases, and narcissism), and positive attitudes towards aggression, among others, which are associated with aggressive behavior (Bushman & Baumeister, 1998, Crick & Dodge, 1994, Dill et al., 1997; Huesmann & Guerra, 1997). In addition to person inputs, situation inputs can also affect aggressive outcomes. For example, provocation and exposure to aggressive cues (e.g., violent

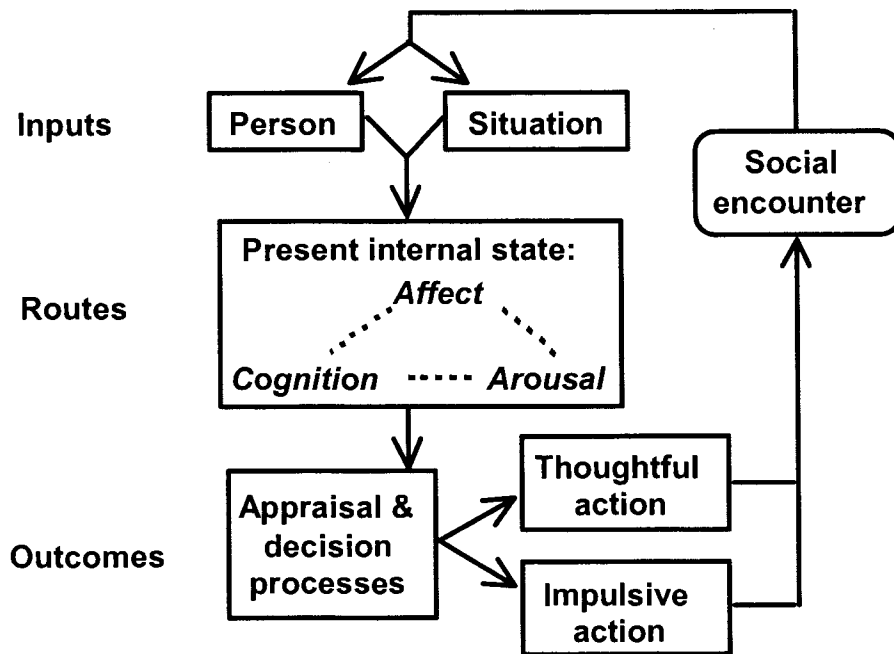


Figure 1. *The General Aggression Model (Anderson & Bushman, 2002a)*

media) increases the likelihood of aggressive responding (Anderson & Bushman, 2002b; Geen, 2001).

The relationship between personal and situational inputs and aggressive outcomes is not direct, but rather mediated through the present internal state of the individual, namely the affective, arousal, and cognitive states (Anderson & Bushman 2002b). For example, being provoked can increase physiological arousal, which could produce an aggressive response, either directly or indirectly through misattributed arousal (Zillmann, 1971, 1979). Likewise, being provoked also produces negative affective states such as feelings of anger and hostility (Anderson & Bushman, 2002a). Finally, personological and situational inputs can produce changes in an individual's cognitive state, such as by increasing hostile cognitions and activating aggressive behavioral scripts, which, in turn, can produce aggressive

behavior (Anderson & Bushman, 2002b; Berkowitz, 1993; Huesmann, 1998). As can be seen by the dashed lines in Figure 1, these present internal states do not act in isolation, but rather influence, and are influenced, by each other. For example, negative affective states, such as anger, can produce increases in physiological arousal, and in the accessibility of aggressive cognitions (Berkowitz, 1993).

The relationship between an individual's present internal state and a given outcome is mediated by appraisal and decision making processes. The first phase in the decision making process is an immediate appraisal. Decisions based on immediate appraisals are made automatically, with little cognitive processing. If there are insufficient cognitive resources to process the appraisal further, or a lack of interest in the outcome, then the immediate appraisal is the final appraisal. Such an appraisal process results in an impulsive action (e.g., hostile aggression). However, if cognitive resources are sufficient, and there is interest in the outcome, reappraisals of internal states are made, which produces thoughtful actions (e.g., instrumental aggression).

One can use the tenants of GAM (Anderson & Bushman, 2002a) to explain triggered displaced aggression effects. Triggered displaced aggression first begins with a strong provocation, which is a situational input. This provocation creates changes in an individual's present arousal, affective, and cognitive internal states. The provocation could heighten physiological arousal, and increase angry affect and aggressive cognitions. The increases in physiological arousal, aggressive affect, and aggressive cognitions could affect the appraisal and decision processes individuals make for other people's behavior. That is, if a provoked individual encounters a

person who commits a slightly annoying offense, they might interpret that offense as provoking, and retaliate with an aggressive response. Moreover, GAM puts no time frame on how long an aggressive internal state can persist. It could persist for minutes, or perhaps days. Thus, one could use GAM to explain displaced aggression findings that occur long after the initial provocation, which is characteristic of many instances of “real life” displaced aggression.

In the Pedersen et al. (2000) studies, the Time 2 triggering event occurred immediately after the initial provocation. Indeed, in most research to date, the temporal gap between the initial provocation and the displaced aggression opportunity rarely, if ever, has exceeded 10 minutes. This is not surprising, considering most of these studies were conceptualized under an excitation transfer framework (Zillmann, 1971, 1979), where physiological arousal was expected to persist for about 10 minutes after the termination of the arousing event (Doob & Klimie, 1972; Fridhandler & Averill, 1982; Tyson, 1998). However, in order for triggered displaced aggression to have broad, ecologically valid explanatory power, underlying processes that can persist across a substantial delay between the provocation and displaced aggression opportunity are required. In essence, what is needed in displaced aggression research is to identify processes that could maintain aggressive internal states. One cognitive process that could sustain an aggressive internal state over an extended period of time between provocation and the triggered displaced aggression opportunity is rumination.

Triggered Ruminative Aggression

In prior aggression research, rumination has been conceptualized as a personological variable, and defined as a tendency to harbor negative feelings elicited by provocations over an extended period of time (Caprara, 1986; Caprara, Barbaranelli, & Comrey, 1992). Correlational research suggests that individuals prone to rumination are more aggressive than individuals less prone to rumination (Caprara, 1986; Caprara, Barbaranelli, Colombo, Politi, & Valerio, 1985; Caprara et al., 1992; Caprara, Cinanni, & Mazzotti, 1989; Caprara, Gargaro, Pastorelli, & Prezza, 1987; Caprara, Mazzotti, Zelli, Coluzzi, & Renzi, 1985; Collins & Bell, 1992). In fact, individuals prone to rumination show heightened aggression towards a provoker even if the provocation occurred 24-hours before the aggression opportunity (Caprara et al., 1985).

Rumination can also be conceptualized as a situational variable, defined as self-focused attention on one's thoughts and feelings (Lyubomirsky & Nolen-Hoeksema, 1995). Ruminating about an event can maintain negative feelings elicited by that event (Martin & Tesser, 1989). For example, self-focused attention is associated with increases in both depressive and angry affect (Lyubomirsky & Nolen-Hoeksema, 1995; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1991; Rusting & Nolen-Hoeksema, 1998). For example, Rusting & Nolen-Hoeksema (1998), told participants they would engage in tasks related to imagination and dreaming. For the first task, participants were angered by reading a story about a professor unfairly treating a student, and participants were instructed to imagine they were that student. Some participants were then induced to ruminate

by writing about self-focused topics (e.g., “why do others treat you as they do”), whereas other participants wrote about irrelevant topics (e.g., “the layout of the local post office”). Participants who ruminated for 8 minutes reported being angrier than those who were distracted.

There is little research examining the role of induced rumination on aggressive behavior. One study (Konecni, 1974) found that preventing individuals from ruminating reduced direct aggression towards an insulting confederate. Recently, two studies (Bushman, Pedersen, Vasquez, Bonacci, & Miller, 2003) have examined the role of rumination directly on triggered displaced aggression. In Study 1, participants were provoked by an insulting experimenter and a poor performance on a verbal task. Next, participants were induced to either ruminate or not ruminate for 25 minutes using the same rumination procedure in the Rusting and Nolen-Hoeksema (1998) study. Participants in the trigger condition then encountered a fumbling, though not insulting, confederate; participants in the no trigger condition encountered a competent confederate. Provoked participants who ruminated before the triggering event displayed more displaced aggression towards the fumbling confederate than participants who did not ruminate. In Study 2, participants were insulted by writing an essay, and receiving a strongly negative evaluation from an ostensible partner. Participants in the rumination condition were told to return 8 hours later, and that they would have to defend their poor performance on the essay to another person. Participants in the no rumination condition were also told to return 8 hours later, but were told their second partner would not see their essay or the evaluation of their essay. During the second session, participants completed a

verbal task. In the trigger condition, participants received a mildly negative evaluation of their performance from their second partner, whereas participants in the no trigger condition received a neutral evaluation. The findings from Study 2 replicated those of Study 1; provoked participants who received a mildly negative evaluation were more aggressive if they ruminated than if they were distracted.

Current Study

The purpose of the current study was to further clarify the effect of rumination on triggered displaced aggression. One criticism of the Bushman et al. (2003) studies is that they did not include no provocation conditions; all participants were provoked. Because the absence of provocation yields null triggered displaced aggression effects, it was assumed to produce null effects under either rumination or distraction conditions. However, such a conclusion cannot be drawn unless provocation is manipulated in the experimental design. Another criticism is that the Bushman et al. studies (2003) presented no evidence of cognitive processes that could mediate the relationship between rumination and triggered displaced aggression. It was suggested that rumination increases triggered displaced aggression because it maintains an aggressive affective and cognitive state that disposes individuals to behave aggressively under mildly provoking conditions. Mediation support is needed to test the validity of this hypothesis.

The purpose of the current study was to replicate and extend the findings of the Bushman et al. (2003) studies. There are three primary differences between the current study and the Bushman et al. (2003) studies. First, the presence or absence

of an initial provocation was manipulated. Second, the operational definitions of rumination and distraction were designed to be more ecologically valid. Rumination participants were asked to write specifically about the provocation whereas distraction participants wrote about an irrelevant topic. Finally, perceptions of how negatively individuals perceived the triggering event were assessed, and used as a potential mediator between rumination and displaced aggression.

In the current study, participants were first provoked by an insulting experimenter and a difficult verbal task, or not provoked by a neutral experimenter and a simple verbal task. Participants were then induced to ruminate by writing about their reactions to the experiment, or were distracted by writing about the campus layout. After the writing activity, participants received either a mildly negative (trigger) or neutral (no trigger) evaluation of their verbal task performance from their partner. Participants were then given the opportunity to engage in displaced aggression against their partner. Perceptions of the negativity of the triggering event were also assessed.

Under conditions of no provocation, rumination was hypothesized to have no effect on triggered displaced aggression. Under conditions of provocation, rumination was expected to increase displaced aggression in the presence of a triggering event, but not in the absence of one. Finally, negative perceptions of the trigger were expected to mediate the relationship between rumination and triggered displaced aggression. That is, for participants who were provoked and ruminate about that provocation, the presence of a triggering event was expected to yield negative perceptions of the triggering event (e.g., the trigger was seen as

provoking). These negative perceptions of the trigger, in turn, were expected to increase displaced aggression. No mediational effects were expected for unprovoked participants, or provoked participants who did not ruminate.

METHOD

Participants

Participants were 385 students (194 females, 191 males) enrolled in undergraduate psychology courses from a large, midwestern university. They received extra course credit in exchange for their voluntary participation. Due to outlying data, 38 participants were dropped from the study. Thus, the final sample size was 347 participants (186 females, 161 males).

Design

The study was a 2 (male vs. female) x 2 (provocation vs. no provocation) x 2 (rumination vs. distraction) x 2 (trigger vs. no trigger) between-subjects factorial design.

Procedure

Participants arrived at the lab under the ruse they were participating in an impression formation study with a same sex partner. After obtaining informed consent, participants were told that they would engage in several tasks that would help them form an impression of their partner. The experimenter emphasized that participants would never interact face-to-face with their partner, but would exchange correspondences via the experimenter.

Participants were told one activity involved tasting food, which would give them an idea of the types of food their partner liked. Participants were given a "Food Preference Form" and told that they and their partner would each taste and evaluate a given food item on that form. Participants then rated how much they liked certain

types of food (e.g., dairy food, snack food, seafood, spicy food). Listed with each food category were two or three exemplars (e.g., hot sauce and curry for spicy food; crackers, chips, and pretzels for snack food). Ratings (e.g., I like spicy food) were made on a 21-point scale with -10 being *strongly disagree* and +10 being *strongly agree*. Greater agreement indicated greater liking for the food type.

The experimenter informed participants that the next activity involved assessing verbal skills. Participants were given 15 anagrams to unscramble. All participants saw a series of scrambled letters presented on a computer screen for 5 sec. The scrambled letters were then erased from the screen, and participants received a prompt to solve the anagram by writing the correct solution on an answer sheet and by saying the answer aloud over an intercom. They had 7 sec. to both write and say their solution aloud. Next, participants were shown the solution and asked to give the solution in a first-person sentence. Participants were told to say their sentence over the intercom. They were given 5 seconds to generate and speak their sentence before the next series of scrambled letters appeared. The experimenter emphasized that participants must say the solution and sentence loudly and clearly because the experimenter would be in another room recording their solutions and sentences.

The actual purpose of the anagram task was to provoke or not provoke participants. Participants in the *provocation* condition were subjected to three aggravations. First, the experimenter played loud and distracting background music, Holst's *Mars, the Bringer of War*, while participants were completing the anagram task. The ostensible purpose of the background music was to drown out hallway

noise. Second, the anagrams participants were asked to solve were difficult (e.g., ELUNANTEI for LIEUTENANT, DMMPAIUNNEO for PANDEMONIUM). Third, the experimenter interrupted, and rudely insulted, the participant three times during the anagram task. After the fourth anagram, the experimenter said, via the intercom, "Look, I can barely hear you. I need you to speak louder please." After the eighth anagram, the experimenter said, in a louder and angrier tone, "Hey, I still need you to speak louder please!" After the twelfth anagram, the experimenter said in a loud, frustrated, and exacerbated tone, "Look, this is the third time I've had to say this! Can't you follow directions? Speak louder!" The experimenter's insults were not live, but rather prerecorded and played over the intercom system. This provocation procedure has been successfully used in other displaced aggression studies (e.g., Bushman et al., 2003; Pederson et al., 2000).

Participants in the *no provocation* condition had a more pleasant experience during the anagram task. First, though they also listened to background music, it was softer and less harsh (Handle's *Water Music*). Second, they were given simpler anagrams to solve (e.g., ESTT for TEST, FSLEH for FLESH). Third, they were not insulted by the experimenter. After the participant completed the fourth, eighth, and twelfth anagrams, the experimenter simply said "You have just completed the fourth (eighth, twelfth) anagram," respectively.

After participants completed the last anagram, they were prompted to turn off the background music. The experimenter took the participants' anagram solution sheet and said that later they would exchange solution sheets with their partner for evaluation. Participants were told the next activity involved writing an essay.

Participants in the *rumination* condition were told a professor, unrelated to the study, was interested in learning about participants' perceptions of the research process. The professor was asking research participants to write an essay about their experiences as a research participant. Participants were instructed to write about what they had done from the start of the study until the present time, and their thoughts and feelings they experienced. They were also told to write about the individuals they encountered in the study, and their thoughts and feelings they had towards those individuals. It should be noted that the only individual participants had interacted with was the experimenter. Participants were told they would have 20 minutes to write their essay, and should spend the entire 20 minutes writing it.

Participants in the *distraction* condition were also told they would write an essay for a professor conducting a study unrelated to the one the participants were in. The professor was supposedly studying visual maps, and was asking research participants to write essays about the layout of the college campus. Participants were instructed to create a mental map of the campus and describe what they saw. They were to write about the various buildings; the purpose of the various buildings; the landscape architecture of the campus; and the spatial relations (e.g., location of buildings) on campus. Distracted participants were also told to spend 20 minutes writing their essay.

After completing their essay, the experimenter returned with the anagram solution sheet supposedly completed by the participant's partner. The experimenter instructed participants to examine the solutions, and evaluate their partners' performance. Participants believed their partner was evaluating their performance on

the anagram task. If the participant was in the *provocation* condition, the partner solved the difficult anagrams; if participant was in the *no provocation* condition, then the partner solved the easy anagrams. For all participants, the partner correctly unscrambled all the anagrams the participant did, plus three more. If the participant had fewer than three incorrect solutions, then the partner correctly solved all the anagrams, which happened seven percent of the time. Participants evaluated their partner's overall performance on the task; the concentration level used by their partner; and the likelihood their partner would succeed in a class requiring good verbal skills. Ratings were made on a 21-point scale with -10 being *unacceptable* and +10 being *acceptable*.

After completing the evaluation for their partner, the experimenter returned with the partner's evaluation of the participant's anagram performance. Participants in the *trigger* condition received a slightly negative evaluation. The evaluation consisted of three items, plus room for written comments. They received scores of a -2 for overall performance; -1 for concentration level; and -1 for success in a class requiring good verbal skills. The partner also provided a written comment; "Although the task was difficult, I would have thought a college [class standing of the participant] would have performed better." Participants in the *no trigger* condition received a slightly positive evaluation of their anagram performance. They received ratings of +2 for overall performance; +1 for concentration level; and +1 for success in a class requiring good verbal skills. The partner also provided the written comment "Although the task was difficult, I thought my partner did a fairly good job for a college [class standing of the participant]."

The next phase of the study served as the displaced aggression opportunity, and is adapted from Lieberman et al.'s (1999) procedure. After the participant finished reading the evaluation, the experimenter returned with the partner's "Food Preference Form." Participants were told to examine the form, and see what types of food their partner did and did not like to eat. They also were told that next that they would sample one of the items on the list. For all participants, their partner indicated they liked most of the foods listed. However, the partner indicated a strong dislike, -9 on a -10 to +10 scale, of spicy foods. The partner also provided the written comment, "I like most of the foods listed above, but I hate spicy foods."

The experimenter then returned with a box containing a 3.5 oz. Dixie™ cup, a container of hot sauce, a lid, two spoons, and a cup of water. The hot sauce was a mixture of 5 oz. of *Melinda's Original Habanero Pepper Sauce XXX HOT* brand hot sauce combined with 12 oz. of *Heinz Chile Sauce*. Participants were told they were randomly assigned to eat pretzels, and their partner was randomly assigned to eat hot sauce. They were also told their partner would decide how many pretzels they would consume, and they would decide how much hot sauce their partner would consume. The experimenter emphasized that they, and their partner, would be required to consume the entire food product that they were given. Participants were then given a chance to sample the hot sauce, so they understood how spicy it was. They were given water to drink if it was too spicy. The experimenter then instructed participants to spoon as much hot sauce they wanted their partner to consume into the cup. Participants were also told to place a lid on the cup so the experimenter did not know how much hot sauce the participants put in the cup. After the participant

finished the hot sauce allocation procedure, the experimenter took the cup away, and returned shortly with a cup of pretzels for the participant to eat. The participant then rated how much they liked eating the pretzels.

Participants also evaluated their perception of the triggering event – the evaluation their partner gave their anagram performance. We predicted that these perceptions would mediate the effect of the trigger on displaced aggression, especially among angered participants who ruminated about the provocation. Participants rated the evaluation based on how angry it made them; how much it bothered them; if it was overly critical; if it was harsh; and if it was nasty. Ratings were made on a 1 (*strongly disagree*) to 10 (*strongly agree*) point scale. Several other items were added as fillers. The items were standardized and summed to yield an overall composite score of how negatively participants perceived the evaluation. Higher scores indicated a more negative perception of the anagram evaluation. The scale showed good internal consistency, with a coefficient alpha of .88. To control for order effects, half of the participants completed the evaluation perception measure before allocating hot sauce to their partner, and half the participants allocated hot sauce to their partner before completing the evaluation perception measure.

At this point, the experiment was terminated. Participants were then probed for suspicion. Participants were asked if anything seemed suspicious about the study. If the participant indicated suspicion, the experimenter probed further to discern when the participant became suspicious and why. The experimenter then fully debriefed the participants by explaining that the study was not about forming

impressions, but rather about displaced aggression. Participants were allowed to ask the experimenter questions about the study, and provide comments about their experience being a participant and being deceived. Finally, the participants were thanked and asked not to inform other potential participants about the true purpose of the study.

RESULTS

Preliminary Analyses

Statistical assumptions. Tukey's (1977) box plot was used to identify potential outliers in the primary dependant variable – the amount of hot sauce allocated to the ostensible partner. Because outlying data can unduly influence least squares estimates, extreme outliers were removed from data set (Barnett & Lewis, 1978). An extreme outlier was defined as allocating more than 25 grams of hot sauce. Removing the extreme outliers left a total sample size of 347 participants (186 females, 161 males). Of the 38 outliers removed, there were 8 outliers in the provocation-rumination-trigger condition, 3 outliers in the provocation-rumination-no trigger condition, 6 outliers in the provocation-distraction-trigger condition, 3 outliers in the provocation-distraction-no trigger condition, 5 outliers in the no provocation-rumination-trigger condition, 1 outlier in the no provocation-distraction-no trigger condition, 8 outliers in the no provocation-distraction-trigger condition, and 3 outliers in the no provocation-distraction-no trigger condition. In order to run Fisher's exact tests, the groups were collapsed across provocation into two 4 (treatment condition) X 2 (outlier, no outlier) tables. The Fisher's exact tests could not detect any differences in the probability of an outlier occurring in any of the groups ($p_s > .05$). Since outlying data appeared to be unrelated to condition, participants with outlying data were dropped form the sample. Descriptive statistics for the reduced data set are presented in Table 1 (hot sauce allocation) and Table 2 (perceived negativity of the triggering event).

Table 1. *Descriptive statistics for hot sauce allocation (grams) for the reduced data set*

Group	n	Mean	Standard Error	Median	Skewness	Kurtosis
All groups	347	2.70 g	0.19 g	1.10 g	1.56	2.94
<u>Group 1</u> Provocation Rumination Trigger	37	5.39 g	0.74 g	4.70 g	0.95	0.32
<u>Group 2</u> Provocation Distraction Trigger	41	2.32 g	0.54 g	0.60 g	1.52	1.99
<u>Group 3</u> Provocation Rumination No trigger	40	2.81 g	0.46 g	1.80 g	1.00	-0.15
<u>Group 4</u> Provocation Distraction No trigger	47	2.7 g	0.44 g	1.60 g	1.07	0.01
<u>Group 5</u> No provocation Rumination Trigger	42	2.41 g	0.49 g	0.80 g	1.50	1.73
<u>Group 6</u> No provocation Distraction Trigger	49	1.78 g	0.41 g	0.60 g	2.32	5.40
<u>Group 7</u> No provocation Rumination No Trigger	43	2.56 g	0.64 g	0.80 g	2.15	4.62
<u>Group 8</u> No provocation Distraction Trigger	48	2.19 g	0.45 g	1.00 g	2.51	4.52

Table 2. *Descriptive statistics for perceived negativity of the triggering event (standardized score) for the reduced data set*

Group	n	Mean	Standard Error	Median	Skewness	Kurtosis
All groups	339	-0.001	0.22	-0.59	0.54	-0.42
<u>Group 1</u> Provocation Rumination Trigger	37	3.51	0.77	3.77	-0.22	-0.58
<u>Group 2</u> Provocation Distraction Trigger	41	-1.59	0.59	-3.03	1.31	2.03
<u>Group 3</u> Provocation Rumination No trigger	37	2.23	0.53	1.87	-0.71	-0.18
<u>Group 4</u> Provocation Distraction No trigger	46	-1.12	0.53	-2.07	1.04	-0.54
<u>Group 5</u> No provocation Rumination Trigger	40	0.36	0.60	0.80	0.21	-0.78
<u>Group 6</u> No provocation Distraction Trigger	47	-2.00	0.51	-3.40	0.84	-0.72
<u>Group 7</u> No provocation Rumination No Trigger	43	2.02	0.62	1.81	0.41	-0.60
<u>Group 8</u> No provocation Distraction Trigger	47	-2.02	0.36	-2.20	0.28	-1.18

Order effects. Recall that half of the participants allocated hot sauce to their partner before completing their perception of the evaluation, and half of the participants completed their perception of the evaluation before allocating hot sauce to their partner. The order in which participants completed the dependent measures did not have a main effect on aggression, $F(1, 314) = 2.76, p > .05$, or perceived negativity of the triggering event, $F(1, 305) = 3.64, p > .05$. Moreover, the order of dependent measures did not interact with provocation, trigger, and rumination for both aggression and perceived negativity of the triggering event, all $ps > .05$. Since order of dependent measures had no effects on either dependent variable, order of dependent measures was dropped from the model.

Primary Analyses

The data were analyzed using a 2 (male vs. female) x 2 (provocation vs. no provocation) x 2 (rumination vs. distraction) x 2 (trigger vs. no trigger) between-subjects factorial design.

Sex differences. There was a significant main effect for sex, with, overall, males being more aggressive than females, $F(1, 331) = 5.09, p < .05, d = 0.80$. There was also a significant sex x rumination interaction, $F(1, 331) = 5.85, p < .05$. The interaction between sex and rumination is presented in Figure 2. There were no sex differences in aggression for participants who ruminated, $t(176) = -0.11, p > .05, d = -0.03$. For distracted participants, males were more aggressive than females, $t(167) = 3.35, p < .001, d = 0.52$. Sex did not interact with trigger or provocation, $ps > .05$.

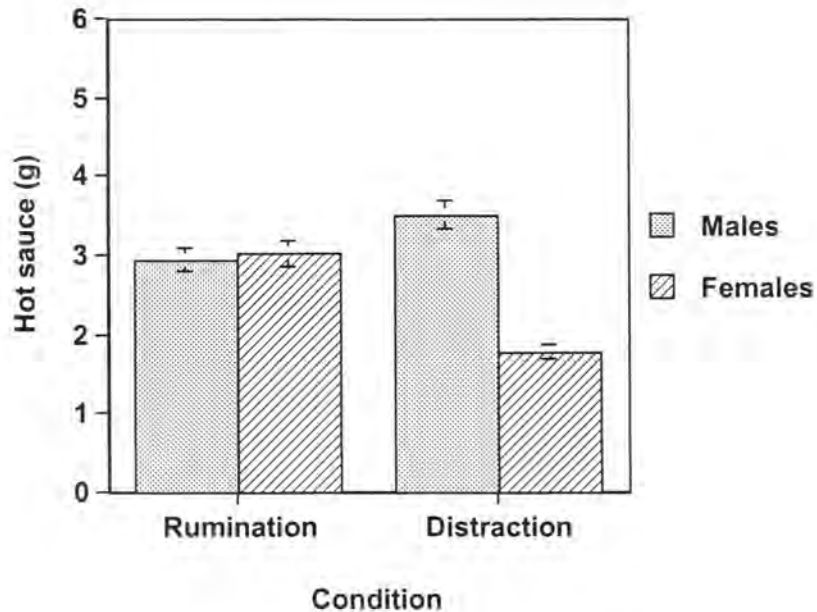


Figure 2. *Interaction between participant sex and rumination on hot sauce allocation. Capped vertical bars denote one standard error.*

Main effects and interactions. The analysis revealed significant main effects for provocation and trigger, $F_s(1, 331) = 8.12$ and 8.67 respectively, $p_s < .05$. Moreover, there was also a significant rumination \times triggering event interaction, $F(1, 331) = 4.01$, $p < .05$. However, the main effects and interaction were qualified by the predicted provocation \times rumination \times triggering event interaction, $F(1, 331) = 4.12$, $p < .05$. In order to discern the nature of the interaction, the two-way interactions between rumination and triggering event were examined separately for provoked and nonprovoked participants. For provoked participants, the rumination \times triggering event interaction was significant, $F(1, 161) = 7.46$, $p < .01$. As shown in Figure 3, in the presence of a minor triggering event, participants allocated more hot sauce if they ruminated than if they were distracted, $t(75) = 3.21$, $p < .01$, $d = 0.68$. In the

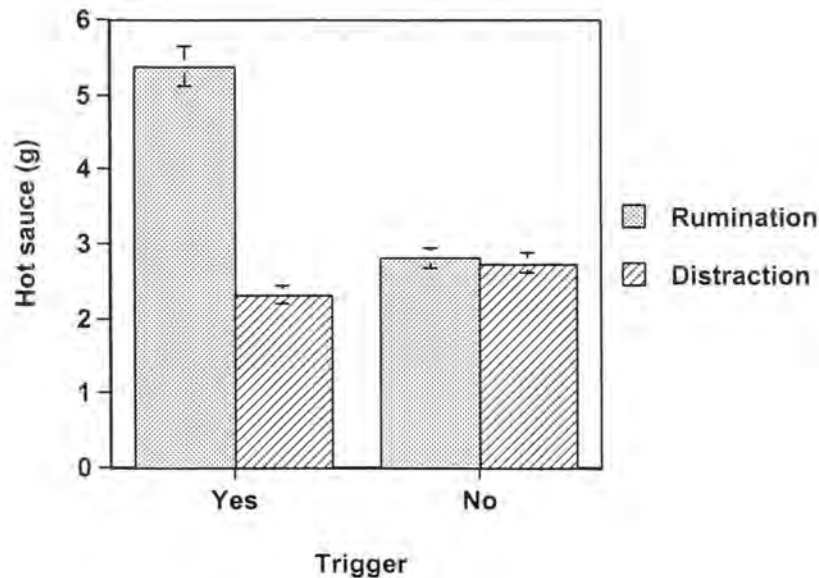


Figure 3. *Effects of triggering event and rumination on hot sauce allocation after an initial provocation. Capped vertical bars denote one standard error.*

absence of a triggering event, there was no differences in hot sauce allocation between participants who ruminated and participants who were distracted, $t(86) = -0.56$, $p > .05$, $d = -0.13$.

In the absence of an initial provocation, the two-way interaction between rumination and triggering event was not significant, $F(1, 178) = 0.07$, $p > .05$. As shown in Figure 4, participants who ruminated and participants who were distracted did not differ in how much hot sauce they allocated to their partner, regardless of whether there was or was not a minor triggering event, $t(83) = -0.20$, $p > .05$, $d = -0.04$ and $t(95) = -0.59$, $p > .05$, $d = -0.14$, respectively.

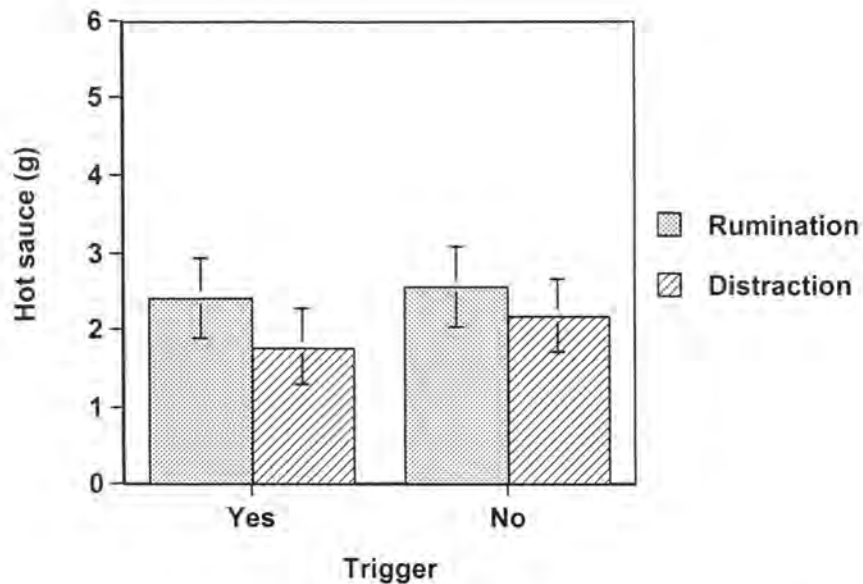


Figure 4. *Effects of triggering event and rumination on hot sauce allocation without an initial provocation. Capped vertical bars denote one standard error.*

Mediation Analyses

Negative perceptions of the triggering event were hypothesized to mediate the relationship between triggering event and displaced aggression among provoked participants who ruminated. (i.e., the provocation-rumination condition). For the three other conditions (provocation-distraction, no provocation-rumination, and no provocation-distraction), no mediation was hypothesized. Mediation analyses were conducted to test these hypotheses using the LISREL 8.52 computer program (Jöreskog & Sörbom, 2002). Table 3 presents the variance-covariance matrices used for analyses.

For participants in the provocation-rumination condition, a causal path was specified linking trigger (a dichotomous, present or absent, variable) to perception of

Table 3. Variance-covariance matrices used for LISREL mediation analyses. Variances are on the diagonal, and covariances are below the diagonal.

Measure	1	2	3
Provocation – Rumination (<i>N</i> = 77)			
1. Trigger	0.25		
2. Evaluation	1.28	23.01	
3. Aggression	0.78	7.53	18.36
Provocation – Distraction (<i>N</i> = 83)			
1. Trigger	0.25		
2. Evaluation	0.83	14.67	
3. Aggression	0.15	1.42	8.15
No Provocation – Rumination (<i>N</i> = 87)			
1. Trigger	0.25		
2. Evaluation	0.59	14.60	
3. Aggression	0.17	1.49	9.36
No Provocation-Distraction (<i>N</i> = 90)			
1. Trigger	0.25		
2. Evaluation	1.06	15.44	
3. Aggression	0.09	0.41	13.77

the evaluation. A second causal path was specified linking perception of the evaluation to aggression. For participants in the other three conditions, a causal path was specified linking trigger to perception of the evaluation. However, the causal

path between perception of the evaluation and aggression was set to 0. It was hypothesized that, regardless of condition, a mildly negative trigger should be interpreted more negatively than a neutral evaluation. Thus, it was allowed to be a causal path for all conditions. The proposed model demonstrated a good fit to the data, $\chi^2(7, N = 337) = 7.19, p > .05$, goodness of fit index = .97, comparative fit index = 1.00, root mean square error of 0.14. For participants in the provocation-rumination condition. The causal path between trigger and perception of the evaluation was positive and significant, $z = 5.48, p < .05$. Also, the causal path between perception of the evaluation and aggression was positive and significant, $z = 3.44, p < .05$. These results suggest that, for provoked participants who ruminate, a minor triggering event produces a negative perception of the triggering event, which, in turn, prompts increased displaced aggression.

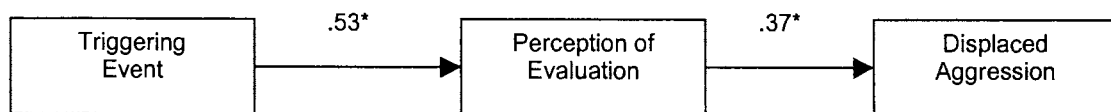


Figure 5. *Perception of trigger negativity as a mediator between trigger and displaced aggression for provoked participants who ruminated. * $p < .05$*

For the other conditions, the causal paths between trigger and perception of the evaluation were positive and significant. To examine the effect of constraining the causal paths between perception of the evaluation and aggression to 0 for the other conditions, another model was run where these paths were allowed to vary. Allowing the path to vary did not significantly improve the fit of the model over the

hypothesized model, $\chi^2(3, N = 337) = 2.87, p > .05$. Moreover, the casual paths between perception of the evaluation and displaced aggression were not significant, $ps > .05$ (see Figures 6-8). This suggests that perceptions of the trigger and aggression are not related to each other in the other conditions.

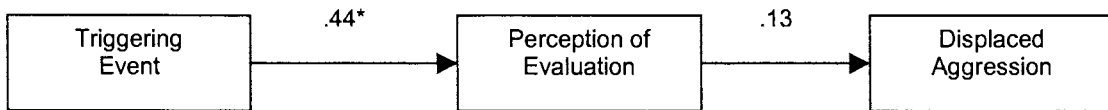


Figure 6. *Perception of trigger negativity as a mediator between trigger and displaced aggression for provoked participants who were distracted. * $p < .05$*

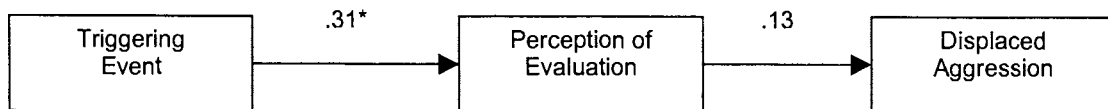


Figure 7. *Perception of trigger negativity as a mediator between trigger and displaced aggression for nonprovoked participants who ruminated. * $p < .05$*

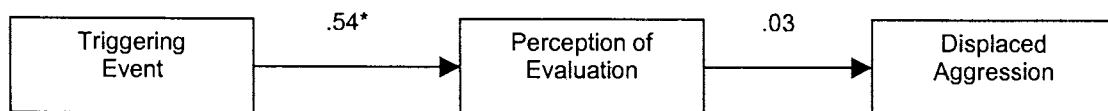


Figure 8. *Perception of trigger negativity as a mediator between trigger and displaced aggression for nonprovoked participants who were distracted. * $p < .05$*

The results of the mediation analyses provide support for the hypothesized model. However, for provoked participants who ruminated, it is possible that the triggering event had a direct effect on displaced aggression. Thus, the hypothesized

model was modified by adding a direct casual path between trigger and displaced aggression, and treating that path as a free parameter. The inclusion of this path, however, did not significantly improve the fit of the model, $\chi^2(3, N = 77) = 3.41, p > .05$. Moreover, the direct path between trigger and displaced aggression was not significant, $z = 1.87, p < .05$. The full model is presented in Figure 9.

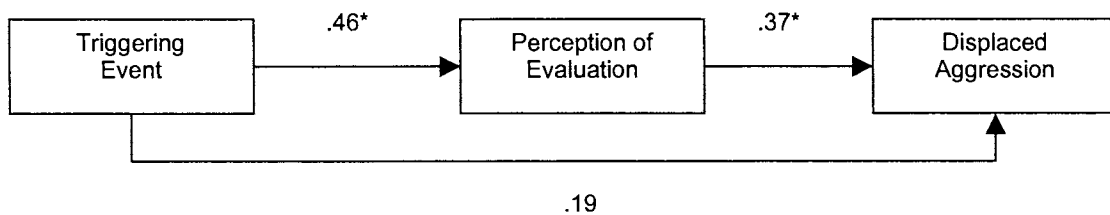


Figure 9. *Perception of trigger negativity as a mediator between trigger and displaced aggression for provoked participants who ruminated. * $p < .05$*

Finally, the mediation observed among participants in the provocation-rumination condition can be explored by examining the indirect effects estimate. The indirect effects estimate and significance test are based on Sobel's (1982) method, which divides the indirect effects estimate by the standard error, and compares that value to a standard normal distribution. However, MacKinnon et al., (2002) argues that the significance test has low statistical power. They recommend using a modified distribution, z' for comparison, rather than a standard normal distribution. For the hypothesized model, the indirect effect of trigger on displaced aggression, via evaluation perception, was significant, $\beta = .20, z' = 2.91, p < .05$. Moreover, even after the direct casual path between trigger and displaced was added to the model, the indirect effect remained significant, $\beta = .17, z' = 2.97, p < .05$. Thus, in summary,

the results of the mediation analyses suggest that, for provoked participants who ruminated, the effect of a triggering event on displaced aggression is mediated by the negative perception of the triggering event.

DISCUSSION

The purpose of the current study was to examine whether ruminating about a provocation increases displaced aggression against individuals who are mildly annoying. Participants were either provoked by an insulting experimenter, or not provoked by a pleasant experimenter. Participants then ruminated by writing about their experiences as a research participant, or were distracted by writing about the layout of the campus. Half of the participants received a mildly negative evaluation of their performance on an anagram task (trigger), whereas the other half received a neutral evaluation (no trigger). All participants were then given the opportunity engage in displaced aggression by deciding how much hot sauce their partner should receive, even though they knew that their partner hated spicy food.

Provoked participants who ruminated were expected to engage in more displaced aggression in the presence of a minor triggering event than in the absence of one. The presence or absence of a triggering event was not expected to have differential effects on displaced aggression for provoked participants who were distracted, and nonprovoked participants. The results supported the hypothesis for a predicted three-way interaction between initial provocation, rumination, and triggering event. Specifically, provoked participants who ruminated were more aggressive in the presence of a minor triggering event than in the absence of one. However, for provoked participants who were distracted, the presence or absence of a minor triggering event had no effect on displaced aggression. For unprovoked participants, neither rumination nor triggering event had an effect on displaced aggression.

The results of the current study lend support to the hypothesis that two antecedent conditions, a strong initial provocation and a minor triggering event, are necessary in order to observe displaced aggression effects (viz. Pederson et al., 2000). Miller and Marcus-Newhall (1997) define this type of interaction as a disjunctively augmented response. That is, the combination of a strong initial provocation coupled with minor triggering event produces an aggressive response directed towards the triggering target that is excessive based on the intensity of the triggering event. Indeed, in the current study, under conditions of no provocation, the presence or absence of a triggering event had no significant effect on aggressive behavior, $t(179) = 0.98, p > .05, d = 0.14$. This suggests that the triggering event, in itself, is indeed minor, and not severe enough to warrant an aggressive retaliation, which replicates findings from other studies of triggered displaced aggression (Bushman et al., 2003; Pedersen et al., 2000).

Rumination has been hypothesized to moderate triggered displaced aggression effects (Pederson et al., 2000; Bushman et al., 2003). That is, activities that remind the individuals about the initial provocation, or the negative feelings associated with that provocation, should increase the likelihood of triggered displaced aggression effects. Such activities could be external (e.g., seeing the provoking individual at a later time), or internal, such as rumination. Ruminating, or thinking about the initial provocation or the negative feelings associated with that provocation, could maintain a cognitive state that disposes individuals to interpret ambiguous provocations negatively, and warranting of an aggressive retaliation. In contrast, activities that distract the individual from thinking about the provocation, or

negative feelings associated with that provocation, should reduce the likelihood of displaced aggression. The results of the current study support the rumination hypothesis. Among provoked participants, those who ruminated about the provocation were more aggressive towards a triggering target than were individuals who were distracted from thinking about the initial provocation. Indeed, being distracted from thinking about the provocation appears to negate the effects of an initial provocation. That is, like unprovoked participants, the presence or absence of a triggering event has no significant effect on displaced aggression, $t(85) = 0.09$, $p > .05$, $d = 0.02$.

The results of the current study replicate the results presented in the Bushman et al. (2003) studies. In the Bushman et al. (2003) studies, the claim was made that rumination produces a cognitive state that disposes individuals to behave aggressively. Specifically, provoked individuals who ruminate are disposed to interpret minor triggering events as provoking, or at least more provoking than they normally would be interpreted. However, Bushman et al. (2003) presented no mediational support for this assertion. In the current study, perceptions of the triggering event was added as a potential mediating variable, and mediational support was found. For provoked participants who ruminated, the perception of how negative the triggering event was mediated the relationship between the triggering event and displaced aggression. They interpreted the minor triggering event negatively (e.g., anger provoking, harsh, and overly critical), and this negative interpretation, in turn, prompted an aggressive retaliation.

One might hypothesize that it was the triggering event, not rumination, that prompted displaced aggression. However, there is evidence to refute that notion. First, under conditions of no provocation, the presence or absence of a triggering event had no effect on displaced aggression, which suggests that the triggering event in itself is not enough to prompt an aggressive retaliation under normal circumstances. This conclusion is also supported by mediational analyses. For nonprovoked participants, the presence of a minor triggering event was associated with a more negative perception of the trigger. Regardless of provocation, a minor triggering event should be interpreted somewhat more negatively than a neutral event. However, for nonprovoked participants, this negative perception of the triggering event was not enough to prompt an aggressive retaliation. Thus, if individuals are not initially angered, a minor triggering event is not perceived as aversive enough to warrant an aggressive retaliation.

The results from the provoked-distracted participants also refutes the notion that displaced aggression is simply a function of a mildly aversive triggering event. Distracted participants behaved much like unprovoked participants. First, the presence or absence of a minor triggering event had no effect on displaced aggression among provoked participants who were distracted from thinking about the provocation. Second, the results of the mediational analysis parallel the results found for nonprovoked participants. Though provoked-distracted participants interpreted a minor triggering event negatively, the negative interpretation was not sufficient enough to prompt aggressive behavior.

A Theoretical Explanation for Rumination Effects

Often times, excitation transfer theory is used as an explanation for triggered displaced aggression effects. That is, arousal generated by a Time 1 event is misattributed to a Time 2 provocation, thus eliciting an aggression response (Zillmann 1972, 1979). For example, an arousing Time 1 activity, such as an erotic film or strenuous exercise, is paired with a Time 2 provocation. In such studies, there is greater aggression if participants engaged in an arousing activity initially than if they did not (e.g., Cantor, Zillmann, & Einsiedel, 1978; Zillmann, Katcher, & Milavsky, 1972). Similarly, an excitation transfer explanation could be applied to the current study. Physiological arousal was initially generated by the insulting experimenter; and later, the source of that arousal was transferred to the minor triggering event, thus providing the justification for an aggressive retaliation.

Though excitation transfer theory could explain the triggered displaced aggression effects observed in the current study, it seems incomplete. Aggression is a multifaceted phenomenon, and using misattributed arousal alone downplays other dimensions of aggression, such as anger and aggressive cognitions. Moreover, research suggests physiological arousal generated by an initial activity, such as exercising or watching erotic films, lingers for at most 15 minutes (Doob & Clime, 1972; Fridhandler & Averill, 1982; Tyson, 1998). Even if misattributed physiological arousal alone was responsible for the displaced aggression effects observed in this study, some process would have to maintain or reinstate the arousal after the lengthy delay (20 minutes) between the initial provocation and the displaced aggression opportunity.

A broader model of aggression, namely the General Aggression Model (GAM; Anderson & Bushman, 2002a), provides a theoretical framework for understanding both short- and long-term triggered displaced aggression effects. An initial provocation is a situational input that creates an internal state of increased physiological arousal, aggressive affect, and aggressive cognitions. If an individual encounters ambiguously provocative behavior shortly after the initial provocation, the individual is primed to behave aggressively. That is, they are aroused, angry, and thinking aggressive thoughts, and thus, disposed to interpret behavior as hostile and deserving of an aggressive retaliation.

GAM (Anderson & Bushman, 2002a) can explain the effect rumination has on displaced aggression, especially aggression that occurs long after the initial provocation. Again, an initial provocation creates an aggressive internal state. If an individual ruminates about the provocation, they are maintaining this aggressive state. However, ruminating about the initial provocation could keep individuals angry, and thinking aggression related thoughts. Moreover, it is possible that rumination could maintain heightened physiological arousal generated by the initial provocation, or possibly reinstate it at a later time. Therefore, when provoked at a substantially later time, the individual is still in an aggressive state, feeling angry and possibly aroused, thinking aggressive thoughts, and thus is primed to behave aggressively.

The results of the current study suggest that rumination affects appraisal and decision making processes. Rumination was hypothesized to affect triggered displaced aggression by priming individuals to interpret the triggering event more negatively than warranted. Indeed, the results of the mediation analyses suggest

that provoked participants who ruminated interpreted the minor triggering event negatively, which, in turn, prompted displaced aggression. Because minor triggering events are often ambiguous with respect to intentionality, individuals must decide if the triggering behavior was provoking or not. Rumination appears to prime individuals to interpret triggering behaviors as provoking enough to warrant an aggressive retaliation. One possibility is that rumination disposes individuals to a hostile perception bias, which has been linked to aggressive behavior (e.g., Crick & Dodge, 1994; Dill et. al, 1997).

The tenants of GAM can also be used to identify means to prevent triggered displaced aggression. The results of the current study suggest that provoked participants who are distracted from thinking about the provocation behave similarly to individuals who were not provoked. That is, distracted individuals are not disposed to interpret minor trigger events as provoking enough to warrant an aggressive response. Therefore, distracting oneself from thinking about a provocation appears to reduce the aggressive internal state generated by the initial provocation. This allows individuals to perceive minor triggering events as trivial, and not sufficiently provoking to warrant an aggressive retaliation. Therefore, when provoked, individuals would be wise to engage in activities that prevent them from ruminating (e.g., focusing attention on a work-related project, reading a book).

Limitations and Future Directions

Though the current study provides insights into a cognitive mechanism, namely rumination, that might underlie triggered displaced aggression, it is still not without limitations. First, some may question whether displaced aggression can be

accurately studied in laboratory settings. For example, does allocating hot sauce to an unknown partner really parallel yelling or hitting another person? However, both meta-analytic work and results from laboratory studies suggest that laboratory measures of aggression do assesses the same underlying construct (Carlson, Marcus-Newhall, & Miller, 1989), and results derived from laboratory studies do parallel findings from “real life” studies of aggression (Anderson & Bushman, 1997).

One criticism of excitation transfer explanations of displaced aggression is that physiological arousal generated by an initial Time 1 provocation cannot, in itself, persist over an extended period of time, namely longer than 15 minutes. Therefore, if misattributed arousal is a factor in displaced aggression, it must either be maintained or reinstated. It is possible that ruminating about a provocation could maintain or reinstate arousal generated by a Time 1 provocation. However, in order to test such a supposition, measures of physiological arousal should be incorporated into the experimental design. In order to discern if rumination maintains arousal, or reinstates it later, multiple readings should be taken before and after the initial provocation, during the rumination period, and after the triggering event.

The results of the mediation analyses suggest that negative perceptions of the triggering event mediate the relationship between trigger and displaced aggression among provoked participants who ruminated. However, there might be other potential mediators that could account for this relationship, which should be explored. For example, GAM (Anderson & Bushman, 2002a) suggests that an aggressive internal state is comprised of arousal, affective, and cognitive factors.

Various affective and cognitive variables that could served as mediators include aggressive or negative affect, or aggressive cognitions.

Finally, potential moderating variables should also be examined. For example, the strength of the provocation could be a moderator; stronger provocations might elicit more rumination which, in turn, prompts greater displaced aggression than weaker provocations. Finally, certain personological factors should also be considered. There is considerable evidence suggesting that some individuals are more prone to rumination than others, and in turn, more likely to behave aggressively (e.g., Caprara, 1986; Caprara, Barbaranelli, Colombo, Politi, & Valerio, 1985; Caprara et al., 1992; Caprara, Cinanni, & Mazzotti, 1989; Caprara, Gargaro, Pastorelli, & Prezza, 1987; Caprara, Mazzotti, Zelli, Coluzzi, & Renzi, 1985; Collins & Bell, 1992). However, no studies to date have examined how dispositional rumination is related to triggered displaced aggression. For example, one might hypothesize that individuals already prone to rumination might show heightened displaced aggression when situationally induced to ruminate.

Conclusion

The current study is valuable because it suggests a cognitive mechanism, namely rumination, that can explain many instances of real life displaced aggression. The inclusion of a long temporal delay between a Time 1 provocation and a Time 2 triggering event is important in understanding displaced aggression effects that occur in the real world. Certainly, at times, individuals are provoked by one person and have an immediate opportunity to lash out at someone else. However, this is not true of all displaced aggression situations. Often times, minor

triggering events occur long after the initial provocation, even hours later.

Rumination appears to maintain a negative internal state that primes individuals to perceive minor annoyances negatively and engage in displaced aggression, and these rumination effects appear to persist over a long period of time.

Individuals undoubtedly face many provocations that make them angry. However, how individuals focus their attention after these provocations affects how they will behave towards others. If individuals choose to think about the provocation, or focus on the bad mood it put them in, they may unfairly lash out against innocent others. If, instead, they chose to not think about the provocation, focus elsewhere, and let their anger dissipate, they are less likely to hurt others. Thus, if angered by a tyrannical boss or an insulting professor, rather than thinking about the insults just yielded, perhaps individuals should think about what they want for lunch.

REFERENCES

- Anderson, C. A., Anderson, K. B., Door, N., DeNeve, K. M., & Flanagan, M. (2000). Temperature and aggression. *Advances in Experimental Social Psychology*, 32, 63-133.
- Anderson, C. A., & Bushman, B. J. (1997). External validity of "trivial" experiments: The case of laboratory aggression. *Review of General Psychology*, 1, 19-41.
- Anderson, C. A., & Bushman, B. J. (2002a). Human aggression. *Annual Review of Psychology*, 53, 27-51.
- Anderson, C. A., & Bushman, B. J. (2002b). Media violence and societal violence. *Science*, 295, 2377-2378.
- Axelrod, R. (1984). *The evolution of cooperation*. New York: Basic Books.
- Bandura, A. (1973). *Aggression: A social learning theory analysis*. Englewood Cliffs, NJ: Prentice Hall.
- Barnett, V., & Lewis, T. (1978). *Outliers in statistical data*. New York: Wiley.
- Baron, R. A., & Bell, P. A. (1975). Aggression and heat: Mediating effects of prior provocation and exposure to an aggressive model. *Journal of Personality and Social Psychology*, 31, 825-832.
- Berkowitz, L. (1993). *Aggression: Its causes, consequences, and control*. New York: McGraw Hill.
- Bushman, B. J., & Baumeister, R. F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: Does self-love or self-hate lead to violence? *Journal of Personality and Social Psychology*, 75, 219-229.

Bushman, B. J., Pedersen, W. C., Vasquez, E. A., Bonacci, A. M., & Miller, N.

(2003). Chewing on it can chew you up: Effects of rumination on triggered displaced aggression. Unpublished manuscript.

Cantor, J. R., Zillmann, D., & Einsiedel, E. F. (1978). Female response to

provocation after exposure to an erotic film. *Communications Research*, 5, 345-412.

Caprara, G. V. (1986). Indications of aggression: The dissipation-rumination scale.

Personality and Individual Differences, 7, 763-769.

Caprara, G. V., Barbaranelli, C., Colombo, G., Politi, A., & Valerio, P. (1985).

Emotional susceptibility, irritability, and hostile rumination as correlations of coronary heart disease. *Personality and Individual Differences*, 19, 569-575.

Caprara, G. V., & Cinanni, V., & Mazzotti, E. (1989). Measuring attitudes towards

violence. *Personality and Individual Differences*, 10, 479-481.

Caprara, G. V., Gargaro, T., Pastorelli, C., & Prezza, M. (1987). Individual

differences and measures of aggression in laboratory studies. *Personality and Individual Differences*, 8, 885-893.

Caprara, G. V., Mazzotti, E., Zelli, A., Coluzzi, M., & Renzi, P. (1985). Effect of insult

and dissipation-rumination on delayed aggression and hostility. *Archivio di Psicologia, Neurologia e Psichiatria*, 46, 130-139.

Carlson, M., Marcus-Newhall, A., & Miller, N. E. (1989). Evidence for a general

construct of aggression. *Personality and Social Psychology Bulletin*, 15, 377-389.

- Carver, C. S., & Glass, D. C. (1978). Coronary-prone behavior pattern and interpersonal aggression. *Journal of Personality and Social Psychology, 36*, 361-366.
- Collins, K., & Bell, R. (1987). Personality and aggression: The dissipation-rumination scale. *Personality and Individual Differences, 25*, 751-755.
- Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information processing mechanisms in children's adjustment. *Psychological Bulletin, 115*, 74-101.
- Dill, K. E., Anderson, C. A., Anderson, K. B., & Deuser, W. E. (1997). Effects of aggressive personality on social expectations and social perceptions. *Journal of Research in Personality, 31*, 272-292.
- Dollard, J. (1938). Hostility and fear in social life. *Social Forces, 17*, 15-25.
- Dollard, J., Doob, L. W., Miller, N. E., Mowrer, O. H., & Sears, R. R. (1939). *Frustration and aggression*. New Haven, CT: Yale University Press.
- Doob, A. N., & Climie, R. J. (1972). Delay of measurement and the effect of film violence. *Journal of Experimental Social Psychology, 8*, 136-142.
- Duncan, B. L. (1976). Differential social perception and attribution of intergroup violence: Testing the lower limit of stereotyping blacks. *Journal of Personality and Social Psychology, 34*, 590-598.
- Fridhandler, B. M., & Averill, J. R. (1982). Temporal dimensions of anger: An exploration of time and emotion. In J. R. Averill (Ed.), *Anger and Aggression* (pp. 253-280). New York: Springer-Verlag.

- Geen, R. G. (2001). *Human aggression* (2nd ed.). Philadelphia, PA: Open University Press.
- Geen, R. B., & Berkowitz, L. (1967). Some conditions facilitating the occurrence of aggression after the observation of violence. *Journal of Personality*, 35, 666-676.
- Higgins, E. T., & King, G. (1981). Accessibility of social constructs: Information-processing consequences of individual and contextual variability. In N. Cantor & J. F. Kihlstrom (Eds.), *Personality, cognition, and social interaction* (pp. 69-121). Hillsdale, NJ: Erlbaum.
- Huesmann, L. R. (1998). The role of social information processing and cognitive schema in the acquisition and maintenance of habitual aggressive behavior. Chapter in Geen, R. G., & Donnerstein, E. (eds.), *Aggression: Theoretical and empirical reviews* (pp. 73-109). New York: Academic Press.
- Huesmann, L. R., & Guerra, N. G. (1997). Children's normative beliefs about aggression and aggressive behavior. *Journal of Personality and Social Psychology*, 72, 408-419.
- Jöreskog, K. G., & Sörbom, D. *Windows LISREL 8.52*. Chicago, IL: Scientific Software.
- Konenci, V. J. (1974). Self-arousal, dissipation of anger, and aggression. *Personality and Social Psychology Bulletin*, 26, 1587-1597.
- Konecni, V. J., & Doob, N. (1972). Catharsis through displacement of aggression. *Journal of Personality and Social Psychology*, 23, 379-387.

- Liberman, J. D., Solomon, S., Greenberg, J., & McGregor, H. A. (1999). A hot new measure of aggression: Hot sauce allocation. *Aggressive Behavior, 25*, 331-348.
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem solving. *Journal of Personality and Social Psychology, 69*, 176-190.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*, 83-104.
- Marcus-Newhall, A., Pedersen, W. C., Carlson, M., & Miller, N. (2000). Displaced aggression is alive and well: A meta-analytic review. *Journal of Personality and Social Psychology, 78*, 670-689.
- Martin, L. L., & Tesser, A. (1989). Toward a motivational and structural theory of ruminative thought. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 306-326). New York: Guilford Press.
- Miller, N. E. (1941). The frustration-aggression hypothesis. *Psychological Review, 48*, 337-342.
- Miller, N., & Marcus-Newhall, A. (1997). A conceptual analysis of displaced aggression. In R. Ben-Ari & Y. Rich (Eds.), *Enhancing education in heterogeneous schools: Theory and application* (pp. 69-108). Ramat Gan, Israel: Bar-Ilan University Press.

- Morrow, J., & Nolen-Hoeksema, S. (1990). Effects of response to depression on the remediation of depressive affect. *Journal of Personality and Social Psychology, 58*, 519-527.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and distress following a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology, 54*, 890-902.
- Pederson, W. C., Gonzales, C., & Miller, N. (2000). The moderating effect of trivial trigger provocation on displaced aggression. *Journal of Personality and Social Psychology, 78*, 913-927.
- Rotton, J., Barry, T., Frey, J., & Soler, E. (1978). Air pollution and interpersonal aggression. *Journal of Applied Social Psychology, 8*, 57-71.
- Rusting, C. L., & Nolen-Hoeksema, S. (1998). Regulating response to anger; Effects of rumination and distraction of angry mood. *Journal of Personality and Social Psychology, 78*, 913-927.
- Sobel, M. E. (1988). The distribution of independent random variables. *SIAM Journal of Applied Mathematics, 14*, 511-526.
- Tukey, J. W. (1977). *Exploratory data analysis*. Reading, MA: Addison-Wesley.
- Tyson, P. D. (1988). Physiological arousal, reactive aggression, and the induction of an incompatible relaxation response. *Aggression and Violent Behavior, 3*, 143-158.
- Worchel, P. (1966). Displacement and the summation of frustration. *Journal of Experimental Research in Personality, 1*, 256-261.

Zillmann, D. (1971). Excitation transfer in communication-mediated aggressive behavior. *Journal of Experimental Social Psychology, 7*, 419-434.

Zillmann, D. (1979). *Hostility and aggression*. Hillsdale, NJ: Erlbaum.

Zilman, D., Katcher, A. H., & Milavsky, B. (1972). Excitation transfer of physical exercise to subsequent aggressive behavior. *Journal of Experimental Social Psychology, 8*, 247-259.