PRIMATES, COALITIONS AND SMALL GROUP POLITICS

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Many scholars have commented upon the tendency for human decision-making to be subject to shifting coalitions. Madison, among others, noted that this could lead to instability. This paper suggests that there is a biological basis to this propensity. Two case studies of "chimpanzee politics" are examined; both indicate that chimpanzee coalition behavior seems to be underlaid by a kind of cost-benefit calculus. Since chimpanzees are humans' closest relatives, this implies the possibility that human coalition behavior has an evolutionary basis. Implications for human politics are discussed.

Introduction

Much political activity and decision-making takes place in small groups. In contemporary American politics, for example, one finds city councils, county legislatures, school boards, other local legislative bodies, state and Congressional legislative committees and subcommittees, multi-judge courts, and executives and their immediate advisors. In each instance, small groups of persons interact regularly and frequently; in many cases, coalitions develop, and individuals shift from one to another. Why? According to one school of thought, such changes spring from and reflect a calculated attempt to futher individual self-interest.[1]

In his *Federalist #10*, James Madison lamented that this tendency, which he called the spirit of factionalism, is "sown in the nature of man" as a consequence, "instability, injustice, and confusion introduced into the public councils have, in truth, been the mortal diseases under which popular governments have everywhere perished..." More recently, sociobiologist Richard Alexander, enumerating what he terms "universal" human traits, called attention to the same behavioral phenomenon, characterizing it more

dispassionately as (1979, p. 1) "extreme flexibility in rates of forming and dissolving coalitions."[2]

We are not the only species to manifest this pattern of behavior. Coalitions--and sometimes shifting alignments--also appear as central features in the social structures of many different primate species, including vervet monkeys (Cheney, 1983; Seyfarth and Cheney, 1984), the savanna baboon (Hall and DeVore, 1965; Packer, 1988), the Japanese macaque (Gouzoules, 1980; Kurland, 1977; Eaton, 1976), the rhesus macaque (Bernstein and Gordon, 1980; Meikle and Vessey, 1981), the bonnet macaque (Silk, 1982; Silk et. al., 1981), langurs (Vessey, 1981; Curtin, 1981), the gelada baboon (Bramblett, 1970), and the chimpanzee (Bygott, 1979; Nishida, 1979; Riss and Goodall, 1977).

Among male chimpanzees, in particular, these shifting coalitions seem to be driven by cost-benefit "power" calculus. Since chimpanzees are, in genetic terms, our closest living relatives, this suggests that, as Madison feared, *human* coalition behavior may be "sown in the nature of man."[3] If so, there are important implications for human politics, as we noted in our concluding comments.

Primates, Coalitions, and Cost-Benefit Analysis

The study of other species, almost all ethologists agree, can be valuable in reconstructing adaptions and behavior patterns involved in hominid evolution. For some purposes, the social carnivores may be appropriate models (e.g., see Schaller and Lowther, 1969); for others, certain herbivores may be more useful (e.g., see Geist, 1978). By and large, however, ethologists focus on primates. As Bernard Campbell (1979, p. 187) has observed:

> While it is clearly wrong to suppose that the behavior of the earliest hominids was exactly like that of gorillas or chimpanzees, or indeed any living primates, we can nevertheless draw certain conclusions and derive certain insights from our studies of primate behavior. We can be resonably certain that the earliest hominids showed many of the social and individual characteristics that higher primates share with each other. It also seems probable that the earliest hominids were at least as intelligent and inventive as the African apes are today.[4]

Several studies have gone beyond the analysis of coalition formation and have described shifts in primate alliance partnerships which seem to evidence, on the individual level, the use of a cost-benefit calculus.[5] Higher primates possess, it seems clear, the sophisticated cognitive mechanisms requisite for such reasoning (Cheney et. al., 1986). With this as background, we discuss in some detail two chimpanzee (*pan troglodytes*) studies--one focusing on an "open zoo" colony, the other on the same species in the wild. These two studies should be viewed together, especially since questions hve been raised about the reliability and validity of the zoo-based study (see Somit, 1984). Their results, however, are quite similar, and we discuss both to better illuminate possible underlying processes.

The Arnhem Zoo Study. For some years, Frans de Waal (1978, 1982) studied a chimpanzee colony living in somewhat confined but semi-naturalistic surroundings at the Arnhem Zoo in the Netherlands.[6] In 1976, the colony included a number of adult males (most notably Yeroen, Kuit, and Nikkie) and nine adult females (of whom Big Mama was the most important). Yeroen was then the alpha male, as he had been for the previous three years; Luit was a second-ranked (beta); Nikkie was third (gamma). In June, 1976, Luit ceased to display toward Yeroen the type of submissive behavior normally manifested by a "subordinate"-- and within two months their positions were reversed. What happened during this period?

Luit began to attack, and often savagely beat, females with whom Yeron was "socially" close. Yeroen would immediately attempt to rescue the female and the other females would, in turn, come to Yeroen's aid. Luit would then be beaten or would flee into trees to escape. Over time, though, females began to avoid contact with Yeroen and, by so doing, avoid a beating from Luit. Along with this, the other females began to support Yeroen less when he confronted Luit. Finally, Yeroen avoided disputes with the Luit altogether--and his reign ended. Luit became alpha and Yeroen fell to gamma (with Nikkie, the third male, moving up to beta).

Interesting, too, was Nikkie's behavior over this two month span. When Yeroen and Luit would get into a fight over Luit's assault on a female, Nikkie would threaten or actually attack any female who came to Yeroen's support. Luit and Nikkie formed, for all practical purposes, a coalition.

But the drama was not yet finished. Soon Nikkie made *his* move to become alpha. During this second struggle, both Luit and Nikkie needed Yeroen's backing, since the females remained relatively "neutral." If Yeroen aided Luit, Luit would remain alpha; if Yeroen sided with Nikkie and this

new coalition propelled Nikkie to the alpha role. It is especially striking to note that before Yeroen made his choice, Luit allowed the "old" alpha, Yeroen, to copulate with fertile, receptive females. Nikkie did the same. Apparently, both of the more dominant males were trying to "buy" Yeroen's support. According to van Hooff (1982, p. 13):

> In [Yeroen's] position at the bottom..., none of the others could obviously permit himself to destroy the chance for a positive coalition between him[self] and Yeroen by preventing Yeroen from mating. In terms of evolutionary profit, is a very high price to pay.

Van Hooff concluded that the males used a cost-benefit calculus to guide their coalition behavior. The coalition shifts that occurred were the result, in his judgement, of this calculus.

One other significant aspect of dominance relations among the Arnhem chimpanzees calls for comment--the efforts of both Luit and Nikkie, during Luit's tenure as alpha, to prevent Yeroens alliance with the other. There was much more to this than merely letting Yeroen copulate with females. As de Waal said (1978, p. 297):

> The best way to stability is the formation of a strong bond by Luit with his former rival Yeroen. So, Luit should support Yeroen (which might lead to reciprocation by Yeroen) and he should prevent bond formation between Yeroen and Nikkie at the cost of everything.

De Waal noted (1978, pp. 278-279) that Nikkie confronted a similar situation:

> Nikkie, faced with the loss of such a powerful supported like Luit [after Luit's accession to alpha and Nikkie's subsequent move to become alpha], should prevent bond formation between Yeroen and Luit and try to form himself an alliance with Yeroen be supporting him against Luit and others.

What actually happened? Luit threatened or actually attacked Nikkie whenever the latter played with or groomed Yeroen, apparently trying to block the development of a bond between Yeroen and Nikkie.

Concurrently, Nikkie's support for Yeroen increased in competitive or aggressive interactions. Similarly, whenever Yeroen played with or groomed Luit, Nikkie would try to drive him away to prevent bond formation between Luit and Yeroen.

Subsequent developments demonstrated that these shifting coalitions were the initial phases of what eventually became a deadly game. Although there had been an uneasy truce among the three for the two previous years, in July, 1980, Yeroen began actively to side with Luit after Nikkie barred Yeroen's access to receptive females. Fighting among the males broke out and grew more violent, and Nikkie was ultimately deposed after losing Yeroen's support. As Luit ascended once more to alpha, the dynamics of the Luit-Nikkie-Yeroen relationship were again altered. As de Waal notes (1986a, p. 242), "It seemed that neither Luit nor Yeroen wanted to be left out if the other two males managed to get together."

On the night of September 12-13, Luit was savagely beaten, suffering deep gashes and losing several fingers; he died shortly thereafter. The only way this could have happened, de Waal believes, is via the active collaboration of Yeroen and Nikkie, neither of whom could defeat Luit alone. Yeroen and Nikkie resumed their alliance after Luit's death--and Dandy, a younger adult male who had not played much of a role in the July-September period, soon emerged as the "common rival" holding Yeroen and Nikkie together.

According to de Waal (1986a, p. 249):

> Quite sophisticated social processes may underlie at least the first big fight, that is, the one between the two members of the ruling coalition. By bringing Nikkie to alpha rank, Yeroen had regained both the group's respect and a good share of sexual activity. I tend to regard this as a 'deal,' whose fulfillment was closely monitored by Yeroen. When Nikkie failed to keep his end of the deal, starting to lean more and more towards Luit in the sexual context, Yeroen simply ended the coalition.
>
> The resulting power vacuum was immediately filled. Luit was the first male to become alpha overnight, apparently without conquering the position. He seemed somewhat uncomfortable, however, perhaps realizing from previous experience that his strength was also his weakness. There is no way of knowing whether the murderous attack

> on Luit was a purposeful act of trying to 'solve the problem' by eliminating a rival, or an act of blind fustration by Yeroen and Nikkie due to the sudden loss of status after the break in their coalition, or something else. The fact is, though, that it did solve their problem.

In sum, de Waal's detailed observations strongly suggest that the male Arnhem chimpanzees used a rational cost-benefit calculus to futher their self-interest in dominance relations.[7] "Shifting coalitions" provided the basic mechanism for advancement of their respective goals, and their tactics included the use of both the "carrot" and the "stick."

The value of such behavior for the "alliance" members is evident. First, the alpha or dominant animal generally has preferential access to valued resources (e.g., food, receptive females, space).[8] Second, supporters of the alpha may also reap considerable rewards. For instance, when Luit became alpha, he permitted Yeroen (whose support was vital if Luit was to remain alpha) to copulate with receptive fertile females. Finally, if Luit's death is a guide, alliance members may be simply more likely to survive.

Nishida's Mahale Mountain Study. The fact that the de Waal research focused on a captive colony raises the possibility that the behavior observed there was, at least in part, a function of an unnatural setting. But essentially similar findings have been obtained with free-ranging chimpanzees. Toshisada Nishida's (1983) study of chimpanzees in the Mahale Mountains in Tanzania provides another example of an apparent cost-benefit calculus and the resultant payoffs for being an "unpredictable" ally.

Nishida observed one group of chimpanzees (K-Group) from 1967 to 1974 and from 1975 to 1978. In May, 1975, Kasonta was alpha, Jajabala beta, Sobonogo gamma, and Kamemanfu delta. Later in the year, Jajabala disappeared for unknown reasons. Starting in March, 1976, Kamemanfu began behaving as "holder of the balance" in a manner which rivals Great Britain's role in the classical 19th century European balance of power system. Table 1 depicts the nature of shifting patterns of alliances from March through May, 1976--the crucial time frame.

Kasonta had been alpha in K-group since 1969; on May 14, 1976, he lost that position to Sobongo. The most striking features of the table are the several shifts in coalition made by the lowest ranking male, Kamemanfu "finally" siding with Sobongo.

Kamemanfu's importance in the male dominance structure is even more critical that the chart indicates. On April 17, Sobongo defeated Kasonta in a one-on-one fight. Nonetheless, Kamemanfu's continuing support of Kasonta allowed him to retain his status as alpha--a status now totally dependent on Kamemanfu's support. Thereafter, Kasonta was most solicitous toward Kamemanfu and even seemed, on occasion, to register anxiety when he lost sight of his "ally."

Sobongo's strategy over the period covered by the table was to avoid the other two males when they were together. But if Kamemanfu happened to approach Sobongo, the two would groom each other for a time. When Kamemanfu ceased grooming Sobongo, the latter continued to groom Kamemanfu. Sobongo was not seen to approach Kamemanfu on his own; he waited for signals from Kamemanfu.

While Kamemanfu usually sided with Kasonta against Sobongo, he displayed much milder aggressive behavior against Sobongo than did Kasonta, avoiding an open break with either of the two more dominant males:

> What seemed most important was that Kamemanfu occasionally changed alliances between the other males. Kamemanfu had close bonds with one of the fighting pairs in one period, but with the other in a subsequent period, as evidenced in grooming relationships. In the middle of the fighting, he suddenly and directly approached Sobongo and engaged in mutual grooming with him. His attitude towards Sobongo appeared ambivalent. Moreover, he seemed to manipulate the fight between Kasonta and Sobongo. (Nishida, 1983, p. 327)

One of the major benefits to Kamemanfu was access to sexually receptive females, and Kamemanfu retained that access no matter which male happened to be alpha. His reproductive success was apparently dependent on an unstable relationship between the more dominant males, since neither of the two seems to have dared risk losing Kamemanfu's possible support by not allowing him to copulate. It appears that Kamemanfu was playing off Kasonta against Sobongo.

After Sobongo became alpha on May 14, he actually allowed Kamemanfu to lead the entire group on a number of occasions, presumably seeking to retain his support. To small avail. In late 1977, Kamemanfu's

Machiavellian nature reasserted itself and he re-allied with Kasonta, who then regained his alpha status. But this ascension was brief, for Kasonta's disappearance may reflect the same dire consequences of alliance politics as did his own study; that is, he suspects that Kasonta was killed by the other two males, just as Luit was apparently killed by Nikkie and Yeroen.

Nishida interprets this sequence of events in terms of reproductive success (1983, p. 333):

> Since both rivals depend on the cooperation of the third male in order to win, neither can afford to show aggression to the third male even when he tries to mate. The third male manipulates the unstable relationship between his superiors by giving indications of a change in allegiance. Quite likely, the third individual's stategy succeeds most when the others' rivalry remains unstable. Moreover, by occasionally cooperating with the defeated male, the third male can improve his own relative status toward the winning male, thus improving his copulatory share.

Both studies, however different their settigs, come to strikingly similar conclusions. Chimpanzees can and do enhance their reproductive payoffs, as well as other benefits, by manipulating the dominance relations of higher ranking individuals. A conscious, deliberate cost-benefit calculus appears to guide their behavior as they shift from one alliance to another. Coalitional politics, moreover, may have significant additional implications for their member's survival. If de Waal's speculation is correct, shifting coalitons eventually led, in both cases, to the death of the losers.

Discussion

We remarked earlier that frequently changing coalitions characterize human small group politics, a phenomenon often inspired by cost-benefit calculations. We have also summarized two studies of chimpanzee behavior which suggest a similar dynamic. We are as yet unable confidently to determine the extent to which this behavioral similarity is a consequence of genetic homology or of evolutionary convergence to meet common survival problems (see note 3; see also Peterson, 1978; Peterson and Somit, 1978). But whatever the specific mechanism might be, coalition behavior apparently

reflecting cost-benefit calculations also characterizes the chimpanzee--our closest living relatives (e.g., see Lewin, 1987).[9]

To conclude, we consider two basic items: (1) the important political issues raised by our analysis; (2) the extent to which humans are condemned to suffer the negative consequences of the purported biologically rooted coalitional behavior.

First, results of our analysis bear directly upon some major points of controversy in political philosophy, indicating the importance of the issues that we address above. To take only the most obvious example, one school of theorists, running from Karl Marx to Lenin to Mao Zedung, contends that politics, political factionalism (and even the state itself) spring from *economic factors* (e.g., class and class warfare) and that all of these will disappear when the classless society is achieved. They hold also that it is possible--perhaps even essential--for the revolutionary movement to engage in coalitions, united fronts, and so on, even with class enemies, as a tactical necessity, a temporary expedient to gain power. But once in power, factions and coalitions would end and an egalitarian society would emerge. Whether force, persuasion, changes in human consciousness, or some other factor would bring about this ultimate utopia is unclear, but their goal is manifest.

Madisonians, on the contrary, are *not* utopians. They see that to rid states of factions can only be done in two ways--"by destroying the liberty which is essential to its existence; the other, by giving to every citizen the same options, the same passions, and the same interests." The first is undesirable, the second impractical, since factionalism, as outlined in *Federalist #10*, is a part of human nature.

Coalitional politics is unreliable, can lead to instability, and is the bane of any society--but humans must live with it, says Madison. Hence, the only viable course is to moderate the evil effects of faction. Indeed, a "well-developed Union" has a "tendency to break and control the violence of faction." And factionalism may actually by valuable in protecting liberty, so long as there is an array of factions, each checked by others, none of which can gain power.

Madison then sets out the architecture of governing that peacefully controls factions, most notably a large republic (so that the many factions check one another) and representative government (so that the citizens' views are "refined" through their deputies). Ultimately, such institutions enhance the positive impact and reduce the iniquitous effects of faction--including violence. Limiting violence this way reduces the odds of the

sanguinary chimpanzee politics described by de Waal and (perhaps) by Nishida.

This brings us to our second point, which suggests the significant role that culture plays in shaping "human nature." As biololgist Benson Ginsburg has stressed (1988, p. 19), although "evolutionary legacies are at the basis of our behavioral potentials, the way in which these potentials are expressed is no longer a matter of biology, but of culture acting upon biological capacities." Thus, once aware of our biologically based predispositions, we can seek to develop social mechanisms which would help to constrain and control, if not eliminate, the deleterious consequences of this tendency. In the end, the Greeks' admonition to "know thyself" may be one means of reconciling our biological natures with our culture and enable us to make significant progress toward 'a kinder, gentler' world.

NOTES

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1. Perhaps the best known theoretical example is William Riker's work (1962). Coalition and dominance behavior occur also in human children's small groups, which seems to signify that these are normal and important parts of human ontogeny (see Barner-Barry, 1977; Edelman and Omark, 1973; Omark and Edelman, 1975).
2. Alexander (1979) has futher suggested that the underlying cost benefit calculus behavior is the product of human evolution. See also J. Schubert (1983).
3. Given the apparent similarity if these aspects of human and chimpanzee behavior, two specific evolutionary hypotheses may be advanced: (a) This trait has independently evolved in each species to meet common survival needs (this is referred to , technically, as analogy). In such a case, species' adaptations to similar environmental pressures during their respective phylogenies (evolutionary histories)

lead to convergent evolution (see, e.g., Lorenz, 1965 for an explanation of this logic).
(b) It could have been transmitted to each species by a common ancestor (referred to as homology). Here, the behavior has been "passed down" to both species from that common ancestor (see Reynolds, 1980, ch. 5 for a brief discussion of this).

4. Also, see Kinzey (1987); F. King et al. (1988). Futhermore, chimpanzees have chromosome patterns strikingly similar to humankind's (Yunis et al., 1980). This close relationship also hints at the value of considering chimpanzees.
5. For the possibility that a similar phenomenon may occur among dolphins, see Booth (1988).
6. However, a word of caution is in order about the use of zoo studies, since neurotic or even psychotic chimp behavior may be aggravated or caused by such conditions (compare Davenport, 1979; N. King et al., 1980). Van Hooff found that chimpanzees living in semi-naturalistic settings (i.e., the Holloman Air Force Base colony in New Mexico) behaved quite similarly to free-ranging chimps in Tanzania. He used his experience at Holloman to create the Arnhem chimpanzee consortium in 1971 (van Hoof, 1973). Since the consortium's origin, many hours of observation have been undertaken and a number of reports published (e.g., see Noe et al., 1980; de Waal and Hoekstra, 1980; de Waal and Roosmalen, 1979; de Waal, 1984).
7. Our discussion of coalition behavior in the Arnhem Zoo colony has been rendered as a "story." However, de Waal's findings are detailed and much quantitative data support the substance of our summary. The reader should not think that our description of his findings is based solely in a few dramatic instances (see, e.g., de Waal, 1984).
8. Dominance, of course, is a much more complex phenomenon than this simple phrase might indicate. Compare, for example, Popp and DeVore (1979); Bygott (1979). For humans, see Omark et al. (1980); J. Schubert (1983).
9. Rather than discuss methods of testing our hypothesis in the body of the paper, which will be of less interest to our readers than the implications of our argument--if correct--we make a few brief comments in this footnote for those who might be interested. We would suggest that the observations of the other primate species which exhibit coalition behavior should be closely scrutinized to determine if these changes also seem to manifest some type of cost-

benefit thinking (See *Manzur, 1973* for a clear model of this approach). *If* we discern consistently positive findings across a broad range of primates, the hypothesis that genetic factors *play a role in* human coalition behavior would be rendered increasingly plausible.

Table 1

Chronological Development of K-Group Coalitions, 1976

Early March-May 9	Kasonta-Kanemanfu	Sobongo
May 10 (1145 to 1316 hours)	Kasonta	Sobongo-Kanemanfu
May 10-13 (1316 hours and after)	Kasonta-Kanemanfu	Sobongo
May 14 (1500 hours)	Sobongo-Kanemanfu	Kasonta

Source: Table was constructed by the authors from the narrative provided in Nianida (1983).

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