

# Ontogeny of personality in red junglefowl



**AVIAN**  
Behavioural Genomics  
and Physiology group

Hanne Thorpe<sup>1</sup>

<sup>1</sup>IFM Biology, Linköping University, Linköping, Sweden  
hanth955@student.liu.se MSc student



Personality is defined as stable individual differences in behaviour over time or contexts. However, we expect some degree of developmental plasticity also in personality. In red junglefowl (*Gallus gallus*) two important life stage changes are weaning and sexual maturity.

Therefore I investigated:

How personality deviates over time, and when personality stabilises



Behaviour	Comparisons between weeks				
	4 vs. 6	6 vs. 8	8 vs. 16	16 vs. 34	34 vs. 40
Vigilance (NAV)	-0.39	-0.01	0.04	0.43**	0.29(*)
Foraging (NAF)	0.28(*)	0.56**	0.25	0.40*	0.32(*)
Activity (NAA)	0.56**	0.50**	0.11	-0.02	0.44**
Vocalisation (NANV)	0.62**	0.43**	-0.06	-0.08	0.22
Latency to movement (NAM)	0.35*	0.08	-0.09	0.32	-0.15
Vigilance (NOV)	-0.09	0.20	-0.08	0.05	0.31(*)
Vigilance (SV)	-	-	-	0.02	0.37
Instant response (SIR)	-	-	-	0.23	0.37(*)
Latency to stand (TIS)	0.50**	0.40*	0.31(*)	-0.22	0.10

Table 1. Spearman rank correlations ( $r_s$  values) of red junglefowl behaviours across age periods from the novel arena (NA), novel object (NO), startle (S) and tonic immobility (TI) tests. Correlations are significant at the following levels: \*0.05-0.02, \*\*0.02-0.00 (- signifies a lack of data).

## SUMMARY

Foraging in a novel environment is stable throughout life. Vigilance is stable after sexual maturity, whilst latency to stand is stable before sexual maturity suggesting this developmental change has an effect on these behaviours (Table 1). Latency to walk had a period of stability before weaning, suggesting that weaning had an effect on this behaviour (Table 1). Other behaviours such as number of vocalisations and activity seem to have a period of instability around 16 weeks suggesting that adolescence has an effect on these behaviours (Table 1).

Vigilance and activity behaviours are closely related to each other regardless of context at each age (Fig 1). The instant response to the startle test is shown to be closely related to the vigilance behaviours (Fig 1). The other behaviours tend not to have constant relationships with any other behaviours regardless of context.

**In conclusion, red junglefowl seem to have three periods of development which effects personality; weaning, sexual maturity and the period in between.**

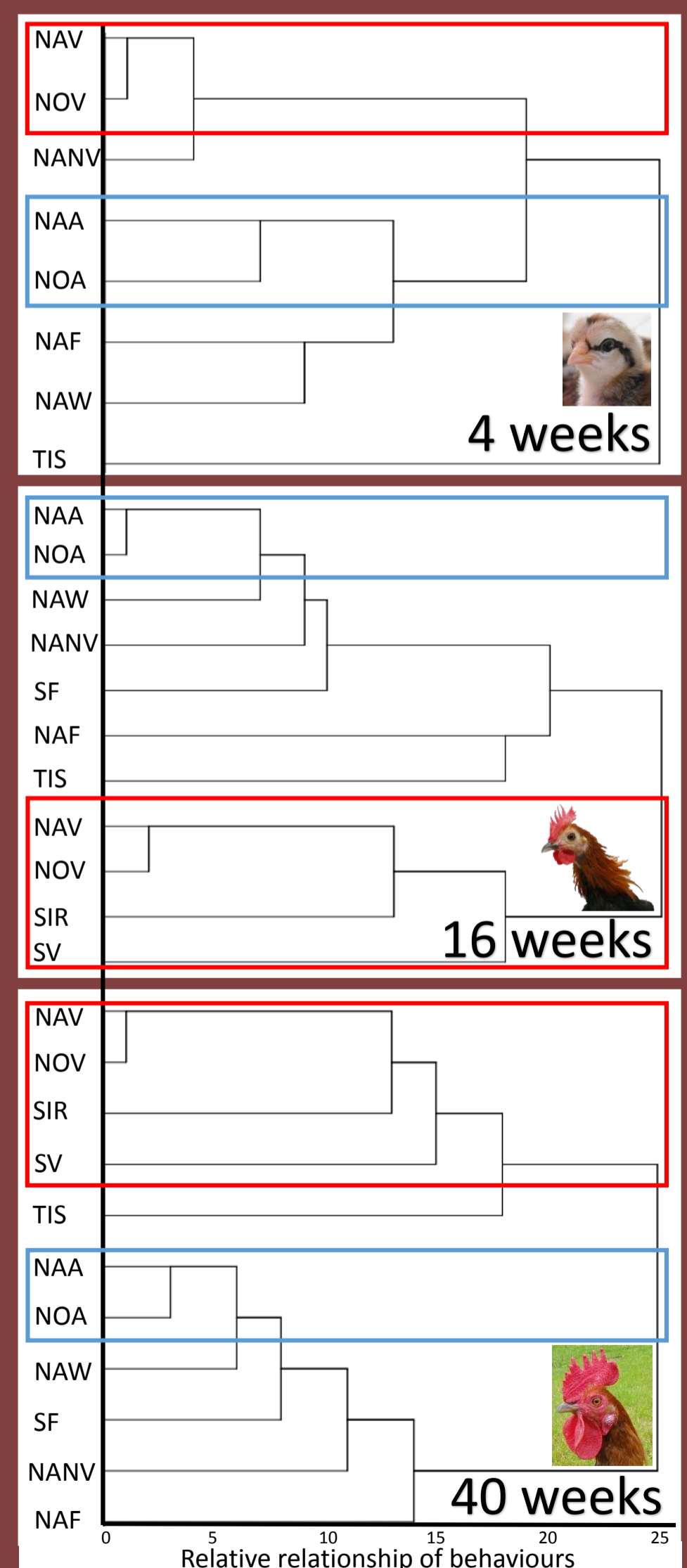


Figure 1. Dendrograms showing the relation between behavioural traits at 4 weeks, 16 weeks and 40 weeks. See Table 1 for abbreviations.

**METHODS:** 36 Red junglefowl (*Gallus gallus*) (18M & 18F) were tested at 4, 6, 8, 16, 34 and 40 weeks of age (all comparisons are not shown here) in a novel arena (NA), novel object (NO), startle (S) and tonic immobility (TI) tests. The floor type and objects were changed for each NA and NO. Activity was measured as the number of sub-areas visited. Other behaviours were observed for 15 minutes in the NA and for 10 minutes in the NO and S at 10s intervals. After 5 minutes in S, the aerial predator model was flown over the enclosure. In the TI, the bird was placed on its back in a v-shaped cradle with pressure applied to its chest for 10s. The latency to the first head movement and until it stood (S) were noted. Vigilance (V), foraging (F), latency to walk (W), number of vocals (NV), activity were observed in the NA, NO and S. The immediate response to a startle (IR) was observed in S. Birds reached sexual maturity at ~21 weeks of age.