Additional file 7: Computational cost of each metric

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1 Simulation Procedure

We simulated 50000 dyads, with trajectories following a Brownian motion. Each trajectory was composed of N fixes. We measured the total CPU time spend in the computation of each metric for the 50000 dyads. This analysis was performed for $N = \{100, 500, 1000, 5000, 10^4, 10^5\}$, and it was repeated 5 times (for each N). Because individuals were given freedom to go in any direction, no assumption on a reference area was made, thus $L_{ixn}T$ and HAI were not considered in this part of the analysis.

2 Code

The R code to compute the CPU time is in the function SimulationTempsCalcul in https://github.com/rociojoo/MetricsDyadJM/. The calculation was parallelized using 4 cores (Processor: Intel Core i7-8550U CPU 1.80GHz × 8).

3 Results

Table 1: Mean CPU time for computing each metric for 50000 simulated dyads (in seconds); the minimum and maximum values are in brackets.

Metric	Number of fixes					
	100	500	1000	5000	10000	100000
$Prox$	0.07 [0.07, 0.07]	0.07 [0.07, 0.07]	0.05 [0.04, 0.06]	0.06 [0.06, 0.07]	0.05 [0.05, 0.06]	0.05 [0.05, 0.06]
Cs	0.52 0.50, 0.54]	0.50 [0.50, 0.51]	0.57 [0.52, 0.66]	0.56 [0.51, 0.60]	0.53 [0.51, 0.55]	0.54 [0.52, 0.56]
$jPPA$	67.9 [64.4, 69.0]	68.9 [68.6, 69.5]	161 [147, 168]	162 [153, 170]	156 [152, 163]	164 [158, 169]
r_{Lonlat}	0.10 [0.10, 0.10]	0.10 [0.10, 0.11]	0.09 [0.08, 0.10]	0.10 [0.09, 0.11]	0.09 [0.09, 0.10]	0.10 [0.09, 0.11]
r_{Speed}	0.13 [0.13, 0.13]	0.13 [0.13, 0.13]	0.12 [0.11, 0.13]	0.13 [0.12, 0.13]	0.12 [0.12, 0.13]	0.14 [0.12, 0.16]
$CSEM$	0.47 [0.47, 0.47]	0.47 [0.47, 0.47]	0.94 [0.85, 1.00]	0.93 [0.88, 0.97]	0.89 [0.87, 0.92]	0.94 [0.87, 1.03]
DI	0.17 [0.17, 0.18]	0.17 [0.16, 0.17]	0.17 [0.16, 0.19]	0.18 [0.17, 0.20]	0.17 [0.17, 0.19]	0.19 [0.17, 0.21]
DI_d	0.13 [0.13, 0.13]	0.13 [0.13, 0.13]	0.12 [0.10, 0.14]	0.13 [0.11, 0.18]	0.12 [0.11, 0.15]	0.13 [0.12, 0.14]
DI_θ	0.15 [0.15, 0.15]	0.15 [0.14, 0.15]	0.16 [0.13, 0.21]	0.15 [0.14, 0.19]	0.14 [0.14, 0.16]	0.15 [0.14, 0.16]