

The effects of temperature on aggression

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Abstract

Research has examined the heat-aggression hypothesis, the idea that aggression increases as temperature rises (Anderson, 1987; Krenzer & Splan, 2018). However, there has been very little research on heat and aggression when playing games. Some research has shown that people are more likely to be aggressive when they are competing against other people as opposed to a computer opponent (Williams & Clippinger, 2002), but heat was not introduced as a factor. This project will join these two lines of research and examine whether heat-aggression is present when playing a board game. Participants were asked to compete in a game of Monopoly: Cheaters Edition. Participants were randomly assigned to one of two conditions, the heat condition (90°F) and the control condition (70°F). A survey was administered to the participants at the end of each session that included the Positive and Negative Affect Schedule (PANAS) and a self-reported aggression rating. The hypothesis was not supported, and results indicated that those in the control condition reported they felt significantly more aggressive than the heat condition.

Introduction

- What is aggression?
 - Aggression consists of physical and nonphysical behaviors, such as slapping, hitting, threatening, and insulting others (Kim, et al, 2020).
- The heat-aggression hypothesis is a common theory about the cause of aggression
 - Heat-aggression hypothesis is: “As temperature rises, the likelihood for relational or violent aggression increases” (Krenzer & Splan, 2018)
 - Major league baseball pitchers are more likely to hit a batter during the game if the temperature is hot (Krenzer & Splan, 2018)
 - There is a positive relationship between average temperature of a city and crime rate (Anderson, 1987).
- There has been less research about aggression using board games, or *Monopoly* more specifically
 - *Monopoly* has been used to measure aggression, bargaining, and risk taking
 - Participants were significantly more aggressive towards computerized opponents as opposed to human opponents (Whitaker, 1980; Williams & Clippinger, 2002)
- Hypothesis
 - I hypothesize that the participants placed in the experimental group (hot room) will show increased levels of aggression compared to the control group.

Materials & Methods

Participants

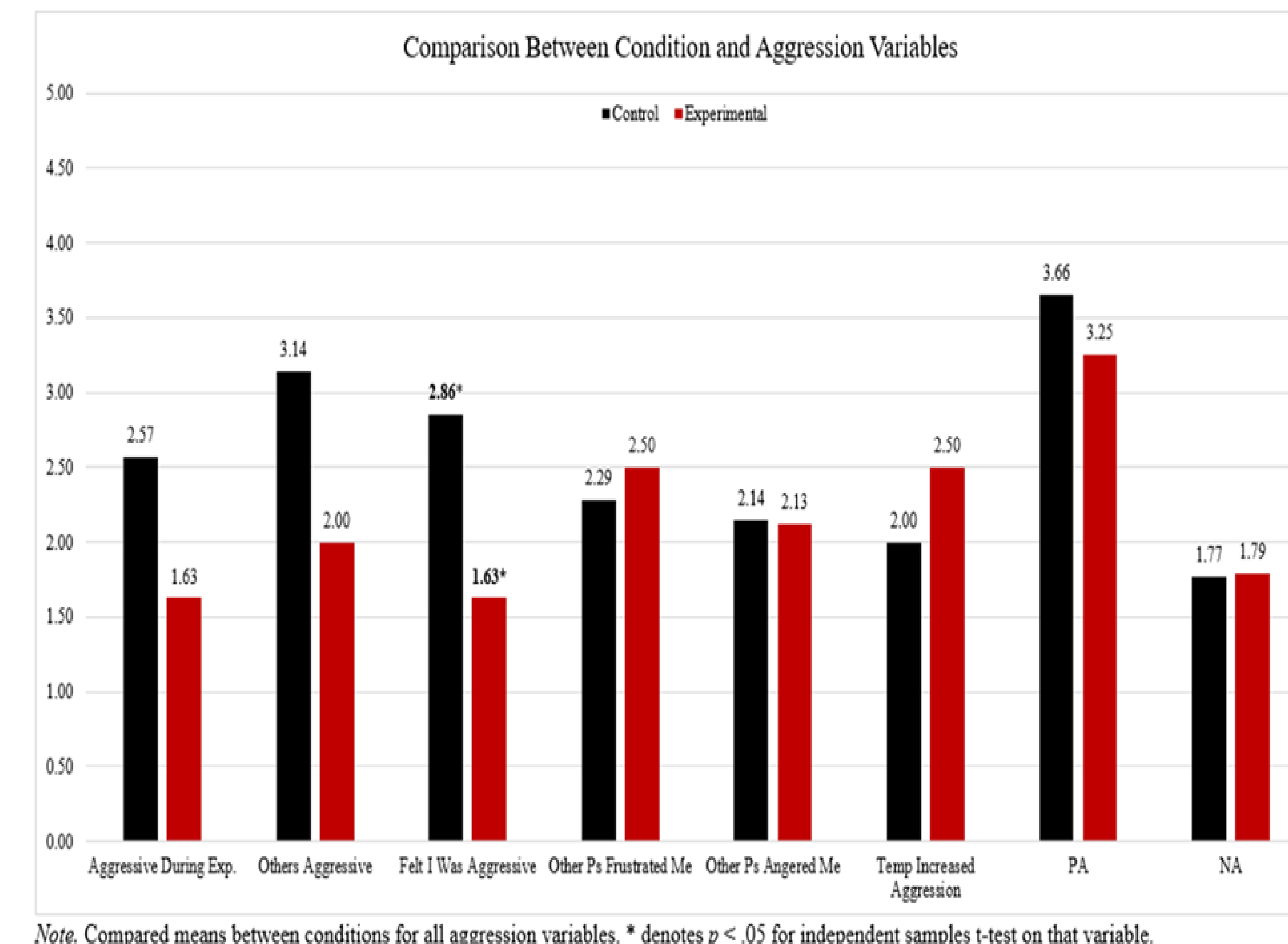
- 23 undergraduate students signed up to participate in the research using the college’s undergraduate research pool.
 - Mean age = 19.87, range 18 - 30
 - 10 cisgender females and 5 cisgender males
 - 6 African American or Black, 9 European American or White
- Each of the students who participated were given one unit of credit for their participation
- Participants were assigned to one of two conditions
 - Control condition: environment was not altered in any way
 - Experimental condition: environment was heated to roughly 91° Fahrenheit

Materials

- Monopoly: Cheater’s edition, 2 portable space heaters, a laptop, a webcam, a thermometer, post experimental surveys, informed consent forms, water, cups, and pencils
- An external hard drive was used to store all recordings of participants and was locked and stored in a cabinet behind a locked door only accessible by professors of the department.

Procedure

- Once all participants arrived at the study, they were asked to fill out an informed consent form
- Participants were given instructions about the experiment including the rules of the board game
- Participants were then led to the room where they would play Monopoly
- They played the game for roughly 45-50 minutes
- Once the game was over, the participants were asked to fill out a survey about their experience while participating in the experiment
- While participants were taking the survey, the researcher counted the participants’ acquired money to determine a winner
 - The winner of each game was given a \$10.00 gift card to Chick-fil-a
- Once the participants finished their surveys, they were debriefed and then allowed to leave



Results

- Survey’s consisted of 3 measures
 - Positive Affect ($\alpha = 0.66$, $n = 10$)
 - Consisted of positive words like excited, strong, and happy
 - Negative Affect ($\alpha = 0.70$, $n = 10$)
 - Consisted of negative words like guilty, irritable, and scared
 - Self-reported aggression, frustration, and perceptions of other players
- Participants in the experimental condition were significantly more uncomfortable when playing the game
 - $t(14) = 2.41$, $p = .032$
 - Thus, the manipulation was successful
- Participants in the control condition were significantly more aggressive than those in the experimental condition
 - $t(14) = 5.46$, $p = .001$
- No significant difference in aggression between the control and experimental conditions regarding any other variables

Conclusion

- The research failed to support the heat-aggression hypothesis and further supports that temperature does not yield any significant effects on a person’s aggression.
 - Those in the experimental condition were significantly more uncomfortable while participating in the experiment
- The participants that were the most aggressive were those in the control condition which is not what I had hypothesized.
 - This result could have occurred because the room may have been too hot and that caused people to not be aggressive but just so uncomfortably hot that all they wanted was to get out of that room

Limitations

- I had a problem gathering enough participants due to the COVID-19 outbreak for the study to have high power
- Participants did not seem comfortable around other people
- Many of the participants had never played Monopoly before and had no prior knowledge of how to play
- Participants may have been too hot so that they were not aggressive

Future Research

- Part 2 of this study will analyze the videos recorded during sessions to investigate nonverbal/unconscious aggression
- Future research could also examine the effect of gender on the heat-aggression hypothesis

