Supplementary Analyses

The analyses reported in the main text pooled data from younger and older children, a decision that we made because the total number of data points from each age group only amounted to about half the data points that we collected from adults (due to various factors, such as children not completing the experiment, or providing incorrect answers, see Figure S1 below). When the children's data were pooled the resulting estimates were more robust (and convergence issues were removed).

However, we also wanted to check for any developmental trends within the child group, as well as to confirm that, when children's data alone were analyzed, the critical interaction between maze type and information structure was still present. We thus conducted two follow-up analyses. The first follow-up analysis compared younger to older children (i.e., using age as a categorical predictor), while the other included the child's age in months as a (centred and scaled) continuous predictor.

The results of these distributional follow-up analyses on the child data, using the ex-Gaussian distribution, can be found in Tables S1 (categorical) and S2 (continuous) below. They fully confirm the distributional analyses reported in the main text. Critically, we again found that the distribution of response times across conditions was shifted in line with an interaction between Information Structure and Maze Type (B=-0.035, EE=0.013, CrI=[-0.062,-0.009]), again without any further modulation by Age (B=-0.018, EE=0.026, CrI=[-0.069,0.034]; see Table S1), showing that both younger and older children can predictively prepare a response to a question while conversing (compare the middle to the bottom panels in Figure S1A, or the middle and the right-hand panels in Figure S1B below). These results also held when age was analyzed as a continuous variable (see Table S2).

Similarly, these key findings were replicated in follow-up (non-distributional) linear mixed-effects analysis of the child data, which are reported in Tables S3 (age as a categorical predictor) and S4 (age as a continuous predictor). The model that compared older to younger children showed a significant interaction between Information Structure and Maze Type (B = -0.061, SE =0.028, t =-2.14; CI =[-0.117,-0.005]), but no further interaction with Age (B = -0.039, SE =0.046, t =-0.84; CI =[-0.129, 0.052]; see Table S3), and the same was true for the model that treated age as continuous (see Table S4).

In sum, follow-up analyses found no strong evidence for a developmental trend within the child data, suggesting that even the younger children in our sample possess the ability to coordinate prediction with early formulation of their response, but further work is necessary to confirm this finding with a larger dataset.

Supplementary Tables

Table S1. Parameters form the Ex-Gaussian analysis, comparing younger to older children (Age). Please refer to the caption for Table 1 (main text) for an explanation of column labels.

	μ			σ			τ		
Predictor	B(EE)	CrI	Rhat	B(EE)	CrI	Rhat	B(EE)	CrI	Rhat
Intercept	0.460(0.007)	0.447, 0.474	1.002	-3.088(0.080)	-3.254,-2.938	1.001	-1.070(0.052)	-1.169,-0.968	1.002
Age	0.001(0.014)	-0.026, 0.029	1.005	0.047(0.140)	-0.217, 0.339	1.001	-0.095(0.101)	-0.296, 0.101	1.001
Information Structure (IS)	0.097(0.007)	0.085, 0.111	1.000	0.336(0.109)	0.136, 0.556	1.000	0.162(0.044)	0.076, 0.248	1.000
Maze Type (MT)	0.027(0.014)	-0.001, 0.055	1.008	0.204(0.140)	-0.085, 0.474	1.002	0.261(0.103)	0.060, 0.461	1.011
Final Word Len	-0.043(0.003)	-0.049,-0.037	1.000	0.107(0.048)	0.015, 0.203	1.001	-0.077(0.018)	-0.113,-0.042	1.000
Answer Type	0.029(0.005)	0.019, 0.039	1.000	0.136(0.099)	-0.057, 0.333	0.999	0.006(0.034)	-0.060, 0.076	1.000
Age:IS	-0.012(0.013)	-0.038, 0.015	1.000	-0.145(0.217)	-0.575, 0.263	1.000	-0.084(0.086)	-0.255, 0.082	1.000
Age:MT	-0.015(0.028)	-0.071, 0.040	1.004	0.546(0.276)	0.022, 1.106	1.001	-0.006(0.208)	-0.421, 0.410	1.005
IS:MT	-0.035(0.013)	-0.062,-0.009	1.000	0.329(0.217)	-0.086, 0.754	1.001	0.182(0.087)	0.015, 0.352	1.001
Age:IS:MT	-0.018(0.026)	-0.069, 0.034	1.001	-0.427(0.444)	-1.303, 0.408	1.000	-0.002(0.182)	-0.357, 0.352	1.000

Table S2. Parameters from the Ex-Gaussian analysis using the child's age (in months) as a scaled continuous predictor (contAge). Please refer to the caption to Table 1 (main text) for an explanation of column labels.

	μ			σ			τ		
Predictor	B(EE)	CrI	Rhat	B(EE)	CrI	Rhat	B(EE)	CrI	Rhat
Intercept	0.461(0.007)	0.447, 0.475	1.002	-3.096(0.076)	-3.252,-2.954	1.000	-1.081(0.053)	-1.183,-0.975	1.007
contAge	-0.001(0.007)	-0.015, 0.013	1.003	0.016(0.066)	-0.110, 0.148	1.000	-0.062(0.052)	-0.164, 0.035	1.003
Information Structure (IS)	0.097(0.007)	0.084, 0.111	1.000	0.345(0.106)	0.134, 0.550	1.000	0.152(0.044)	0.068, 0.238	1.001
Maze Type (MT)	0.024(0.014)	-0.005, 0.052	1.006	0.247(0.133)	-0.018, 0.505	0.999	0.263(0.105)	0.058, 0.468	1.000
Final Word Len	-0.043(0.003)	-0.049,-0.037	1.001	0.106(0.046)	0.018, 0.196	1.000	-0.077(0.018)	-0.112,-0.043	1.000
Answer Type	0.029(0.005)	0.019, 0.039	1.000	0.136(0.100)	-0.058, 0.336	1.000	0.006(0.034)	-0.060, 0.074	0.999
contAge:IS	-0.005(0.007)	-0.018, 0.009	1.000	-0.081(0.106)	-0.287, 0.130	1.000	-0.043(0.043)	-0.129, 0.041	1.001
contAge:MT	-0.011(0.014)	-0.039, 0.016	1.000	0.295(0.134)	0.037, 0.563	1.003	-0.037(0.100)	-0.234, 0.162	1.006
IS:MT	-0.036 (0.013)	-0.062,-0.009	1.000	0.325(0.213)	-0.088, 0.741	1.000	0.184 (0.089)	0.006, 0.360	1.000
contAge:IS:MT	-0.010 (0.013)	-0.037, 0.017	1.000	-0.243(0.211)	-0.648, 0.178	0.999	-0.009(0.087)	-0.178, 0.161	0.999

Table S3. Parameters from the Linear Mixed-Effect analysis, comparing younger to older children (Age).

Predictor	B	SE	t value	lowerCI	upperCI
(Intercept)	-0.423	0.016	-26.856	-0.454	-0.392
Information Structure	0.181	0.018	10.119	0.146	0.217
Maze Type	0.089	0.029	3.115	0.033	0.145
Age	-0.019	0.028	-0.667	-0.074	0.036
Final Word Len	-0.075	0.008	-9.880	-0.090	-0.060
Answer Type	0.047	0.015	3.086	0.017	0.077
Information Structure:Maze Type	-0.061	0.028	-2.136	-0.117	-0.005
Information Structure:Age	-0.018	0.023	-0.780	-0.063	0.027
Maze Type:Age	-0.028	0.056	-0.502	-0.139	0.082
Information Structure:Maze Type:Age	-0.039	0.046	-0.836	-0.129	0.052

Table S4. Parameters from the Linear Mixed-Effect analysis, using the child's age (in months) as a scaled continuous predictor (contAge).

Predictor	B	SE	t value	lowerCI	upperCI
(Intercept)	-0.424	0.016	-26.645	-0.456	-0.393
Information Structure	0.196	0.018	11.139	0.161	0.230
Maze Type	0.085	0.029	2.936	0.028	0.142
contAge	-0.016	0.014	-1.141	-0.042	0.011
Final Word Len	-0.075	0.008	-9.903	-0.090	-0.060
Answer Type	0.046	0.015	3.119	0.017	0.075
Information Structure:Maze Type	-0.065	0.029	-2.267	-0.121	-0.009
Information Structure:contAge	-0.005	0.011	-0.472	-0.028	0.017
Maze Type:contAge	-0.028	0.027	-1.028	-0.081	0.025
Information Structure:Maze Type:contAge	-0.019	0.023	-0.830	-0.063	0.026

Supplementary Figure

Figure S1. (A) Distribution of response times by Age Group, Information Structure and Maze Type. The Adult panels combined are based on 4528 data points; the combined number of data points is 2867 for the Older children panels and 1996 for the Younger children panels (B) Mean response times (after excluding data points > 1500ms, as in the Gaussian analyses) by age and condition. Error bars represent 95% by-participant CIs bootstrapped over 1000 samples.