

Seal study shows diverse parenting styles

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Grey seal mother aggressively protecting her pup from a neighbouring female.

To most of us, one seal seems much like another. But a new study shows they have varied personalities that lead to distinctive approaches to parenting.

Research on grey seal colonies show that some are attentive mothers, regularly checking their pups are safe, while others take a more laissez-faire approach. And these aren't isolated differences, but seem to be manifestations of more basic differences in the seals' psychological makeup.

Some take a consistent, proactive approach to dealing with risk, whereas others make more or less effort depending on the situation - a riskier but potentially more rewarding approach.

Researchers from Durham University and the University of St Andrews

studied differences in grey seal behavior on the island colony of North Rona, off the coast of Scotland, as part of a long-term study of how individuals varied in breeding success.

They did this by driving a custom-built remote-controlled vehicle (RCV) across the breeding area and into the vicinity of a particular target female and her pup. They then played a recording of howling wolves - animals that would once have hunted their ancestors, before they were exterminated in Britain.

Tests on 28 females revealed a wide range of responses. Some seals reliably expressed a degree of concern by lifting their heads and looking about; some paid little attention to the howling RCV. Others pushed at it with their muzzles in an effort to drive it away. Seals showed the same [behavioural responses](#) both within and across successive breeding seasons.

Similarly, some males were consistently nonchalant towards the robotic intruder, others quickly got out of its way, and still others tried to drive it off with displays of aggression.

"Our findings show that there is no such thing as an average seal," says lead author Dr. Sean Twiss of Durham University's School of Biological and Biomedical Sciences. "Individuals behave differently and do so consistently."



Grey seal mother checking her pup.

He adds that while behavioural ecologists have been increasingly interested in these kinds of consistent differences in animal behavior in recent years, most studies of the subject have taken place in the lab, so it's not certain how far their conclusions apply to animals in the wild. And while there's been plenty of research on some animals, big mammals have received little attention.

"Anyone with pets will be familiar with the idea that animals can have different personalities, but we wanted to test and quantify these behavioral differences in a real-life situation," Twiss explains.

It's a slightly unexpected result; you might imagine that either attentive or aloof parenting would be more successful at rearing pups in the long term, and that most individuals would therefore end up adopting this behavior.

"If maternal attentiveness contributes to fitness, one would be forced to ask why selection has not favored a single optimum level of pup-checking, or flexibility in the number of checks made," comments co-author Dr. Patrick Pomeroy of the Sea Mammal Research Unit at the University of St Andrews. "Our next task is to find out if personality differences have fitness consequences."

Twiss adds that further research, which hasn't yet been published, suggests that these disparities in [parenting style](#) point to more basic divisions in personality type. Some seals react to their environment in predictable ways - the cautious mothers who always investigated the threat - while others show more varied, unpredictable behavior

depending on the situation, perhaps continuing to rest rather than checking out every possible threat.

The first strategy is safer, whereas the latter could go badly wrong but could also pay big rewards if it works out. The evidence seems to suggest mothers of the first type invest an average amount of energy into rearing young and are rewarded with average pup growth rates, whereas the second type put in a lot of effort or a little, and get correspondingly high or low growth rates.

These differences in behavioural style may mean some seals fare better than others as their environments change.

Twiss says the team hopes to illuminate the physical basis of these differences and whether they have genetic roots, but speculates that they might both survive because they have advantages in different circumstances.

The researchers used an off-road RCV built by Twiss in his garden shed and fitted with a video camera and sound system. They decided wolf calls would be a sound the seals wouldn't have heard before, but that would still have been perceived as a potential threat – their ancestors would have been in danger from wolves when they still roamed the UK.

They kept track of how individual animals behaved over time, to build up a picture of how each reacted to possible threats, and how consistent these reactions were. It's not hard to tell individual seals apart, as their fur has distinctive patterns.

In particular, they looked at how often mothers performed the 'pup check' manoeuvre in a set period – this is when the mother raises her head off the ground and looks at her young to check it's safe. Mother seals stay with their pups, which don't move far, so it's relatively easy to

monitor their behavior in this way.

The work on individual differences has relied on information produced by Pomeroy and Twiss's long-term studies on the site. Detailed breeding behaviour has been recorded and a large number of [seals](#) individually identified; the associated time series of data on each seal makes this a rich resource for understanding individual behavior in a wider context.

The results appear in *Marine Mammal Science*.

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