Supplementary Materials: Early language experience in a Tseltal Mayan village

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Full model outputs

In the main text we only report significant effects from the models used to analyze the five speech environment variables. Here we give the full model outputs, figures showing the distribution of each variable and the residuals of each model, and the output of a comparably constructed gaussian mixed-effects linear regression for: TCDS min/hr, ODS min/hr, TC–O transitions/min, O–TC transitions/min, and sequence duration.

The predictors in the models are abbreviated: tchiyr.std = centered, standardized target child age in months; stthr.tri = the start time of the clip as either morning, midday, or afternoon; hsz.std = centered, standardized household size of the target child; nsk.std = centered, standardized number of speakers present in the clip, aclew_child_it = the unique identifier for each child.

Target-child-directed speech (TCDS)

Random clips. TCDS rate in the random clips demonstrated a skewed distribution with extra cases of zero. We therefore modeled it using a zero-inflated negative binomial mixed-effects regression. In order to do this, we rounded the rate of TCDS min/hr to the nearest integer in modeling the influence of time of day, child age, and so on.

In what follows we first show the distribution of TCDS min/hr across clips. We then show the full output of the model reported in the text—both the original, with midday as the reference point for time of day and then a second version with afternoon as the reference point for time of day. We follow these model outputs with a figure showing two residual plots for the main model Table 1. Finally, we show the full output for a gaussian linear mixed-effects model of the data using logged TCDS min/hr as the dependent variable, which is more common in current psycholinguistics, but is not appropriate for this distribution of data Figure 1. However, the gaussian model shows a similar pattern of results as the zero-inflated negative binomial model. As before, we show the model results with both

midday and afternoon as the reference levels for time of day, followed by the residuals for the gaussian model.

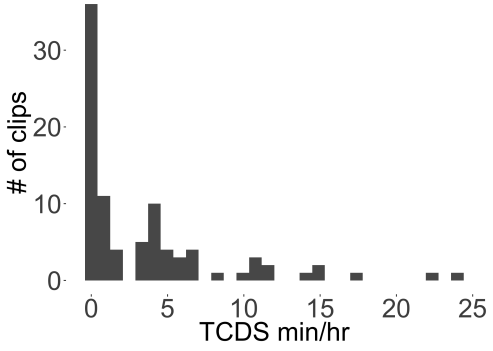

Figure 1. The distribution of TCDS rates found across the 90 random clips.

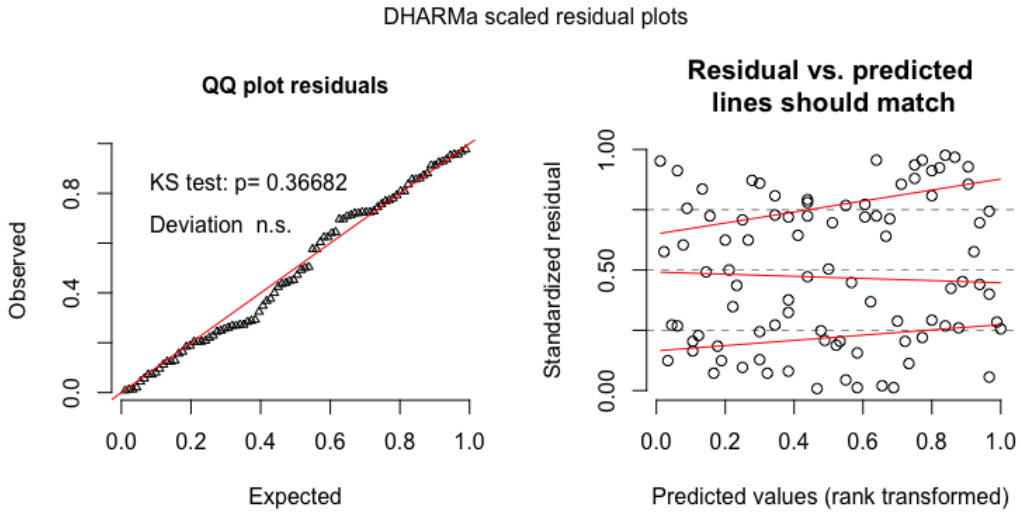

Figure 2. The model residuals from the zero-inflated negative binomial mixed-effects regression of TCDS min/hr for the random sample.

Table 1

Full output of the zero-inflated negative binomial mixed-effects regression of TCDS min/hr for the random sample.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	0.82	0.39	2.12	0.03
cond	tchiyr.std	0.44	0.42	1.05	0.29
cond	stthr.trimorning	0.82	0.40	2.06	0.04
cond	stthr.triafternoon	0.49	0.37	1.31	0.19
cond	hsz.std	-0.09	0.26	-0.33	0.74
cond	nsk.std	-0.13	0.16	-0.79	0.43
cond	tchiyr.std:stthr.trimorning	-0.24	0.39	-0.60	0.55
cond	tchiyr.std:stthr.triafternoon	-0.81	0.38	-2.15	0.03
cond	tchiyr.std:hsz.std	-0.21	0.32	-0.66	0.51
cond	tchiyr.std:nsk.std	0.61	0.20	3.06	0.00
zi	(Intercept)	-56.90	14,003.31	0.00	1.00
zi	nsk.std	-55.17	14,243.76	0.00	1.00
random_effect	aclew_child_id	0.30	NA	NA	NA

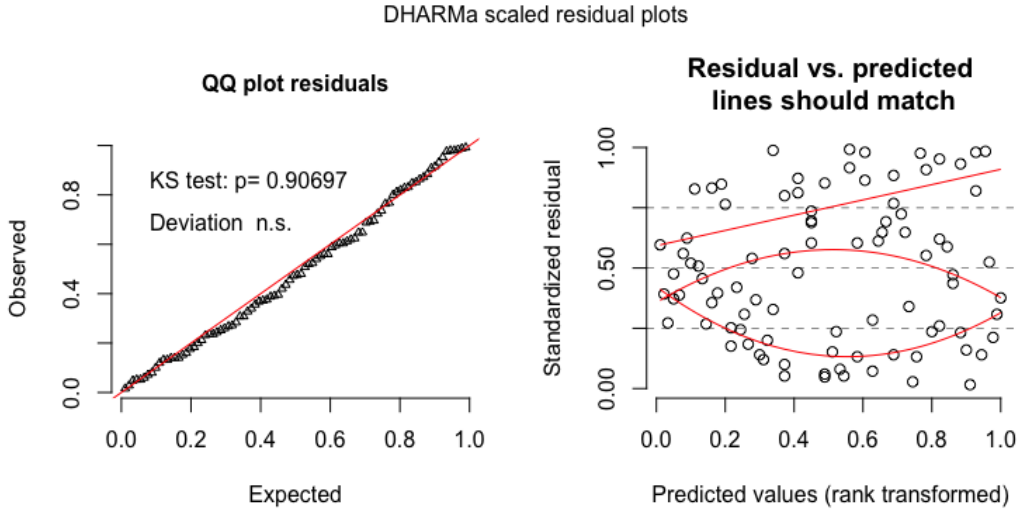

Figure 3. The model residuals from the gaussian mixed-effects regression of TCDS min/hr for the random sample.

Table 2

Model output of the zero-inflated negative binomial mixed-effects regression of TCDS min/hr for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.36	0.23	5.88	0.00
cond	tchiyr.std	-0.31	0.25	-1.22	0.22
cond	stthr.tri.amidday	-0.49	0.38	-1.29	0.20
cond	stthr.tri.amorning	0.30	0.29	1.06	0.29
cond	hsz.std	-0.09	0.22	-0.40	0.69
cond	nsk.std	-0.11	0.18	-0.60	0.55
cond	tchiyr.std:stthr.tri.amidday	0.73	0.36	2.04	0.04
cond	tchiyr.std:stthr.tri.amorning	0.46	0.28	1.65	0.10
cond	tchiyr.std:hsz.std	-0.20	0.26	-0.76	0.45
cond	tchiyr.std:nsk.std	0.57	0.20	2.83	0.00
zi	(Intercept)	-58.40	13,710.05	0.00	1.00
zi	nsk.std	-56.19	13,945.46	0.00	1.00
random_effect	aclew_child_id	0.00	NA	NA	NA

Turn-taking clips. TCDS rate in the turn-taking clips demonstrated a fairly normal distribution. We therefore modeled it using a plain (i.e., non-zero-inflated) negative binomial mixed-effects regression. In order to do this, we rounded the rate of TCDS min/hr to the nearest integer in modeling the influence of time of day, child age, and so on, as before. Below we show the distribution of TCDS min/hr across clips, the full output for the models reported in the text (both with the midday and afternoon reference level versions for time-of-day), the residual plots for the main model Table 6, and parallel models using gaussian linear mixed-effects analyses. Again, the gaussian model shows a similar pattern of

Table 3

Full output of the gaussian mixed-effects regression of TCDS min/hr for the random sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	0.78	0.22	3.44	0.00
cond	tchiyr.std	0.49	0.26	1.90	0.06
cond	stthr.trimorning	0.51	0.25	2.03	0.04
cond	stthr.triafternoon	0.29	0.22	1.32	0.18
cond	hsz.std	-0.20	0.20	-1.00	0.32
cond	nsk.std	0.23	0.12	1.96	0.05
cond	tchiyr.std:stthr.trimorning	-0.16	0.27	-0.59	0.55
cond	tchiyr.std:stthr.triafternoon	-0.68	0.24	-2.85	0.00
cond	tchiyr.std:hsz.std	-0.08	0.24	-0.36	0.72
cond	tchiyr.std:nsk.std	0.25	0.15	1.68	0.09
random_effect	aclew_child_id	0.20	NA	NA	NA
random_effect	Residual	0.84	NA	NA	NA

results as the negative binomial model.

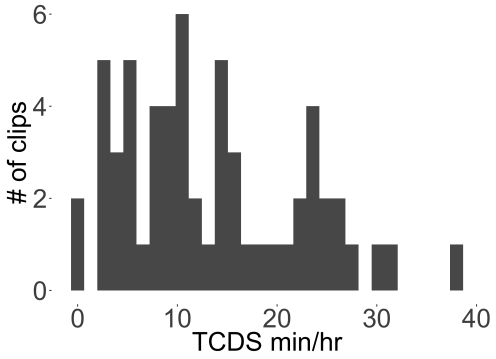

Figure 4. The distribution of TCDS rates found across the 90 turn-taking clips.

Table 4

Model output of the gaussian mixed-effects regression of TCDS min/hr for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.07	0.19	5.75	0.00
cond	tchiyr.std	-0.19	0.22	-0.86	0.39
cond	stthr.tri.amidday	-0.29	0.22	-1.32	0.18
cond	stthr.tri.amorning	0.22	0.22	0.98	0.33
cond	hsz.std	-0.20	0.20	-1.00	0.32
cond	nsk.std	0.23	0.12	1.96	0.05
cond	tchiyr.std:stthr.tri.amidday	0.68	0.24	2.85	0.00
cond	tchiyr.std:stthr.tri.amorning	0.52	0.23	2.24	0.02
cond	tchiyr.std:hsz.std	-0.08	0.24	-0.36	0.72
cond	tchiyr.std:nsk.std	0.25	0.15	1.68	0.09
random_effect	aclew_child_id	0.20	NA	NA	NA
random_effect	Residual	0.84	NA	NA	NA

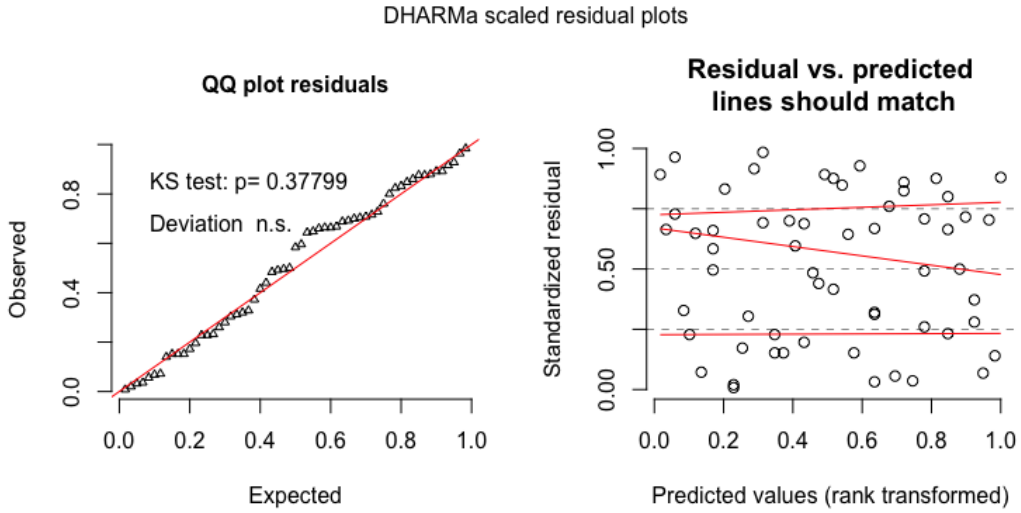

Figure 5. The model residuals from the zero-inflated negative binomial mixed-effects regression of TCDS min/hr for the turn-taking sample.

Table 5

Full output of the negative binomial mixed-effects regression of TCDS min/hr for the turn-taking sample.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.22	0.23	9.85	0.00
cond	tchiyr.std	-0.16	0.21	-0.77	0.44
cond	stthr.trimorning	0.33	0.25	1.32	0.19
cond	stthr.triafternoon	0.06	0.23	0.28	0.78
cond	hsz.std	-0.16	0.16	-1.01	0.31
cond	nsk.std	-0.10	0.10	-0.96	0.33
cond	tchiyr.std:stthr.trimorning	-0.27	0.25	-1.10	0.27
cond	tchiyr.std:stthr.triafternoon	-0.03	0.21	-0.16	0.88
cond	tchiyr.std:hsz.std	-0.49	0.20	-2.42	0.02
cond	tchiyr.std:nsk.std	0.14	0.12	1.15	0.25
random_effect	aclew_child_id	0.00	NA	NA	NA

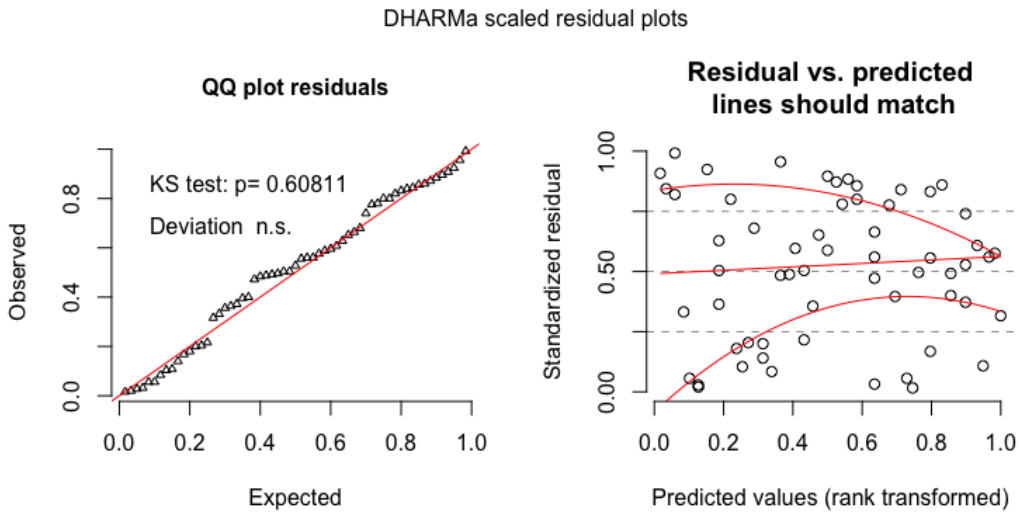

Figure 6. The model residuals from the gaussian mixed-effects regression of TCDS min/hr for the turn-taking sample.

Table 6

Model output of the negative binomial mixed-effects regression of TCDS min/hr for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.29	0.20	11.32	0.00
cond	tchiyr.std	-0.19	0.20	-0.95	0.34
cond	stthr.tri.amidday	-0.06	0.23	-0.28	0.78
cond	stthr.tri.amorning	0.27	0.22	1.24	0.22
cond	hsz.std	-0.16	0.16	-1.01	0.31
cond	nsk.std	-0.10	0.10	-0.96	0.33
cond	tchiyr.std:stthr.tri.amidday	0.03	0.21	0.16	0.88
cond	tchiyr.std:stthr.tri.amorning	-0.24	0.22	-1.10	0.27
cond	tchiyr.std:hsz.std	-0.49	0.20	-2.42	0.02
cond	tchiyr.std:nsk.std	0.14	0.12	1.15	0.25
random_effect	aclew_child_id	0.00	NA	NA	NA

Other-directed speech (ODS)

Random clips. ODS rate in the random clips demonstrated a skewed distribution with extra cases of zero. We therefore modeled it using a zero-inflated negative binomial mixed-effects regression. In order to do this, we rounded the rate of ODS min/hr to the nearest integer in modeling the influence of time of day, child age, and so on. Below first show the distribution of ODS min/hr across clips. We then show the full output of the model reported in the text—both the original, with midday as the reference point for time of day and then a second version with afternoon as the reference point for time of day. We follow these model outputs with a figure showing two residual plots for the main model Table 10. Finally, we show the full output for a gaussian linear mixed-effects model of the

Table 7

Full output of the gaussian mixed-effects regression of TCDS min/hr for the turn-taking sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.08	0.24	8.55	0.00
cond	tchiyr.std	-0.13	0.23	-0.55	0.58
cond	stthr.trimorning	0.38	0.30	1.28	0.20
cond	stthr.triafternoon	0.11	0.27	0.40	0.69
cond	hsz.std	-0.15	0.17	-0.85	0.39
cond	nsk.std	-0.08	0.12	-0.67	0.50
cond	tchiyr.std:stthr.trimorning	-0.34	0.30	-1.16	0.24
cond	tchiyr.std:stthr.triafternoon	0.00	0.26	-0.02	0.99
cond	tchiyr.std:hsz.std	-0.49	0.22	-2.24	0.02
cond	tchiyr.std:nsk.std	0.17	0.15	1.13	0.26
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.71	NA	NA	NA

data using logged ODS min/hr as the dependent variable, which is not appropriate for this distribution of data Figure 7. However, the gaussian model shows a similar pattern of results as the zero-inflated negative binomial model. As before, we show the model results with both midday and afternoon as the reference levels for time of day, followed by the residuals for the gaussian model.

Table 8

Model output of the gaussian mixed-effects regression of TCDS min/hr for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.19	0.21	10.47	0.00
cond	tchiyr.std	-0.13	0.23	-0.58	0.56
cond	stthr.tri.amidday	-0.11	0.27	-0.40	0.69
cond	stthr.tri.amorning	0.28	0.26	1.04	0.30
cond	hsz.std	-0.15	0.17	-0.85	0.39
cond	nsk.std	-0.08	0.12	-0.67	0.50
cond	tchiyr.std:stthr.tri.amidday	0.00	0.26	0.02	0.99
cond	tchiyr.std:stthr.tri.amorning	-0.34	0.28	-1.23	0.22
cond	tchiyr.std:hsz.std	-0.49	0.22	-2.24	0.02
cond	tchiyr.std:nsk.std	0.17	0.15	1.13	0.26
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.71	NA	NA	NA

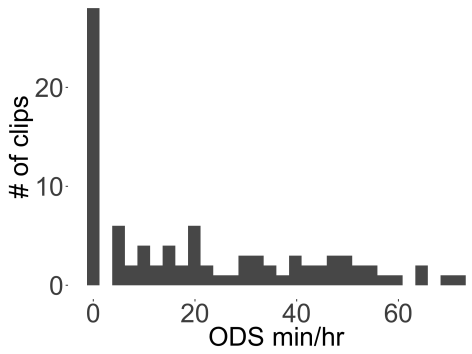

Figure 7. The distribution of ODS rates found across the 90 random clips.

Table 9

Full output of the zero-inflated negative binomial mixed-effects regression of ODS min/hr for the random sample.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.87	0.16	17.95	0.00
cond	tchiyr.std	-0.13	0.18	-0.70	0.49
cond	stthr.trimorning	0.36	0.17	2.09	0.04
cond	stthr.triafternoon	0.29	0.16	1.89	0.06
cond	hsz.std	0.04	0.10	0.44	0.66
cond	nsk.std	0.65	0.09	7.33	0.00
cond	tchiyr.std:stthr.trimorning	0.10	0.21	0.48	0.63
cond	tchiyr.std:stthr.triafternoon	0.38	0.17	2.21	0.03
cond	tchiyr.std:hsz.std	0.32	0.13	2.41	0.02
cond	tchiyr.std:nsk.std	-0.02	0.13	-0.15	0.88
zi	(Intercept)	-50.25	10,421.88	0.00	1.00
zi	nsk.std	-53.76	10,600.83	0.00	1.00
random_effect	aclew_child_id	0.00	NA	NA	NA

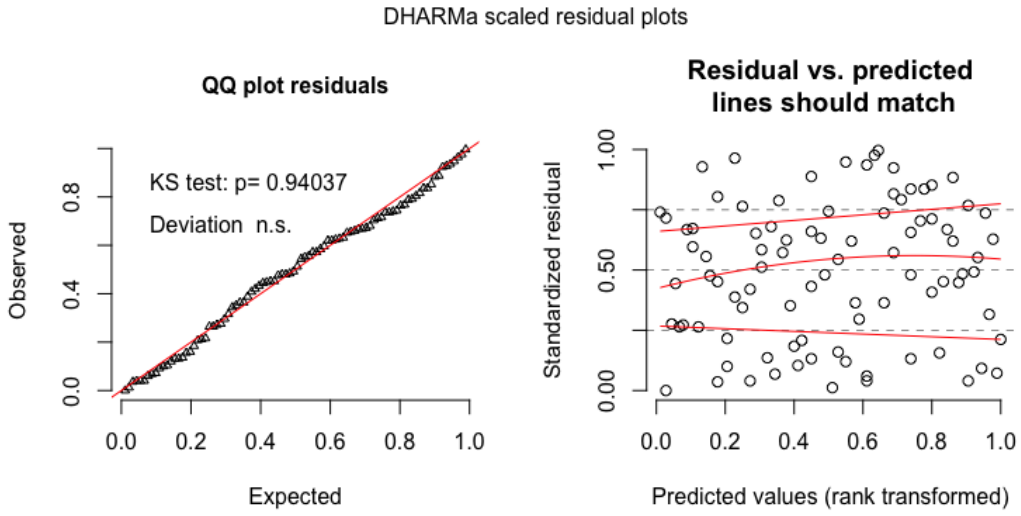

Figure 8. The model residuals from the zero-inflated negative binomial mixed-effects regression of ODS min/hr for the random sample.

Table 10

Model output of the zero-inflated negative binomial mixed-effects regression of ODS min/hr for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	3.16	0.11	28.09	0.00
cond	tchiyr.std	0.25	0.14	1.84	0.07
cond	stthr.tri.amidday	-0.29	0.16	-1.89	0.06
cond	stthr.tri.amorning	0.07	0.14	0.48	0.63
cond	hsz.std	0.04	0.10	0.44	0.66
cond	nsk.std	0.65	0.09	7.33	0.00
cond	tchiyr.std:stthr.tri.amidday	-0.38	0.17	-2.21	0.03
cond	tchiyr.std:stthr.tri.amorning	-0.28	0.17	-1.62	0.10
cond	tchiyr.std:hsz.std	0.32	0.13	2.41	0.02
cond	tchiyr.std:nsk.std	-0.02	0.13	-0.15	0.88
zi	(Intercept)	-50.71	11,450.44	0.00	1.00
zi	nsk.std	-54.22	11,647.05	0.00	1.00
random_effect	aclew_child_id	0.00	NA	NA	NA

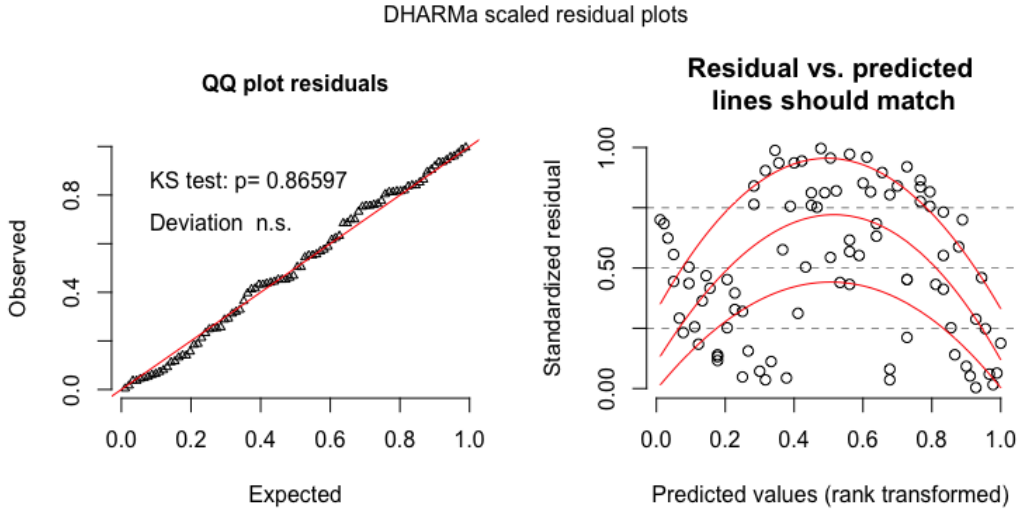

Figure 9. The model residuals from the gaussian mixed-effects regression of ODS min/hr for the random sample.

Table 11

Full output of the gaussian mixed-effects regression of ODS min/hr for the random sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.21	0.17	12.75	0.00
cond	tchiyr.std	-0.08	0.20	-0.41	0.68
cond	stthr.trimorning	0.21	0.21	1.02	0.31
cond	stthr.triafternoon	0.34	0.19	1.80	0.07
cond	hsz.std	-0.22	0.14	-1.62	0.10
cond	nsk.std	1.53	0.09	16.25	0.00
cond	tchiyr.std:stthr.trimorning	-0.01	0.23	-0.03	0.98
cond	tchiyr.std:stthr.triafternoon	0.42	0.20	2.10	0.04
cond	tchiyr.std:hsz.std	0.32	0.17	1.90	0.06
cond	tchiyr.std:nsk.std	0.08	0.12	0.68	0.50
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.72	NA	NA	NA

Turn-taking clips. ODS rate in the random clips demonstrated a skewed distribution with extra cases of zero. We therefore modeled it using a zero-inflated negative binomial mixed-effects regression. In order to do this, we rounded the rate of ODS min/hr to the nearest integer in modeling the influence of time of day, child age, and so on, as before. Below we show the distribution of ODS min/hr across clips, the full output for the models reported in the text (both with the midday and afternoon reference level versions for time-of-day), the residual plots for the main model Table 13, and parallel models using gaussian linear mixed-effects analyses. Again, the gaussian model shows a similar pattern of results as the negative binomial model.

Table 12

Model output of the gaussian mixed-effects regression of ODS min/hr for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.55	0.14	18.71	0.00
cond	tchiyr.std	0.34	0.16	2.12	0.03
cond	stthr.tri.amidday	-0.34	0.19	-1.80	0.07
cond	stthr.tri.amorning	-0.12	0.18	-0.66	0.51
cond	hsz.std	-0.22	0.14	-1.62	0.10
cond	nsk.std	1.53	0.09	16.25	0.00
cond	tchiyr.std:stthr.tri.amidday	-0.42	0.20	-2.10	0.04
cond	tchiyr.std:stthr.tri.amorning	-0.43	0.20	-2.19	0.03
cond	tchiyr.std:hsz.std	0.32	0.17	1.90	0.06
cond	tchiyr.std:nsk.std	0.08	0.12	0.68	0.50
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.72	NA	NA	NA

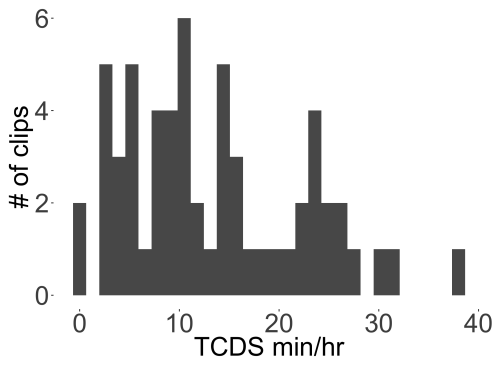

Figure 10. The distribution of TCDS rates found across the 90 turn-taking clips.

Table 13

Full output of the negative binomial mixed-effects regression of TCDS min/hr for the turn-taking sample.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.22	0.23	9.85	0.00
cond	tchiyr.std	-0.16	0.21	-0.77	0.44
cond	stthr.trimorning	0.33	0.25	1.32	0.19
cond	stthr.triafternoon	0.06	0.23	0.28	0.78
cond	hsz.std	-0.16	0.16	-1.01	0.31
cond	nsk.std	-0.10	0.10	-0.96	0.33
cond	tchiyr.std:stthr.trimorning	-0.27	0.25	-1.10	0.27
cond	tchiyr.std:stthr.triafternoon	-0.03	0.21	-0.16	0.88
cond	tchiyr.std:hsz.std	-0.49	0.20	-2.42	0.02
cond	tchiyr.std:nsk.std	0.14	0.12	1.15	0.25
random_effect	aclew_child_id	0.00	NA	NA	NA

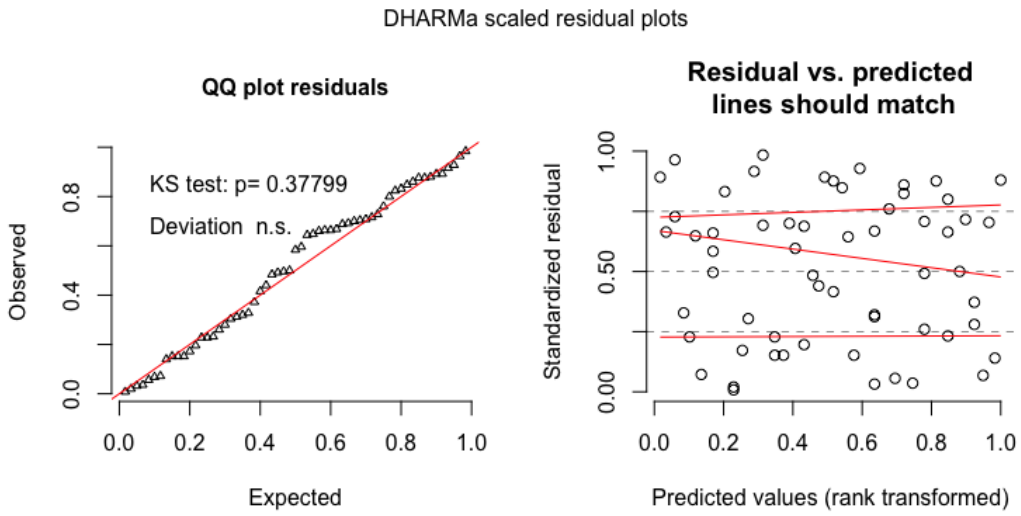

Figure 11. The model residuals from the zero-inflated negative binomial mixed-effects regression of TCDS min/hr for the turn-taking sample.

Table 14

Model output of the negative binomial mixed-effects regression of TCDS min/hr for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.29	0.20	11.32	0.00
cond	tchiyr.std	-0.19	0.20	-0.95	0.34
cond	stthr.tri.amidday	-0.06	0.23	-0.28	0.78
cond	stthr.tri.amorning	0.27	0.22	1.24	0.22
cond	hsz.std	-0.16	0.16	-1.01	0.31
cond	nsk.std	-0.10	0.10	-0.96	0.33
cond	tchiyr.std:stthr.tri.amidday	0.03	0.21	0.16	0.88
cond	tchiyr.std:stthr.tri.amorning	-0.24	0.22	-1.10	0.27
cond	tchiyr.std:hsz.std	-0.49	0.20	-2.42	0.02
cond	tchiyr.std:nsk.std	0.14	0.12	1.15	0.25
random_effect	aclew_child_id	0.00	NA	NA	NA

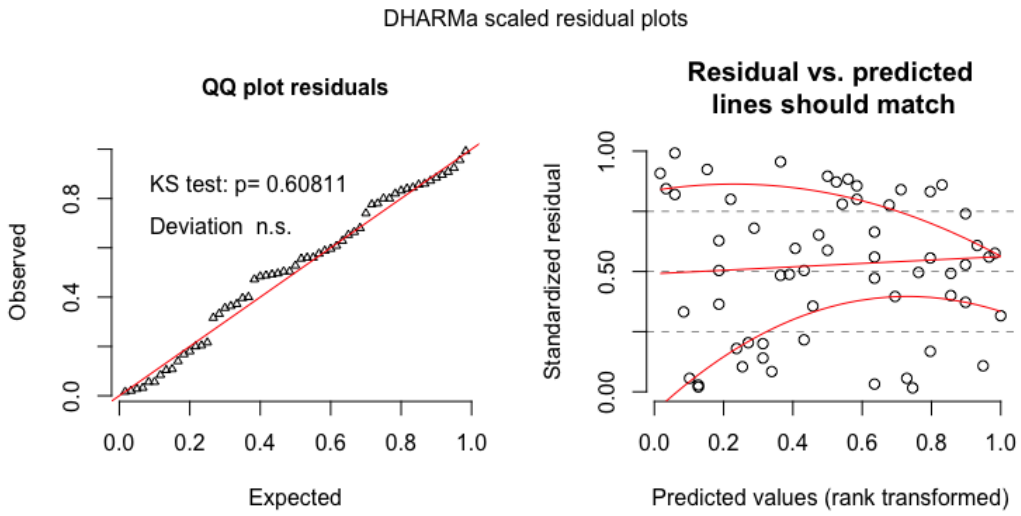

Figure 12. The model residuals from the gaussian mixed-effects regression of TCDS min/hr for the turn-taking sample.

Table 15

Full output of the gaussian mixed-effects regression of TCDS min/hr for the turn-taking sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.08	0.24	8.55	0.00
cond	tchiyr.std	-0.13	0.23	-0.55	0.58
cond	stthr.trimorning	0.38	0.30	1.28	0.20
cond	stthr.triafternoon	0.11	0.27	0.40	0.69
cond	hsz.std	-0.15	0.17	-0.85	0.39
cond	nsk.std	-0.08	0.12	-0.67	0.50
cond	tchiyr.std:stthr.trimorning	-0.34	0.30	-1.16	0.24
cond	tchiyr.std:stthr.triafternoon	0.00	0.26	-0.02	0.99
cond	tchiyr.std:hsz.std	-0.49	0.22	-2.24	0.02
cond	tchiyr.std:nsk.std	0.17	0.15	1.13	0.26
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.71	NA	NA	NA

Target-child-to-other turn transitions (TC–O)

Random clips. Target-child-to-other contingent response rate (TC–O transitions/min) in the random clips demonstrated a skewed distribution with extra cases of zero. We therefore modeled it using a zero-inflated negative binomial mixed-effects regression. In order to do this, we rounded the rate of TC–O transitions/min to the nearest integer in modeling the influence of time of day, child age, and so on. Below we first show the distribution of TC–O transitions/min across clips. We then show the full output of the model reported in the text—both the original, with midday as the reference point for time of day and then a second version with afternoon as the reference point for time of day. We

Table 16

Model output of the gaussian mixed-effects regression of TCDS min/hr for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.19	0.21	10.47	0.00
cond	tchiyr.std	-0.13	0.23	-0.58	0.56
cond	stthr.tri.amidday	-0.11	0.27	-0.40	0.69
cond	stthr.tri.amorning	0.28	0.26	1.04	0.30
cond	hsz.std	-0.15	0.17	-0.85	0.39
cond	nsk.std	-0.08	0.12	-0.67	0.50
cond	tchiyr.std:stthr.tri.amidday	0.00	0.26	0.02	0.99
cond	tchiyr.std:stthr.tri.amorning	-0.34	0.28	-1.23	0.22
cond	tchiyr.std:hsz.std	-0.49	0.22	-2.24	0.02
cond	tchiyr.std:nsk.std	0.17	0.15	1.13	0.26
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.71	NA	NA	NA

follow these model outputs with a figure showing two residual plots for the main model Table 17. Finally, we show the full output for a gaussian linear mixed-effects model of the data using logged TC–O transitions/min as the dependent variable, which is not appropriate for this distribution of data Figure 13. However, the gaussian model shows a similar pattern of results as the zero-inflated negative binomial model. As before, we show the model results with both midday and afternoon as the reference levels for time of day, followed by the residuals for the gaussian model.

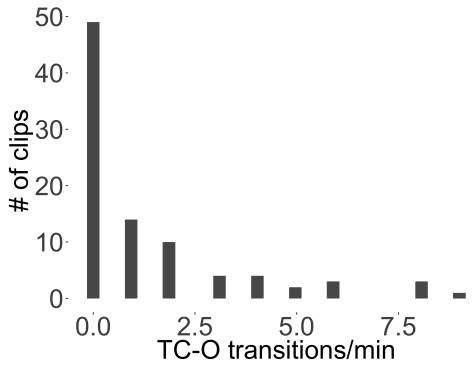

Figure 13. The distribution of TC–O turn transitions/min rates found across the 90 random clips.

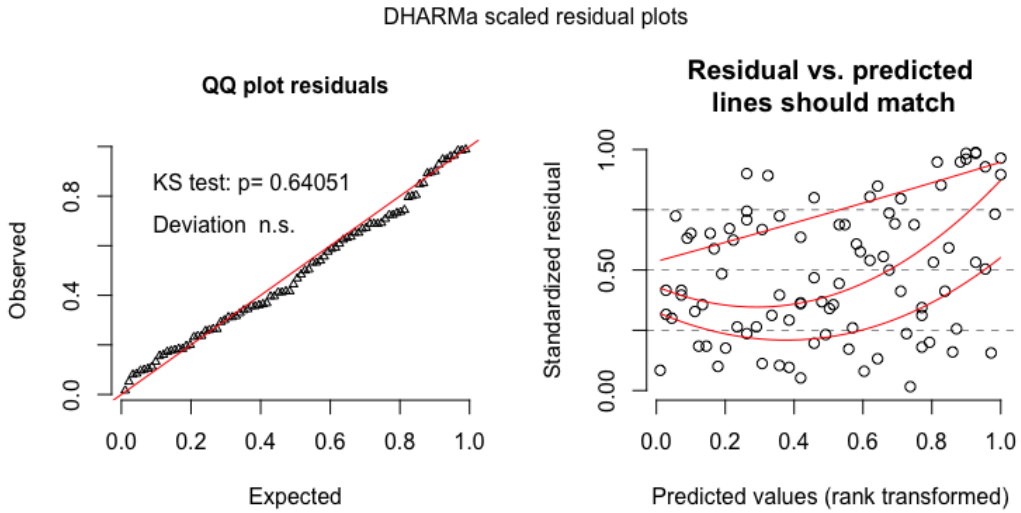

Figure 14. The model residuals from the zero-inflated negative binomial mixed-effects regression of TC–O turn transitions/min for the random sample.

Table 17

Full output of the zero-inflated negative binomial mixed-effects regression of TC–O turn transitions/min for the random sample.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	-0.13	0.50	-0.25	0.80
cond	tchiyr.std	0.89	0.61	1.46	0.14
cond	stthr.trimorning	0.48	0.45	1.07	0.28
cond	stthr.triafternoon	0.34	0.40	0.85	0.39
cond	hsz.std	-0.17	0.45	-0.38	0.70
cond	nsk.std	-0.18	0.18	-1.01	0.31
cond	tchiyr.std:stthr.trimorning	-0.14	0.48	-0.29	0.77
cond	tchiyr.std:stthr.triafternoon	-1.08	0.44	-2.44	0.02
cond	tchiyr.std:hsz.std	0.11	0.56	0.20	0.84
cond	tchiyr.std:nsk.std	0.56	0.23	2.48	0.01
zi	(Intercept)	-116.67	53,056.16	0.00	1.00
zi	nsk.std	-100.02	52,343.82	0.00	1.00
random_effect	aclew_child_id	0.71	NA	NA	NA

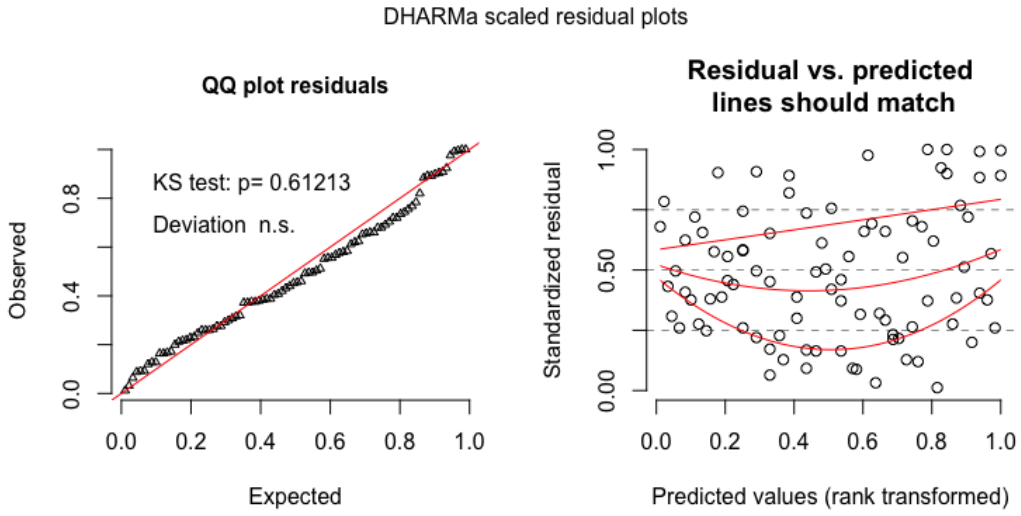

Figure 15. The model residuals from the gaussian mixed-effects regression of TC–O turn transitions/min for the random sample.

Table 18

Model output of the zero-inflated negative binomial mixed-effects regression of TC–O turn transitions/min for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	0.22	0.40	0.54	0.59
cond	tchiyr.std	-0.20	0.50	-0.40	0.69
cond	stthr.tri.amidday	-0.34	0.40	-0.85	0.39
cond	stthr.tri.amorning	0.14	0.32	0.44	0.66
cond	hsz.std	-0.17	0.45	-0.38	0.70
cond	nsk.std	-0.18	0.18	-1.01	0.31
cond	tchiyr.std:stthr.tri.amidday	1.08	0.44	2.44	0.02
cond	tchiyr.std:stthr.tri.amorning	0.94	0.38	2.52	0.01
cond	tchiyr.std:hsz.std	0.11	0.56	0.20	0.84
cond	tchiyr.std:nsk.std	0.56	0.23	2.48	0.01
zi	(Intercept)	-115.42	48,611.57	0.00	1.00
zi	nsk.std	-99.00	48,061.56	0.00	1.00
random_effect	aclew_child_id	0.71	NA	NA	NA

Table 19

Full output of the gaussian mixed-effects regression of TC–O turn transitions/min for the random sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.06	0.14	7.80	0.00
cond	tchiyr.std	0.25	0.16	1.59	0.11
cond	stthr.trimorning	0.14	0.12	1.19	0.24
cond	stthr.triafternoon	0.01	0.10	0.13	0.90
cond	hsz.std	-0.11	0.14	-0.82	0.41
cond	nsk.std	0.09	0.06	1.56	0.12
cond	tchiyr.std:stthr.trimorning	-0.02	0.12	-0.20	0.84
cond	tchiyr.std:stthr.triafternoon	-0.30	0.11	-2.73	0.01
cond	tchiyr.std:hsz.std	0.00	0.16	0.02	0.99
cond	tchiyr.std:nsk.std	0.09	0.07	1.34	0.18
random_effect	aclew_child_id	0.21	NA	NA	NA
random_effect	Residual	0.38	NA	NA	NA

Turn-taking clips. TC–O transitions/min in the random clips demonstrated a fairly normal distribution. We therefore modeled it using a plain (i.e., non-zero-inflated) negative binomial mixed-effects regression. In order to do this, we rounded the rate of ODS min/hr to the nearest integer in modeling the influence of time of day, child age, and so on, as before. Below we show the distribution of TC–O transitions/min across clips, the full output for the models reported in the text (both with the midday and afternoon reference level versions for time-of-day), the residual plots for the main model Table 21, and parallel models using gaussian linear mixed-effects analyses. Again, the gaussian model shows a similar pattern of results as the negative binomial model.

Table 20

Model output of the gaussian mixed-effects regression of TC–O turn transitions/min for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.07	0.12	8.80	0.00
cond	tchiyr.std	-0.05	0.14	-0.37	0.71
cond	stthr.tri.amidday	-0.01	0.10	-0.13	0.90
cond	stthr.tri.amorning	0.12	0.10	1.24	0.22
cond	hsz.std	-0.11	0.14	-0.82	0.41
cond	nsk.std	0.09	0.06	1.56	0.12
cond	tchiyr.std:stthr.tri.amidday	0.30	0.11	2.73	0.01
cond	tchiyr.std:stthr.tri.amorning	0.28	0.11	2.59	0.01
cond	tchiyr.std:hsz.std	0.00	0.16	0.02	0.99
cond	tchiyr.std:nsk.std	0.09	0.07	1.34	0.18
random_effect	aclew_child_id	0.21	NA	NA	NA
random_effect	Residual	0.38	NA	NA	NA

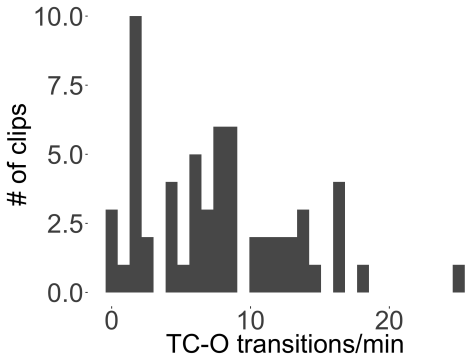

Figure 16. The distribution of TC–O turn transitions/min found across the 90 turn-taking clips.

Table 21

Full output of the negative binomial mixed-effects regression of TC–O turn transitions/min for the turn-taking sample.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.78	0.29	6.19	0.00
cond	tchiyr.std	0.12	0.29	0.40	0.68
cond	stthr.trimorning	0.06	0.32	0.18	0.86
cond	stthr.triafternoon	0.11	0.27	0.41	0.68
cond	hsz.std	-0.04	0.23	-0.17	0.86
cond	nsk.std	-0.21	0.12	-1.84	0.07
cond	tchiyr.std:stthr.trimorning	-0.04	0.30	-0.13	0.89
cond	tchiyr.std:stthr.triafternoon	-0.19	0.25	-0.75	0.45
cond	tchiyr.std:hsz.std	-0.19	0.28	-0.68	0.50
cond	tchiyr.std:nsk.std	0.05	0.13	0.41	0.68
random_effect	aclew_child_id	0.32	NA	NA	NA

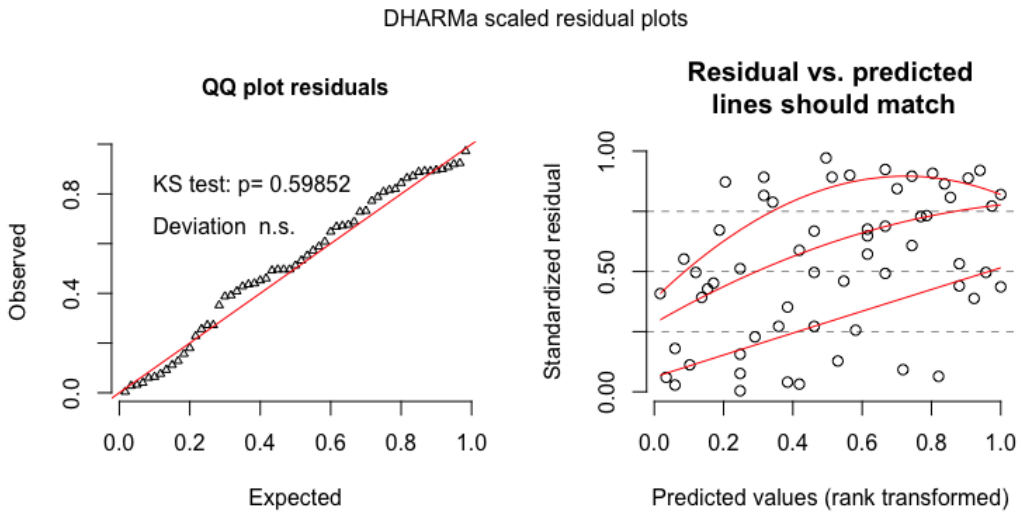

Figure 17. The model residuals from the zero-inflated negative binomial mixed-effects regression of TC–O turn transitions/min for the turn-taking sample.

Table 22

Model output of the negative binomial mixed-effects regression of TC–O turn transitions/min for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.90	0.24	7.88	0.00
cond	tchiyr.std	-0.07	0.27	-0.26	0.79
cond	stthr.tri.amidday	-0.11	0.27	-0.41	0.68
cond	stthr.tri.amorning	-0.05	0.24	-0.21	0.83
cond	hsz.std	-0.04	0.23	-0.17	0.86
cond	nsk.std	-0.21	0.12	-1.84	0.07
cond	tchiyr.std:stthr.tri.amidday	0.19	0.25	0.75	0.45
cond	tchiyr.std:stthr.tri.amorning	0.15	0.27	0.56	0.58
cond	tchiyr.std:hsz.std	-0.19	0.28	-0.68	0.50
cond	tchiyr.std:nsk.std	0.05	0.13	0.41	0.68
random_effect	aclew_child_id	0.32	NA	NA	NA

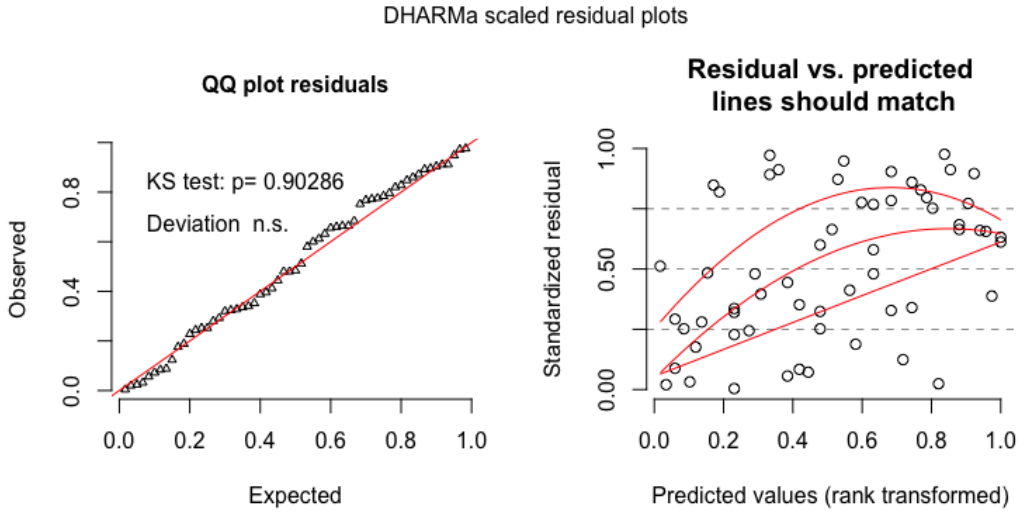

Figure 18. The model residuals from the gaussian mixed-effects regression of TC–O turn transitions/min for the turn-taking sample.

Table 23

Full output of the gaussian mixed-effects regression of TC–O turn transitions/min for the turn-taking sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.07	0.20	10.19	0.00
cond	tchiyr.std	-0.02	0.23	-0.09	0.93
cond	stthr.tri.amidday	-0.11	0.21	-0.52	0.60
cond	stthr.tri.amorning	-0.08	0.20	-0.40	0.69
cond	hsz.std	-0.02	0.20	-0.12	0.90
cond	nsk.std	-0.18	0.10	-1.86	0.06
cond	tchiyr.std:stthr.tri.amidday	0.11	0.20	0.55	0.58
cond	tchiyr.std:stthr.tri.amorning	0.09	0.22	0.42	0.67
cond	tchiyr.std:hsz.std	-0.17	0.25	-0.68	0.50
cond	tchiyr.std:nsk.std	0.09	0.12	0.79	0.43
random_effect	aclew_child_id	0.30	NA	NA	NA
random_effect	Residual	0.51	NA	NA	NA

Other-to-target-child turn transitions (O–TC)

Random clips. Other-to-target-child contingent response rate (O–TC transitions/min) in the random clips demonstrated a skewed distribution with extra cases of zero. We therefore modeled it using a zero-inflated negative binomial mixed-effects regression. In order to do this, we rounded the rate of O–TC transitions/min to the nearest integer in modeling the influence of time of day, child age, and so on. Below we first show the distribution of O–TC transitions/min across clips. We then show the full output of the model reported in the text—both the original, with midday as the reference point for time of day and then a second version with afternoon as the reference point for time of day. We

Table 24

Model output of the gaussian mixed-effects regression of TC–O turn transitions/min for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.07	0.20	10.19	0.00
cond	tchiyr.std	-0.02	0.23	-0.09	0.93
cond	stthr.tri.amidday	-0.11	0.21	-0.52	0.60
cond	stthr.tri.amorning	-0.08	0.20	-0.40	0.69
cond	hsz.std	-0.02	0.20	-0.12	0.90
cond	nsk.std	-0.18	0.10	-1.86	0.06
cond	tchiyr.std:stthr.tri.amidday	0.11	0.20	0.55	0.58
cond	tchiyr.std:stthr.tri.amorning	0.09	0.22	0.42	0.67
cond	tchiyr.std:hsz.std	-0.17	0.25	-0.68	0.50
cond	tchiyr.std:nsk.std	0.09	0.12	0.79	0.43
random_effect	aclew_child_id	0.30	NA	NA	NA
random_effect	Residual	0.51	NA	NA	NA

follow these model outputs with a figure showing two residual plots for the main model Table 25. Finally, we show the full output for a gaussian linear mixed-effects model of the data using logged O–TC transitions/min as the dependent variable, which is not appropriate for this distribution of data Figure 19. However, the gaussian model shows a similar pattern of results as the zero-inflated negative binomial model. As before, we show the model results with both midday and afternoon as the reference levels for time of day, followed by the residuals for the gaussian model.

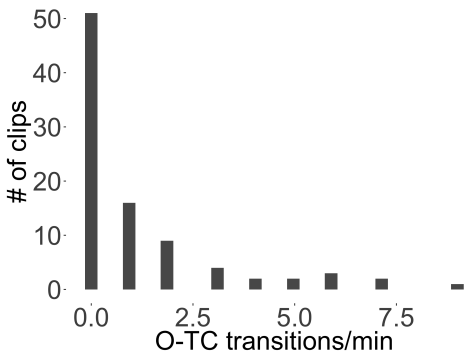

Figure 19. The distribution of O–TC turn transitions/min rates found across the 90 random clips.

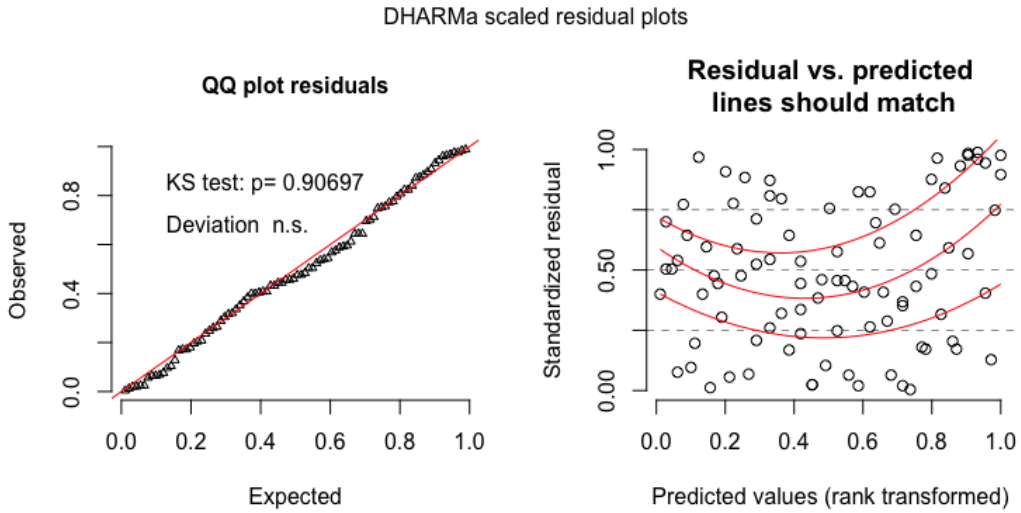

Figure 20. The model residuals from the zero-inflated negative binomial mixed-effects regression of O–TC turn transitions/min for the random sample.

Table 25

Full output of the zero-inflated negative binomial mixed-effects regression of O–TCturn transitions/min for the random sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	-0.46	0.54	-0.84	0.40
cond	tchiyr.std	1.14	0.66	1.74	0.08
cond	stthr.trimorning	0.32	0.49	0.65	0.52
cond	stthr.triafternoon	0.50	0.41	1.21	0.22
cond	hsz.std	-0.20	0.50	-0.41	0.68
cond	nsk.std	-0.14	0.18	-0.79	0.43
cond	tchiyr.std:stthr.trimorning	-0.12	0.51	-0.24	0.81
cond	tchiyr.std:stthr.triafternoon	-1.46	0.46	-3.13	0.00
cond	tchiyr.std:hsz.std	0.14	0.61	0.23	0.82
cond	tchiyr.std:nsk.std	0.52	0.22	2.30	0.02
zi	(Intercept)	-115.46	43,943.60	0.00	1.00
zi	nsk.std	-98.63	42,142.48	0.00	1.00
random_effect	aclew_child_id	0.80	NA	NA	NA

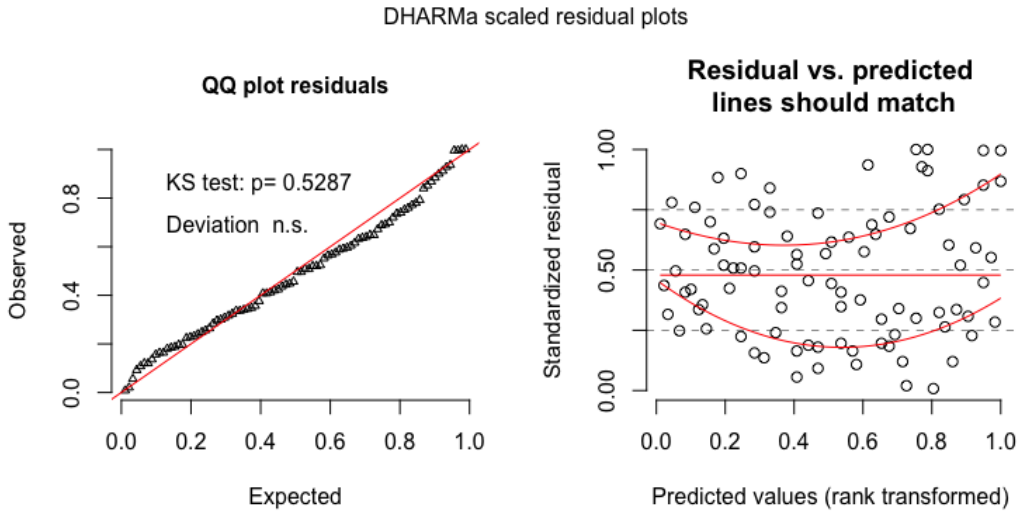

Figure 21. The model residuals from the gaussian mixed-effects regression of O–TC turn transitions/min for the random sample.

Table 26

Model output of the zero-inflated negative binomial mixed-effects regression of O–TC turn transitions/min for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	0.04	0.43	0.08	0.93
cond	tchiyr.std	-0.32	0.54	-0.59	0.56
cond	stthr.tri.amidday	-0.50	0.41	-1.21	0.22
cond	stthr.tri.amorning	-0.18	0.36	-0.49	0.62
cond	hsz.std	-0.20	0.50	-0.41	0.68
cond	nsk.std	-0.14	0.18	-0.79	0.43
cond	tchiyr.std:stthr.tri.amidday	1.46	0.46	3.13	0.00
cond	tchiyr.std:stthr.tri.amorning	1.33	0.42	3.19	0.00
cond	tchiyr.std:hsz.std	0.14	0.61	0.23	0.82
cond	tchiyr.std:nsk.std	0.52	0.22	2.30	0.02
zi	(Intercept)	-115.66	41,463.41	0.00	1.00
zi	nsk.std	-98.60	38,727.01	0.00	1.00
random_effect	aclew_child_id	0.80	NA	NA	NA

Table 27

Full output of the gaussian mixed-effects regression of O–TC turn transitions/min for the random sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.01	0.12	8.09	0.00
cond	tchiyr.std	0.23	0.14	1.57	0.12
cond	stthr.trimorning	0.10	0.11	0.92	0.36
cond	stthr.triafternoon	0.00	0.10	0.00	1.00
cond	hsz.std	-0.12	0.12	-0.96	0.34
cond	nsk.std	0.07	0.05	1.33	0.18
cond	tchiyr.std:stthr.trimorning	-0.02	0.12	-0.17	0.87
cond	tchiyr.std:stthr.triafternoon	-0.29	0.10	-2.76	0.01
cond	tchiyr.std:hsz.std	-0.03	0.15	-0.19	0.85
cond	tchiyr.std:nsk.std	0.08	0.07	1.13	0.26
random_effect	aclew_child_id	0.19	NA	NA	NA
random_effect	Residual	0.36	NA	NA	NA

Turn-taking clips. O–TC transitions/min in the random clips demonstrated a fairly normal distribution. We therefore modeled it using a plain (i.e., non-zero-inflated) negative binomial mixed-effects regression. In order to do this, we rounded the rate of O–TC transitions/min to the nearest integer in modeling the influence of time of day, child age, and so on, as before. Below we show the distribution of O–TC transitions/min across clips, the full output for the models reported in the text (both with the midday and afternoon reference level versions for time-of-day), the residual plots for the main model Table 29, and parallel models using gaussian linear mixed-effects analyses. Again, the gaussian model shows a similar pattern of results as the negative binomial model.

Table 28

Model output of the gaussian mixed-effects regression of O–TC turn transitions/min for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.01	0.11	9.04	0.00
cond	tchiyr.std	-0.06	0.13	-0.45	0.66
cond	stthr.tri.amidday	0.00	0.10	0.00	1.00
cond	stthr.tri.amorning	0.10	0.09	1.06	0.29
cond	hsz.std	-0.12	0.12	-0.96	0.34
cond	nsk.std	0.07	0.05	1.33	0.18
cond	tchiyr.std:stthr.tri.amidday	0.29	0.10	2.76	0.01
cond	tchiyr.std:stthr.tri.amorning	0.27	0.10	2.66	0.01
cond	tchiyr.std:hsz.std	-0.03	0.15	-0.19	0.85
cond	tchiyr.std:nsk.std	0.08	0.07	1.13	0.26
random_effect	aclew_child_id	0.19	NA	NA	NA
random_effect	Residual	0.36	NA	NA	NA

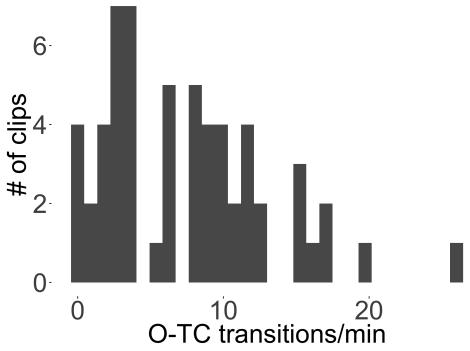

Figure 22. The distribution of O–TC turn transitions/min found across the 90 turn-taking clips.

Table 29

Full output of the negative binomial mixed-effects regression of O–TC turn transitions/min for the turn-taking sample.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.84	0.29	6.32	0.00
cond	tchiyr.std	0.06	0.30	0.20	0.84
cond	stthr.trimorning	-0.05	0.33	-0.15	0.88
cond	stthr.triafternoon	0.03	0.28	0.10	0.92
cond	hsz.std	-0.04	0.23	-0.16	0.88
cond	nsk.std	-0.23	0.12	-1.88	0.06
cond	tchiyr.std:stthr.trimorning	0.12	0.31	0.39	0.69
cond	tchiyr.std:stthr.triafternoon	-0.08	0.26	-0.30	0.77
cond	tchiyr.std:hsz.std	-0.19	0.28	-0.66	0.51
cond	tchiyr.std:nsk.std	0.08	0.14	0.62	0.53
random_effect	aclew_child_id	0.31	NA	NA	NA

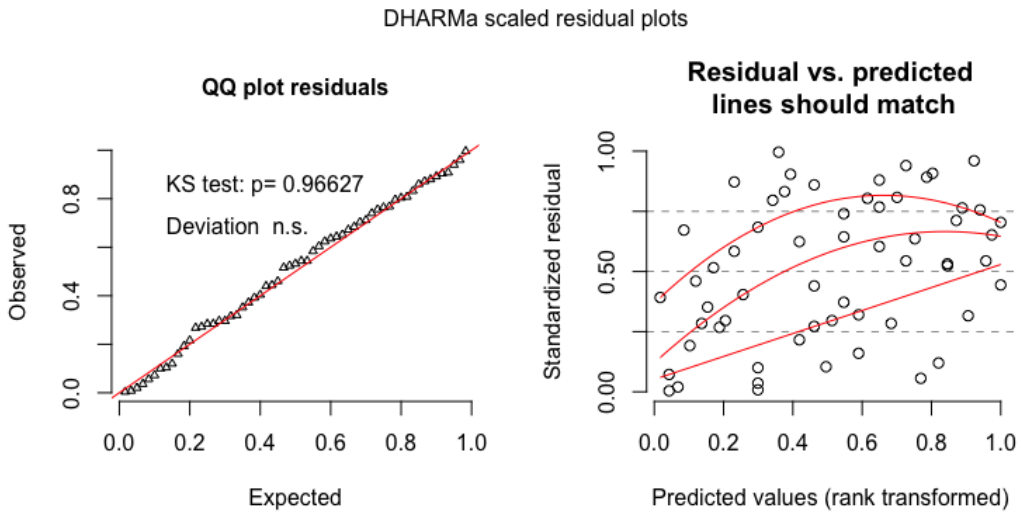

Figure 23. The model residuals from the negative binomial mixed-effects regression of O–TC turn transitions/min for the turn-taking sample.

Table 30

Model output of the negative binomial mixed-effects regression of O–TC turn transitions/min for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	1.87	0.25	7.55	0.00
cond	tchiyr.std	-0.02	0.27	-0.06	0.95
cond	stthr.tri.amidday	-0.03	0.28	-0.10	0.92
cond	stthr.tri.amorning	-0.08	0.26	-0.30	0.77
cond	hsz.std	-0.04	0.23	-0.16	0.88
cond	nsk.std	-0.23	0.12	-1.88	0.06
cond	tchiyr.std:stthr.tri.amidday	0.08	0.26	0.30	0.77
cond	tchiyr.std:stthr.tri.amorning	0.20	0.27	0.73	0.46
cond	tchiyr.std:hsz.std	-0.19	0.28	-0.66	0.51
cond	tchiyr.std:nsk.std	0.08	0.14	0.62	0.53
random_effect	aclew_child_id	0.31	NA	NA	NA

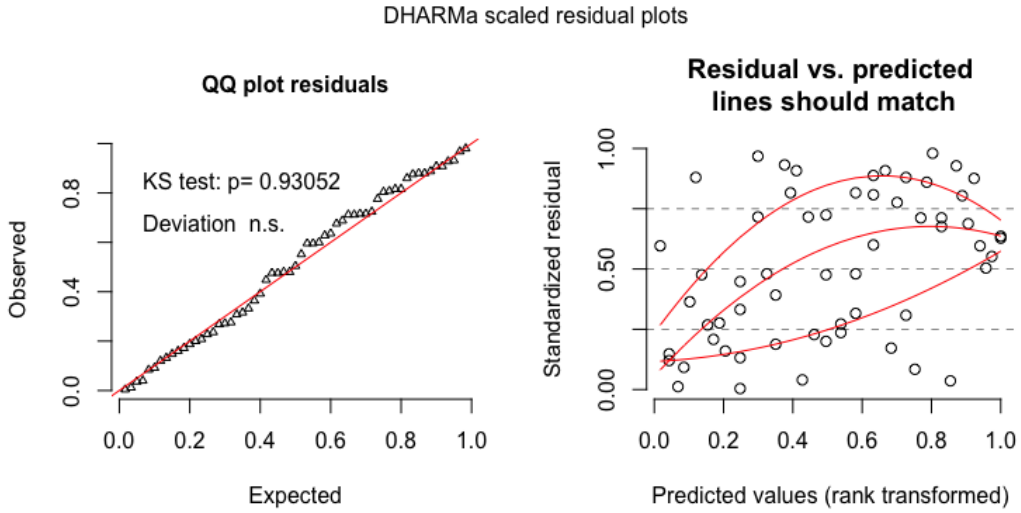

Figure 24. The model residuals from the gaussian mixed-effects regression of O–TC turn transitions/min for the turn-taking sample.

Table 31

Full output of the gaussian mixed-effects regression of O–TC turn transitions/min for the turn-taking sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.01	0.25	8.10	0.00
cond	tchiyr.std	0.04	0.25	0.16	0.87
cond	stthr.trimorning	-0.09	0.27	-0.34	0.74
cond	stthr.triafternoon	0.04	0.22	0.16	0.87
cond	hsz.std	0.00	0.21	-0.01	0.99
cond	nsk.std	-0.20	0.10	-1.98	0.05
cond	tchiyr.std:stthr.trimorning	0.17	0.25	0.66	0.51
cond	tchiyr.std:stthr.triafternoon	0.00	0.21	-0.02	0.99
cond	tchiyr.std:hsz.std	-0.13	0.26	-0.52	0.61
cond	tchiyr.std:nsk.std	0.08	0.12	0.69	0.49
random_effect	aclew_child_id	0.30	NA	NA	NA
random_effect	Residual	0.53	NA	NA	NA

Interactive sequence duration

Random clips. Other-to-target-child contingent response rate (O–TC transitions/min) in the random clips demonstrated a skewed distribution with extra cases of zero. We therefore modeled it using a zero-inflated negative binomial mixed-effects regression. In order to do this, we rounded the rate of O–TC transitions/min to the nearest integer in modeling the influence of time of day, child age, and so on. Below we first show the distribution of O–TC transitions/min across clips. We then show the full output of the model reported in the text—both the original, with midday as the reference point for time of day and then a second version with afternoon as the reference point for time of day. We

Table 32

Model output of the gaussian mixed-effects regression of O–TC turn transitions/min for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.04	0.21	9.74	0.00
cond	tchiyr.std	0.04	0.24	0.15	0.88
cond	stthr.tri.amidday	-0.04	0.22	-0.16	0.87
cond	stthr.tri.amorning	-0.13	0.22	-0.59	0.56
cond	hsz.std	0.00	0.21	-0.01	0.99
cond	nsk.std	-0.20	0.10	-1.98	0.05
cond	tchiyr.std:stthr.tri.amidday	0.00	0.21	0.02	0.99
cond	tchiyr.std:stthr.tri.amorning	0.17	0.23	0.75	0.46
cond	tchiyr.std:hsz.std	-0.13	0.26	-0.52	0.61
cond	tchiyr.std:nsk.std	0.08	0.12	0.69	0.49
random_effect	aclew_child_id	0.30	NA	NA	NA
random_effect	Residual	0.53	NA	NA	NA

follow these model outputs with a figure showing two residual plots for the main model Table 17. Finally, we show the full output for a gaussian linear mixed-effects model of the data using logged O–TC transitions/min as the dependent variable, which is not appropriate for this distribution of data Figure 13. However, the gaussian model shows a similar pattern of results as the zero-inflated negative binomial model. As before, we show the model results with both midday and afternoon as the reference levels for time of day, followed by the residuals for the gaussian model.

Table 33

Full output of the negative binomial mixed-effects regression of interactive sequence duration (sec) for the random sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.22	0.14	15.56	0.00
cond	tchiyr.std	0.11	0.19	0.55	0.58
cond	stthr.trimorning	0.14	0.17	0.78	0.44
cond	stthr.triafternoon	0.13	0.16	0.80	0.42
cond	hsz.std	0.01	0.08	0.12	0.90
cond	nsk.std	0.01	0.05	0.13	0.90
cond	tchiyr.std:stthr.trimorning	0.20	0.19	1.05	0.30
cond	tchiyr.std:stthr.triafternoon	0.04	0.18	0.26	0.80
cond	tchiyr.std:hsz.std	0.14	0.11	1.26	0.21
cond	tchiyr.std:nsk.std	-0.03	0.06	-0.51	0.61
random_effect	uniq.segment	0.11	NA	NA	NA
random_effect	aclew_child_id	0.00	NA	NA	NA

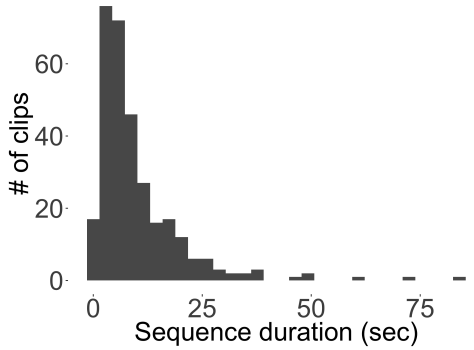

Figure 25. The distribution of interactive sequence duration (sec) found across the 90 random clips.

Table 34

Model output of the negative binomial mixed-effects regression of interactive sequence duration (sec) for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.35	0.09	27.16	0.00
cond	tchiyr.std	0.15	0.12	1.26	0.21
cond	stthr.tri.amidday	-0.13	0.16	-0.80	0.42
cond	stthr.tri.amorning	0.01	0.12	0.06	0.95
cond	hsz.std	0.01	0.08	0.12	0.90
cond	nsk.std	0.01	0.05	0.13	0.90
cond	tchiyr.std:stthr.tri.amidday	-0.04	0.18	-0.26	0.80
cond	tchiyr.std:stthr.tri.amorning	0.15	0.13	1.17	0.24
cond	tchiyr.std:hsz.std	0.14	0.11	1.26	0.21
cond	tchiyr.std:nsk.std	-0.03	0.06	-0.51	0.61
random_effect	uniq.segment	0.11	NA	NA	NA
random_effect	aclew_child_id	0.00	NA	NA	NA

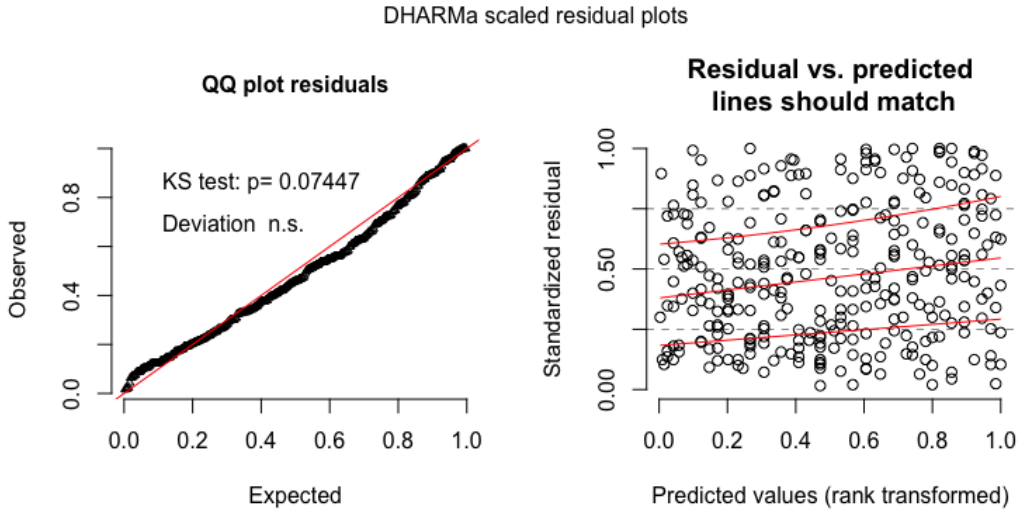

Figure 26. The model residuals from the negative binomial mixed-effects regression of interactive sequence duration (sec) for the random sample.

Table 35

Full output of the gaussian mixed-effects regression of interactive sequence duration (sec) for the random sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	-2.24	0.18	-12.46	0.00
cond	tchiyr.std	0.10	0.25	0.41	0.68
cond	stthr.trimorning	0.08	0.22	0.36	0.72
cond	stthr.triafternoon	0.13	0.20	0.65	0.51
cond	hsz.std	0.01	0.11	0.07	0.94
cond	nsk.std	0.01	0.06	0.17	0.87
cond	tchiyr.std:stthr.trimorning	0.34	0.24	1.39	0.16
cond	tchiyr.std:stthr.triafternoon	0.11	0.22	0.49	0.62
cond	tchiyr.std:hsz.std	0.17	0.14	1.15	0.25
cond	tchiyr.std:nsk.std	-0.06	0.08	-0.74	0.46
random_effect	uniq.segment	0.19	NA	NA	NA
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.85	NA	NA	NA

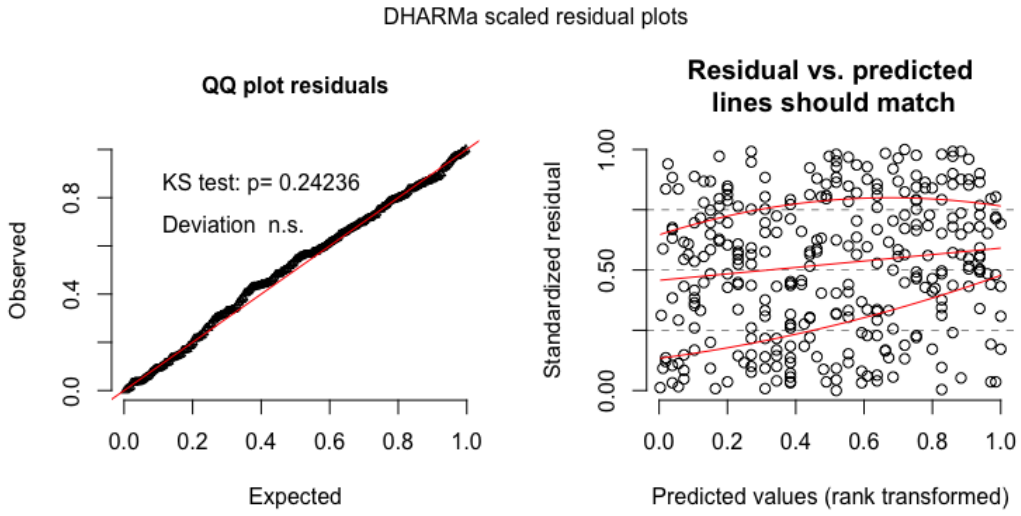

Figure 27. The model residuals from the gaussian mixed-effects regression of interactive sequence duration (sec) for the random sample.

Table 36

Model output of the gaussian mixed-effects regression of interactive sequence duration (sec) for the random sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	-2.11	0.11	-19.42	0.00
cond	tchiyr.std	0.21	0.16	1.36	0.18
cond	stthr.tri.amidday	-0.13	0.20	-0.65	0.51
cond	stthr.tri.amorning	-0.05	0.15	-0.36	0.72
cond	hsz.std	0.01	0.11	0.07	0.94
cond	nsk.std	0.01	0.06	0.17	0.87
cond	tchiyr.std:stthr.tri.amidday	-0.11	0.22	-0.49	0.62
cond	tchiyr.std:stthr.tri.amorning	0.22	0.17	1.34	0.18
cond	tchiyr.std:hsz.std	0.17	0.14	1.15	0.25
cond	tchiyr.std:nsk.std	-0.06	0.08	-0.74	0.46
random_effect	uniq.segment	0.19	NA	NA	NA
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.85	NA	NA	NA

Turn-taking clips. O–TC transitions/min in the random clips demonstrated a fairly normal distribution. We therefore modeled it using a plain (i.e., non-zero-inflated) negative binomial mixed-effects regression. In order to do this, we rounded the rate of O–TC transitions/min to the nearest integer in modeling the influence of time of day, child age, and so on, as before. Below we show the distribution of O–TC transitions/min across clips, the full output for the models reported in the text (both with the midday and afternoon reference level versions for time-of-day), the residual plots for the main model Table 21, and parallel models using gaussian linear mixed-effects analyses. Again, the gaussian model

142 shows a similar pattern of results as the negative binomial model.

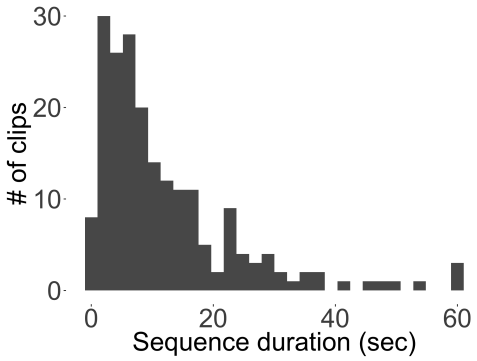

Figure 28. The distribution of interactive sequence duration (sec) found across the 90 turn-taking clips.

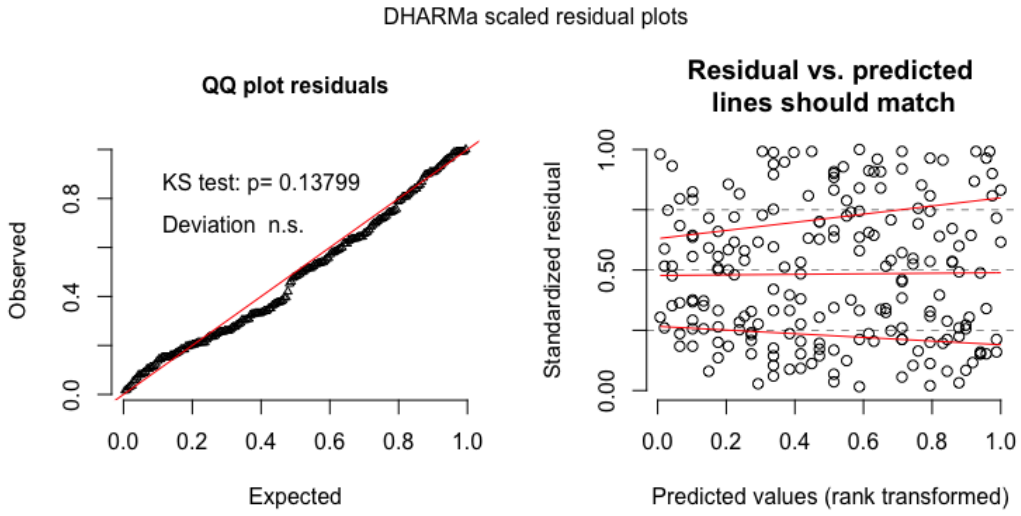

Figure 29. The model residuals from the negative binomial mixed-effects regression of interactive sequence duration (sec) for the turn-taking sample.

Table 37

Full output of the negative binomial mixed-effects regression of interactive sequence duration (sec) for the turn-taking sample.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.25	0.14	16.54	0.00
cond	tchiyr.std	-0.18	0.12	-1.51	0.13
cond	stthr.trimorning	0.06	0.16	0.37	0.71
cond	stthr.triafternoon	0.38	0.14	2.61	0.01
cond	hsz.std	-0.17	0.10	-1.74	0.08
cond	nsk.std	-0.01	0.06	-0.18	0.85
cond	tchiyr.std:stthr.trimorning	-0.02	0.17	-0.12	0.90
cond	tchiyr.std:stthr.triafternoon	0.02	0.14	0.14	0.89
cond	tchiyr.std:hsz.std	-0.18	0.13	-1.37	0.17
cond	tchiyr.std:nsk.std	0.03	0.08	0.38	0.70
random_effect	uniq.segment	0.00	NA	NA	NA
random_effect	aclew_child_id	0.00	NA	NA	NA

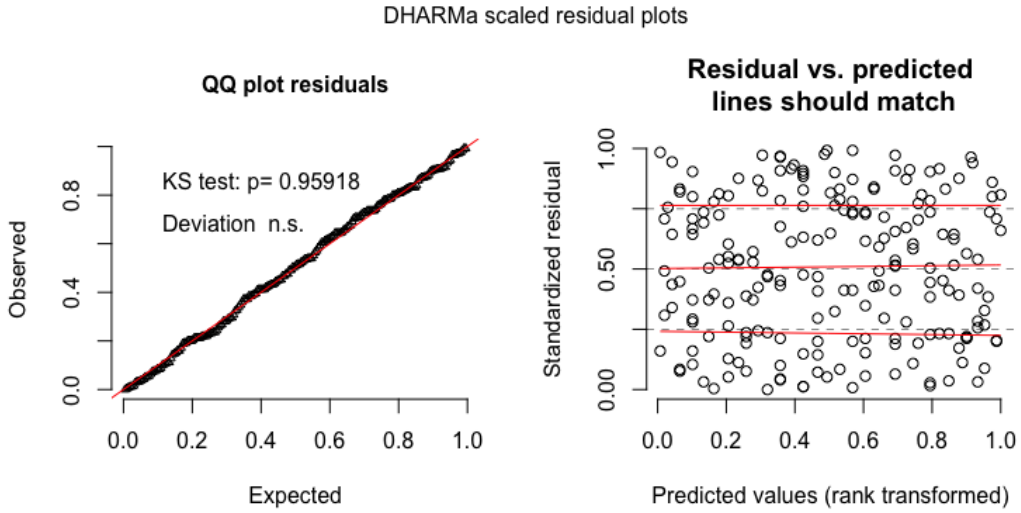

Figure 30. The model residuals from the gaussian mixed-effects regression of interactive sequence duration (sec) for the turn-taking sample.

Table 38

Model output of the negative binomial mixed-effects regression of interactive sequence duration (sec) for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	2.63	0.12	20.93	0.00
cond	tchiyr.std	-0.16	0.13	-1.23	0.22
cond	stthr.tri.amidday	-0.38	0.14	-2.61	0.01
cond	stthr.tri.amorning	-0.32	0.15	-2.12	0.03
cond	hsz.std	-0.17	0.10	-1.74	0.08
cond	nsk.std	-0.01	0.06	-0.18	0.85
cond	tchiyr.std:stthr.tri.amidday	-0.02	0.14	-0.14	0.89
cond	tchiyr.std:stthr.tri.amorning	-0.04	0.17	-0.24	0.81
cond	tchiyr.std:hsz.std	-0.18	0.13	-1.37	0.17
cond	tchiyr.std:nsk.std	0.03	0.08	0.38	0.70
random_effect	uniq.segment	0.00	NA	NA	NA
random_effect	aclew_child_id	0.00	NA	NA	NA

References

Table 39

Full output of the gaussian mixed-effects regression of interactive sequence duration (sec) for the turn-taking sample, with midday as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	-2.33	0.16	-14.96	0.00
cond	tchiyr.std	-0.20	0.14	-1.40	0.16
cond	stthr.trimorning	0.08	0.19	0.39	0.70
cond	stthr.triafternoon	0.57	0.18	3.11	0.00
cond	hsz.std	-0.23	0.12	-2.01	0.04
cond	nsk.std	-0.02	0.07	-0.32	0.75
cond	tchiyr.std:stthr.trimorning	0.02	0.20	0.08	0.94
cond	tchiyr.std:stthr.triafternoon	-0.01	0.19	-0.08	0.94
cond	tchiyr.std:hsz.std	-0.20	0.15	-1.32	0.19
cond	tchiyr.std:nsk.std	0.05	0.10	0.49	0.62
random_effect	uniq.segment	0.00	NA	NA	NA
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.89	NA	NA	NA

Table 40

Model output of the gaussian mixed-effects regression of interactive sequence duration (sec) for the turn-taking sample, with afternoon as the reference level for time of day.

component	term	estimate	std.error	statistic	p.value
cond	(Intercept)	-1.75	0.16	-11.17	0.00
cond	tchiyr.std	-0.22	0.17	-1.29	0.20
cond	stthr.tri.amidday	-0.57	0.18	-3.11	0.00
cond	stthr.tri.amorning	-0.50	0.19	-2.58	0.01
cond	hsz.std	-0.23	0.12	-2.01	0.04
cond	nsk.std	-0.02	0.07	-0.32	0.75
cond	tchiyr.std:stthr.tri.amidday	0.01	0.19	0.08	0.94
cond	tchiyr.std:stthr.tri.amorning	0.03	0.21	0.14	0.89
cond	tchiyr.std:hsz.std	-0.20	0.15	-1.32	0.19
cond	tchiyr.std:nsk.std	0.05	0.10	0.49	0.62
random_effect	uniq.segment	0.00	NA	NA	NA
random_effect	aclew_child_id	0.00	NA	NA	NA
random_effect	Residual	0.89	NA	NA	NA