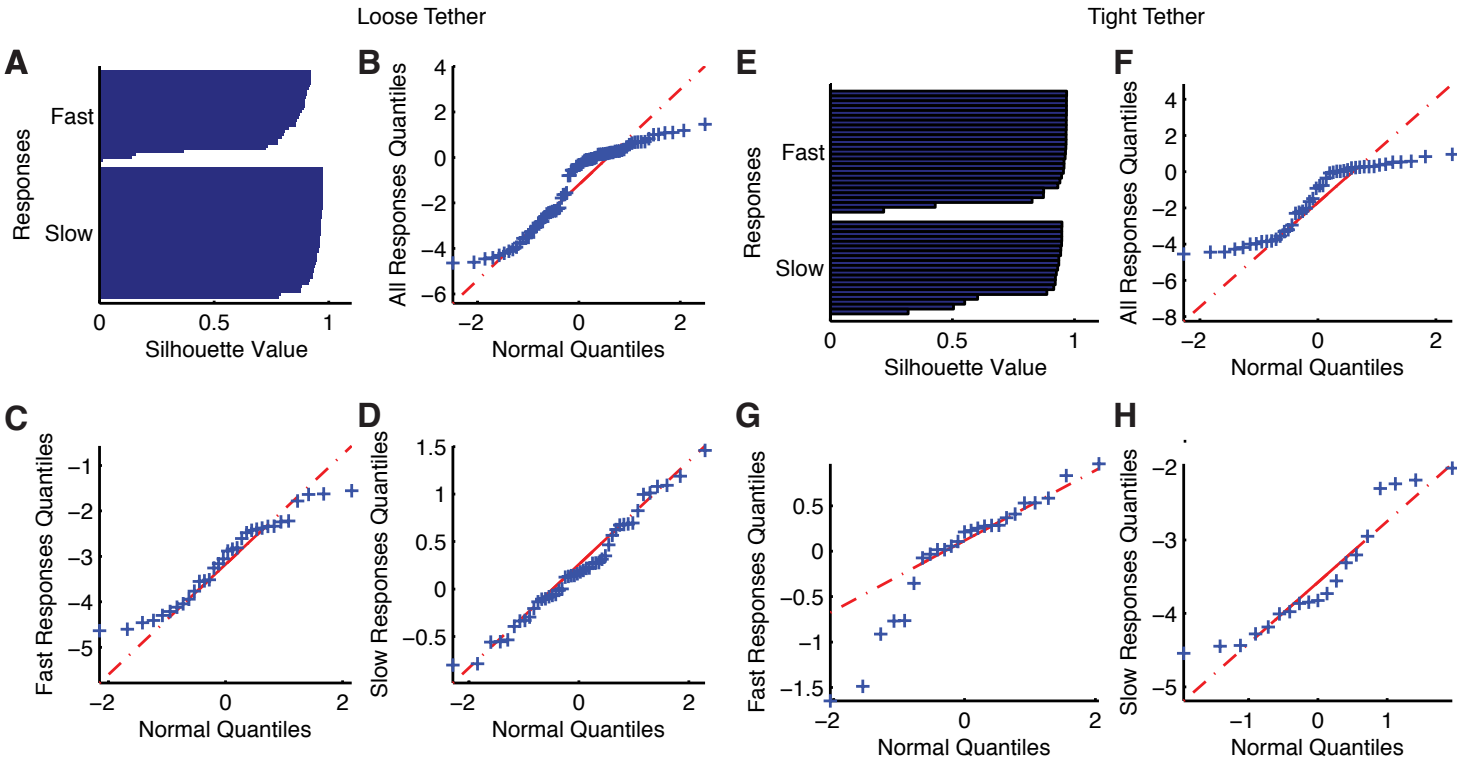

Fig. S1. Cluster (silhouette plots) and normality analysis (quantile–quantile plots) for loose (A–D) and tight tether experiments (E,F). (A,E) Silhouette plots of k-mean clusters with k=2 types of responses: fast and slow. For a given value of k and for each escape time t_i, let a_i be its average distance to all other escape times in its cluster, while b_i is the average distance to all escape times in the closest cluster not including t_i. Each bar in the plot represents the value of $s_i=(a_i-b_i)/\max(a_i,b_i)$. Each s_i lies between –1 and 1, with values close to 1 indicative of appropriate clustering, as observed in the depicted plots for k=2. (B,F) Empirical quantiles of all escape responses as a function of expected quantiles under the assumption of a normal (Gaussian) distribution. Blue crosses are quantile values while the red line connects the first and third data quartiles (robust linear regression line). (C,G) Empirical quantiles of fast escape responses as a function of expected quantiles under the assumption of a normal (Gaussian) distribution. Plotting conventions as in B and F. (D,H) Empirical quantiles of slow escape responses as a function of expected quantiles under the assumption of a normal (Gaussian) distribution. Plotting conventions as in B and F. Only the slow responses in loose tether experiments (see D) were approximately normal as they fell mostly along the regression line.

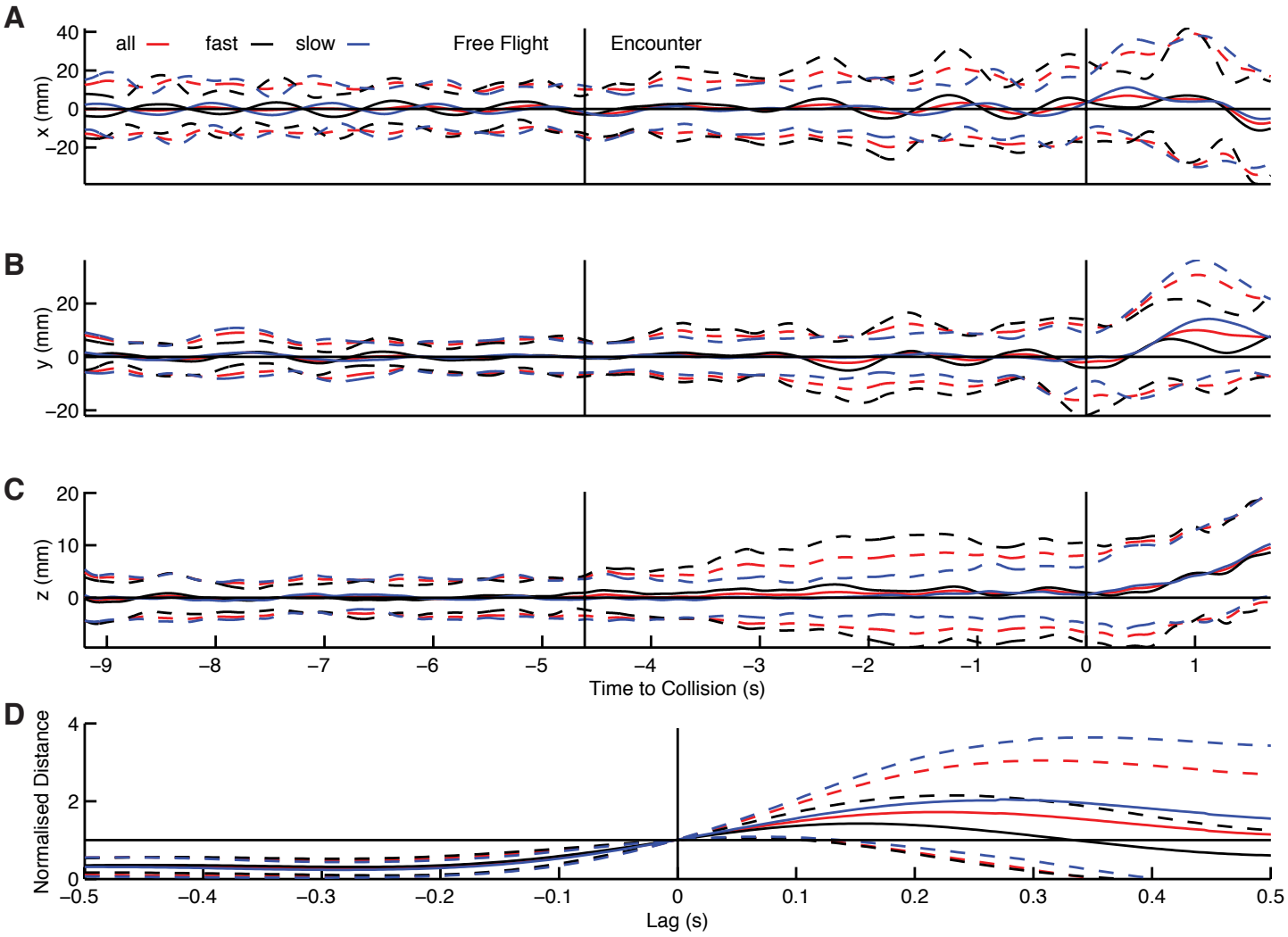

Fig. S2. Averaged trajectory and normalized distances for loose tether experiments separated into all, fast and slow responses. (A–C) Mean trajectories are solid lines with red, black and blue denoting all, fast and slow responses, respectively. Standard deviations of the trajectories are dashed lines with colours denoted in a similar manner to the mean trajectories. (D) Normalized distances with line type and colours denoted as in A–C.

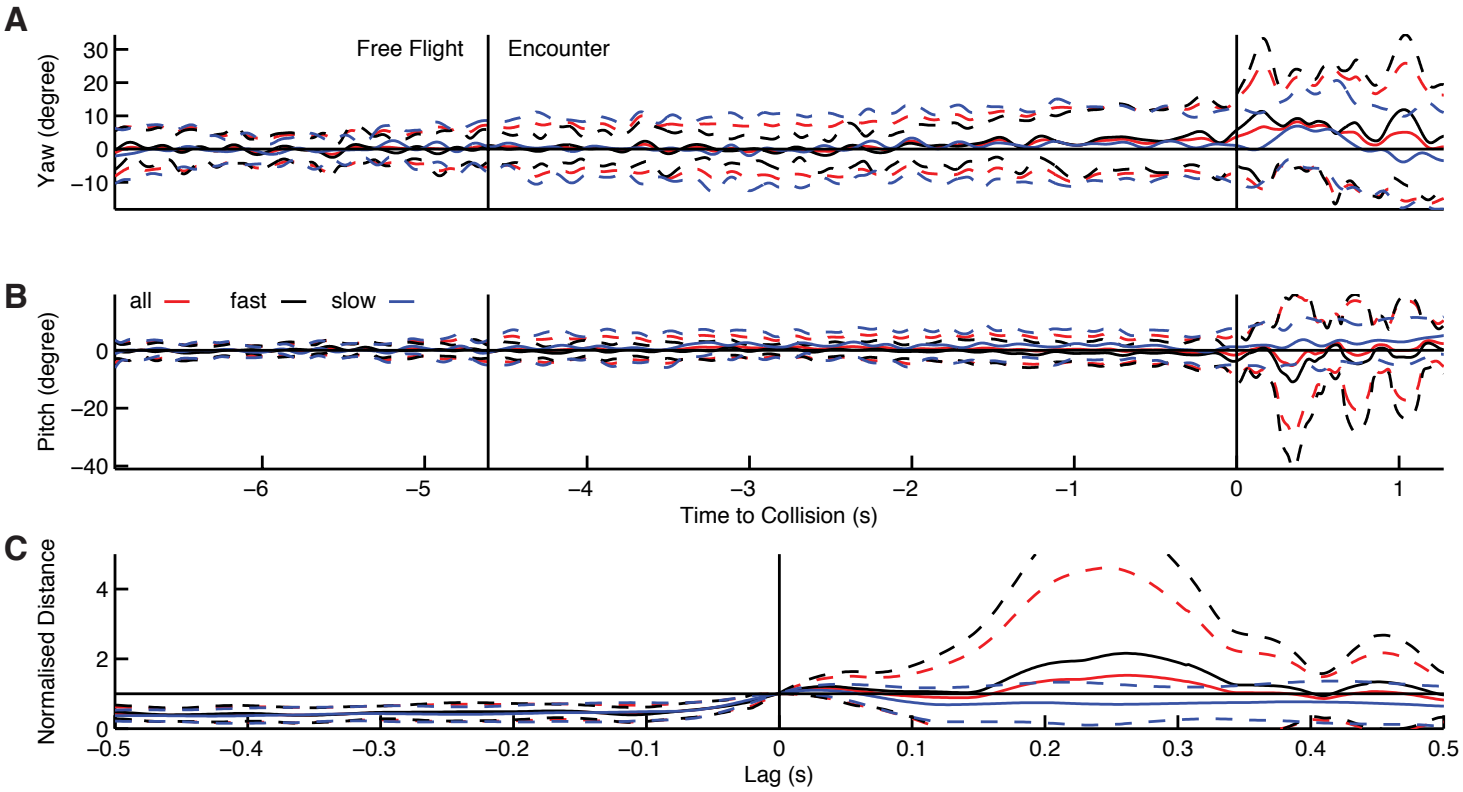

Fig. S3. Averaged trajectory and normalized distances for tight tether experiments separated into all, fast and slow responses. (A,B) Mean trajectories are solid lines with red, black and blue denoting all, fast and slow responses, respectively. Standard deviation of the trajectories is shown as dashed lines with colors denoted in a similar manner to the mean trajectories. (C) Normalized distances with line type and colors denoted as in A,B.

Movie 1. Example (viewed from the top) of a collision avoidance behavior generated by a loosely tethered locust in response to the looming stimulus. The subject begins translating away from the simulus. When it crosses the doubled confinement ellipsoid, the collision avoidance behavior is registered. The corresponding trajectory is depicted in Fig. 1E and Fig. 3B–E (blue line). The time stamp ('Time') indicates the time remaining to collision. The collision avoidance behavior is indicated by the appearance of a corresponding tag ('Response!'). To reduce the video file to an acceptable size, we substantially compressed the spatial resolution of the raw video file and reduced the temporal resolution to 10 frames s^{-1}. In addition, only the encounter phase of the trial is shown.

Movie 2. Example (viewed from the upper left side) of a collision avoidance behavior generated by a more tightly restrained locust in response to the looming stimulus. The subject changes its pitch, triggering the response, and then makes a major yaw turn away from the stimulus. The corresponding trajectory is depicted in Fig. 5B, C and F (blue line). The time stamp ('Time') indicates the time remaining to collision. The collision avoidance behavior is indicated by the appearance of a corresponding tag ('Response!'). To reduce the video file to an acceptable size, we substantially compressed the spatial resolution of the raw video file and reduced the temporal resolution to 10 frames s^{-1}. In addition, only the encounter phase of the trial is shown.