Interpersonal Aggression Effects on Arousal

Anders R. Goodwin and Shane P. Sommers

Ripon College

Author Note

Anders R. Goodwin, Department of Psychology, Ripon College; Shane P. Sommers, Department of Psychology, Ripon College.

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Correspondence concerning this article should be addressed to Anders Goodwin, Ripon College, 600 Campus Drive #299, Ripon, WI 54971.

E-mail: goodwinan@ripon.edu

Abstract

Physiological arousal reduction has been posited as a general theory of behavior that could unify the behavioral sciences. This study explores physiological arousal reduction in the context of interpersonal aggression in an attempt to further the evidentiary base underlying the general behavioral theory. Participants freely responded to a provocative or non-provocative act by a confederate. Basal skin conductance was measured as a manifestation of physiological arousal. Results indicate that arousal and aggression are poorly correlatively linked, and a need for more wide-ranging research under the auspices of the general theory is expressed.

Keywords: aggression, arousal

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Introduction

Physiological arousal, a major research concern in the 20th century, has largely been abandoned by behavioral science in the 21st. This experiment seeks to resurrect a line of inquiry explored most notably by Hatcher (1987, 2014) that proposes changes in physiological arousal as a general explanatory mechanism for behavior. In much the same way that evolution has unified biology, and quantum mechanics has unified chemistry and physics, physiological arousal is proposed by Hatcher to act as a general theory in light of which psychology can bring its disparate branches back under one umbrella. This study seeks to explore the connection between one specific type of behavior, namely interpersonal aggression, and physiological arousal in the hope of contributing to a body of evidence for the theory of general behavior proposed by Hatcher.

Definition of Aggression

Anderson, Gentile and Buckley (2007) give a succinct and useful definition of aggression, which lists the three qualities required of an act in order for it to be considered aggression: "(a) [the behavior] is intended to harm another individual, (b) the behavior is expected by the perpetrator to have some chance of actually harming that individual, and (c) the perpetrator believes that the target individual is motivated to avoid harm." The harm entailed in this definition need not be physical. Aggression has been broken down into different categories by Anderson, Gentile, and Buckley as well as other researchers. The rest of this section will define common aggression terminology, which will be useful in discussing aggression theory, aggression research, and the study of arousal's impact on aggression.

Much early aggression research classified the motivation behind an aggressive act as either hostile (reactive) or instrumental (proactive). Hostile aggression is unplanned, thoughtless, driven by anger, and occurs in reaction to a provocation (Anderson & Bushman, 2002). The primary goal of physical aggression is to harm the victim. A person impulsively punching someone at a bar over a real or perceived insult is an example of hostile (reactive) aggression. Although reactive aggression need not be physical, it often takes that form.

Instrumental aggression is planned and is used to reach a goal other than directly harming a victim (Anderson & Bushman, 2002). A robber stabbing a victim during the course of a robbery would be perpetrating an act of instrumental aggression if the stabbing enabled the robber to escape, for example. Hostile aggression can be seen as an end in itself, whereas instrumental aggression is a means to an end. It should be noted that these two types of aggression are not mutually exclusive. Aggressive acts may be motivated by a combination of hostile and instrumental aggression. For example, a mother may act impulsively (i.e. hostilely) and spank her child when the child runs out into the street, but the aggression may also be instrumental if the mother uses the spanking as a means to keep her child from future danger. While categorizing aggression as either hostile or instrumental may be useful for developing theories, its interpretive power as applied to individual acts is limited by inaccuracies in self-reporting of mental states by aggressors (Anderson & Bushman, 2002).

Besides using the categories of hostile and instrumental (which describe the motivation of an act) the actual form of the aggressive act can be seen as physical, verbal, or relational. Physical aggression entails harming a person via direct physical methods ranging from mild (a pinch) to severe (shooting) (Anderson, Gentile & Buckley, 2007). Relational aggression harms others through damage caused to others' feelings of acceptance and their relationships. An

example of relational aggression would be one child spreading rumors about another child in order to damage that child's social standing. Verbal aggression harms others through name-calling or written statements. These three forms of aggression can be seen individually or in conjunction with one another. Any specific act of aggression does not necessarily fit neatly into these categories, but the categories are a useful tool to help facilitate and discuss aggression research.

Social Learning Theory

Insights derived from social learning theory have served as a driving theory behind models of aggression. Social learning theory posits that people acquire responses by direct experience or by observing others. One can learn not only from performing an act and receiving a reward or punishment but also from witnessing an act and the associated reception of a reward or punishment (Bandura, 1983, as cited in Anderson & Bushman, 2002).

Social learning theory was demonstrated by Alfred Bandura's Bobo doll experiment, which had children watch adults act aggressively towards the Bobo doll, a soft inflatable toy painted like a clown with a weighted base that would return to an upright position after being knocked over (Bandura, Ross, & Ross, 1964). Children in the experimental condition witnessed an adult behave in a verbally and physically aggressive manner toward the Bobo doll, yelling at it and knocking it over. Children in the control did not witness any verbal or physical aggression. The study found that the children who had witnessed aggressive behavior toward the doll from adults behaved more aggressively toward the doll when left alone with it. This experiment demonstrates social learning theory quite well, showing that aggressive responses can be learned not only through direct experience but also through observation of others.

According to social learning theory, "children are more likely to imitate a witnessed behavior if they also witness a reward for the action, and they are less likely to imitate a witnessed behavior if they witness the action being punished" (Carnagey & Anderson, 2003, pp. 8-9). Children learn to interpret the events in their environment and begin to assemble a set of rules for how to behave. The rules they establish are altered, reinforced or inhibited by their social interactions (Carnagey & Anderson, 2003; Bandura, Ross & Ross, 1964). Video games act as learning environments and simulated social interactions featuring reward and punishment, which can in turn alter a video game player's set of rules for how to behave.

Social learning theory may not manifest itself in immediate actions, as exemplified by Buckley and Anderson (2006), who clarified the difference between learning and performance, showing how children can learn a behavior through observation, but not use it until circumstances call for it. For instance, a child may learn a way to inflict violence upon a foe but may never perform the newly learned violent behavior because they saw the act of violence punished in the game. However, in the future, once the threat of punishment has been removed the aggressive behavior may be performed.

General Aggression Model

The General Aggression Model, proposed by Anderson and Bushman (2002), expands and synthesizes social learning theory and other theories into a holistic frame by which to examine instances of aggression in media, in the hopes that this model can also be applied to real world aggression situations. The General Aggression Model describes a cyclical relationship between a person and their environment. The General Aggression Model attempts to explain the way two types of variables – person variables, such as trait hostility, self-esteem, sex, beliefs,

attitudes, values, and goals, and situation variables like exposure to real-world or media violence – combine to affect an individual's present internal state (Adachi & Willoughby, 2010; Anderson & Bushman, 2002).

The General Aggression Model suggests that two types of input variables--the person and the situation--affect the way that a person behaves (Carnagey & Anderson, 2003). "Person factors include all of the characteristics a person brings to a situation, such as personality traits, attitudes, [and] genetic predispositions" (Anderson & Bushman, 2002, p. 35). Situation variables include all of the important features of the environment, or situation (Anderson & Bushman 2002). In situations of aggression, these variables may include aggressive cues, presence of provocation, pain, rewards, and frustration (Carnagey & Anderson, 2003). The general aggression model is shown below in Figure 1, which illustrates the cyclical process of inputs, routes, and outcomes that form the core loop of the model.

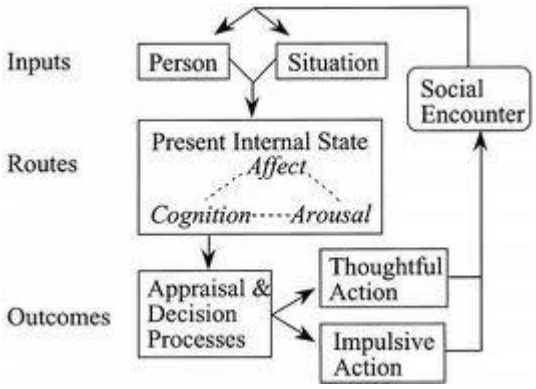

Figure 1. The General Aggression Model. Reproduced from Anderson & Bushman, 2002.

The person and situation factors described by Anderson & Bushman (2002) as well as Carnagey & Anderson (2003) impact a person's present internal state and thus the way they appraise situations. A person's internal state consists of affect, cognition and arousal. Internal

states can be seen as the mechanism mediating the relationship of person and situation variables (Anderson & Bushman, 2002; DeWall & Anderson, 2014).

All of the aforementioned factors affect the way that a person interprets and makes a decision about what action to take in a given situation (for a more thorough explanation of the General Aggression Model see Anderson & Bushman, 2002). A person's appraisal of a situation can result in either thoughtful or thoughtless action. Each social encounter (real or virtual) affects a person's input variables and their subsequent appraisals of situations. See Figure 1 for a visual representation of episodic processes in the General Aggression Model (Anderson & Busman, 2002; DeWall & Anderson, 2014)

Aggression in Experiments

The literature on aggression, as of late, has been heavily focused on the effect video games have on aggression. While the effects of video games on aggression are fascinating, they often prove difficult to study. There is much debate and contention over the methodology used in aggression research. There are some third variables, which some researchers think may affect many studies about aggression. For example, Adachi and Willoughby (2011) found that when violent and non-violent games were equated for levels of competitiveness, violent games elevated aggression (as measured by the Hot Sauce Paradigm) no more than the non-violent games. Adachi and Willoughby's (2011) findings suggest that competitiveness may be the video game characteristic, which provokes the most aggression in short-term experimental studies. Further studies comparing the effects and interactions of violence and competition on aggression are needed.

Adachi and Willoughby also critique the validity of the tests of aggression many researchers use. Adachi and Willoughby found that the most commonly used measure of aggressive behavior in the video game literature is the modified Taylor Competitive Reaction Time Test (TCRTT), which has participants ostensibly compete in a reaction time task, wherein they get to mete out noise blasts to their opponent. They hypothesize that the TCRTT may not truly be measuring a person's intent to harm but rather their level of competitiveness, due to the fact that giving a louder noise blast could be seen as a way to gain a competitive advantage. At the time of their writing no study had measured the TCRTT's association with aggression outside of the laboratory.

The current study aims to examine subtle interpersonal aggression; we will eschew contentious measures of aggression such as word stem completion and self-report questionnaires, instead focusing on the role arousal plays in subtle interpersonal aggression.

Subtle Forms of Aggression

Glomb and Liao (2003) looked at non-physical forms of aggression within the workplace. They ignored acts of physical aggression and focused non-physical acts—"low level, less extreme aggressive behaviors (such as yelling at another person, talking, behind another person's back, and with holding needed resources p. 487." They found a positive relationship between being the target of aggressive behavior and engaging in it. This aligns with social exchange theory, which suggests that relationships develop through a series of reciprocal interactions (Blau, 1964, as cited in Glomb & Liao, 2003). It appears as though being the target of aggression, even if it is mild increases a person's chance reciprocating aggression. An act of aggression need not be extreme to provoke a retaliatory act of aggression.

Sex Differences in Aggression

The notion that males are more aggressive than females seems like commonsense. However, upon examination of the literature on aggression this notion is called into question. Buss (1961) viewed aggression as a primarily male phenomenon. This early view of aggression as a male phenomenon came about because of the methods used to measure it. Björkqvist and Niemelä (1992) observed that most studies on human aggression had been conducted by male researchers, who had operationally defined aggression as physical aggression, rather than interpersonal aggression, verbal aggression or indirect aggression.

Eagly and Steffen (1986) performed a meta-analysis which found that men were more aggressive than women were, but that the sex difference was greater for physical than non-physical aggression. They also point out that studying aggression through a teacher-learner method provokes greater aggression in men than in women. While Eagly and Steffen found through their meta-analysis that in general men were more aggressive than women were, it seems as though their assertion should be reexamined and weighed against conflicting evidence and complaints about the operationalizing of aggression.

Within the realm of adult interpersonal conflict it seems as though physical aggression is the exception, not the rule (Björkqvist, 1994). It causes one to wonder why physical aggression is studied so much more frequently than verbal, relational, and indirect aggression. One reason could be the difficulty of measuring more subtle types of aggression and the fact that physical aggression is seen as a larger social issue than other ostensibly more benign forms.

Arousal

Given the seemingly disparate types of aggression and the wide-ranging processes thought to play a role in creating the specific instances of aggression discussed, one may wonder whether any unifying force exists that animates all aggression. Hatcher (1987) posits a system of physiological arousal which he argues has the potential to form a fundamental theory of behavior in much the same way that evolution underlies biology or quantum mechanics physics. It is through this system of arousal that aggression as a behavior can be unified and understood; furthermore, if many types of behaviors can be linked to arousal levels, the plausibility of arousal as a general behavioral mechanism comes into focus. This study aims to show that one specific behavior, interpersonal aggression, can be understood through physiological arousal levels, contributing to the broader theory.

One strength of this fundamental behavioral theory is that it rests on generally accepted biological processes, most relevantly evolution. Hatcher (1987) suggests that behavior can be conceptualized as fitness-enhancing, arguing that organisms as simple as paramecium demonstrate distinct behaviors that seem to lead to their continuance as a species. In this way, the behavior of a paramecium conforms to classical notions of evolution via natural selection. This logic is then extended to higher-order behavior, such as that demonstrated by humans. Arguing that natural and artificial systems differ on several key variables, Hatcher explains that physiological arousal is naturally-created due to its resistance to change, its existence across the history of humanity, and its adaptive purpose within autonomic nervous responses.

Having thus established arousal as a natural system, Hatcher (1987) turns to its utility as a general model for behavior. He contends that any general behavioral system based on an evolutionary framework must account for three functions: general avoidance of danger, maintenance of an optimal balance between danger and opportunity to acquire life-sustaining

resources, and an appetitive system to motivate the organism to acquire those resources. Hatcher then makes explicit the link between danger and arousal, stating that systems of arousal serve to moderate danger to the organism.

Finally, two closely-related systems of arousal are explored as candidates for a general theory of behavior: arousal-reduction theory (or drive theory), and optimal-arousal theory (or activation theory). As outlined by Hatcher (1987), arousal-reduction theory suggests that under any given circumstance an organism will seek to lower its arousal, while optimal-arousal theory states that an organism will have a base level of arousal which they will seek to maintain through actions that either reduce or increase their arousal level, relative to their optimal level and current arousal level (pp. 187-188). These two theories applied to aggression form the basis for the experiments described later in this paper.

Aggression and Arousal

Several studies have established the link between physiological arousal and aggressive action. Taylor's 1967 electric-shock task demonstrates clearly the basic link between physiological arousal, which he measured through skin conductance, provocation, and aggressive tendencies. After putting subjects through a learning task which involved electric shocks administered to the participant by a confederate and vice-versa, Taylor concluded that "The increase in aggression as a function of increasing provocation…is significant at the 001 level" (pp. 303). Taylor additionally establishes that "physiological arousal varies directly with aggressive provocation" (pp. 305), explaining that increased provocation leads to increased physiological arousal and vice-versa. Linking the two findings together, it appears that provocation increases physiological arousal and aggression, with the level of provocation

determining the resultant increase in both measures. Furthermore, Taylor found that those participants not inclined to control their aggressive tendencies exhibited more physiological arousal than did those prone to controlling such behavior, which suggests that aggression may be directly linked, rather than simply indirectly linked as a function of provocation.

This link between arousal and aggression has been demonstrated by a variety of studies. A fairly recent review of studies measuring arousal effects on aggression suggests that, generally speaking, high aggression is positively correlated with aggressive action (Tyson, 1998). Tyson also indicates that aggression can be manipulated with a variety of therapies that deal with arousal, indicating that techniques such as biofeedback, relaxation and systematic desensitization, which seek to either directly or indirectly lower physiological arousal, are effective treatments for aggressive behavior.

Not all studies have found results in such concordance with the research done by Tyson (1998) and Taylor (1967), however. Thomas' 1982 study of media and interpersonal aggression combined an analysis of heart rate with provocations in the form of an aggressive film and a confederate's actions toward the participant. Aggressive action on the participant's part was explored by way of administering electric shocks to the confederate. Seemingly contrary to the previously discussed findings in the area, Thomas found that angered men exhibited the lowest heart rate prior to and after administering the shocks.

Such seemingly contrary results may, in fact, simply be part of the broader phenomenon encompassing aggression and arousal, as a series of articles and studies (Hokanson, 1961; Hokanson & Burgess, 1962a; Hokanson & Burgess, 1962b) suggests. Hokanson's (1961) first study allowed white male participants that were either high or low in hostility to administer

electric shocks to an abusive experimenter, while their systolic blood pressure was measured. Hokanson found that during the act of shocking the experimenter, high-hostility participants experienced the highest average levels of systolic blood pressure, and that they showed the highest reduction rate after administering the shock (1961). This squares with Thomas' results, which indicated that angered males were seemingly less aroused after an aggressive act. Hokanson suggests that this reduction in arousal after an aggressive act reflects the release of frustration on part of the participant, which leads to a less-aroused state.

A further study, co-authored by Hokanson and Burgess (1962a), extended Hokanson's previous research and found a similar phenomenon, but with an interesting twist. In this study, Hokanson and Burgess allowed males and females to aggress physically against the frustrating experimenter; aggress verbally against the frustrating experimenter; aggress against the experimenter in a mental fantasy; or not aggress against the frustrating experimenter. Their finding that the physical and verbal aggressors experienced declines in physiological measures of arousal similar to that of a control, low aggression group suggests that aggression is correlated with arousal in that it allows for a release of aggression; however, the lack of significant decrease in physiological arousal experienced by the fantasy and no-aggression group led the authors to conclude that merely having the opportunity to aggress against the frustrator in reality was responsible for the attendant decrease in arousal.

The third study in the series adds additional wrinkles to the mix: the type of frustration experienced and the status of the frustrator. In a series of tasks, Hokanson and Burgess (1962b) delineated two different types of frustration, namely ego-threat and goal-blocking frustration, and had each of these types of frustration induced by an experimenter with a low status relative to the participant and one with high status. Interestingly, the results indicated that although

participants had the opportunity to aggress against both types of frustrators, they only experienced a significant reduction in arousal after aggressing against the low-status frustrator. Ultimately, Hokanson and Burgess state that their conclusions "…raise a question about the generality of the 'tension-reducing' function usually associated with overt aggression" (p. 236).

The Current Research

The present research studies interpersonal aggression effects on physiological arousal by allowing freely chosen responses from the participant in an evaluative task of a confederate after verbal provocation in the same evaluative task by the confederate. This study seeks to overcome several deficits within the extant literature, and address the area from a new angle. Much of the literature studying aggression and arousal utilizes electric shocks as the aggression by the participant, a useful but unrealistic situation. By examining interpersonal aggression the present research looks to study the aggression-arousal link in a more common, realistic situation. One additional deficit the research seeks to overcome is the potential statistical variation among differing participants involved in the use of baseline arousal measures; by looking solely at mean differences in arousal measures, the present research seeks to ignore the potential confound of differing baseline arousal levels between participants, a confound present in much of the previous literature. Additionally, by running every participant through both levels of the confederate response variable, the present research will allow more generalizable conclusions to be drawn as we will be dealing with a unified sample rather than differing samples between conditions, as many previous experiments have been designed. Finally, this research seeks to integrate the design and measurement standards of ongoing research by Hatcher (2014) to more closely align the results obtained with a specific theory and its associated research, in an attempt to robustly support the theory of arousal as a general causal agent in behavior by means of

converging evidence. Much of the previous literature on the subject does not attempt to integrate or further a general theory, instead content to examine the phenomenon in relative isolation.

The authors predict that mean change in arousal levels will occur to a significantly higher degree when participants are given low ratings by the confederate, as the low rating will act as a provoking stimulus that incites the participant to an aggressive response, namely giving a low rating in return, which will in turn generate more change in arousal. The authors do predict a significantly higher mean level of arousal for males than for females due to social norms of the impermissibility of female aggression acting as an aggression-reducing, and therefore arousal-reducing, situational factor within the general aggression model (Anderson & Bushman, 2002).

Method

Participants

The 20 participants (significantly less than the 34 required to find a moderate effect as derived by power calculations) for this study were drawn from undergraduate psychology students at a small, Midwestern liberal arts college. The participants were predominantly white, with a mean age of 19, and most participated either for extra credit or as part of a mandatory course requirement. Eight participants were male and 12 were female. The participants signed up for the experiment via sign-up sheets distributed in class and were emailed the night before as a reminder. The "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 2010) guided the ways in which the participants were dealt with.

Design

This experiment utilized a 2x2 mixed factorial design. The independent variables studied were gender (male, female) and rating given by the confederate to the experimenter on the evaluative task (high, low). The dependent variable was arousal measured by mean difference of pre- and post-response skin conductance. Specifically, participants' arousal levels, measured in micromhos, were measured at six seconds immediately prior to and six seconds immediately following assignment of a poem rating via an online chat. These two intervals' measurements were subtracted to form a single change in mean micromhos score. All participants underwent both confederate rating conditions, with the confederate responses presented in a counterbalanced order to account for primacy and recency effects.

Materials

Research materials utilized included a lab coat for the experimenter, an Apple IIe physiograph with an associated skin conductance measuring program, two basal skin conductance electrodes, electro-conductive gel, a laptop for the online poem exchange, a topic sheet (see Appendix D) and pen for the participant, a script for the experimenter (see Appendix B), paper and pen for the experimenter to record the various ratings, a sheet of poems for the confederate (see Appendix C), and a consent form (see Appendix A).

Procedure

The experiment occurred in a small, windowless room in the basement of an academic building on a college campus. Participants were emailed the night prior to the experiment to remind them of their participation.

Upon arrival, participants were first be given a consent form, which they signed. They were also informed of their ability to withdraw from the experiment at any time without penalty. Next, the participants heard a set of instructions from the experimenter explaining the task to be completed and the general method of the study. Participants were told that their skin conductance level would be measured as they completed an evaluative task.

The evaluative task was as follows. The experimenter provided the participant with a list of eight topics, on each of which the participant was to write a two-line poem. The experimenter told the participant that they would share these poems via an online chat room with another participant, and that each participant would give a quality rating to the other person after each

poem, as well as an anger rating after seeing the ratings for their poems. The experimenter then left the room and began timing the participant, stopping the participant either after ten minutes had elapsed or the participant had finished writing their poems. After writing the poems, the electrodes were attached to the participant's middle and ring fingertips, the experimenter brought up the chat room on the laptop, and the poem exchange began.

The poem exchange proceeded in the following manner. The experimenter typed the participant's first poem into the chat room. The confederate, using the chat room, gave the participant a quality rating based upon the script the confederate was given prior to the experiment. This rating constituted one independent variable, with trials being divided into two types of ratings, high ratings and low ratings. The experimenter then stated the poem rating aloud and asked the participant to rate their level of anger at the poem rating. Then, after being told via the chat room that the experimenter was ready to proceed, the confederate entered his first poem, also taken from the script provided to the confederate by the experimenter. Next, the experimenter asked the participant to read and rate the confederate's poem. After hearing the participant's rating, the experimenter typed this rating into the chat room and marked down the time of the rating on the physiograph's computer program. Each poem rating as well as the participant's anger level was then recorded by the experimenter. The poem exchange proceeded in this manner for eight poems by the participant and eight poems by the confederate, with each exchange of poems and ratings counting as one trial for a total of eight trials.

After completing the procedure, the participant was debriefed according to the debriefing portion of the experimenter script.

Results

An initial independent t-test was run to compare the anger scores from the high confederate rating trials to those from the low confederate rating trials. In this test, as with all subsequent analyses in this study, $\alpha = .05$. Anger scores were significantly higher during the high trials ($M = 1.14$, $SD = 0.35$) rather than the low trials ($M = 1.96$, $SD = 0.86$), $t(38) = 3.99$, $p < .001$, indicating that participants were provoked by low ratings of their poems by the confederate.

A 2x2 repeated measures analysis of variance (rANOVA) examined the main effect of confederate rating (high and low) on basal skin conductance, as well as the interaction of gender and confederate rating. No significant main effect of confederate rating was obtained, $F(1, 18) = .53$, $p = .48$, suggesting that participants' arousal levels were not significantly altered by the differing confederate ratings of their poems. Similarly, gender and confederate rating did not interact significantly, $F(1, 18) = 1.74$, $p = .20$.

A second set of independent t-tests examined the main effect of gender on basal skin conductance. The overall mean change in micromhos was not significant between genders, $t(18) = -.27$, $p = .79$. Furthermore, no significant difference in micromhos was obtained between genders in either the high trials, $t(18) = .80$, $p = .43$, or the low trials, $t(18) = -1.25$, $p = .23$.

Finally, point-biserial correlations were done to examine the correlation between basal skin conductance and the two independent variables. A very small, non-significant negative correlation was found between confederate rating and micromhos, $r(38) = -.08$, $p = .62$. A slight, non-significant positive correlation was obtained between gender and micromhos, $r(18) = .06$, $p = .79$.

Discussion

Neither of our hypotheses were supported. We predicted that mean change in arousal levels would occur to a significantly higher degree when participants were given low ratings by the confederate, but no such difference appeared within our data. Furthermore, males did not appear to be more aroused by aggression than females, contrary to our second hypothesis.

Gender Differences

The authors predicted a significantly higher mean level of arousal change for males than for females, believing social norms regarding the impermissibility of female aggression would act as an aggression-reducing, and therefore arousal-reducing, situational factor within the general aggression model. Males and females did not differ in arousal scores. This suggests that arousal may not be the primary factor which causes interpersonal aggression, but this should be tested in an experiment capable of eliciting more anger and aggression than our current experiment. Perhaps males and females have similar physiological responses to criticism, but they act upon them in different ways.

Eagly and Steffen (1986) found that males demonstrate much higher aggression than females when experimenters use the teacher learner paradigm. Our experiment avoided the teacher learner paradigm, which may account for why their reactions were so similar. It would be intriguing to test some other assumptions people hold about how much aggression males and females demonstrate. Studying the sex differences and interpersonal aggression should be taken up by more psychologists, given Björkqvist's (1994) assertion that physical aggression appears to be the exception, not the norm, when it comes to interpersonal conflict, and that such aggression is commonly considered the domain of males.

High and Low Ratings

The lack of statistical difference between arousal scores within the confederate low rating and confederate high rating condition could be caused by different emotions that the high and low ratings brought on. Perhaps the low ratings made people feel more sadness than anger. Maybe the high ratings elicited excitement, or some other emotion from the participant which created a similar physiological arousal response to that of the low rating condition. People do not always react to stimuli in the same way. Humans are very complex and it appears that the way we react to positive and negative feedback is likewise complex—or participants were not affected by the ratings of the confederate.

What Emotions Were Really Provoked?

The simple 5-point anger Likert scale which participants completed after each trial showed that participants rated themselves as significantly angrier after receiving a low score. The experimenters were initially concerned about whether the poem writing and rating task would elicit anger which correlates with aggression. The experimenters were pleased that this validity check suggested that we were actually provoking anger which would make participants' behavior more justifiably interpretable as aggression. However, the significance must be put into perspective: participants' average anger rating after receiving a high score was 1.14; the average anger score after a low rating was 1.96. A Likert rating of 1 meant "not angry at all"; a Likert rating of 2 meant "slightly angry." Making someone feel slightly angry rather than not at all angry does not appear to be enough to make their arousal levels change significantly.

Participants reported a significant increase in anger, but we received no insight into any of the other emotions they felt. Perhaps if we had also added Likert scales for sadness, anxiety,

happiness, or excitement we would have more insight into the mix of emotions participants experienced. The addition of these extra scales would have made the experiment more cumbersome and may in and of themselves have caused some anxiety, which would affect arousal. Our struggles speak to the difficulty of isolating and studying one specific thing, in this case interpersonal aggression, as well as commonly-accepted findings relating to participants' lack of insight into their own their motives and emotions (Nisbett & Wilson, 1977)

Intent to Harm

Even if any significance had been discovered, this experiment would not have been able speak to whether participants actually intended harm toward the confederate. Participants' rating behaviors could be affected by norms regarding reciprocity. This means that people could end up exchanging scores in an unthinking reciprocal manner, rather than out of a desire to cause harm to the confederate. A mindless exchange seems more likely to occur when the participants have little investment in the task, as several anecdotally related to the researchers during debriefing.

Apathy

Some participants did not appear to take the poem writing and rating seriously. Many wrote quick poems and did not seem to put much thought into them. Other participants simply accepted the low ratings, appearing to think that their poem was bad. This all resulted in some participants who did not seem to care about the ratings they received. It makes sense that participants would not rate themselves as angry or retaliate with a low score if they have no investment in the task.

If our participants had been creative writing students (people who view themselves as writers and whose self-concepts are informed by this) we might obtain different results. It was difficult to choose a topic for the evaluative task, as people value things differently. Rating topics that would be more universally anger provoking (such as appearance) could elicit anger and aggression more consistently than this study's poetry task, but would presumably be more traumatizing to participants and therefore potentially unethical. There was much discussion amongst the experimenters prior to settling on the poetry task.

Limitations

This study faced numerous limitations beyond the control of the experimenters. The legitimacy of our results suffer from a lower than desired participant count. Only 50% of participants who signed up for the experiment actually came and took the experiment. Thus, the number of participants required according to our power calculation was not reached. In the future more participants could be run and the data could be re-evaluated.

Older equipment was used, in hopes of integrating this research with Hatcher's (1987, 2014) ongoing research. The older equipment was difficult to operate and mechanical failures caused a small loss of data. It would be interesting to run a comparable study with modern equipment and be able to correlate heart rate and other signs of physiological arousal. Newer equipment would make collecting and keeping track of data simpler and less stressful.

Methodological Changes

Ideally a pilot study would have been run to refine the methods and design of the experiment. However, due to the limited time available to run the experiment, no pilot study was

conducted. In the future, a pilot study should be considered to avoid the methodological pitfalls this experiment ran into.

In future research it is hoped to measure participant's arousal levels while receiving feedback, in addition to measuring arousal levels when giving feedback. The experimenters thought about implementing this extra element, but decided against it due to the fairly lengthy time commitment already required of participants.

People behave differently in person and online. This experiment used Google Chat out of convenience. In most online interactions people do not know each other in real life. In this study participants believed that they were exchanging poems with another Ripon College student, which made the setting somewhat less anonymous than the average internet interaction. Therefore even if significance had been found it would have been difficult to generalize it to a true anonymous online setting. The experimenters debated eschewing the chat program in favor of having a confederate in the room, hidden behind a divider, giving ratings aloud, with the participants doing the same. The idea was ultimately thought to be too large of a change to implement at the last minute. Comparing the results of this study a similar one with the confederate in the room, would be interesting and show how people react differently online and in person. Another experiment which could be run would use the poetry rating task, but have the participant and confederate sitting face to face.

Arousal as a General Theory

The results obtained do not lend support to Hatcher's (1987) proposed theory of physiological arousal as a general behavioral explanation. No support for a link between provocation, arousal and aggression can be drawn from the results of this study. However, much

previous research seems to indicate that certain forms of aggression, primarily physical, do correspond to changes in arousal level. For this reason the experimenters caution against taking this study's results to undermine Hatcher's theory.

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Appendix A

Research Participant Consent Form

RESEARCH PARTICIPANT CONSENT FORM
Interpersonal Aggression Effects on Arousal
Anders Goodwin and Shane Sommers
Ripon College
Psychology Department

Purpose of Research: The purpose of this research is to examine attitudes and physiological responses to criticism and praise.

Specific Procedures to be Used: You will be given 10 minutes to write 8 poems about 8 topics given to you. You will then have your basal skin conductance level measured while rating another participants poems and having your own poems rated.

Duration of Participation: The experiment should last roughly 20-30 minutes.

Benefits to the Individual: Some students will receive participation credit or extra credit. Participants will have the opportunity to learn about the process of psychological experimentation.

Risks to the individual: Deception may be used in this experiment. Risks are no more than the participant would encounter in everyday life.

Confidentiality: Your name will not be associated with your data. You will be assigned a number which will be used in interpreting the results. Poems generated by participants will not be published or disseminated in any way.

Voluntary Nature of Participation: I am eighteen (18) years of age or older. I am not required nor have I been coerced to participate in this experiment. If I agree to participate I can withdraw my participation at any time without penalty.

Human Subject Statement:

If I have any questions about this experiment, I can contact ***Professor Petersik of the Psychology Department***. The phone number is 748-8134. The email address is petersikt@ripon.edu.

I HAVE HAD THE OPPORTUNITY TO READ THIS CONSENT FORM, ASK QUESTIONS ABOUT THE RESEARCH PROJECT AND AM PREPARED TO PARTICIPATE IN THIS PROJECT.

_____ _____

Participant's Signature **Date**

_____

Participant's Name

_____ _____

Researcher's Signature **Date**

Appendix B

Experimenter Script

Please have a seat here. Hello, and welcome to our experiment – thank you for your participation. I encourage you to pay full attention while doing the study, as doing so will make our results the most accurate they can be. Are you receiving extra credit for your participation in this study? (*If yes, write down name and prof's name/class*).

This study will entail a creative task which I will explain in detail later, as well as the measurement of your skin conductance using the physiograph. The physiograph measures the activity of the sweat glands at the end of your fingertips, and there is no possibility of an electric shock while using the physiograph. Are you okay with that? Do you have any questions at this time?

(*Give participant consent form*) Here is the consent form for the study. Please read it, and if you still agree to participate after reading it please sign the form. We can begin once you sign the form.

(*After participant signs consent form*) Thank you. We will now begin the first portion of the experiment. The first portion of this experiment is a poem-writing task. Please follow the directions on the sheet I will provide you with. You will have up to ten minutes to complete this task. If you finish before time is up or have any questions, please let me know – I will be just outside this room. Your time begins once I leave the room.

(*At 10 minutes or when participant is finished*) Thank you. We will now begin the second portion of the experiment. For this portion of the experiment I will connect you to the physiograph. Please stick out your non-dominant hand. I am going to use your middle and ring fingers. I am first going to clean the area with rubbing alcohol. Next I will place electrode gel on the electrodes – this is so the electrodes can get a better read. Now I will wrap the electrodes around your fingers. Does that feel okay? Good. Please leave your hand resting on the table during the experiment and try to move as little as possible.

This portion of the experiment will entail an online exchange and rating of poems between you and another participant in another room. I will type your first poem into the chat window. The other participant will rate it on the 1-9 poem rating scale you see before you via the chat window. I will then ask you to rate your current level of anger on the 1-5 scale that you see before you – please do not think about this rating, just say the first number that comes to your mind. Then, the other participant will type his or her poem into the chat window. I will then ask you to assign it a rating from 1-9 per the poem rating scale – again, please do not think about this rating, just say the first thing that comes to your mind. I will type this rating into the chat window. This process will repeat for each poem. Do you have any questions about the procedure at this time?

(*Type first poem into chat, get rating back, write down confederate rating, ask for anger rating, write down anger rating, wait for confederate poem, ask for participant rating, when rating is given mark event on physiograph, write down participant rating. Repeat for each poem.*)

(*After all trials are complete, detach physiograph from participant.*)

This experiment was studying interpersonal aggression's effect on physiological arousal. We wanted to determine how physiologically arousing giving negative/aggressive and positive kinds of feedback would be. We are examining the link between aggression and arousal. The research may also support the use of physiological arousal as a general explanation of behavior.

Deception was used in this experiment. In the experiment, you interacted not with another participant, but with a confederate who knew of the experiment's purpose and was given specific instructions on how to rate your poems in advance. This was done to create a more realistic psychological situation.

In the event that your participation in this experiment has caused harm to you, we urge you to consider contacting the on-campus counseling services, which may be accessed in the third floor of Bartlett Hall. You may also set up an appointment with Cindy Viertel at ViertelC@ripon.edu. Concerns about this experiment may be addressed to Timothy Petersik, Professor of Psychology, at PetersikT@ripon.edu.

Do you have any questions, concerns or comments about the experiment you just participated in?

Thank you for your participation.

Appendix C

Confederate Poem Sheet

Topic #1: Weather

Snow falling softly from the sky

Alights on the tree, pleasing to the eye.

Topic #2: Animals

Silent tread, steely gaze,

Woe betide the feared cat's prey.

Topic #3: School

School is great, and school is cool

Except for all the pesky rules.

Topic #4: Family

Teacher, cook, and lots of fun

Mothers are all these things in one.

Topic #5: Home

A refuge in these troubled times,

Hold strong and safe, home of mine.

Topic #6: Food

Each bite a breath, each sip a lifetime,

What bliss and joy to wine and dine!

Topic #7: Work

How miserable is this life of mine,

A slave to the corporate bottom line.

Topic #8: Travel

Sights unseen, words unheard

I long to travel all the earth.

Appendix D

Participant Poem Sheet

Instructions: Please write a two-line poem on each of the following topics in the space provided under each topic. You will have ten (10) minutes to write a total of eight (8) poems. Please keep in mind that these poems will be seen and evaluated by other participants.

Example poem
Roses are red, violets are blue,
I hope this example poem enlightens you.

Topic #1: Weather

Topic #2: Animals

Topic #3: School

Topic #4: Family

Topic #5: Home

Topic #6: Food

Topic #7: Work

Topic #8: Travel