

Primate social behaviour



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Primate intelligence and social behaviour Introduction Most primates spend their lives in large social groups and the social brain hypothesis posits that selection has favoured larger brains and more complex cognitive capacities as a means to cope with the challenge of social life (Silk 2007) Research in the field and laboratory shows that sophisticated social cognition underlies social behavior in primate groups. Social behaviour is behaviour and interactions that takes place between organisms of the same species. There are many different levels of social behaviour.

The "simplest" or lowest forms of social behaviour are those which specific biological processes account directly for the behaviour. These are biological behaviours, of which there are three levels (the taxis, biotaxis and biosocial) the biosocial level is the level at which the reciprocal simulative function of other organisms is the source of the groups behaviour. The higher levels of social behaviour are those of plastic adaptive adjustments arising through widened learning capacities and the entrance of thinking. These higher levels are psychological behaviours of which there are two levels.

The psychotaxis is the level at which behavioural plasticity becomes increasingly important in directing the course of behavioural development, as in the effects of maternal behaviour on the subsequent behaviour of the gorilla. The second psychological level is the psychosocial level where the development of bonds becomes an important factor in determining an organism's further behaviour (Greenberg, 1988) These two psychological behaviours, the psychotaxis and psychosocial levels are the levels of social behaviour that are easiest to observe in a zoo setting.

I have further broken these levels up into further categories, these are;

Social observation: individuals watching one another
Mother and infants: this is the basic social group for many primates. Mother infant bonding is essential to teach the infant how to interact properly as an adult.

Dominance: Primates and animals that live in groups tend to form "dominance hierarchies" the rank is learned through play, agonistic interactions and affiliative interactions.

Grooming: this is an important affiliative mechanism and is used to

strengthen links
Communication: this includes scents, body postures,

gestures, vocalisations
Play: attempts to define play behaviour has been

historically tricky (Pellengrini 2005)
Cooperative feeding: individuals feeding

together
The aim of this study is to test the hypothesis that " more

'advanced' primates make the most use of social behaviour" so first we must

look at how we decide what makes a primate more advanced or more

intelligent than another and also look at the emergence of intelligence.

The social intelligence hypothesis was developed to explain the evolution of

primate intelligence and suggests that life in complex social environments

was the primary selective pressure for primate cognitive evolution and for

enlarged brains (Maclean 2008). It has been suggested that " intelligence"

and Laland showed there to be a positive correlation between social

learning, innovation and tool use and species' relative and absolute "

executive" brain volumes. (Reader and Laland 2002) Also, relative neocortex

size is positively correlated with social group size in primates.

Researchers simply do not know how best to measure cognitive ability across species, but a measure of brain size is a good first approximation until more further research can suggest better characteristics, so brain size is how we will divide the zoo primates into levels of intelligence. The primate with the largest brain size is the Western Lowland Gorilla, followed by the Chimpanzee and then the Back Handed Spider Monkey (Kiwauka, 2010)

Methodology On the 8th of May 2010 three different primates were observed at Sydneys Taronga zoo.

The three primates that were chosen for this study was: The Western Lowland Gorilla, Chimpanzee and Black Handed Spider Monkey. These three primates were chosen because there was at lease six individuals in each enclosure this is important because there needs to be several individuals interacting with each other for it to be ossible to effectively observe their social behaviour with each other. Primate groups are important because they show social learning which can lead to the development of temporal stable condition or even proto-culture (Voelkl 2008).

There were seven behaviours that we decided would be observable and quantifiable on the day and they were; social observation, dominance, grooming, communication, play, cooperative feeding, mother infant, and presenting. These behaviours were put into a table and it was decided that a tally system would be the easiest method of quantifying. One tally was put down for each time the behaviour occurred. So if there was a mother holding her infant for the whole time they were being observed; only one tally was put down for that behaviour. Figure 1 shows what our data sheet looked like on the day.

Within a group of three people we all observed the entire enclosure at the same time and marked down a tally each time we saw a behaviour that was on our list. But to avoid marking the same behaviour several times we would discuss sightings of behaviour with each other before marking it down. Each species was observed for 45 minutes at a time by our whole group. It would have been more ideal and accurate to be able to observe all three primate species at around the same time of day and all around feeding time but time constraints on the day made this method unable to be carried out.

Social Behaviour Gorilla Chimp Spider monkey Dominance 5 2 Grooming Communication 4 1 Play 7 1 Co-operative feeding 2 Presenting Social observation 6 5 2 Mother infant 2 1 Results The Gorilla appeared to show the highest amount of social behaviour ($n=9$) (figure 2) showing a range of different behaviours with most of their social behaviour being play and social observation. The chimpanzee and spider monkeys showed a lesser amount of social behaviour ($n=9$, $n=6$) but also a high proportion of this was social observation behaviours.

Discussion The results gathered proved to be inconclusive because the statistical Chi square test showed no significant results because there were not enough observations to make the analysis reliable. The primates needed to be observed over a longer period of time in order to gain enough data to have reliable results. This study would need to be carried out in a period of months instead of one day. This would make it easier to acquire data from the same time of day for each species. So each day there would be data collected for both feeding time and non feeding time for each of the species.

This was definitely a limitation of our experiment because we only had one day to make our observations and the three species were observed at different times of day. The Gorillas were observed during and after their feeding time, giving us more social behaviours to observe. But the Spider Monkeys and Chimpanzees were observed after feeding time and late in the afternoon so they weren't as active as the Gorillas. It was also a warm sunny day so when observing the Spider Monkeys and Chimps they spent most of their time sunning themselves and not interacting with each other.

But the difference between these two was that the Chimpanzees would lie around in groups with all the members close to each other whereas the Spider monkeys were all spread out into their separate spaces in the enclosure. This is fission-fusion social system where group members are not always in constant contact with each other. Studies have shown that Chimpanzees and Spider monkey have similar social structures; they form parties of variable sizes which are smaller when food is scarce.

This is very different to the social structure of Gorillas that live in long term groups with a stable membership this suggests that the principles underlying social evolution in the Spider Monkeys and Chimpanzees are different from the Gorillas so we could expect to experience different amounts or different types of social behaviour between these species (Wrangham, 1980) There is a general trend that can be concluded from our results if we look at the amount of social behaviour that was observed, and that is that the Gorilla showed the greatest amount of social behaviour, followed by the Chimpanzee then the Spider Monkey which both showed similar amounts of social behaviour. This supports our hypothesis but a strong conclusion

cannot be made because they were observed at different times of day and we cannot make a significant statistical analysis because of the lack of data, so we cannot accept nor prove our hypothesis that " more 'advanced' primate's make the most use of social behaviour" This experiment would be valuable if we had more time, better knowledge and more insight into how to observe social behaviour.

Having more time to observe the primates would improve our observations because we would be able to recognize the different behaviours more clearly giving us stronger results and a larger set of data to work with. References

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