

1 **Electronic Supplemental Material S2**

2 **Using a robotic fish to investigate individual differences in social**
3 **responsiveness in the guppy (S2)**

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10 **Calculation of average time-delayed cross-correlation (TLXC)**

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12 We calculated the time-delayed normalized cross correlation function for different values of
13 the lagtime τ : $C(\tau) = \langle v(t)v_f(t+\tau) \rangle_t$ with v_f being the velocity of the focal individual and $\langle \dots \rangle_t$
14 indicating a time average over all points where $v(t)v_f(t+\tau)$ is defined. As the cross correlation,
15 requires the shifting of the velocity vector of the focal individual by k points, with $\tau = k\Delta t$ (Δt :
16 time difference between two time frames), the time average for different τ (different k) has to
17 be taken over $k_{avg} = \lfloor (T - \tau) / \Delta t \rfloor$ points where $v(t)v_f(t+\tau)$ is defined. Here T is the total
18 trajectory duration used in experiments $T = 120s$. For example for $\tau = 3s$ and $\Delta t = 0.111$, we
19 obtain $k_{avg} = 1053$. Eventually, we calculated **TLXC** as the average $C(\tau)$ over a finite range of
20 timelags ($\tau = 0 - 6s$): **TLXC** = $\langle C(\tau) \rangle$.