

Supplementary Information

Quantifying sources of variation in turn-taking: How much do demographics and personality explain?

The tables below report the expanded expanded actor-plus-partner models used in the main analyses. “Actor” denotes the focal speaker and “partner” the interlocutor. For Floor Transfer Offset (FTO), Overlap, and Pauses, the models included crossed random intercepts for actor, partner, and dyad. The primary Speech Activity models included actor and partner intercepts; the dyad-intercept fit is reported separately as a boundary diagnostic in Table S5. All expanded models used the same complete-case samples within each corpus: 3,092 speaker–conversation observations from 1,380 people in 1,546 CANDOR dyads, and 21,636 observations from 11,597 people in 10,809 Fisher dyads. Models were estimated by maximum likelihood in `lme4`, using the `bobyqa` optimizer. Nested fixed-effect comparisons were evaluated by likelihood-ratio tests; changes in marginal or conditional R^2 describe the magnitude of the corresponding loss or gain in fit.

Table S1: Sex and age coefficients from the expanded models. Entries are Wald estimates with 95% confidence intervals. The reference levels are female for sex and 16–24 for age, separately for actor and partner. FTO is reported in milliseconds; the remaining outcomes are proportions. Each age coefficient is a contrast with the 16–24 group rather than a linear age slope.

Term	FTO (ms)	Overlap	Pauses	Speech Activity
<i>CANDOR</i>				
Actor: male	66 [48, 84]	−0.0057 [−0.0090, −0.0024]	0.0349 [0.0270, 0.0428]	−0.0168 [−0.0267, −0.0069]
Actor: 25–34	−4 [−28, 20]	−0.0039 [−0.0084, 0.0005]	−0.0053 [−0.0158, 0.0053]	0.0358 [0.0227, 0.0489]
Actor: 35–44	−31 [−58, −5]	−0.0043 [−0.0092, 0.0006]	−0.0007 [−0.0124, 0.0111]	0.0526 [0.0379, 0.0673]
Actor: 45–54	−42 [−75, −8]	−0.0024 [−0.0086, 0.0038]	−0.0035 [−0.0182, 0.0112]	0.0658 [0.0474, 0.0841]
Actor: 55+	−41 [−79, −4]	−0.0043 [−0.0113, 0.0028]	0.0067 [−0.0103, 0.0236]	0.0708 [0.0495, 0.0921]
Partner: male	56 [38, 73]	−0.0061 [−0.0093, −0.0029]	0.0076 [0.0011, 0.0141]	−0.0133 [−0.0220, −0.0047]
Partner: 25–34	−23 [−46, 0]	0.0068 [0.0025, 0.0111]	−0.0104 [−0.0192, −0.0017]	−0.0219 [−0.0334, −0.0104]
Partner: 35–44	−32 [−57, −6]	0.0103 [0.0056, 0.0151]	−0.0174 [−0.0270, −0.0077]	−0.0362 [−0.0490, −0.0234]
Partner: 45–54	−61 [−93, −29]	0.0155 [0.0096, 0.0215]	−0.0224 [−0.0345, −0.0103]	−0.0401 [−0.0562, −0.0240]
Partner: 55+	−29 [−66, 7]	0.0161 [0.0093, 0.0229]	−0.0154 [−0.0291, −0.0017]	−0.0591 [−0.0776, −0.0406]
<i>Fisher</i>				
Actor: male	60 [54, 66]	−0.0075 [−0.0088, −0.0063]	0.0256 [0.0228, 0.0285]	−0.0110 [−0.0152, −0.0068]
Actor: 25–34	−51 [−60, −43]	−0.0019 [−0.0035, −0.0002]	−0.0101 [−0.0141, −0.0061]	0.0338 [0.0282, 0.0394]
Actor: 35–44	−71 [−80, −62]	−0.0036 [−0.0053, −0.0019]	−0.0120 [−0.0162, −0.0078]	0.0513 [0.0454, 0.0571]
Actor: 45–54	−80 [−90, −70]	−0.0069 [−0.0087, −0.0050]	−0.0120 [−0.0165, −0.0074]	0.0629 [0.0565, 0.0693]
Actor: 55+	−78 [−89, −66]	−0.0074 [−0.0095, −0.0052]	−0.0090 [−0.0144, −0.0037]	0.0712 [0.0637, 0.0787]
Partner: male	58 [52, 64]	−0.0088 [−0.0102, −0.0074]	0.0064 [0.0041, 0.0088]	−0.0172 [−0.0206, −0.0138]
Partner: 25–34	−38 [−47, −30]	0.0080 [0.0061, 0.0098]	−0.0116 [−0.0149, −0.0083]	−0.0138 [−0.0181, −0.0095]
Partner: 35–44	−39 [−48, −30]	0.0112 [0.0093, 0.0131]	−0.0162 [−0.0196, −0.0127]	−0.0254 [−0.0300, −0.0208]
Partner: 45–54	−38 [−47, −28]	0.0116 [0.0095, 0.0137]	−0.0165 [−0.0202, −0.0127]	−0.0377 [−0.0427, −0.0327]
Partner: 55+	−38 [−49, −26]	0.0123 [0.0099, 0.0148]	−0.0224 [−0.0267, −0.0181]	−0.0421 [−0.0478, −0.0363]

Notes. FTO coefficients were estimated in seconds and multiplied by 1,000 for presentation. The table reports the sex and age coefficients requested for directional interpretation; the full models also include education and the corpus-specific covariates described in the main text.

Table S2: Actor-partner-dyad random-intercept ablations in samples with greater cross-dyad recurrence. “Full” is the complete modeling sample. “Actor ≥ 2 ” retains observations for which the actor appears in at least two dyads. “Both ≥ 2 ” additionally requires the partner to appear in at least two dyads. Each ΔR_c^2 is the drop in conditional R^2 after removing the named random intercept and refitting the model.

Corpus	Metric	Sample	N_{obs}	N_A	N_P	N_{people}	N_D	R_m^2	R_c^2	$\Delta R_c^2(A)$	$\Delta R_c^2(P)$	$\Delta R_c^2(D)$
CANDOR	FTO	Full	3,092	1,380	1,380	1,380	1,546	.076	.663	.070	.044	.143
CANDOR	FTO	Actor ≥ 2	2,426	714	1,114	1,136	1,424	.081	.633	.061	.046	.144
CANDOR	FTO	Both ≥ 2	2,004	692	692	692	1,002	.091	.641	.063	.036	.140
CANDOR	Overlap	Full	3,092	1,380	1,380	1,380	1,546	.059	.592	.175	.133	.119
CANDOR	Overlap	Actor ≥ 2	2,426	714	1,114	1,136	1,424	.058	.625	.146	.111	.130
CANDOR	Overlap	Both ≥ 2	2,004	692	692	692	1,002	.060	.623	.154	.098	.132
CANDOR	Pauses	Full	3,092	1,380	1,380	1,380	1,546	.058	.584	.236	.061	.088
CANDOR	Pauses	Actor ≥ 2	2,426	714	1,114	1,136	1,424	.071	.538	.206	.068	.064
CANDOR	Pauses	Both ≥ 2	2,004	692	692	692	1,002	.085	.526	.204	.060	.067
CANDOR	Speech Activity	Full	3,092	1,380	1,380	1,380	1,546	.161	.739	.352	.207	–
CANDOR	Speech Activity	Actor ≥ 2	2,426	714	1,114	1,136	1,424	.153	.744	.336	.222	–
CANDOR	Speech Activity	Both ≥ 2	2,004	692	692	692	1,002	.174	.752	.340	.195	–
Fisher	FTO	Full	21,636	11,597	11,597	11,597	10,809	.097	.831	.042	.030	.166
Fisher	FTO	Actor ≥ 2	16,884	6,848	9,750	9,917	9,969	.099	.825	.050	.038	.171
Fisher	FTO	Both ≥ 2	13,812	6,681	6,681	6,681	6,900	.098	.821	.050	.033	.160
Fisher	Overlap	Full	21,636	11,597	11,597	11,597	10,809	.064	.663	.123	.300	.088
Fisher	Overlap	Actor ≥ 2	16,884	6,848	9,750	9,917	9,969	.060	.668	.112	.294	.092
Fisher	Overlap	Both ≥ 2	13,812	6,681	6,681	6,681	6,900	.067	.673	.129	.280	.086
Fisher	Pauses	Full	21,636	11,597	11,597	11,597	10,809	.059	.816	.207	.034	.132
Fisher	Pauses	Actor ≥ 2	16,884	6,848	9,750	9,917	9,969	.058	.816	.204	.045	.137
Fisher	Pauses	Both ≥ 2	13,812	6,681	6,681	6,681	6,900	.060	.816	.207	.035	.133
Fisher	Speech Activity	Full	21,636	11,597	11,597	11,597	10,809	.070	.672	.480	.126	–
Fisher	Speech Activity	Actor ≥ 2	16,884	6,848	9,750	9,917	9,969	.071	.673	.476	.127	–
Fisher	Speech Activity	Both ≥ 2	13,812	6,681	6,681	6,681	6,900	.070	.676	.479	.126	–

Notes. A = actor, P = partner, and D = dyad. Dashes mark the absence of a dyad intercept from the primary Speech Activity model. In the full samples, 714 of 1,380 CANDOR participants (51.7%) and 6,848 of 11,597 Fisher participants (59.0%) appeared in two or more dyads. Actors represented by a single dyad supplied 21.5% of CANDOR observations and 22.0% of Fisher observations. Every participant observed as a partner also appeared as an actor. Both members recurred in other dyads for 1,002 of 1,546 CANDOR dyads (64.8%) and 6,900 of 10,809 Fisher dyads (63.8%). In every restricted sample, the largest random-intercept drop remained dyad for FTO, actor for Pauses and Speech Activity, actor for CANDOR Overlap, and partner for Fisher Overlap.

Table S3: Sensitivity to dyad composition in the expanded models. The actor-by-partner sex term tests whether the male–male combination departs from the additive actor and partner sex effects. Age distance is the absolute difference between the participants’ exact ages. The joint comparison adds both terms. ΔR_m^2 is the change in marginal R^2 relative to the additive model.

Corpus	Metric	Added term(s)	ΔR_m^2	χ^2	df	p
CANDOR	FTO	Actor $\times$ partner sex	.0007	1.94	1	.164
		Age distance	.0002	0.52	1	.470
		Joint	.0010	2.55	2	.279
	Overlap	Actor $\times$ partner sex	.0015	5.24	1	.022
		Age distance	.0037	10.86	1	< .001
		Joint	.0055	16.89	2	< .001
	Pauses	Actor $\times$ partner sex	.0004	1.77	1	.184
		Age distance	.0000	0.02	1	.902
		Joint	.0004	1.77	2	.412
	Speech Activity	Actor $\times$ partner sex	.0002	1.81	1	.178
		Age distance	.0001	0.19	1	.666
		Joint	.0003	2.07	2	.356
Fisher	FTO	Actor $\times$ partner sex	.0013	19.02	1	< .001
		Age distance	.0015	22.86	1	< .001
		Joint	.0027	40.46	2	< .001
	Overlap	Actor $\times$ partner sex	.0013	29.97	1	< .001
		Age distance	.0007	15.16	1	< .001
		Joint	.0019	43.68	2	< .001
	Pauses	Actor $\times$ partner sex	.0011	21.09	1	< .001
		Age distance	.0002	4.43	1	.035
		Joint	.0012	24.85	2	< .001
	Speech Activity	Actor $\times$ partner sex	.0006	16.57	1	< .001
		Age distance	.0002	4.96	1	.026
		Joint	.0007	20.91	2	< .001

Notes. Likelihood-ratio tests compare each augmented model with the additive expanded model on identical observations. Parametric-bootstrap intervals were not computed for these exploratory composition comparisons and are therefore not reported. The slightly negative unrounded ΔR_m^2 for CANDOR Pauses with age distance (−0.0000019) reflects numerical re-estimation and is displayed as .0000. Although several tests were conventionally significant in Fisher, the gains in marginal fit were uniformly small; the largest was .0055 for CANDOR Overlap.

Table S4: Robustness of the Overlap results to minimum speaking-time thresholds and to the denominator used in the overlap proportion. O/S is overlap time divided by the actor’s speaking time; O/T is overlap time divided by total conversation time. Speaking-time floors exclude actors whose estimated speaking time falls below the stated threshold.

Corpus	Variant	N	Dropped (%)	Median	95th pct.	Maximum	$\beta_{A, male}$	$\beta_{P, male}$	R_m^2	R_c^2	$\Delta R_c^2(A)$	$\Delta R_c^2(P)$	$\Delta R_c^2(D)$
CANDOR	O/S , primary	3,092	0.00	.0390	.1190	.4750	-.0057	-.0061	.059	.592	.175	.133	.119
CANDOR	O/S , 30-s floor	3,091	0.03	.0390	.1190	.4750	-.0057	-.0062	.059	.594	.175	.132	.120
CANDOR	O/S , 60-s floor	3,091	0.03	.0390	.1190	.4750	-.0057	-.0062	.059	.594	.175	.132	.120
CANDOR	O/S , 120-s floor	3,090	0.06	.0390	.1190	.4750	-.0057	-.0062	.059	.593	.175	.131	.120
CANDOR	O/T denominator	3,092	0.00	.0143	.0406	.2337	-.0028	-.0029	.035	.717	.118	.010	.273
Fisher	O/S , primary	21,636	0.00	.0400	.1300	.6210	-.0075	-.0088	.064	.663	.123	.300	.088
Fisher	O/S , 30-s floor	21,630	0.03	.0400	.1300	.6210	-.0075	-.0089	.065	.664	.125	.298	.088
Fisher	O/S , 60-s floor	21,573	0.29	.0400	.1300	.6210	-.0075	-.0089	.065	.669	.126	.294	.091
Fisher	O/S , 120-s floor	20,573	4.91	.0400	.1280	.6210	-.0076	-.0093	.068	.684	.118	.272	.102
Fisher	O/T denominator	21,636	0.00	.0151	.0503	.2408	-.0034	-.0044	.080	.840	.016	.048	.281

Notes. The speaking-time restrictions left the coefficient signs and the broad ordering of the actor, partner, and dyad ablation drops nearly unchanged. The denominator did not: under O/T , the dyad drop became the largest random-intercept drop in both corpora, increasing to .273 in CANDOR and .281 in Fisher. Thus, conclusions about the level at which Overlap variance is assigned are specific to the O/S definition used in the primary analysis.

Table S5: Speech Activity random-intercept ablations and dyad-boundary diagnostic in the expanded models. The primary model contains actor and partner random intercepts. The final two columns describe the diagnostic model obtained by adding a dyad intercept.

Corpus	R_m^2	R_c^2	$\Delta R_c^2(A)$	$\Delta R_c^2(P)$	Dyad variance	$\Delta R_c^2(D)$
CANDOR	.161	.739	.352	.207	1.43×10^{-16}	4.54×10^{-8}
Fisher	.070	.672	.480	.126	1.98×10^{-16}	3.76×10^{-8}

Notes. Both diagnostic actor-partner-dyad models were singular because the estimated dyad variance lay on the boundary. Their log likelihoods were unchanged to the reported precision relative to the primary actor-partner models. This result is a property of the fitted random structure, not evidence that floor allocation lacks dyadic organization: a shared dyad intercept shifts both participants' activity shares in the same direction and is poorly suited to representing within-dyad redistribution of a strongly oppositional measure.