Anger and Aggression among Aka Hunter-Gatherers

Courtney Helfrecht[1], Nicole Hess[1]*, Edward Hagen[1], Aaron Sell[2], and Barry Hewlett[1]

[1]Department of Anthropology, Washington State University, [2]Department of Psychology, University of California, Santa Barbara

Theory: Effects of strength and sex on anger and aggression

1. Physically strong men should expect others to value their welfare more than weak men (i.e. be willing to contest a broader range of resources), and as a result be generally more likely to experience and express anger than physically weaker men (Sell 2006).

2. Due to higher variance in fitness, males are sexually selected to compete physically with other males for access to mates.

3. Because parental investment has a higher contribution to female than male fitness, women should avoid physical competition and instead aggress indirectly (Campbell 1999). Alternatively, indirect aggression should be used for within-group competition, whereas physical aggression is reserved primarily for between-group aggression (Hess 2006).

Hypotheses

1. Male anger and hitting correlates positively with physical strength.
2. There is a male bias in physical aggression.
3. There is a female bias in indirect aggression.

Population: Aka pygmies

Aka pygmies are hunter-gatherers living in the Central African Republic. They have a close relationship with neighboring Bantu farmers. Genetically, these groups are thought to have diverged c. 54K-90K BP. The Western pygmy groups are thought to have diverged from one another c. 2800 BP.

The Aka are an interesting group in which to test evolutionary theories of aggression in that they live in small, kin-based communities, are reputed to be extraordinarily peaceful, and adhere to a strong ethic of cooperation and sharing.

Method: Peer-rating photos

Thirty two Aka children, 26 adolescents, and 40 adults were recruited into the study. Head shots, similar to those depicted on this poster, were taken of each participant and printed. Most participants also served as peer-raters. Participants were rated by presenting their photos, one at a time, to a peer-rater in the same age category as the participant. The rater was asked if the person in the photo committed the specific aggressive act (e.g., hitting) less than most or more than most other Aka, providing a two-level rating (0, 1). Ratings were summed for each participant and then divided by the number of raters, resulting in a rating score between 0 and 1. The stack of photos was shuffled prior to each rating task; raters rated themselves.

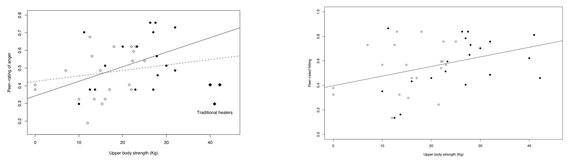
Method: Measuring upper body strength with a modified hand grip dynamometer

Upper body strength was measured using a slightly modified hand grip dynamometer: instead of squeezing the two levers together with a single hand grip (as in the figure), one lever is flipped and the two levers are pushed together, one hand on each lever.

Result: Anger and hitting positively correlated with upper body strength in men and women

Anger and hitting were the average peer-ratings. This study included adults only. The three traditional Aka healers in the study (all men) were large outliers on strength (see figure). With healers included, the positive relationship between strength and anger was not significant (r = .21, p = .10), whereas with healers excluded, the relationship was significant (r = 0.45, p = .0025). Unlike previous results (Sell 2006) this relationship was found in both men and women.

There was a significant positive correlation between strength and peer-rated hitting (r = .37, p = .02) for all adults (healers and women included).



Result: Inconsistent sex biases in aggression

	Female M	Male M	t	df	p
Children					
Hits	0.39	0.54	-3.17	29.8	.004*
Gossips	0.46	0.52	-1.50	29.8	.14
Excludes	0.44	0.48	-1.14	29.8	.27
Adolescents					
Hits	0.43	0.59	-4.38	23.9	.0002*
Gossips	0.49	0.47	0.41	21.4	.69
Excludes	0.49	0.48	-0.10	17.4	.92
Adults					
Hits	0.54	0.58	-0.67	37.8	.51
Gossips	0.53	0.50	0.87	37.5	.39

Gossiping:

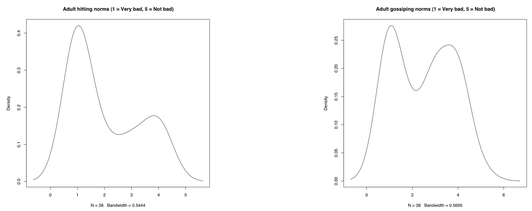
	Estimate	SE	t	Pr(>|t|)
(Intercept)	0.21	0.048	4.49	<.001 ***
Anger	0.69	0.096	7.25	<.001 ***
Sex (male)	-0.08	0.028	-2.80	0.008 **

RSE(37) = 0.086, R-sqr = 0.60, Adj. R-sqr = 0.57,
F(2,37) = 27.21, p << .001.

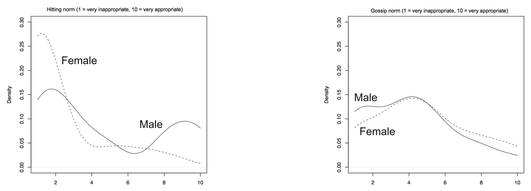
Male children and adolescents were peer-rated as hitting more than females, but no other significant sex differences in simple means were found.

Controlling for anger, a significant adult female bias in gossiping appeared. After controlling for anger, age, and other variables, no other sex bias in aggression emerged.

Bimodality in aggression social norms

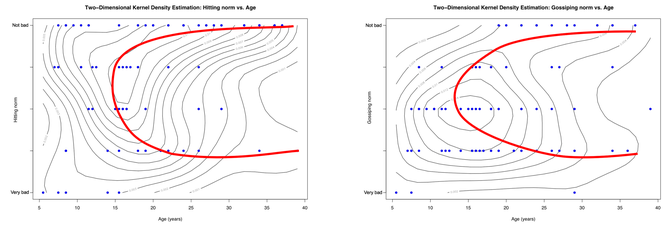


Aka adults



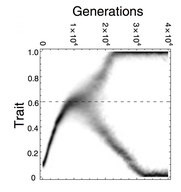
UCSB undergraduates

Hints of ontogenetic bifurcation of aggression norms among the Aka



Post hoc theorizing

Applying adaptive dynamic analysis to a continuous Hawk-Dove game where each individual plays strategy x, 0<x<1, with quadratic benefit and cost functions and a pairwise payoff function (see below), Doebeli et al. (2004) showed that the population bifurcated into two types, hawks and doves. Speculatively, this might explain (1) the bimodel distribution of Aka and UCSB aggression norms and (2) the extraordinary differences in aggression seen in the Pygmies (low) vs. Bantu (high).



$$B(x) = b_2x^2 + b_1x$$
$$C(x) = c_2x^2 + c_1x$$
$$P(x,y) = B(x+y) - C(x)$$
$$2b_2 < c_2 < b_2 < 0 \rightarrow bifurcation$$

Acknowledgements: We thank the Aka people for generously allowing us to ask "our silly questions," as well as our patient translators, Aubin and Nicaise. We additionally thank the village of Bagandou, the government of the Central African Republic, and WSU.