CAMBRIDGE

Cambridge University Press
978-0-521-11008-2 - The Real Chimpanzee: Sex Strategies in the Forest
Christophe Boesch
Index
More information

Index

Note. Entries can be assumed to refer to chimpanzees unless humans or another species are mentioned or implied. Most of the former relate to Taï National Park chimpanzees and are not indexed under 'Taï'. The Gombe population is also extensively discussed and not all of these references are listed under 'Gombe'. The letter 'n' in a page reference denotes a chapter endnote.

adoption, 24, 47–50
aggression
  controlling, 125–6
  feeding by humans and, 128, 135n12, 135n16
  toward females, 129, 135n10
  see also coercive male behaviour; conflict
alpha males, 26, 27, 37–9, 78
altruism
  among male chimpanzees, 47–50
  coexistence with aggression, 1, 149
  in different human societies, 151
  empathy and, 55–6, 58n10, 151
  in intercommunity violence, 50–1, 119, 128–9, 134n4
  in leopard attacks, 51–4, 134n5
  see also cooperative behaviour
anthrax, 18
ants, 64–5
apes, population sizes, 162, 163n1
  see also gorillas; humans; orangutans

baboons, 28, 30n7, 31n14, 34, 36, 40, 57n6, 70
bees, 65
  see also honey
beetles, Plate 13
birth intervals in human and chimpanzee, 145, 155
Boesch-Achermann, Hedwige (author's wife), 31n12
bonobos, 70, 130–1
Bossou, Guinea, 112, Plate 1
Boyd, William, *Brazzaville Beach* (1990), 81
Brazzaville Beach (1990) by William Boyd, 81
Budongo National Forest, Uganda, 30n6, 105n2, 118, 124, 127, Plate 1
Buffon, Georges-Louis, Comte de, *Natural History of the Quadrupeds* (1762), 111
bushmeat, 162

captive populations
  atypical behaviour in, 4–5, 131
  characteristics of, 75n8, 157n12
  studies in, 112
castration, 80, 82–3
Central African populations
  distinction from West African, 68
  limited studies of, 112–13
  tool use in, 117, 159n23
  see also Goualougo; Loango
Chimpanzee Politics (1982) by Franz de Waal, 4
chimpanzee populations
  common characteristics, 69–70
  cultural differences, 72–3, 75n7, 103–4
  diversity of, 7, 72, 131–3
  ecological differences, 4–6, 110, 116, 131
  hunting differences, 42, 109–10, 120–2
  map of locations, Plate 1
  published studies of, 2, 6, 15, 112
  significance of the Niger Gap, 68, 74n1
  tool use differences, 116–18, 124, 134n.1–2, 159n.22–3

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-0-521-11008-2 - The Real Chimpanzee: Sex Strategies in the Forest
Christophe Boesch
Index
More information

warfare as ubiquitous among, 103–4, 127–30
see also captive populations; Central African populations; East Africa; West Africa
chimpanzee species
behavioural flexibility, 131–3, 136n17, 153
human knowledge of, 110–11, 132
coercive male behaviour
female choice and, 11–12, 15, 17, 30n7, 126
human polygamy and, 148
competitive behaviour, *see* food competition; sexual competition
conflict
frequency among males, 36
group solidarity/identity and, 2
resolution, 25, 32n16, 57n3, 59n13
within-group conflicts, 78–9, 80, 119
see also aggression; intergroup conflict
Congo, Democratic Republic of, 130, 136n15
see also Goualougo
cooperative behaviour
alongside sexual competition, 40–4, 150
claimed exclusivity to humans, 139–40
in hunting, 41–3, 119–20, 122–3
in intergroup conflict, 44–7, 103, 119
predation pressure and, 149–51, 154
rationales for, 40, 44, 58n7
see also altruism
copulation, *see* mating
cultural differences, 72–3, 75n7, 103–4

Dart, Raymond, 73, 159n24
Darwin, Charles, 12, 111
de Waal, Franz, *Chimpanzee Politics* (1982), 4
death, attitudes to, 52, 59n12
see also killing
deforestation, 72, 135n7
demographics, 97–8, 104, 106n7, 142, 157n11
DNA, *see* genetic techniques
driver ants, 64–5
drumming, as male display, 21, 61

East Africa
absence of leopard predation, 124, 127
human origins in, 113
reason for dryness of, 68, 154
sociality of chimpanzee populations, 75n4
see also Budongo; Gombe; Kibale; Mahale; Uganda
ecological influences on behaviour, 4–6, 110, 114, 131, 150
see also predation pressure
emasculation, 80, 82–3
empathy, 56, 58n10, 132, 151
environment, *see* ecological influences on behaviour
evolution, 8–9, 36, 55, 68–9, 73–4
see also human evolution
exploitative view of sex, 12
extinction, 72

farming and chimpanzees, 161
feeding by humans, 128, 135n12, 135n16
female choice
copulation refusal, 11–12
dependence on males and, 147, 155
mating with strangers, 17–18, 88–9, 96–7
paternity studies as evidence, 16, 37
and results of male conflicts, 13
selectivity in, 12, 14–15, 29n2
sociality and, 126–7
see also coercive male behaviour
female dominance in bonobos, 130
female friendships, 23–5, 124–7
female immigration
age for, 71
and fatal violence, 100
and female competition, 19, 127, 136n14
group size and, 38
female rank
emigration from natal group, 19
investment in offspring and, 25, 27, Plate 11
production of sexual swellings and, 19
sex of offspring and, 15, 30n5
females (chimpanzee)
altruism, in intercommunity violence, 50–1
birth intervals in human and chimpanzee, 145, 155
food competition by, 22, 24, 124–5, 127
genital mutilation in human, 148
imprisonment of stranger, 91–2, 94
infertility/unavailability and sex competition, 3, 142

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-0-521-11008-2 - The Real Chimpanzee: Sex Strategies in the Forest
Christophe Boesch
Index
More information

females (chimpanzee) (cont.)
injury by males, 21
involvement in intergroup conflict, 79–80, 81–3, 94–5, 129
male aggression toward, 129, 135n10
numbers of, and incursions, 98–9
numbers of, and paternity, 37–8
promotion of male offspring by, 25–7, Plate 12
social position of, 21–3, 96, 106n11
see also maternal investment; women
females (human), *see* women
fertility, *see* sexual swellings
field observation
advantages over theory, 8–9
difficulties in forest areas, 64, 113
habituation to humans, 18, 91, 96, 106n9, 128
history of, 112–13, 132
of humans, 143
fighting, *see* conflict; warfare
fission–fusion groups, 4, 70, 96, 137n19, 153
flora, diversity of, 67
food
dependency of human females and, 146
time devoted to seeking and processing, 4, 124
see also fruit; insects; meat; nut cracking; seeds
food competition
by females, 22, 24, 124–5, 127
growth of mutual support, 3
human habitat change and, 154–5
as a motive for warfare, 97, 101
food sharing
with adopted infants, 48–9
hunting roles and, 44, Plate 18
with offspring, 115–16, Plates 8–10
forest
adaptations to, 9, 71, 115–19, 121–3
as archetype chimpanzee habitat, 8–9, 114–15
biodiversity of, 67
difficulties presented to the scientist, 64
human origins and, 68–9, 73–4, 154
preservation of chimpanzees and, 162–3
significance of the Niger Gap, 68
sociality of species in, 60
fossils, 68, 73, 74n2
friendships in other species, 32n15
see also female friendships
fruit, 5, 60–2, 67, 90–1, 95

gamete sizes, 12
genetic techniques
establishing paternity, 7–8, 13–14, 26n1, 148
human relationship to chimpanzees, 69, 111
genital mutilation in women, 148
genitalia, male
castration, 80, 82–3
penis length, 20, 35–6, 57n1
sexual competition and, 35–6
testis size, 35–6, 57n2, 145–6
gestation time, 18
glaciation influence, 68
Gombe National Park, Tanzania, 5–6, 15, 113, Plate 1
as atypical, 114
female sociality in, 25, 75n4, 96, 106n11, 124–7
hunting techniques in, 42, 109–10, 120–3, 135n6
intergroup conflict, 78–9, 81, 129
male coercion in, 15
offspring of high-ranking females, 27, 32n17
as reference population, 6, 113–14
support and cooperation in, 118, 136n13
tool use in, 116, 118, 134n1, 159n22
Goodall, Jane
Gombe chimpanzee studies, 15, 81, 84, 112, 127–30, 135n12
as protégé of Louis Leakey, 113
In the Shadow of Man (1970), 5, 109
Through a Window (1995), 84
gorillas, 111, 115, 133
human origins and, 68–9, 74n3
sexual competition in, 34–6, 83, 90
social structures, 70, 129
Goualougo Triangle, Congo, Plate 1
female sociality in, 75n4, 106n11
studies in, 112, 132–3, 134n3
tool use, 117, 159n22–3
see also Central African populations; Congo
grooming behaviour, 62–3, 125–6, Plate 5, Plate 7
group behaviour
behavioural flexibility, 6
hunting in groups, 41–3, 120–3
intensity of conflict, 103
as protection against predators, 59n11
sociality and the forest environment, 60

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-0-521-11008-2 - The Real Chimpanzee: Sex Strategies in the Forest
Christophe Boesch
Index
More information

solidarity/identity and conflict, 2
see also cooperative behaviour; intergroup conflict; neighbouring groups
group cohesion
by drumming and vocalisation, 63
fission–fusion groups, 4, 70, 96, 137n19, 153
see also within-group solidarity
groups
female departure from natal groups, 19, 22, 71
multimate, and male genitalia, 36
size of, and behaviour, 88, 106n7
size of, and female friendships, 24–5, 125
size of, and paternity, 37–8, 102–3

habitats
behavioural diversity and, 72, 114, 126
female sociality and, 125
human colonisation of, 146, 153–4
see also ecological influences; forest; open habitats
harem species, 14, 34–5, 83
Homo species, *see* human evolution
honey, 65–6, 116–17
hormones, *see* ovulation; testosterone levels
Hrdy, Sarah Blaffer
studies of Indian langurs, 32n18
The Woman That Never Evolved (1981), 15
human behaviour
anthropological studies, 143
claims of unique behaviour, 139–40
limits on similarities with chimpanzees, 9, 145, 152
parallels in chimpanzees, 1–2, 6, 77, 102–5, 114, 132, 152–5
human evolution
chimpanzee and bonobo studies and, 130–4
forest origins of modern humans, 68–9, 73–4, 124, 137n19, 154
infant development in early man, 157n11
probable predation pressure in, 103, 149–50
recent discoveries, 137n21, 154, 159n24
the savannah model, 113–14, 124, 131, 154
warfare in early man, 141
humans
concealment of ovulation, 20, 31n10
genetic separation from chimpanzees, 69, 74n3, 110–11
habituation to, 18, 91, 96, 106n9, 128
impatience, compared with chimpanzees, 132, 136n18
population pressure on chimpanzees, 161, 162
significance of male genitalia, 36
warfare among, 1, 84, 104, 105n5, 138, 141
hunting
by bonobos, 130–1
collaborative hunts, 41–3, 119–23, Plates 14–18
empathy and, 56
frequency, 42, 58n9
importance, with tool use, 133
prey animals, 41, 58n9
skill and age, 41, 49, 56, 59n15
skill and human sexual success, 144
as a species characteristic, 114
techniques, 41–3, 48–9, 109–10, 119–24, 135n6
hunting roles, 43–4
hyenas, 56, 59n14, 102, 149

In the Shadow of Man (1970) by Jane Goodall, 5, 109
inbreeding and incest, 70–1, 75n6
infanticide by females, 127, 135n12
infanticide by males
in intergroup conflict, 89–90, 106n8
in other species, 28, 32n18, 116, 126
strategies for preventing, 17, 31n9, 126
infanticide in human societies, 142, 147, 158n15
infants
adoption of, 24, 47–50
development of, 71, 145–6, 158n13
forbearance toward stranger, 92, 94
slow maturation of, 142, 145
see also offspring
injuries
due to snares, 161–2
tending by group members, 52, 118, 128
from within-group conflict, 78–9, 105n2
insects as food, 64–5, 114–18, Plate 13
intergroup conflict
cooperative behaviour in, 44–7, 103, 119
degree of organisation, 83–4, 92–3, 100–1, 107n13
differing levels of support, 119, 128, 136n13
human, causes of, 138–9
infanticide in, 89–90, 106n8

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-0-521-11008-2 - The Real Chimpanzee: Sex Strategies in the Forest
Christophe Boesch
Index
More information

intergroup conflict (cont.)
patrols into neighbouring territories, 44–7, 85–7
prediction of attacks, 98, 107n13
use of lethal violence, 79, 81–2, 103–4, 105n3, 128
see also warfare
investment in offspring, *see* maternal investment; paternity

Jolly, Alison, *Lucy's Legacy: Sex and Intelligence in Human Evolution* (1999), 13, 15

Kanyawara, Uganda, 30n6–7, 118, 124–6, Plate 1
see also Kibale National Park
Kibale National Park, Uganda, 15, 25, 30n6–7, 120–2
see also Kanyawara; Ngogo
killing
death rates from human warfare, 140, 142, 156n3, 156n5
effect on females, 100, 142
in intergroup conflicts, 79, 81–2, 89–90, 103–4, 128, 156n5
of wives by husbands, 147
see also infanticide
kin recognition, 57n5, 58n10, 118, 128
kissing, 91

langur monkeys, 28, 32n18, 83, 90, 126
Leakey, Louis, 113–14
leopards, 22–3, Plate 6
altruism when facing, 51–3, 119
chimpanzee attacks on, 53–4, 133, 135n8
predation on humans, 150
squirrels warning of, 62
see also predation pressure
life expectancy, 70–1
Linné, Carl von, 111
lions
cooperation in hunting, 40, 58n8, 123–4, 152
fights for the control of prides, 83
infanticide in, 31n9, 90, 126
territoriality, 102
see also predation pressure
Loango National Park, Gabon, 117–18, 132, 134n3, 159n.22–3, Plate 1
see also Central African populations
Lucy's Legacy: Sex and Intelligence in Human Evolution (1999) by Alison Jolly, 13, 15

Mahale Mountains National Park, Plate 1
absence of leopard predation, 119, 124, 135n.7–8
as an open habitat, 72, 115
female intergroup transfers, 75n4, 96, 106n8, 106n10
female sociality and choice, 125–6
history of studies in, 8, 30n6, 112
hunting behaviour, 42, 120–3, 135n6
intergroup conflict, 79, 129
maternal investment in, 27
support and cooperation, 118–19
tool use, 116, 118
within-group conflict, 79, 129
male coercion, *see* coercive male behaviour
male philopatry, 28, 70
male rank
dominance behaviour, 21, 71
and paternity, 37
see also alpha males
males, chimpanzee
adoption by, 48–50
age of adulthood, 71
aggression and protectiveness toward females, 94–5, 129, 135n10
cooperative behaviour, 40–4, 75n5, 103, 108n17, 152
knowledge of female physiology, 38–9
numbers and conflict behaviour, 88
numbers and hunting behaviour, 122
offspring recognition by, 39
voice recognition among, 63–4, 100–1, 107n15
see also paternity
males, human
aggression as proposed origin for war, 2
contribution to feeding offspring, 146
genital size, 36
unequal reproductive opportunities, 143–5
maternal investment, 22, 55, 142
female rank and, 25–7, Plate 11
in humans, 142
sexual selectivity and, 12, 15
mating
among neighbouring groups, 17–18
with female prisoners, 91–2, 94, 99
initiation of, 16, 30n8, 125–6, 135n9
interruption by the female, 17
success, aggression and, 100, 135n10, 139
meat
average consumption, 42
friendship and food competition, 24–5

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-0-521-11008-2 - The Real Chimpanzee: Sex Strategies in the Forest
Christophe Boesch
Index
More information

importance of, 40–1
precedence in access to, 22
see also food sharing; hunting
menopause, 146–7, 158n14
monkeys
absence of empathy, 56
chimpanzees attacked by, 109–10, 120–1
langur monkeys, 28, 32n18, 83, 90, 126
as prey animals, 41, 67, 121, Plates 14–18
subspecies divergence, 68
variety in Taï forests, 67
see also hunting
monogamous behaviour and its limits, 8, 13
Morris, Desmond, *The Naked Ape* (1967), 140

The Naked Ape (1967), by Desmond Morris, 140
Natural History of the Quadrupeds (1762) by Georges Buffon, 111
neighbouring groups
females seeking sires from, 17–18, 88–9, 96–7
knowledge of, 97–9, 100–1, 102, 107n14
nonviolent interactions, 96–7
threats from, 5
see also intergroup conflict
nest building, 66–7, 71, 73, 91
nest sharing, 49–50, 66
Ngogo, Uganda, Plate 1
female status in, 106n11, 129
hunting and meat eating, 42, 120–4
lethal inter- and within-group conflict, 81, 105n2, 106n8, 128–9
ongoing studies in, 30n6, 132
support in conflict, 119, 136n13
tool use, 118, 131
see also Kibale
Niger Gap, 68
night calls, 66
Nishida, Toshisada, 30n6, 31n9, 75n4, 105n8, 105n10, 112
see also Mahale
nut cracking
and extraction, 115, 117, 160, Plates 8–10
Panda nuts, 49, 66

offspring
breast-feeding and weaning, 19, 22, 25, 47–8, 71, 124, 145–7
food sharing with, 115–16, Plates 8–10
multiple partners and survival of, 29n3, 149
numbers under polygamy and polyandry, 148
paternal investment in, 39, 57n6, 146–7
see also infants; maternal investment
open habitats, 5, 72, 114–15
orangutans, 36, 70, 133, 145–6
orphans, 47–50
ovulation, 20, 31n10, 38–9

Parinari excelsa, 115–16
paternity
adoption independent of, 49–50
confidence in, among humans, 147
confusion and infanticide, 17, 31n9, 129
correlations with male rank, 37
evidence of female choice, 16, 21
investment in offspring, 39, 57n6, 146–7
possible recognition by males, 39
techniques for establishing, 7–8, 13–14, 29n1
patrolling frequency, 85, 87
see also territoriality
penis length, 20, 35–6, 57n1
Piltdown hoax, 111
play, 39, 57n6
poaching, 161, 162
polyandry, 143, 148
polygamy, 143, 148
see also harem species
population
densities of humans and chimpanzees, 146
pressure and war, 1, 101, 104, 106n12
trends, 162
predation pressure
effects of absence, 5, 25
female sociality and, 124
food competition, sociality and, 124, 135n7, 154
on humans, 103, 149–51
leopards in the Taï forest, 24
on monkeys, 67–8
within-group solidarity and, 2, 3, 31n14, 54–5
xenophobia arising from, 102
see also leopards; lions
primates
philopatry among, 28
self-recognition and empathy among, 56, 59n13
sexual competition and genital size, 36
social structure, 69–70
see also apes; monkeys

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-0-521-11008-2 - The Real Chimpanzee: Sex Strategies in the Forest
Christophe Boesch
Index
More information

red deer, 15, 30n5, 34
reproduction
  rate of, and vulnerability, 162
  rate of, and warfare, 103
  success, male rank and group size, 37–8
  success and human status, 143–5, 157n8–10
revenge, 93, 106n12, 139
risk taking
  in intergroup conflicts, 44, 50–1, 83–4, 87, 95, 99, 149
  in sexual competition, 11, 34
  when facing leopards, 53–5

Sacoglottis gabonensis, 61–2, 90, 93
savannah, *see* open habitats
'the savannah model', 113–14, 124, 131, 154
seals, 14, 34
seeds, 65
self-recognition, 56, 59n13
selflessness, *see* altruism
sex
  bonobos, 130
  gamete size and origins of, 12
  ratio effects, 98–9, 102, 142
  value placed on by different species, 34
  see also mating
sexual competition, 36–9
  cooperation alongside, 40–4, 55–6
  female infanticide and, 135n11
  female infertility/unavailability and, 3
  in human males, 143–5
  as motivation for warfare, 97–104, 138–9, 145
  in other species, 34
  as a social challenge, 153
  Taï chimpanzees, 33–4
sexual dimorphism, 21, 34, 145
  see also genitalia
sexual swellings, Plate 5
  manipulative behaviour by females, 19–20
  ovulation and, 38–9
  size variation, 20
snares, 161
sociality and environment, 60, 75n4, 124–7
sperm lifetime, 17
sperm selection and sperm competition, 15, 30n4, 36
squirrels, 62
Sterculia rhinopetala, 65–6
Stumpf, Rebecca, 30n8

Taï National Park, Côte d'Ivoire, Plates 1–4
  behavioural differences from other studied populations, 9, 109–10, 116–19, 132
  forest fauna, 22, 67
  history of studies on, 8, 112
  hunting techniques in, 41–4, 48–9, 58n9, 120–3
  paternity studies in, 16
  tool use in, 65–6, 115–16, 134n1–2, 159n22, 160
Tanzania, *see* Gombe; Mahale
termites, 114, 117
territoriality
  awareness of boundaries, 84, 98, 101
  female choice of partner and, 14
  of human foragers, 146
  patrols into neighbouring territories, 44–7, 84–7
  of Taï chimpanzees, 84, 106n6
  use of fatal violence and, 83, 102
testis size, 35–6, 57n2
testosterone levels, 36, 57n4
Through a Window (1995), by Jane Goodall, 84
ticks, 62–3, 72–3
tool making, 2, 114
tool sets, 117, 133
tool use
  combination with hunting, 133
  by different populations, 116–18, 124, 134n1–2, 159n22–3
  extracting honey and larvae, 65–6, 116–17
  fishing for insects and larvae, 65, 114–16, Plate 13
  in humans and chimpanzees, 152
  nut cracking and extraction, 49, 66, 115–17, 160
  use of weapons, 53, 133
'typical' behaviour, 113

Uganda, 30n6, 117–18
  see also Budongo; Kanyawara; Kibale; Ngogo
ultimate game, 150–1

vegetation type, 67, Plate 1
voice recognition, 63–4, 100–1, 107n14–15

warfare
  archaeological and historical evidence for human, 141, 156n4
  as characteristic of chimpanzee populations, 127–30

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-0-521-11008-2 - The Real Chimpanzee: Sex Strategies in the Forest
Christophe Boesch
Index
More information

as characteristic of human societies, 1, 84, 97, 104, 105n5, 138–43
chimpanzee behaviour viewed as, 76–7, 102–3
conduct of, among chimpanzees, 84–97
death rates from human, 140, 142, 156n3, 156n5
definition and causes, 77, 105n1, 106n12, 107n16, 108n18, 155n1
lethal intergroup violence, 79–84, 103–4, 105n3, 128
parallels between human and chimpanzee, 102–5, 141
polygamy and, 148
sex as motivation for, 97–101, 138
sexual success of warriors, 144
see also conflict
water, access to, 152, 159n22
weapons, 53, 78, 103, 108n17, 133
West Africa, 68
see also Bossou; Taï
within-group conflicts, 78–9, 80, 119
within-group solidarity
altruism and, 54–6
between-group hostility and, 3
predation pressure as driver for, 2, 54–5, 150
wolves, 102
The Woman That Never Evolved (1981) by Sarah Hrdy, 15
women
disempowerment, 145–9, 155
genital mutilation of, 148
as objects of warfare, 139
as victims of infanticide, 142
as victims of warfare, 138, 142
violence against, 147, 155, 159n25

xenophobia, 2, 56, 102–3, 129, 150

zoos, *see* captive populations

© Cambridge University Press www.cambridge.org