

Aggression and Competition in Captive Western Lowland Gorillas and their Wild Counterparts

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Introduction

- Direct observational studies of Western Lowland Gorillas (*Gorilla gorilla gorilla*) provide information on their social structure and life history patterns

- Typical group composition:
 - One silverback male, a harem of adult females, and their offspring (Less et al., 2010; Robbins et al. 2004)
 - Group composition gives insight on the types of environmental issues affecting gorillas

Within Group Conflict

- Conflict among females stems from competing for reproductive access, the silverback's protection and favor, and for food amongst other females (Stoinski et al., 2009; Robbins et al., 2004; Doran et al., 2002; Scott & Lockard, 2007)
- Conflict can take the form of noncontact and contact aggression between individuals.
 - Facial expressions and body language
 - “Rough-up” behaviors
- Affiliation

Purpose of study

- The purpose of this study is to identify how aggression and competition are displayed by the female Western Lowland Gorillas at Zoo Atlanta by examining the type of behaviors displayed and attempting to calculate the rate of aggressive behaviors.
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Hypotheses

1. The type of aggressive behaviors displayed by female dyads is predicted to be mostly noncontact aggression. I predict contact aggression to be rare, if not nonexistent.
2. In regards to proximity, as the distance between one female and the silverback decrease, the likelihood of female-female aggression should increase from females at a greater distance from the silverback.
3. Contact and noncontact aggression are predicted to occur more often when food is present and scattered around the habitat, and to occur less often when no food is present.

Subjects

- **Subjects**

- Taz (age 25), silverback male (n=1)
- Kuchi (age 30), Kudzoo (age 20), Sukari (age 16), and Lulu (age 15) are the adult females (n=4)
- Kazi (age 9), Macy Baby (age 8), Henry (age 4), Merry Leigh (age 3), Andi (age 1), and Anaka (age 1) are the juveniles/infants (n=6; female, n=3; male, n=3).
- N=11

Materials

- Samsung F90 camcorder
- Ethogram
 - Coded for specific noncontact and contact aggressive behaviors, social bonding behaviors, and maintenance behaviors

Noncontact Agg.	Code	Operational Definition
Sex Solicitation	SS	Female purses lips and stares at/ follows/ reaches toward male.
Copulation	Cop	Dorso-ventral or ventro-ventral mounting with pelvic thrusting
Intimidation Displays	IDs	Resting on chest or abdomen; beating on a surface; rapid exaggerated strutting or running; pursed lips
Beating on object	BOO	Beating on the surface of an object
Exaggerated running/strutting	ER/ES	Exaggerated running or strutting toward an individual
Pursed lips	PL	Pursed lips, not during solicitation
Throwing/shoving	TO/SO	Throwing or shoving objects toward an individual
Charging/Chasing	CHAR/CHAS	Charging toward or chasing another individual
Lunging	LUN	Lunging at an individual with no contact
Open-Mouth	OM	Open-mouth threat showing the canines and tensing muscles of the face
Supplant	SUP	Gorilla approaches another and the latter moves away.
-Avoid (receiving individual)	AV	The approaching animal then takes that spot. -An animal moves away from or gets out of path of another.
Stare	STARE	A fixed, unwavering stare at another with brow furrowed and facial muscles tense

Ogden et al. (1991); Cordoni & Palagi (2007)

Design

- Naturalistic observation
- All occurrence sampling
- Time sampling and behavior coding/transcribing

Procedure

- Two observation trips to Zoo Atlanta
 - Each included recording video data for two consecutive days
 - Observed for approximately one hour each day
- 134 minutes of usable video data
 - Some data was excluded because of camera difficulties, visitors blocking the camera, and unclear images
- Video data was transcribed, specifically to record aggressive behaviors
 - Each female was transcribed individually

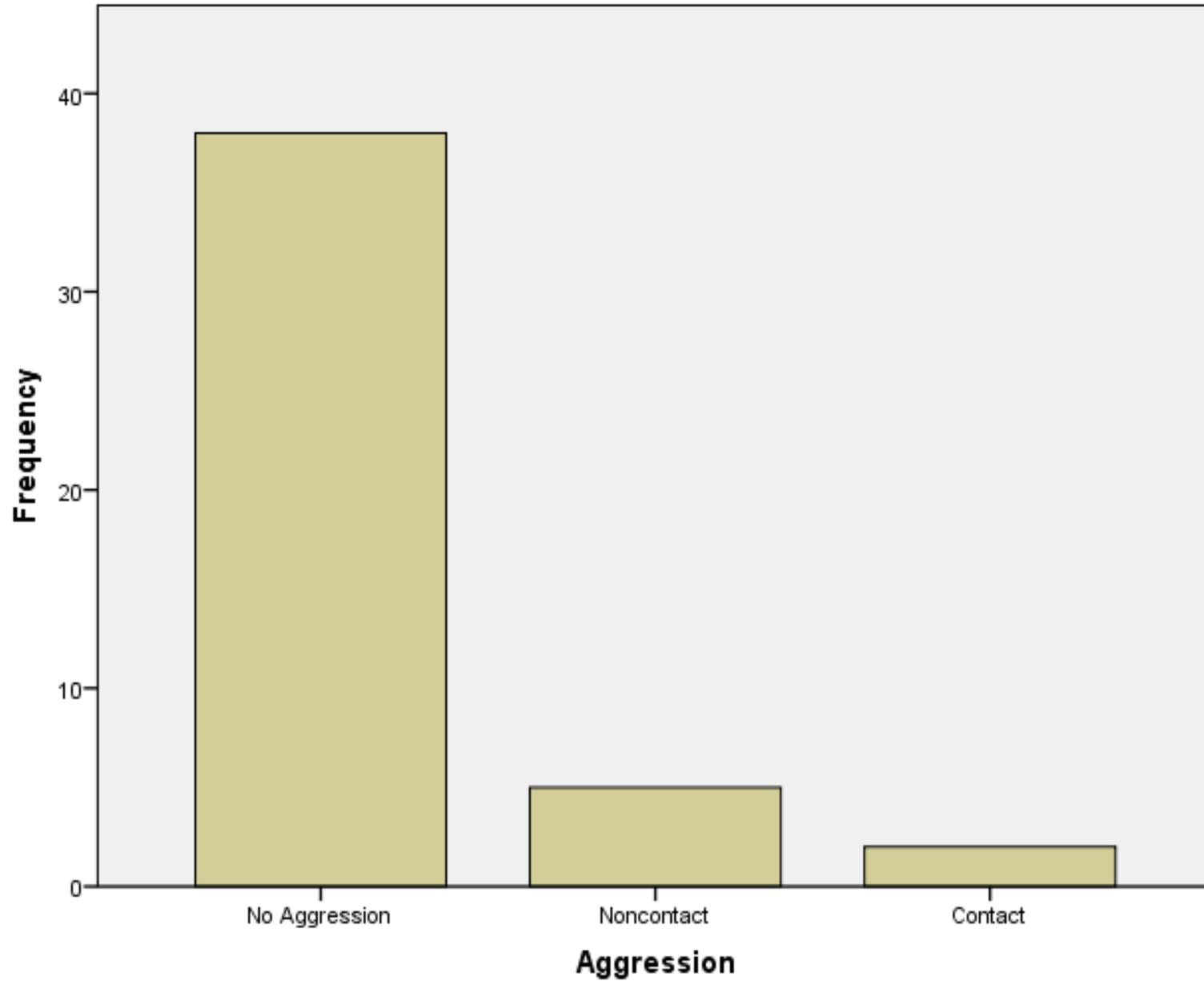
Results

- Analyses were conducted with SPSS software
 - Descriptive statistics
 - One-way ANOVAs
- Significance level was set at .05 for ANOVAs
- The total number of occurrences was 45
- 7 were aggressive interactions involving the adult females

Results

- **Hypothesis One: Is there more noncontact or contact aggression among females?**
- Noncontact aggression: $M = .5714$, $SD = .53452$.
- Contact aggression: $M = .4286$, $SD = .53452$
 - Per individual

Frequency of Aggression



Results

- **Hypothesis Two: Does aggression toward an individual at close proximity to the silverback increase from other females?**
- There was no significant effect of proximity on aggression at the $p < .05$ level for the conditions of close proximity and far proximity ,
 $F(1,43)=5.842, p=.06$

Results

- **Hypothesis Three: There will be an increase in aggression from females when food is present and scattered around the habitat.**
- There were also no significant effects of food presence on aggression at the $p < .05$ level for food being present and no food being present, $F(1,43) = .474, p = .495$

Discussion

- Hypothesis one showed noncontact aggression occurring more frequently than contact aggression
- Hypotheses two and three were not supported by the data
- Hypothesis two was not supported in the relationship between close proximity and aggression, but results were close to showing significance
 - More data is needed
- How was aggression displayed in this population?
- How was affiliative and social bonding behaviors displayed?
- How does this data compare to recorded wild populations?

Future Research

- More data is needed on this population
 - Specifically looking at aggression
- In depth information on the individuals to help make predictions

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Questions?
