



Figure s2. Method for creating treatments (5 ms, 79 ms, alternating calls) for each trial. Pre-recorded calls were randomly drawn from the library of 10 (either *Smilisca sila* or *Engystomops pustulosus*) so that the same call was not repeated within a single trial. Specific call combinations were not repeated for a receiver (bat, midge, or female frog). Note that, as a result of leader-follower preferences [1], the order in which calls are presented in the 5 ms and 79 ms treatments change the way these stimuli are perceived (e.g. call #8 and call #2 broadcast at 5 ms overlap is different than call #2 and call #8 broadcast at 5 ms overlap). Thus, from the library of 10 calls, there were 90 potential stimuli each for the 5 ms and 79 ms treatments, and 45 combinations for the alternative treatment.

1. Höbel G. 2010 Interaction between signal timing and signal feature preferences: causes and implications for sexual selection. *Animal Behav.* **79**, 1257-1266.