Supplementary section:

Figure legend

Supplementary Figure 1: Amplitude envelops (above) and spectrograms below) of the 14 different call types emitted by *P.p. rubigenosus* and used as stimuli in the present study. These were used to prepare pitch-shifted synthetic variants matching their natural variation within calls emitted by the population (see methods for additional details). Figure adapted from Clement et al., 2006.

Supplementary Figure 2: Example of a well-isolated single unit selective for 1 of 14 calls in the mean call set. *A.*. Neural potentials filtered from 500 Hz to 3 kHz. *Inset.* 107 overlaid isolated spikes. *B.* Inter-spike interval histogram for the single unit depicted above, indicative of high frequency bursting and demonstrating a clear refractory period. *B.C.* Raster plot and PSTH of the neuron's response to an array of simple syllabic calls presented at their mean fundamental frequency. Calls were presented 30 times with an inter-stimulus interval of 500ms. Black horizontal bars above the rasters represent the onset and duration of each stimulus in the sequence. PSTH bin width = 10ms.

Supplementary Figure 3: Summary of procedures for assessing the significance of intervals of quiescence and increases in spike density. (*A*. *top*) Spike density functions were generated for spikes recorded during the no-stimulus control interval (Panels *A* and *C*, *top*) and each post-stimulus interval. (Panels *A* and *C, bottom*). *A)* Shaded gray area represents the longest duration for which each 250 ms spike density function was continually below the no-stimulus mean spike density (indicated with a horizontal dashed line). *B*. This was termed the "longest quiescence". *B*. A distribution of values

was generated for the longest quiescence by randomization of spike times in the no-stimulus control period. Intervals of quiescence were measured from 10,000 randomized spike density functions and added to a probability distribution. This distribution represents interval lengths expected under the null-hypothesis that spike times are random. Measured post stimulus intervals were compared to this distribution and considered significant at $p < 0.01$. *C and D.* The same procedure was used to assess significance of peak values of the spike density functions (the highest "instantaneous" firing rate) using a distribution of peak firing rates generated from randomly rearranged spike times.

Video 1 Aggressive and affiliative interactions between two conspecifics in a captive bat colony viewed with infra-red light. rBNB is emitted during aggression between two individuals on bottom left and QCFl call is emitted during appeasing (kissing/licking) behavior between two individuals at the top. Males are marked with ornaments on a collar around the neck (Clement et al., 2006).