

1 **1 Alternative event-pairing results**

2 Our event-pairing procedure pairs events together within a dyad whenever the direction of
3 grooming changes, and we pair together the most recent event before the direction change.
4 During the review process, Michio Nakamura correctly pointed out that this is an arbitrary de-
5 cision, and that we could equally well have chosen, e.g. the earliest event in the same direction.
6 In light of this comment, we reran our analysis with this alternative pairing procedure. The
7 results are presented are below, using plots in an identical format to the original manuscript. As
8 can be seen, the alternative pairing procedure does not alter our conclusion that time-matching
9 does not occur after a delay.

10 **2 Reciprocity over different delay periods**

11 Michio Nakamura also suggested that although reciprocity might not occur after a very long
12 delay due to memory decay, if we restrict attention to shorter delays then we might find evidence
13 of time-matching. We examined this question in a previous version of the manuscript, and we
14 present the results here. We used a 20-minute moving time-window over Δ , and perform time-
15 matching regressions on data within the data, showing the regression slope (Figure 8) and fit
16 (Figure 9). As can be seen, there is no evidence of time-matching once the window excludes
17 data from $\Delta \leq 0$.

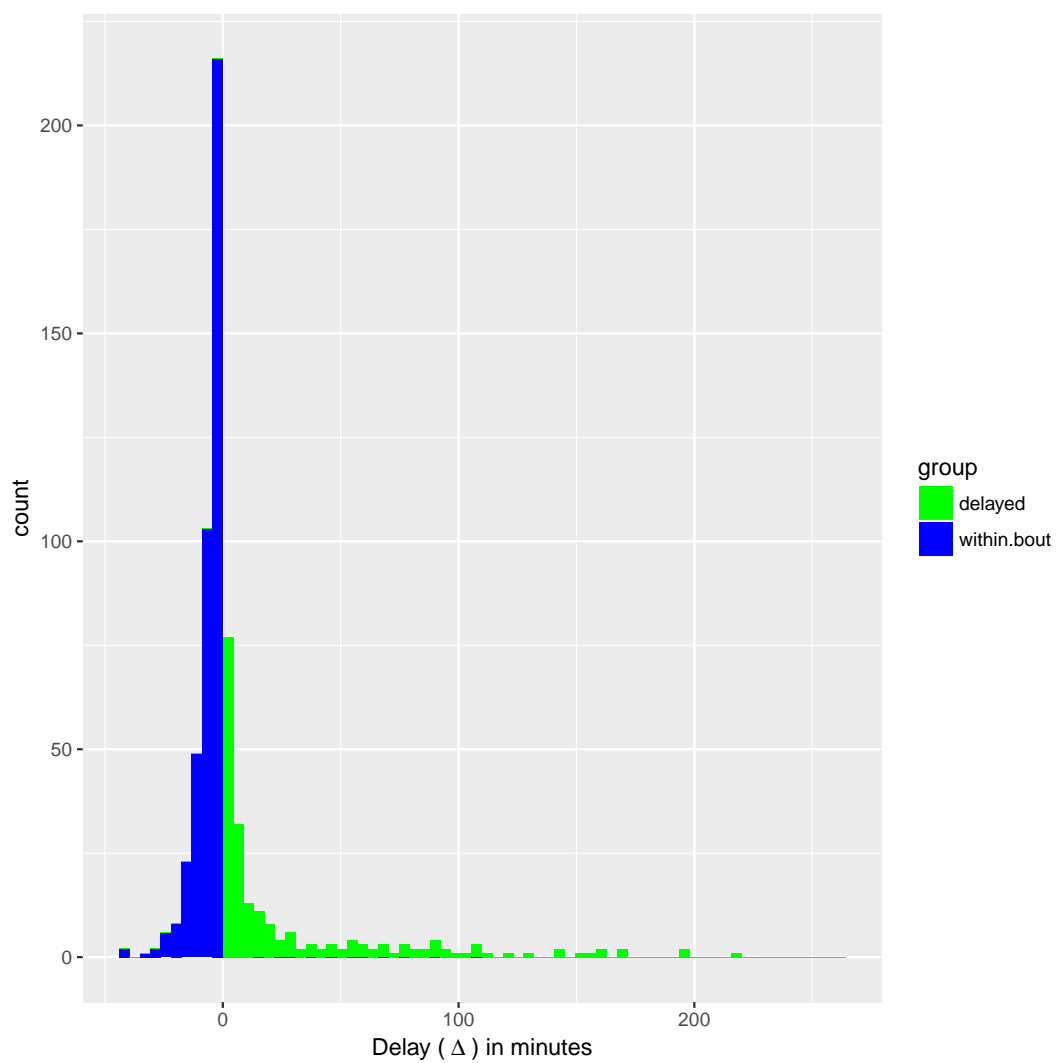


Figure 1: Histogram of Δ measured in minutes.

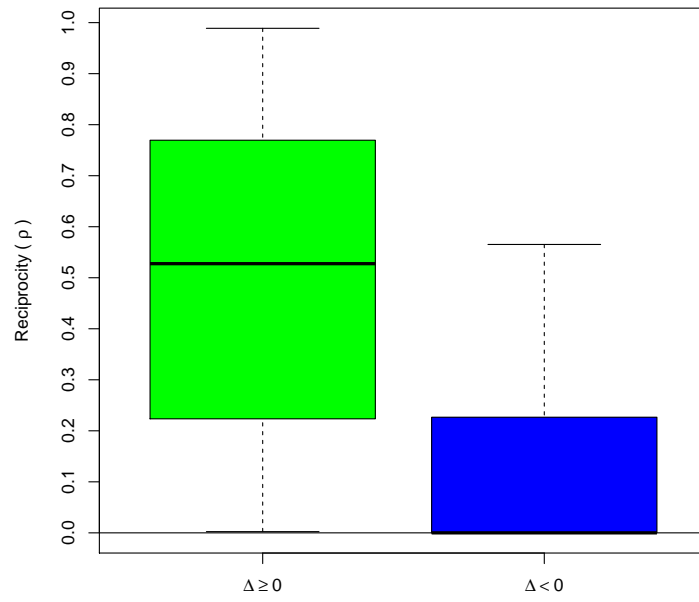
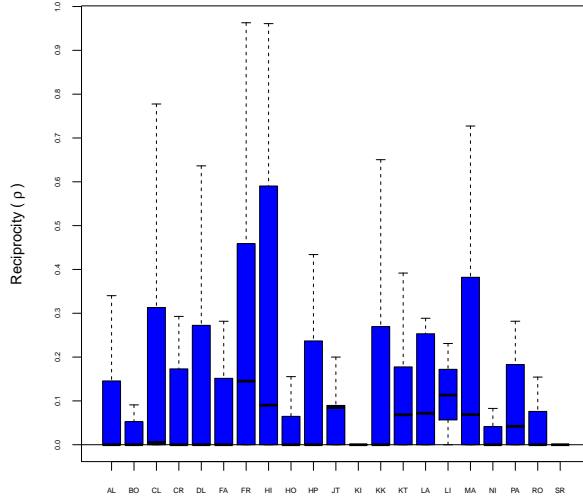
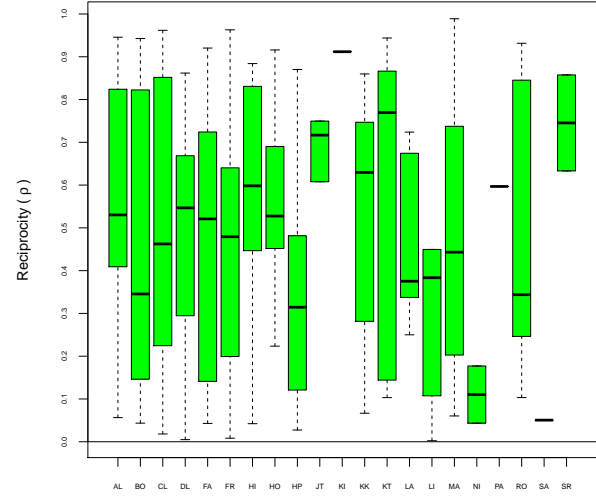


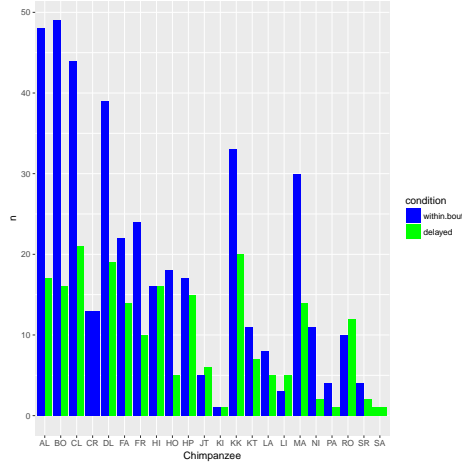
Figure 2: Box plots for the reciprocity measure $\rho = |X - Y| / (X + Y)$ by comparison condition. Delayed grooming $\Delta \geq 0$ is shown on the left ($n = 555$), and within-bout grooming $\Delta < 0$ on the right ($n = 277$).



(a) Reciprocity by chimpanzee - $\Delta < 0$

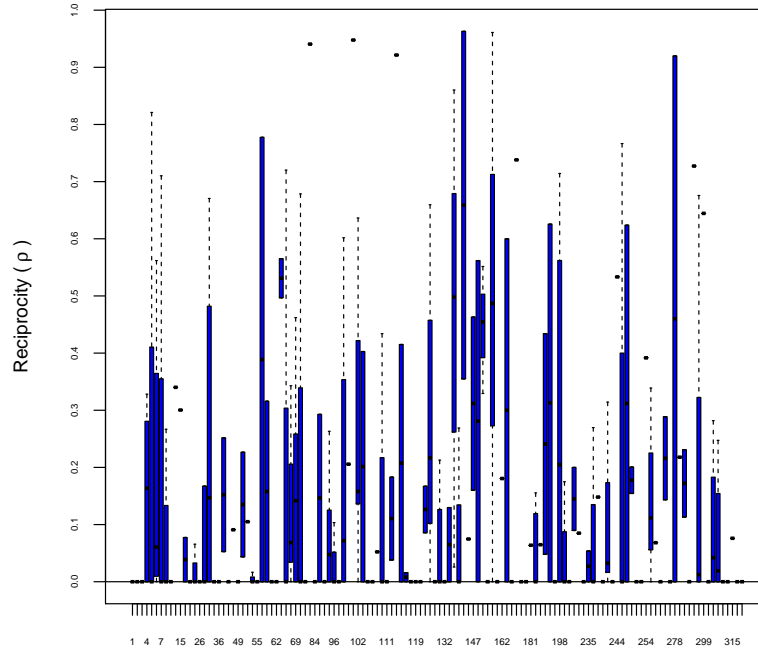


(b) Reciprocity by chimpanzee - $\Delta \geq 0$

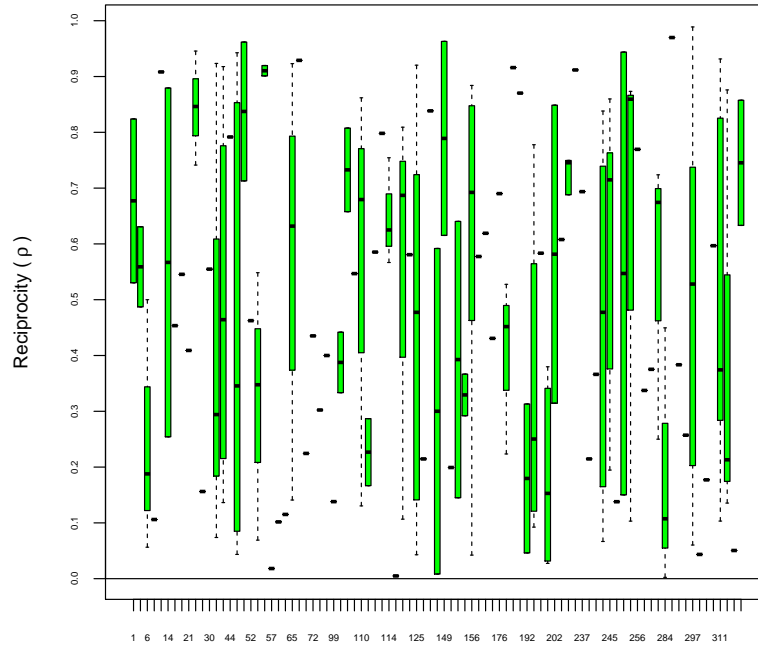


(c) Number of paired events by chimpanzee

Figure 3: Box plots for the reciprocity measure $\rho = |X - Y| / (X + Y)$ grouped by individuals. Figure a) above is restricted to within-bout grooming — i.e. $\Delta < 0$ — whereas b) below illustrates the delayed case $\Delta \geq 0$. The corresponding sample sizes are summarised underneath in c).



(a) Reciprocity by dyad - $\Delta < 0$



(b) Reciprocity by dyad - $\Delta \geq 0$

Figure 4: Box plots for the reciprocity measure ρ grouped by dyad. Figure a) above is restricted to within-bout grooming — i.e. $\Delta < 0$ — whereas b) below illustrates the delayed case $\Delta \geq 0$.

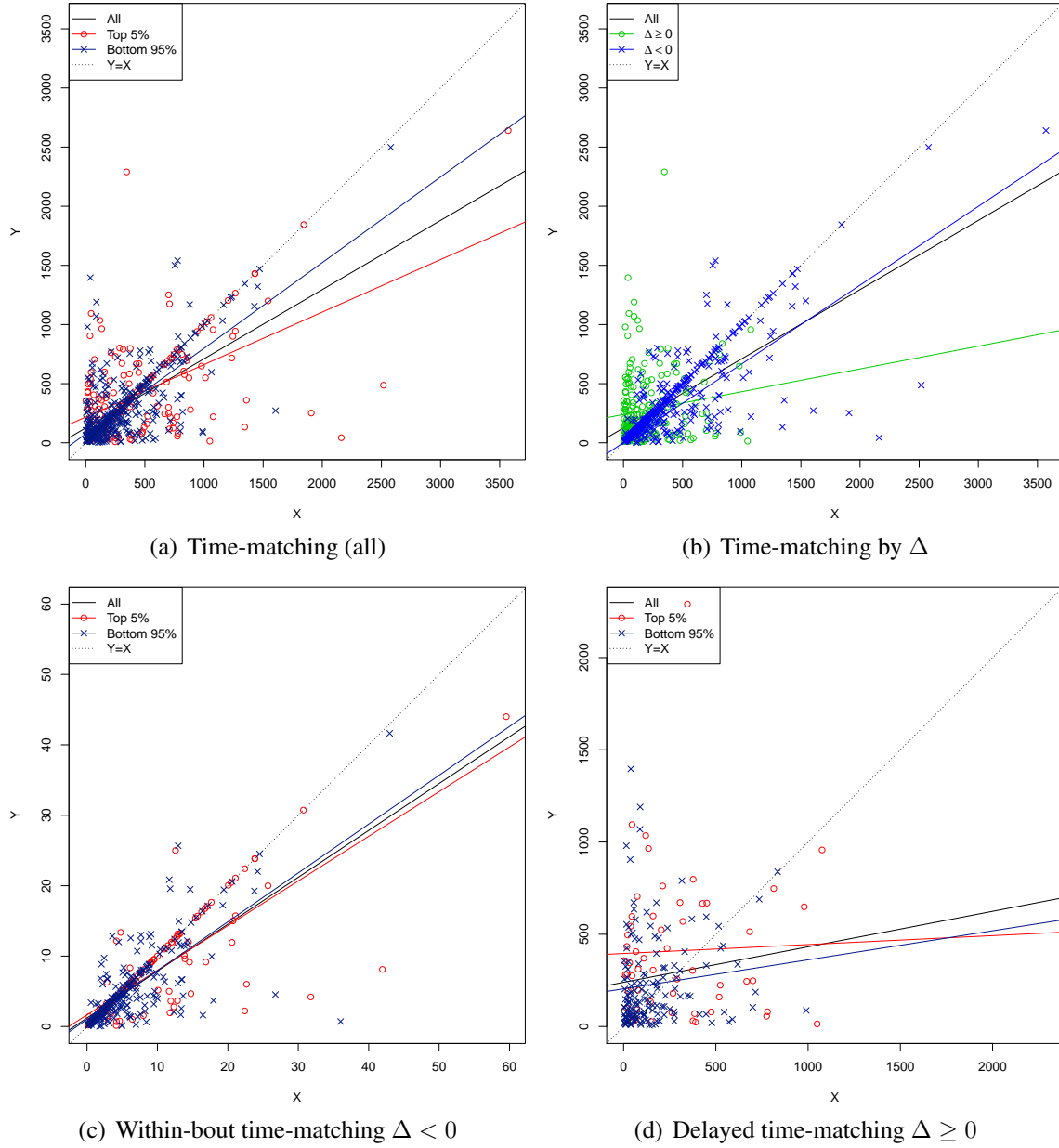


Figure 5: Longitudinal time-matching in minutes, showing: overall time-matching (top-left), color-coded according to delay (top-right), within-bout only (bottom-left) and delayed only (bottom-right). Each point on the scatter-plots below represents a pair of grooming events for a single dyad $\{A, B\}$. The x-axis represents the number of minutes that A spent grooming B , and the y-axis represents the time invested by B in grooming A .

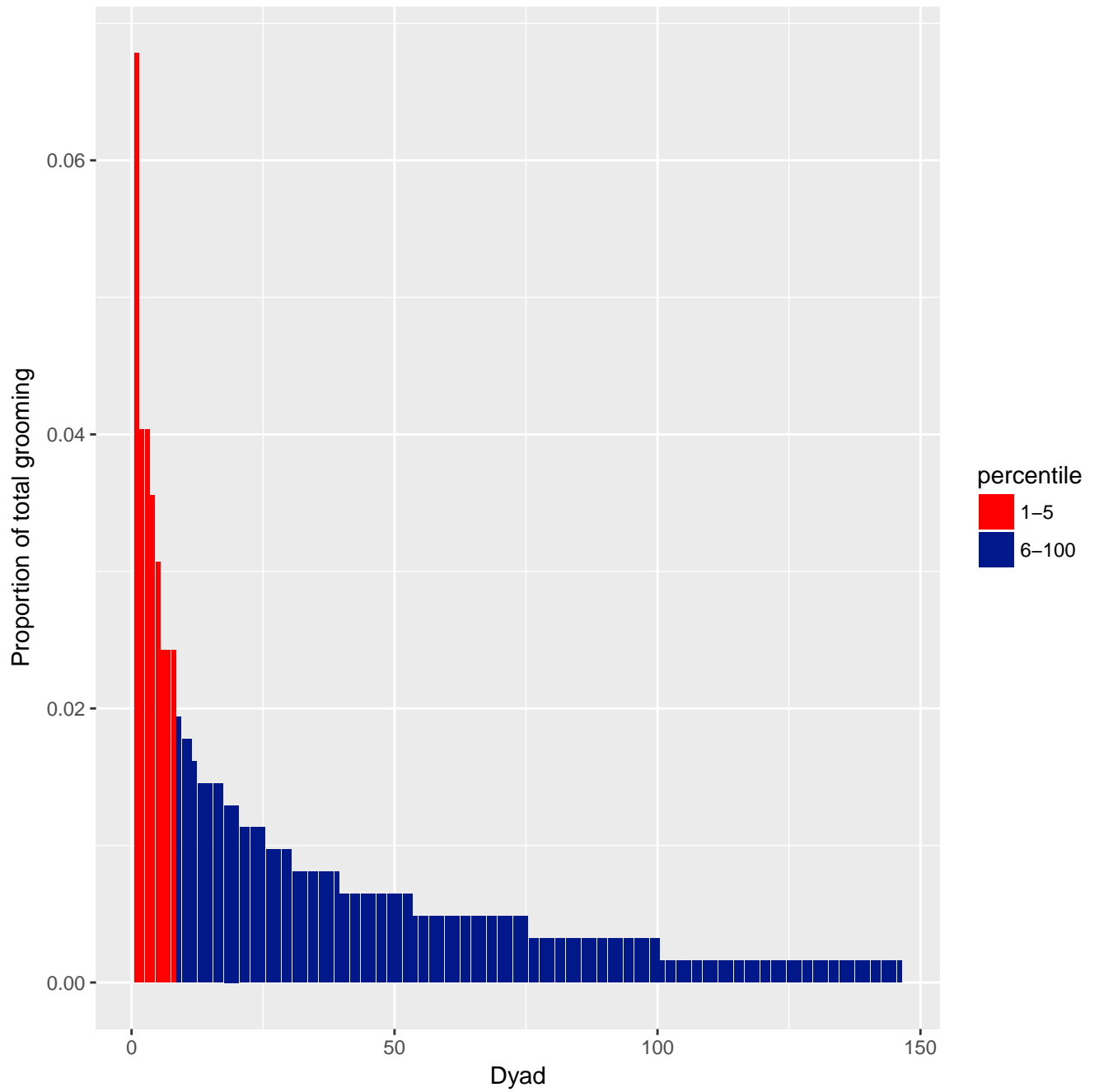


Figure 6: Distribution of total grooming duration over dyads. The dyads in the top five percentiles ($\{AL, WH\}$, $\{BO, RO\}$, $\{DL, SA\}$, $\{HI, HP\}$, $\{KI, SR\}$, $\{KK, NI\}$, $\{KY, SA\}$, $\{SA, WI\}$) are highlighted in red.

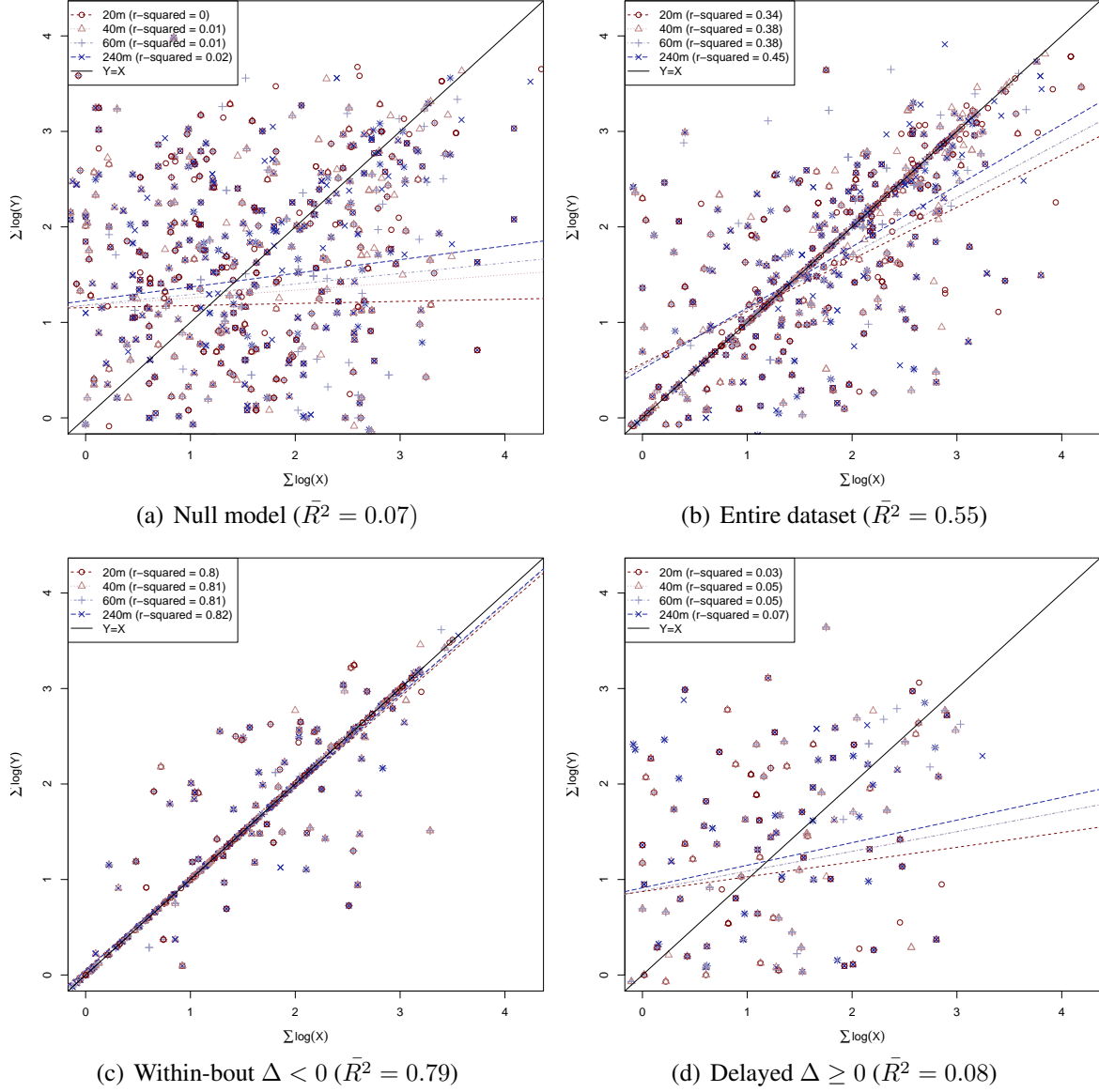


Figure 7: Windowed time-matching. The above plots illustrate time-matching when grooming durations are summed over time windows of 20 minutes, 40 minutes, 1 hour and 4 hours. The \bar{R}^2 values in parentheses in the caption beneath each figure shows the average of the R^2 values over each regression within the comparison group. Plot (a) shows windowed time-matching of a null model in which grooming durations for each animal are independent and identically-distributed random variables. Plot (b) shows the empirical summed durations without distinguishing between within-bout or extra-bout reciprocation. When we separate the data according to the delay Δ we see that most of this time-matching is accounted for by within-bout activity (c). When we restrict attention to delayed time-matching, the effect largely disappears (d).

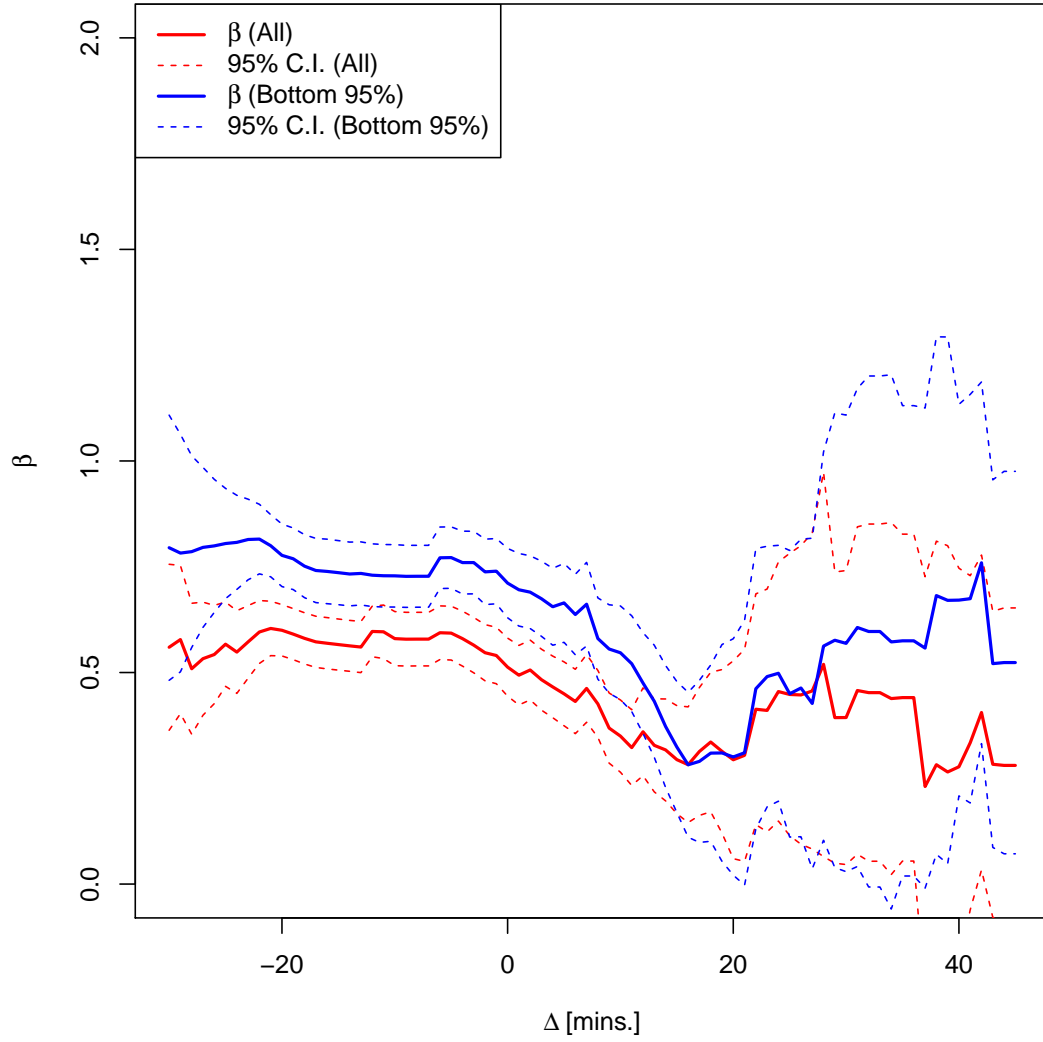


Figure 8: Time-matching regression results for a 20 minute moving window of Δ showing slope and associate confidence intervals as the delay changes. Results are not statistically significant once the window moves beyond the 0-20 minute period.

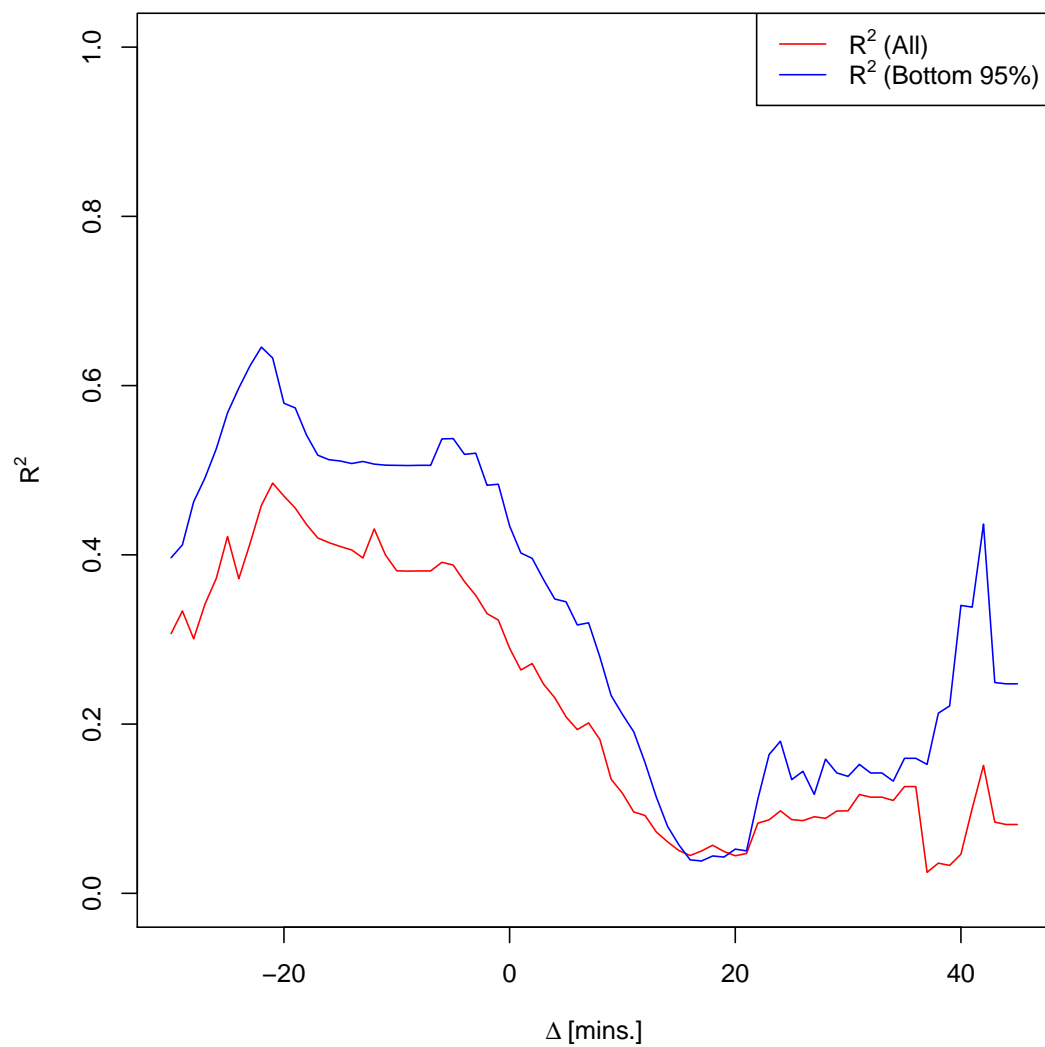


Figure 9: Time-matching regression results for a 20 minute moving window of Δ showing R^2 . The fit becomes very poor once the window moves beyond the 0-20 minute period.