

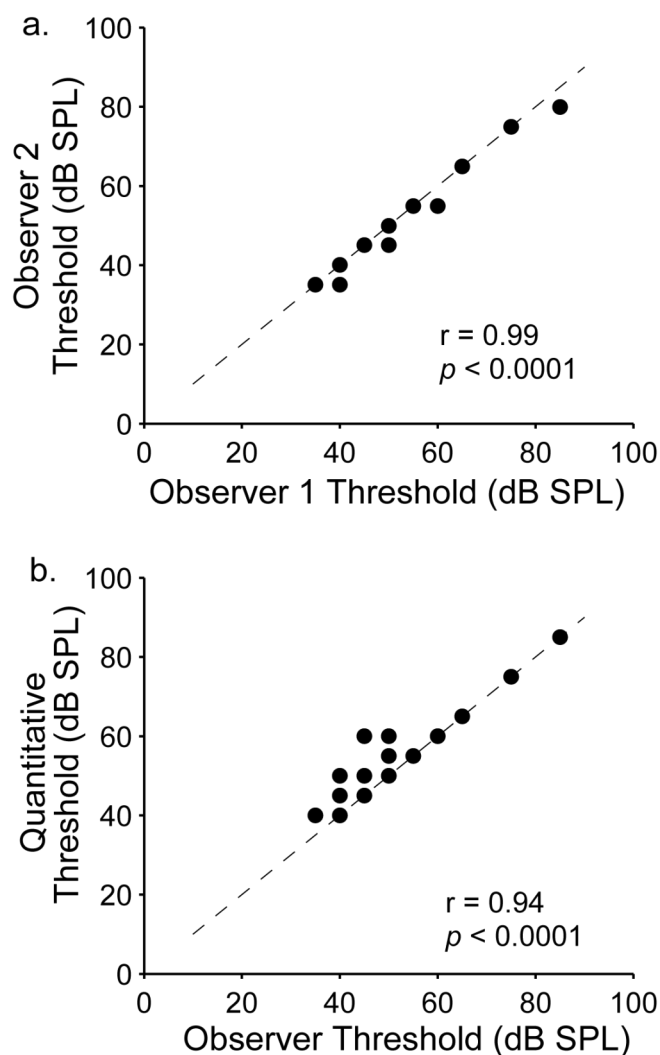
**Supplementary Table 1.**

**Number of missing ABR latency data points filled in with mean values**

	PEAK 1*				PEAK 2**			
	Non-breeding		Breeding		Non-breeding		Breeding	
	Male	Female	Male	Female	Male	Female	Male	Female
Click	0	0	0	0	0	0	0	0
500 Hz	3	1	4	4	3	1	4	4
1000 Hz	1	0	4	3	1	0	4	3
2000 Hz	1	0	2	2	1	0	2	2
3000 Hz	1	0	0	1	1	0	2	1
4000 Hz	1	0	0	0	1	0	1	0
6000 Hz	1	0	1	0	1	0	1	0
8000 Hz	1	0	2	2	1	0	2	1

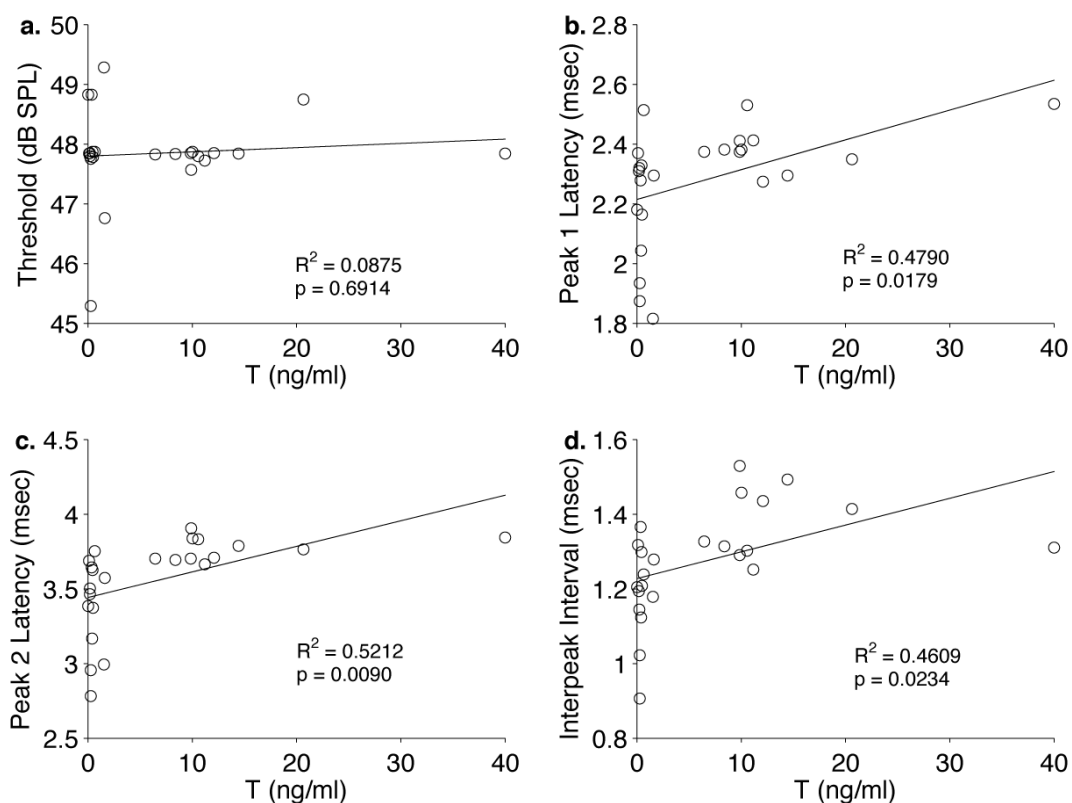
\* Filled in values represent 35 out of 312 total peak 1 data points (11.2%)

\*\* Filled in values represent 37 out of 312 total peak 1 data points (11.9%)



**Supplementary Fig 1.** Blind observer and quantitative analyses verify visual estimates of ABR thresholds. Each circle represents the threshold value for a representative ABR response. The dashed line represents the unity line. Pearson's  $r$  and  $p$  value are indicated for each comparison.

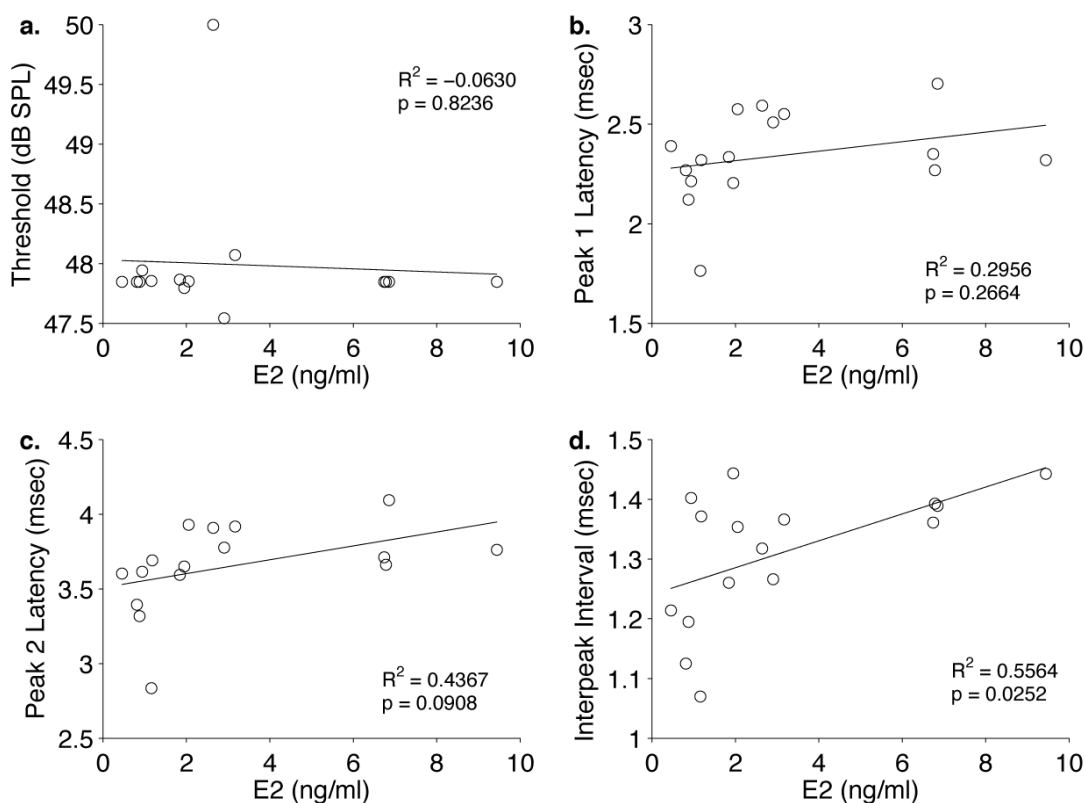
*a)* Blind observer threshold estimates ( $y$ -axis) for a subset (10%) of all ABR responses significantly correlate with estimates made by one author ( $x$ -axis). *b)* Visual estimates ( $x$ -axis) significantly correlate with an automated estimate ( $y$ -axis) comparing the maximum voltage response in a 10 msec post-stimulus window with the maximum pre-stimulus voltage displacement plus 2 standard deviations.



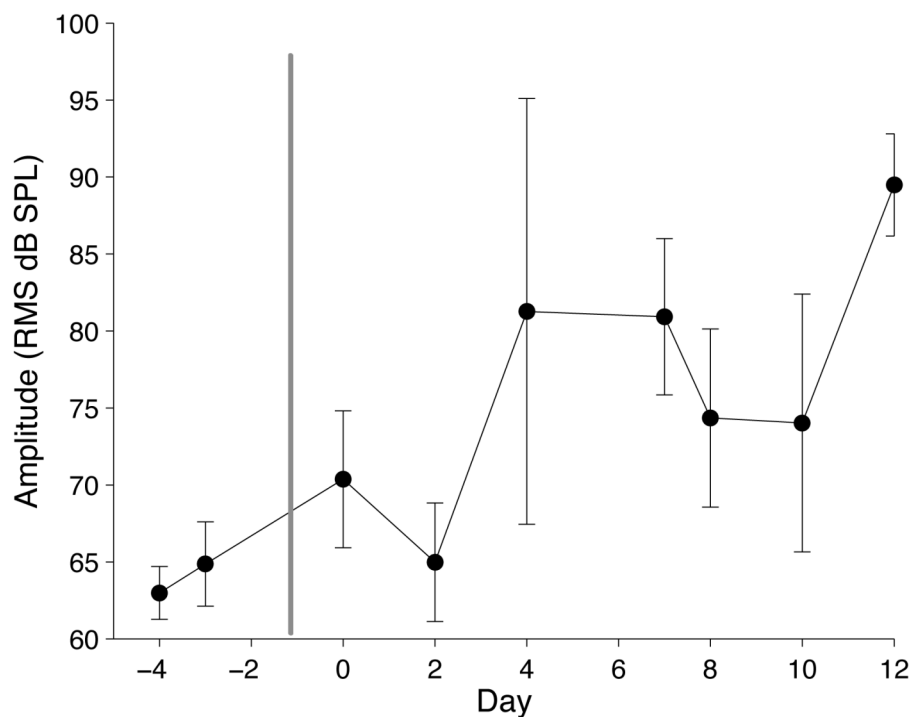
**Supplementary Fig 2.** ABR latencies, but not thresholds, correlate with male plasma T level.

*a)* Individual ABR thresholds were averaged across all stimulus frequencies to give a single threshold value for each bird. These values are plotted as a function of individual T levels.

Thresholds do not correlate with hormone level in male white-crowned sparrows. *b)* Individual iso-intensity peak 1 latencies were averaged across all stimulus frequencies to give a single peak 1 latency for each bird. Peak 1 latencies significantly correlate with T level ( $p < 0.05$ ). Similar results were found for Peak 2 latencies (*c*) and Inter-peak intervals (*d*).



**Supplementary Fig 3.** ABR latencies and thresholds do not correlate with female plasma  $E_2$  level. *a)* Individual ABR thresholds were averaged across all stimulus frequencies to give a single threshold value for each bird. These values are plotted as a function of individual  $E_2$  levels. Thresholds do not correlate with hormone level in female white-crowned sparrows. *b)* Individual iso-intensity peak 1 latencies were averaged across all stimulus frequencies to give a single peak 1 latency for each bird. Peak 1 latencies do not significantly correlate with  $E_2$  level. Similar results were found for Peak 2 latencies (*c*) and Inter-peak intervals (*d*).



**Supplementary Fig 4.** Non-breeding songs have lower amplitudes than breeding songs. We recorded an individual male white-crowned sparrow under non-breeding conditions until day 0, at which point we implanted him with a subcutaneous T pellet and switched him to a long-day photoperiod. The vertical grey line separates songs produced under non-breeding conditions (left) from those produced during the transition into breeding (right). After exposure to breeding-like conditions, song amplitude gradually rises from 70.4 +/- 4.45 dB SPL on day 0 to 87.5 +/- 4.15 dB SPL on day 12. Data are mean +/- STDEV.