

Clever Cronies: Why Brains Are Key to Friendship

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Whether you're a human or a horse, it takes a lot of brainpower to support a complex social group – and that puts a limit on how many friends we can have

MOST animals have acquaintances but only a few species are capable of true friendship. This select group of mammals includes the higher primates, members of the horse family, elephants, cetaceans and camelids. It is no coincidence that all of these animals live in stable, bonded social groups. Group living has its benefits, but it can also be stressful and you cannot simply leave when the going gets tough – which is where friendship comes in. Friends form defensive coalitions that keep everyone else just far enough away, without driving them off completely.

Friendship gives social groups a very different structure from the amorphous herds of deer or antelope. From the point of view of each animal within it, a bonded society is made up of layers, like an onion, with your best friends at the core and successive layers filled with individuals with whom you are decreasingly intimate. Whatever the species, the core tends to consist of some five intimates, with the next layer taking the group to around 15, and the widest circle encompassing a total of around 50 friends. Each layer provides different benefits. So while intimates offer personal protection and help, you may rely on a larger friendship group for food, and the entire society for defence against predators.

[It takes intelligence to live in a bonded, layered social system](#). Whereas a herd animal must simply know its neighbour, here you need to know the structure of the whole social network of the group. This is important because when you threaten me you risk upsetting my friends too, and they may come to my aid. In other words, you must be aware of the wider social consequences of your actions. The cognitive demands of this are reflected in [the link between the size of a species' social group and the size of its brain](#) – or, more specifically, the size of the frontal lobes, since this is where calculations about social relationships seem to be made. This link is not straightforward, though. What matters is the complexity of individual relationships, not simply the number. So, smart monkeys, such as baboons and macaques, need bigger brains to manage groups of a given size than do less intelligent monkeys. Apes need bigger computers still.

Grooming is time-consuming, meaning that chimps cannot sustain social groups of more than about 50 (*Image: Suzi Eszterhas/Minden Pictures*)

This link between group size and brain size – sometimes referred to as the social brain hypothesis – turns out to apply not only to species but also to individuals. [Neuroimaging studies of both macaques and humans](#) have shown that the number of friends an individual has is linked to the size of parts of their frontal lobes. Many aspects of cognition are necessary for the complex social decisions that animals make, but one that seems to be especially important is "mentalising" – the ability to understand another's state of mind. "I believe that you suppose that I wonder whether you think that I intend to..." represents five mind states, and is what human adults can typically manage. The size of

key regions of your prefrontal cortex determines your mentalising skills, [which in turn determine the number of friends you have](#).

Many species create and service their friendships by social grooming. Grooming – or light stroking in the case of humans – triggers the release of endorphins in the brain, which makes you feel relaxed and trusting. The bigger the group, the more time an animal devotes to grooming, but the fewer individuals it grooms. This is because as group size increases and group living becomes more stressful it becomes increasingly necessary to ensure that your friends are reliable and will come to your aid when you need them. You do this by spending more of your available social time grooming core friends. [Among female baboons, at least, this has demonstrable benefits](#) – those with stronger friendships produce less of the stress hormone cortisol and produce more surviving offspring.

Since the quality of a relationship depends on how much time is invested in it, and there is only so much time available for grooming in a busy day, this sets an upper limit on the number of friends an animal can have, and hence the overall size of the social group. If you try to groom too many individuals, you end up spreading your time too thinly, the quality of your friendships is poorer and social groups are consequently less stable and keep breaking up. In monkeys and apes, this sets an upper limit on average social-group size of about 50, which is just what you find in baboons and chimps.

Laughter and language

But humans are different. Over the past two million years, there seems to have been increasing pressure to evolve ever-larger social groups. Based on the social brain hypothesis, I have calculated that [our social group size should be around 150](#). This has come to be known as "Dunbar's number" and turns out to be both a common community size in human social organisations and the typical size of personal social networks. But how could humans and their immediate ancestors have sustained groups that greatly exceed the number that can be bonded by grooming?

It seems we have exploited three additional behaviours that are very good at triggering the release of endorphins but can be done in groups, allowing several individuals to be "groomed" at the same time. First came laughter, which we share with the great apes. Essentially a form of chorusing, laughter typically involves a group of three people, making it more efficient than grooming as a bonding mechanism. Next, perhaps 500,000 years ago, we added singing and dancing, which increased the grooming group still further. Finally, language gave greater control over both laughter – through jokes – and song and dance. Ultimately, it allowed rituals to be associated with religion, and this made super-groups possible.

Even though we can feel a bond with a super-group consisting of thousands, most of us have no more than around 150 in our personal social network. About half of these are family, and tend to remain constant throughout our lives. But non-kin friendships are very susceptible to decay if we do not invest in them. [Failure to spend time with a friend for a year reduces the quality of that friendship by about one third](#). Although our friends may change considerably over a lifetime, how we negotiate friendship remains surprisingly constant. Each of us has a characteristic pattern in the way we distribute our social capital, whether measured as time spent contacting friends or emotional closeness to them. Our best friend, for example, gets the same amount of time no matter who they

happen to be. [This is rather like a personal social signature](#), and it remains fixed even when our friends change.

Read more: ["Friendship: The chemistry of our social glue"](#)

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