

# Evidence of 'personality' in the grey seal (*Halichoerus grypus*)

Samuel I. Hardman and Sean D. Twiss

School of Biological and Biomedical Sciences, Durham University, South Road, Durham, DH1 3LE  
s.i.hardman@durham.ac.uk



Behavioural types or 'personalities' have now been shown in both male<sup>1</sup> and female<sup>2,3</sup> grey seals with recent work showing that females exhibit behavioural types on a continuum from proactive to reactive<sup>2</sup>. Proactive females tend to show little behavioural flexibility across situations, readily form routines and often exhibit high levels of aggression (Fig 1). In contrast, reactive individuals show more behavioural plasticity across situations, are better able to react to environmental stimuli and are generally less aggressive. Here we present evidence of grey seal 'personality' at Donna Nook, a new study site in Lincolnshire.



Figure 1. Proactive females are typically more aggressive and show little behavioural flexibility. Reactive individuals are less aggressive and better able to react to their environment.

## The study sites

All behavioural observations for this study at Donna Nook grey seal colony, Lincolnshire, during the breeding season (4<sup>th</sup> November – 14<sup>th</sup> December 2012). Observations were split between two sites (Fig 2).

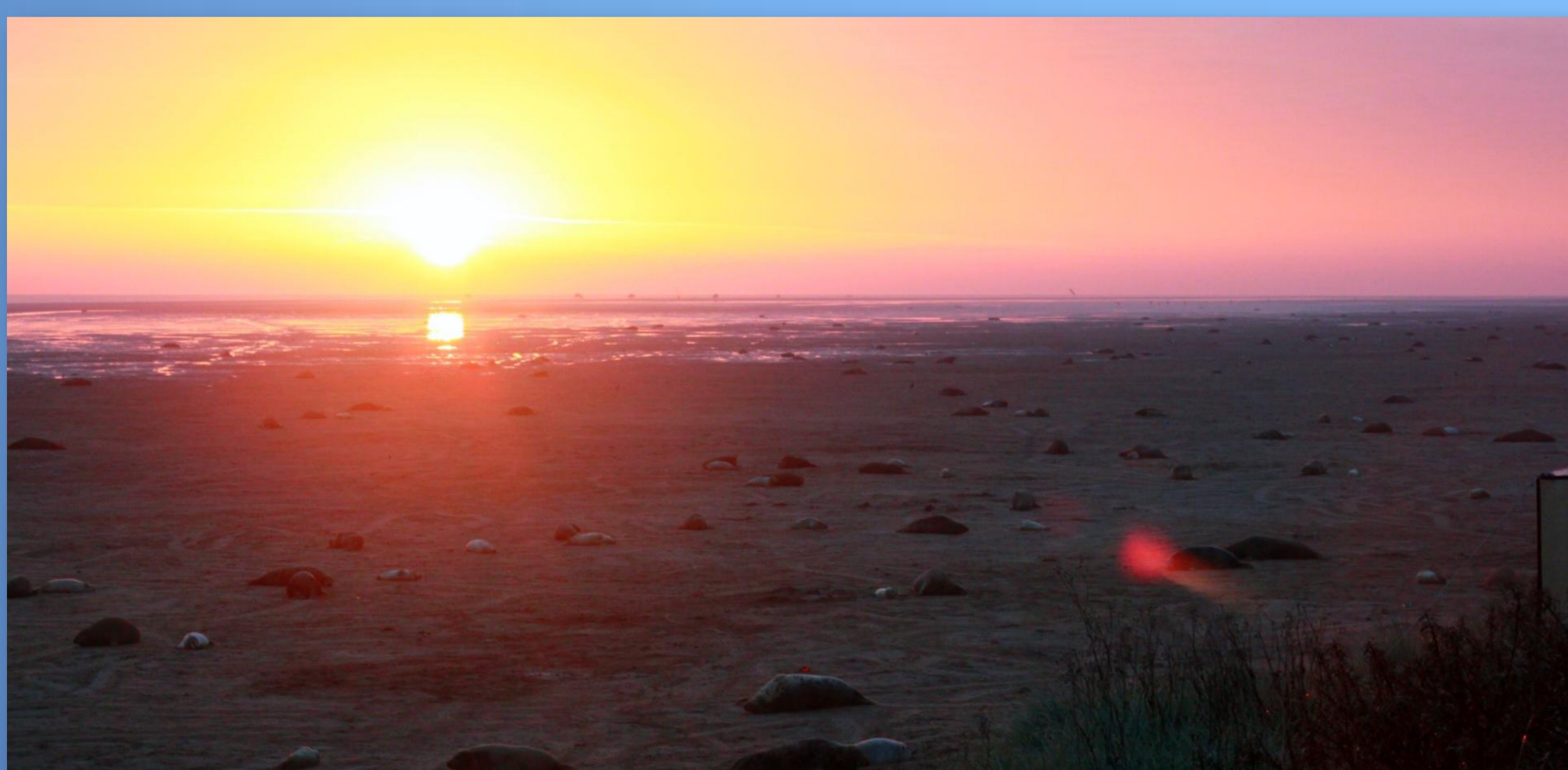


Figure 2. The RAF study site (top) is closed to public access but the public study site (bottom) is open to the public and can receive several thousand visitors on a busy day.

## Measuring personality

Animals are considered to have personality when there are consistent differences in the behaviour of individuals of the same species and age and sex class<sup>4</sup>.

Over multiple observations we recorded maternal attentiveness as the rate at which individually identified females turned to check on their pups in both disturbed and undisturbed situations<sup>2</sup> (Fig 3). Here 'disturbed' was defined as the period immediately following an aggressive interaction. These data were then used as a behavioural metric from which to measure personality.



Figure 3. A female checking on her pup at North Rona, Scotland.

A previous study at North Rona, Scotland<sup>2</sup> also compared pup-checking rates of females in both undisturbed and disturbed situations.

Some individuals responded to disturbance by increasing their pup checking rate and were classed as **reactive** as they react to changing conditions.

Those individuals whose pup checking rate remained consistently the same across situations were classed as **proactive** as they had fixed behaviours that did not change readily in changing conditions.

Our data allowed us to investigate the repeatability of these results at an alternative grey seal colony with very different topography and colony structure.

## Results

Females exhibited significant repeatability in their pup-checking rates while undisturbed at both the RAF site (ICC = 0.40, 95% CI = 0.017 - 0.66, P = <0.0001) and public site (ICC = 0.31, 95% CI = 0.025 - 0.63, P = 0.01).

Although the frequency of maternal pup checks increased significantly with disturbance (Wilcoxon test, W=9878, P = <0.001) individuals were not consistent in their pup-check rates when disturbed at either the RAF site (ICC = -0.11, 95% CI = -0.29 - 0.24, P= 0.7) or public site (ICC = 0.23, 95% CI = -0.12 - 0.63, P = 0.1).

We found that the pup-check rate of undisturbed seals at the RAF site was significantly higher than at the public site (Wilcoxon test, W = 3159, P = <0.001) (Fig 4).

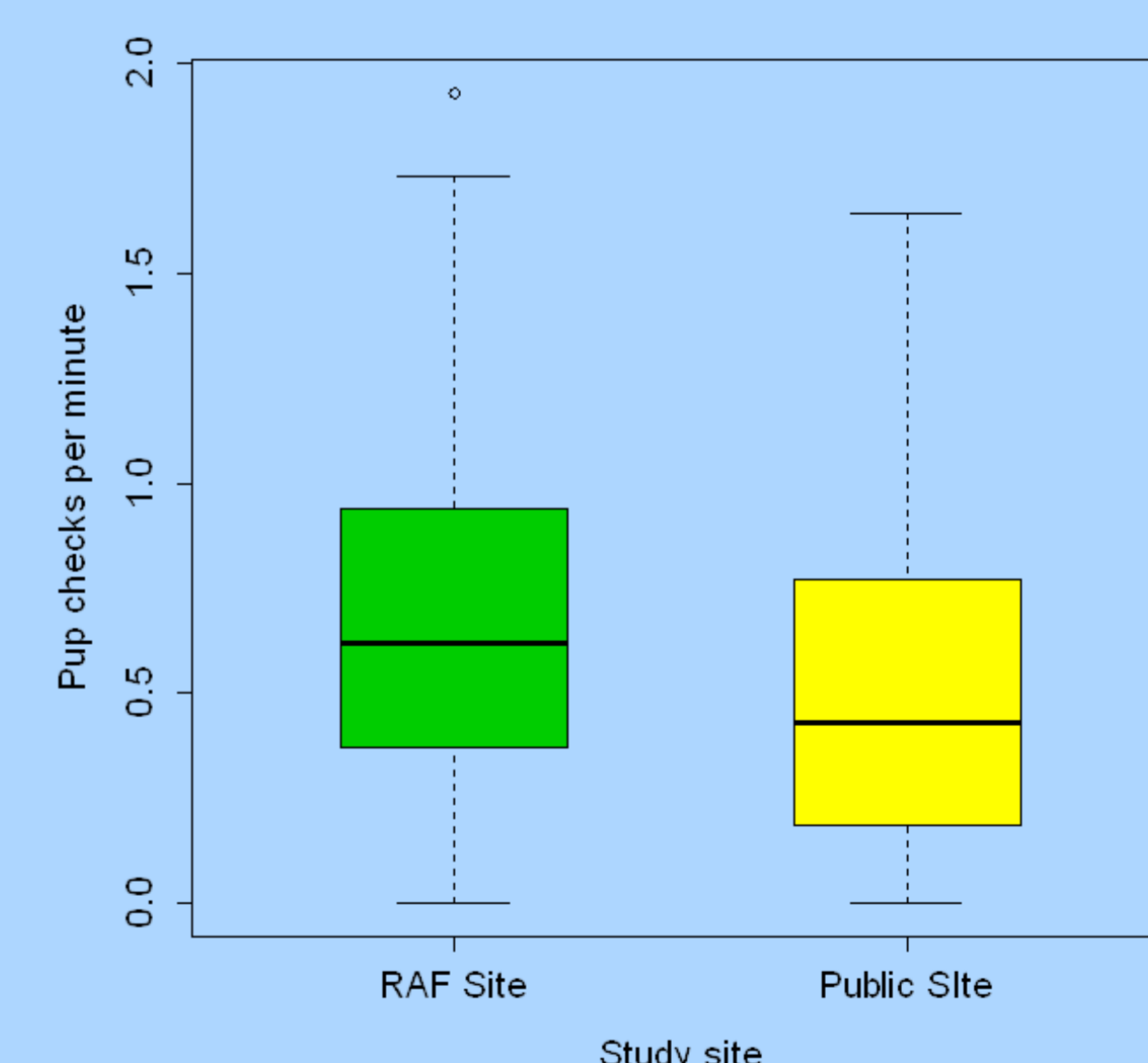


Figure 4. Boxplots showing the rate of pup checking by undisturbed female grey seals at the RAF and public study sites. Boxes show the median, upper and lower quartiles and the sample minimum and maximum values.

## Do grey seals have personalities?

Our results show that grey seals do exhibit consistent individual differences in undisturbed pup-check rates indicative of personality in this species.

Unlike at North Rona<sup>2</sup> we did not find individual consistency in disturbed pup-check rates. This result may be explained by the fact that unlike Twiss et al. (2012)<sup>2</sup> we did not use a standardised stimulus to induce disturbance.

Undisturbed pup-check rates were higher at the RAF site than at the public site. Habituation to disturbance at the public site may explain this result or it may be that the public site selects for individuals that are already tolerant of disturbance while those that are not move to the quieter RAF site.

Individuals at very different sites exhibit consistent individual differences in patterns of maternal attentiveness in undisturbed situations, but the level of responsiveness to disturbance differs, possibly due to prevailing levels of disturbance at the respective sites.

## References

1. TWISS, S. D. & FRANKLIN, J. 2010. Individually consistent behavioural patterns in wild, breeding male grey seals (*Halichoerus grypus*). *Aquatic Mammals*, 36, 234-238. 2. TWISS, S. D., CAIRNS, C., CULLOCH, R. M., RICHARDS, S. A. & POMEROY, P. P. 2012. Variation in Female Grey Seal (*Halichoerus grypus*) Reproductive Performance Correlates to Proactive-Reactive Behavioural Types. *PLoS ONE*, 7, e49598. 3. TWISS, S. D., CULLOCH, R. & POMEROY, P. P. 2011. An in-field experimental test of pinniped behavioral types. *Marine Mammal Science*, 28, 280-294. 4. SIH, A., BELL, A. & JOHNSON, J. C. 2004. Behavioral syndromes: an ecological and evolutionary overview. *Trends in Ecology & Evolution*, 19, 372-378.