

Appendix 1: Results of 1000 node-label permutations of song-sharing networks of 12 males with *Index 1* and *Index 3*, comparing observed and permuted correlations between the average index of a bird and two song metrics (Delivery and Switching). When we expected a positive correlation (with *Index 1*), the *P* value was calculated as 1- (Number of permutations where the observed correlation coefficient was greater than the permuted value /Number of permutations). When we expected a negative correlation (with *Index 3*), the *P* value was calculated as 1- (Number of permutations where the observed correlation coefficient was less than the permuted value /Number of permutations). Significant correlations are marked in bold.

Index	Song metric	$R_{observed}$	Average of $R_{permuted}$	No. of permutations where observed $R_{observed} > R_{permuted}$	<i>P</i>
<i>Index 1</i>	Delivery	0.5367	-0.0027	951/1000	0.0490
	Switching	0.0676	0.0094	524/1000	0.4760
<i>Index 3</i>	Delivery	-0.5915	-0.0233	966/1000	0.0340
	Switching	0.0249	-0.0255	568/1000	0.4320