Converging evidence that common timing processes underlie temporal-order and simultaneity judgments: A model-based analysis

Electronic Supplementary Material

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This document reports in a succinct manner the results of our model-based analyses of additional data sets from published studies. These analyses proceeded exactly as described in the manuscript, that is, by fitting the IC model jointly to data from SJ and TOJ tasks for each observer and condition (in case the same observer served in several conditions) on the constraint that parameters related to timing processes are identical under both tasks whereas parameters related to decisional and response processes may vary across tasks. Because the sensory modality of each stimulus in the pair varied across data sets, subscripts for model parameters use the general designations "r" (for the reference stimulus) and "t" (for the test stimulus); which stimulus modality was the reference and which was the test will be identified for each individual data set. In each case, results reported here include a plot of data and fitted psychometric functions for each observer and condition, a table of parameter estimates, and a brief discussion of the fit of the model. We omit discussing these results in relation to the issues addressed in the papers where the data were first reported. Our analyses are reported in chronological order of publication of the papers.

1. Schneider and Bavelier (2003)

In a study of prior entry (a hypothetical acceleration of sensory processing caused by attention), Schneider and Bavelier (2003) investigated the role of different types of attentional cues using SJ and TOJ tasks with each observer in each condition. Conditions varied along a set of four experiments that differed as to which type of attentional cue was used. In turn, each experiment included several conditions regarding the temporal proximity between the cue and its target. Temporal delays between stimuli were always delivered via pairs of relatively simple (but not identical) visual stimuli presented at different locations on a monitor. Only one of the locations was cued in each trial; the cued location was regarded as the reference and, thus, temporal delays were regarded as negative when the stimulus in the uncued location was presented before the stimulus in the cued location. Despite the fact that both stimuli were always of the same modality, we fitted the general model in which the distribution of perceived onsets may differ for the two stimuli, for two reasons. One is that the stimuli were not identical (they were small circular targets of different colors); the other reason is more important because, if the prior entry hypothesis is correct, perceived onsets should indeed differ in the cued (reference) and uncued (test) locations.

In Experiment 1, nine observers participated and SJ and TOJ data were collected at temporal delays ranging from −100 ms to 100 ms in steps of 25 ms, with 20 trials per delay under each task. This protocol was used at each of seven different, randomly interwoven conditions regarding *cue lead time* (the amount of time by which presentation of the cue preceded presentation of its target):

0, 40, 75, 125, 200, 500, or 1000 ms. The cue was a thin ring larger than its target and concentric with it. In each trial, cue and targets were not extinguished until the observer responded. Data from each observer in each condition under each task are shown in Figure S1 along with our fitted psychometric functions; parameter estimates are listed in Table S1. The fitted model is not rejected in any of the 63 cases, indicating that timing processes can be regarded as identical under SJ and TOJ tasks despite conspicuous differences in observed performance across tasks and the ensuing differences in classical PSS estimates from each task (see Fig. 3A in Schneider & Bavelier, 2003).

Experiment 2 was identical in design except that (1) the cue was not a ring displayed at its target location but an arrow always displayed at the center of the monitor that pointed to the location in which its target would be presented and (2) only six cue lead times were used: 0, 100, 300, 500, 1000, and 1500 ms. Also nine observers participated in this experiment, eight of whom had participated in Experiment 1. (In strict chronology as far as observers' participation is concerned, Experiment 3 was carried out first, followed by Experiment 2 and then Experiment 1, but this is immaterial except as regards potential familiarity effects). Data from each observer in each condition under each task are shown in Figure S2 along with our fitted psychometric functions; parameter estimates are listed in Table S2. Across the 54 cases, the fitted model is only rejected for observer #8 in conditions 1 (0 ms cue) and 6 (1500 ms cue), for observer #5 in condition 2 (100 ms cue), and for observer #9 in condition 4 (500 ms cue), but note in Figure S2 that in these cases the fitted curves follow the path of the data as accurately as some occasionally noisy data points permit. Despite the four rejections, these results again indicate that timing processes can be regarded as identical under SJ and TOJ tasks despite conspicuous differences in observed performance across tasks and the ensuing differences in classical PSS estimates from each task (see Fig. 3B in Schneider & Bavelier, 2003).

Experiment 3 also used the same design as Experiment 2, except that a cue lead time of 600 ms replaced the cue lead time of 500 ms and the type of cue varied. In this case, each trial started with the display (at the center of the monitor) of a cartoon face with mouth, nose, and eye whites without pupils. The cue consisted of the subsequent addition (500–1000 ms after the beginning of the trial) of pupils within the eye whites gazing towards the location of its target. Ten observers participated in this experiment, nine of whom were those who took part in Experiment 2. Data from each observer in each condition under each task are shown in Figure S3 along with our fitted psychometric functions; parameter estimates are listed in Table S3. Across the 60 cases, the fitted model is only rejected for observer #4 in condition 6 (1500 ms cue), for observer #5 in conditions 2 (100 ms cue) and 4 (600 ms cue) and for observer #7 in condition 1 (0 ms cue), but note in Figure S3 that the fitted curves follow the path of the data very accurately also in these cases. Timing processes can again be regarded as identical under SJ and TOJ tasks despite conspicuous differences in observed performance across tasks and the ensuing differences in classical PSS estimates from each task (see Fig. 3C in Schneider & Bavelier, 2003).

In Experiment 4, circular rings were again used as cues, but other rings were also presented that altered the informative value of the true cue. The experiment was divided into two parts (with different observers in each part): In Experiments 4A and 4B, the cue lead times were respectively fixed at 75 and 150 ms. Six conditions were defined in each part according to how many rings were displayed in each trial: 1, 2, 4, 6, 9, or 12 (Experiment 4A) and 1, 2, 4, 6, 8, or 10 (Experiment 4B). Only one of the rings displayed in a trial turned up to be concentric with the location of its target and, thus, was the true cue among other non-informative rings. Twelve observers participated in each part, none of whom had participated in the preceding experiments. Since data from Experiment 4A were not available, data from Experiment 4B from each observer in each condition under each task are shown in Figure S4 along with our fitted psychometric functions; parameter estimates are listed in Table S4. The fitted model is not rejected in any of the 72 cases, indicating again that

timing processes can be regarded as identical under SJ and TOJ tasks despite conspicuous differences in observed performance across tasks and the ensuing differences in classical PSS estimates from each task (see Fig. 9B in Schneider & Bavelier, 2003).

2. Fujisaki and Nishida (2009)

In a study about the resolution of temporal-order judgments in cross-modal combinations, Fujisaki and Nishida (2009) used audio-visual, audio-tactile, visuo-tactile, and tactile-tactile pairs. Only in their Experiment 4 were SJ and TOJ tasks used under otherwise identical conditions and our analyses are limited to data from that experiment. The visual stimulus was a Gaussian luminance blob presented for 6.25 ms on the center of a monitor where observers kept their gaze. The auditory stimulus was a white-noise burst lasting 6.25 ms. The tactile stimulus was a 6.25-ms up-then-down vertical movement delivered to the tip of the right index finger by the tip of a vibration generator; in tactile-tactile pairs, stimuli were delivered to the index fingers of each hand. In the audio-visual combination, the visual stimulus was the reference and the auditory stimulus was the test. In the audio-tactile combination, the tactile stimulus was the reference and the auditory stimulus was the test. In the visuo-tactile combination, the visual stimulus was the reference and the tactile stimulus was the test. In the tactile-tactile combination, the reference stimulus was that delivered to the left hand and the test stimulus was that delivered to the right hand. Under each task, 12 trials were administered at each of 27 temporal delays: 0, ±5, ±10, ±20, ±30, ±40, ±50, ±60, ±80, ±100, ±150, ±200, ±250, and ±300 ms. Seven observers participated in the experiment.

We fitted the general model in which the distribution of perceived onsets may differ for the two stimuli, even for the tactile-tactile combination because it is unclear that peripheral processing and transmission times will be identical for stimuli delivered to the left and to the right hands. In any case, this decision does not compromise the fit of the general model in the event that processing and transmission times are actually identical, for two reasons. First, and most important, because model parameters reflecting timing processes for each stimulus can end up estimated at the same values if the data so demands; second, because this decision does not affect the extent to which data from SJ and TOJ tasks can both be accounted for on the implicit assumption that timing parameters are identical across tasks (regardless of whether or not they are also identical for the two stimuli).

Data from each observer under each combination in both tasks are shown in Figure S5 along with our fitted psychometric functions; parameter estimates are listed in Table S5. The fitted model is not rejected in any of the 28 cases, indicating again that timing parameters can be regarded as identical under SJ and TOJ tasks despite conspicuous differences in observed performance across tasks and the ensuing differences in classical PSS estimates from each task (see Fig. 5 in Fujisaki & Nishida, 2009).

3. Sanders et al. (2011)

In a study on perceptual asynchrony between vestibular and auditory stimuli, Sanders et al. (2011) used SJ and TOJ tasks with a sample of 14 observers. The vestibular (reference) stimulus was an externally caused back-and-forth head rotation about the earth-vertical axis that lasted four seconds; the auditory (test) stimulus was a 10-ms, 800-Hz tone whose delay was defined with respect to the onset of the motion. Auditory delays ranged from −200 ms to 700 ms in steps of 50 ms, although the particular subset of delays that was used varied slightly and not systematically across observers and tasks. The number of trials administered at each delay under each task for each observer also varied between 5 and 20. We also fitted the general model (i.e., that with potentially different timing parameters for each stimulus) to these data, with the results shown in Figure S6; parameter estimates are listed in Table S6. The fitted model is again not rejected for any of the 14 observers, indicating that timing parameters can be regarded as identical under SJ and TOJ tasks

despite conspicuous differences in observed performance across tasks and the ensuing differences in classical PSS estimates and widths of the temporal binding window obtained with each task (see Figs. 2 and 3 in Sanders et al., 2011).

References

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Schneider, K. A., & Bavelier, D. (2003). Components of visual prior entry. *Cognitive Psychology*, *47*(4), 333–336. doi:10.1016/S0010-0285(03)00035-5

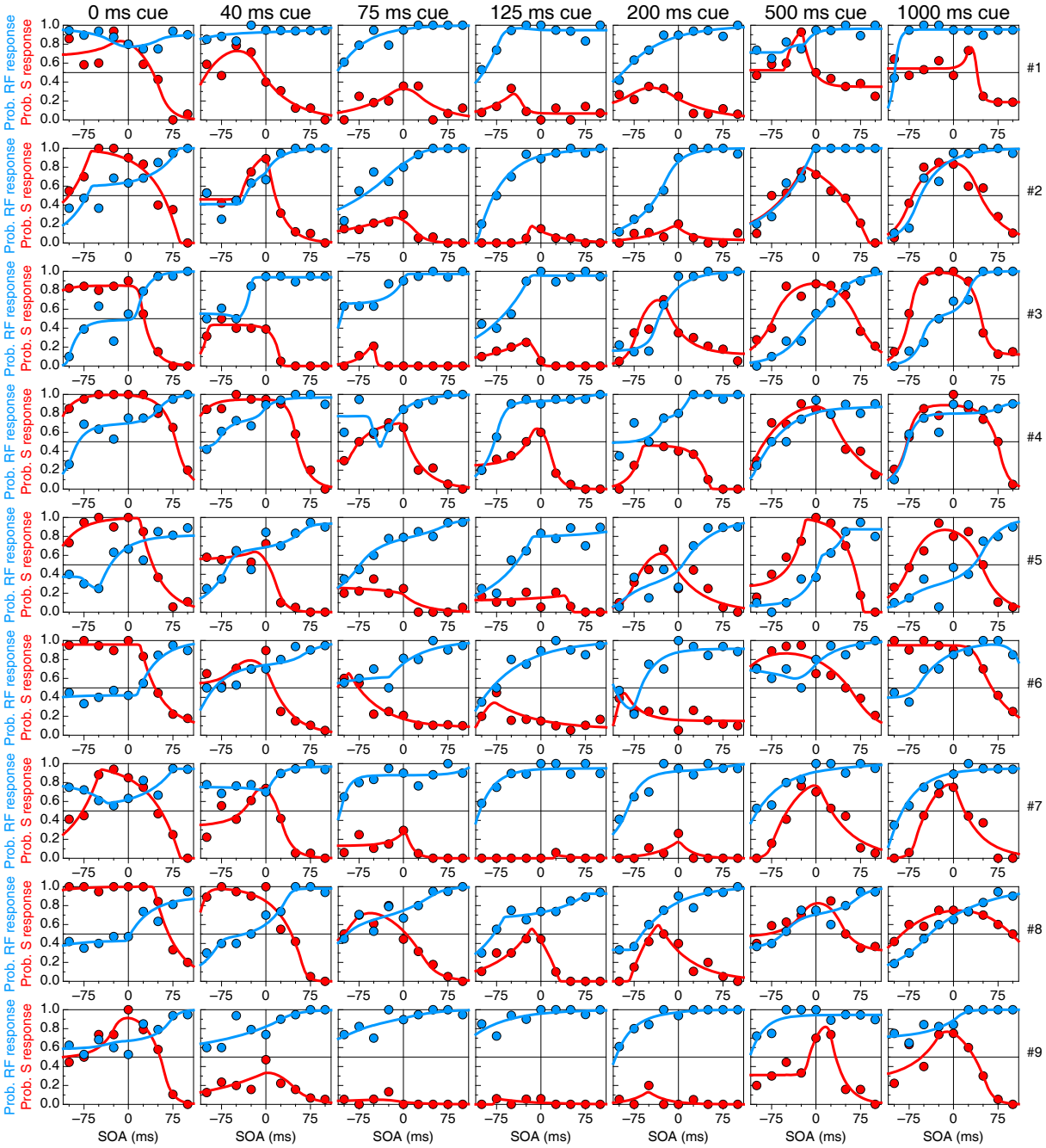

Figure S1. Fitted psychometric functions to SJ and TOJ data from Experiment 1 in Schneider and Bavelier (2003). Each column pertains to a different condition regarding the cue lead time (see top labels); each row pertains to a different observer (see labels on the right). The ordinate represents proportion of “simultaneous” (S) responses for SJ data and proportion of “reference first” (RF) responses for TOJ data. Other graphical conventions as in analogous figures in the main paper.

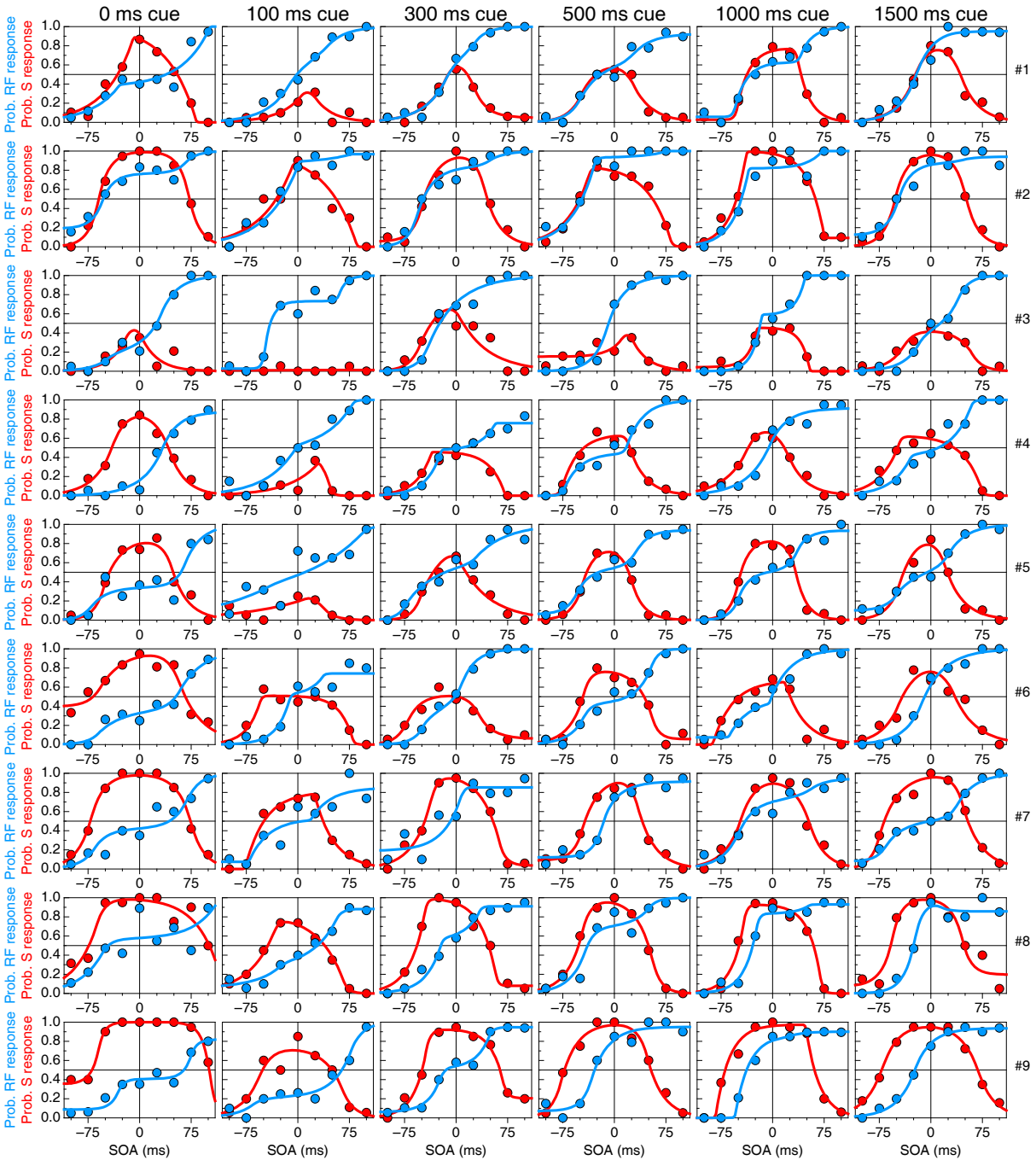

Figure S2. Fitted psychometric functions to SJ and TOJ data from Experiment 2 in Schneider and Bavelier (2003). Each column pertains to a different condition regarding the cue lead time (see top labels); each row pertains to a different observer (see labels on the right). The ordinate represents proportion of "simultaneous" (S) responses for SJ data and proportion of "reference first" (RF) responses for TOJ data. Other graphical conventions as in analogous figures in the main paper.

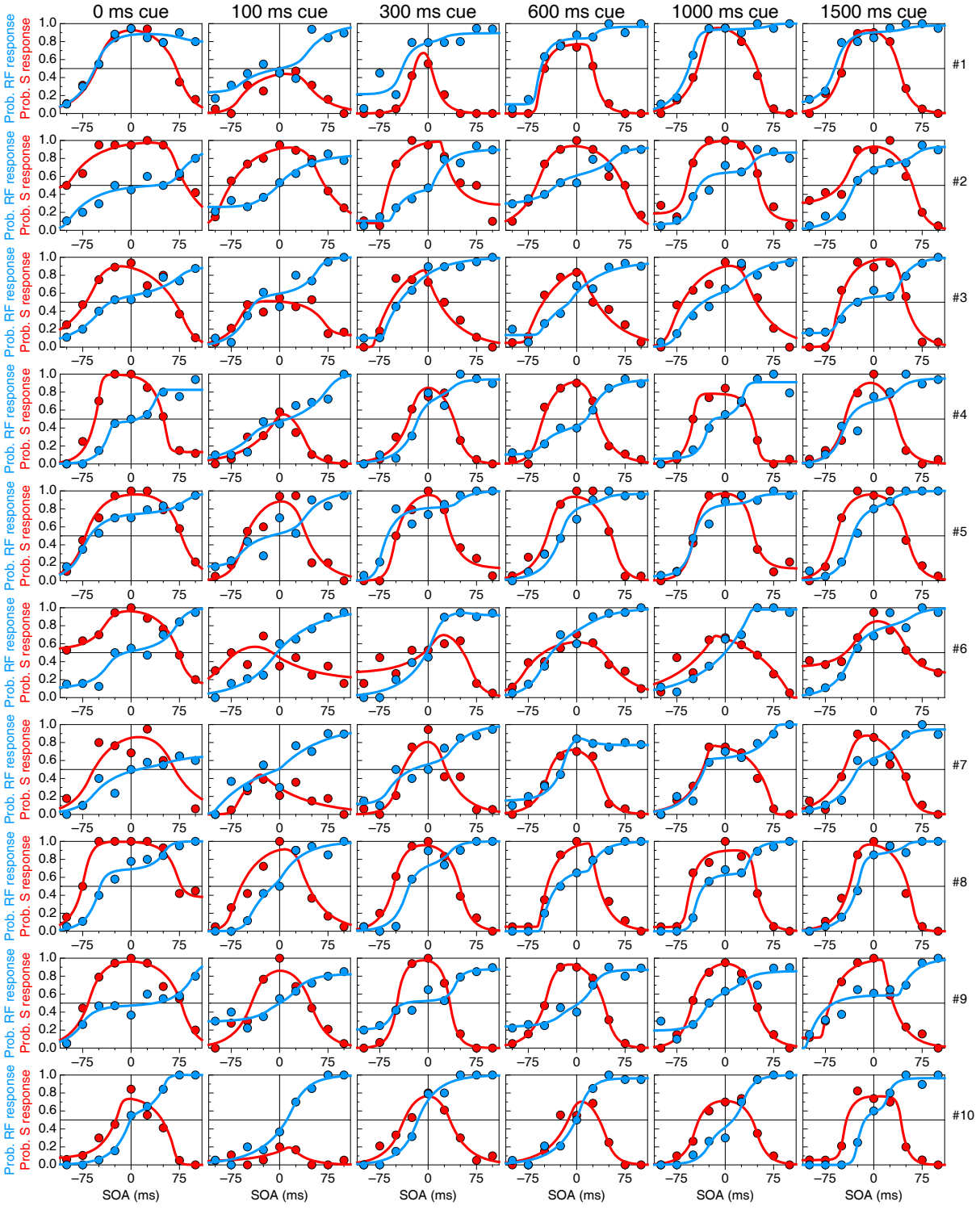

Figure S3. Fitted psychometric functions to SJ and TOJ data from Experiment 3 in Schneider and Bavelier (2003). Each column pertains to a different condition regarding the cue lead time (see top labels); each row pertains to a different observer (see labels on the right). The ordinate represents proportion of “simultaneous” (S) responses for SJ data and proportion of “reference first” (RF) responses for TOJ data. Other graphical conventions as in analogous figures in the main paper.

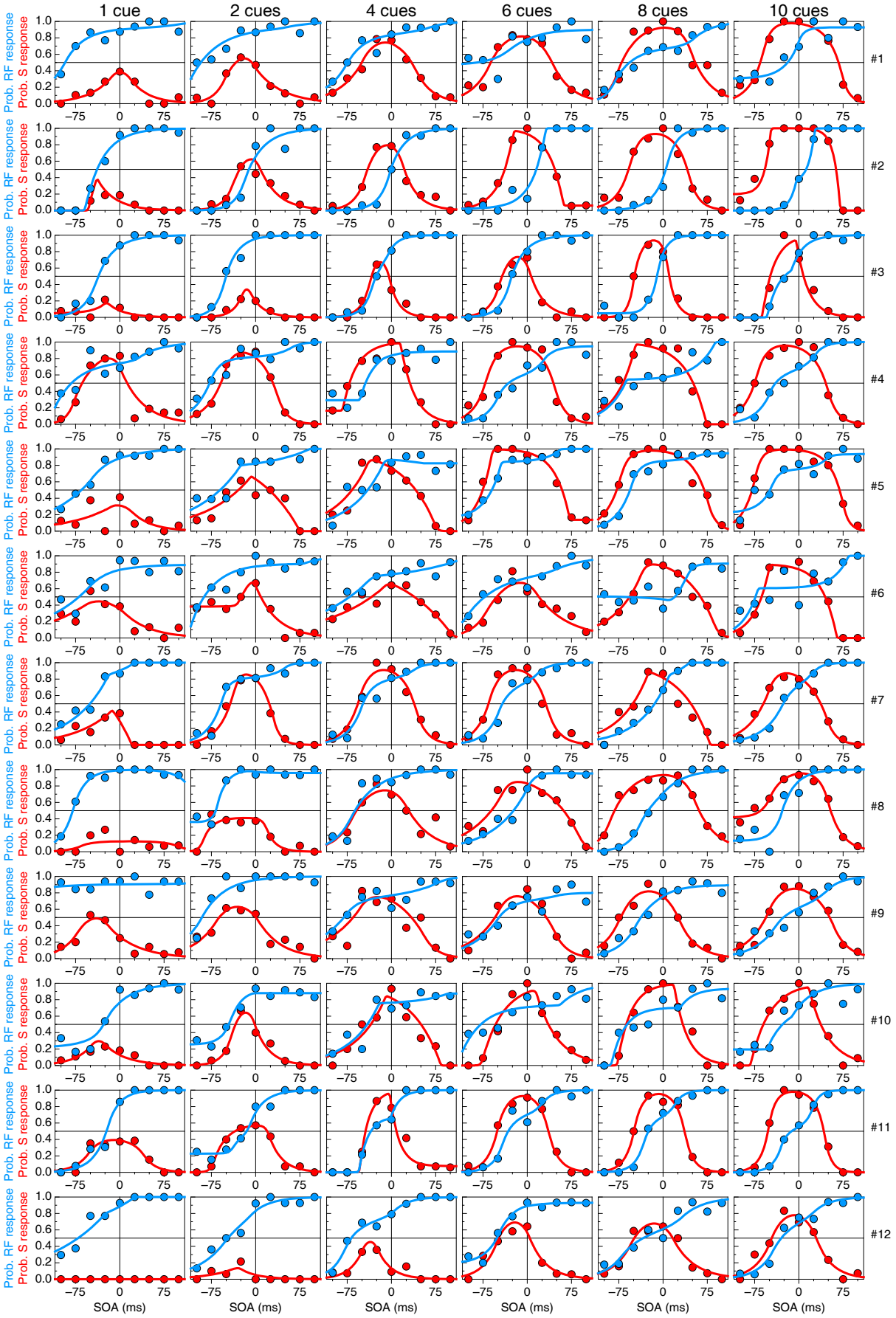

Figure S4. Fitted psychometric functions to SJ and TOJ data from Experiment 4B in Schneider and Bavelier (2003). Each column pertains to a different condition regarding number of cues (see top labels); each row pertains to a different observer (see labels on the right). The ordinate represents proportion of "simultaneous" (S) responses for SJ data and proportion of "reference first" (RF) responses for TOJ data. Other graphical conventions as in analogous figures in the main paper.

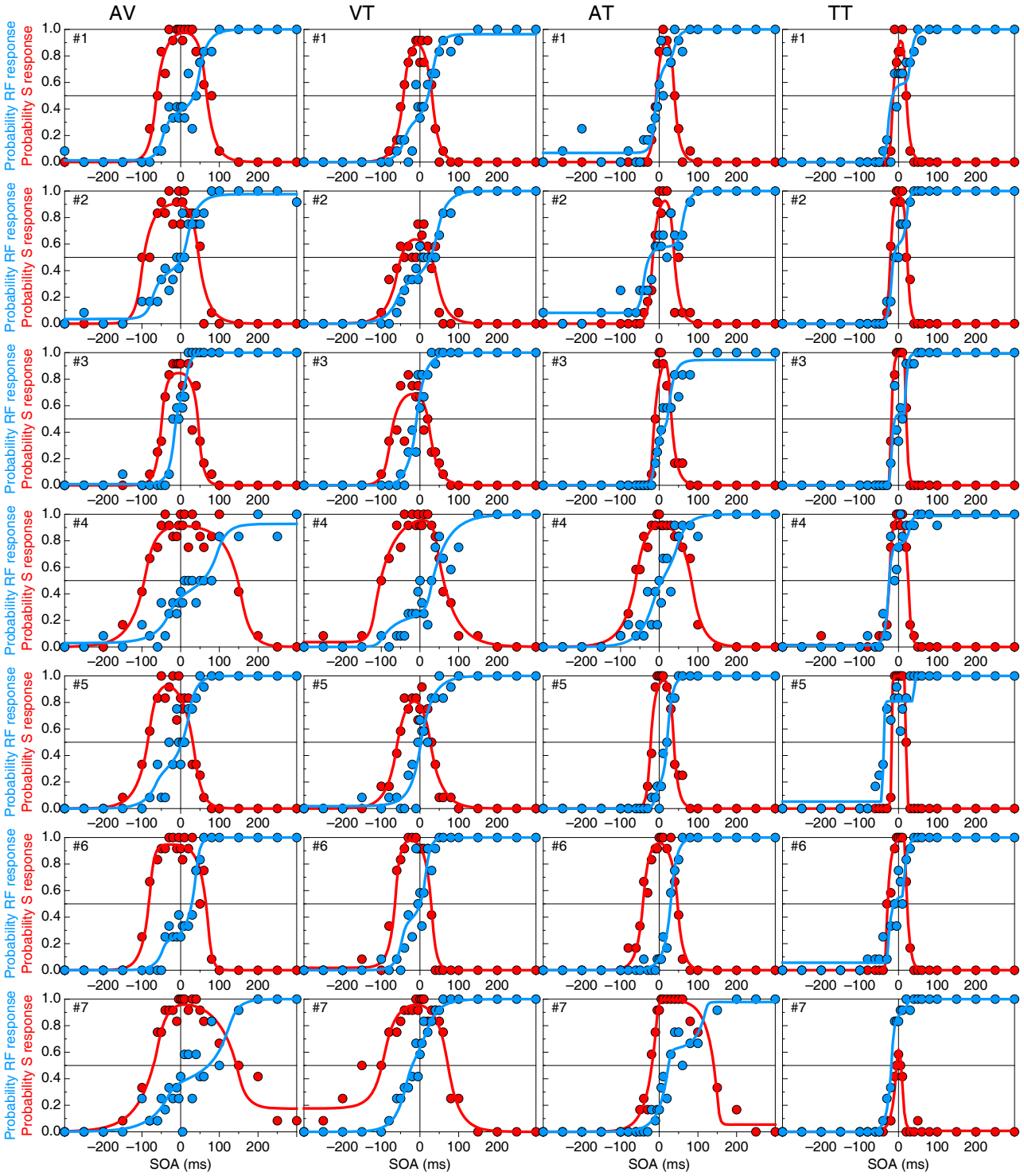

Figure S5. Fitted psychometric functions to SJ and TOJ data from Experiment 4 in Fujisaki and Nishida (2009). Each column pertains to a different cross-modal or uni-modal condition (see top labels; AV: audio-visual; VT: visuo-tactile; AT: autdio-tactile; TT: tactile-tactile); each row pertains to a different observer (see inset label in each panel). The ordinate represents proportion of “simultaneous” (S) responses for SJ data and proportion of “reference first” (RF) responses for TOJ data. Other graphical conventions as in analogous figures in the main paper.

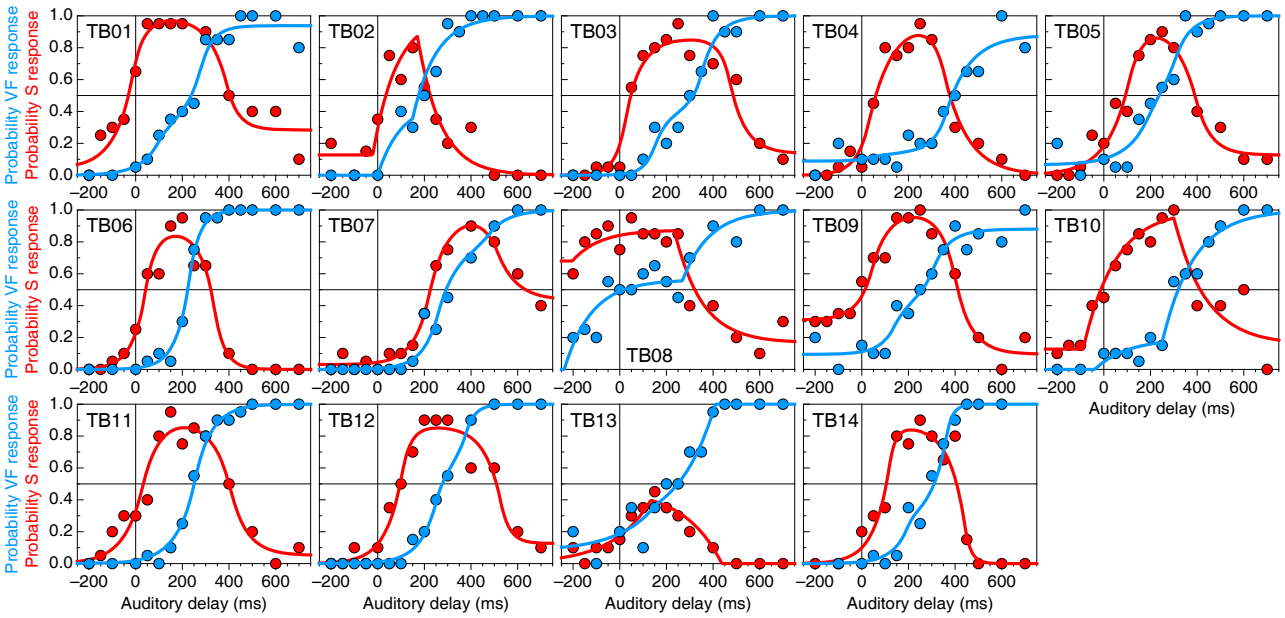

Figure S6. Fitted psychometric functions to SJ and TOJ data in the one-condition experiment Sanders et al. (2011). Each panel pertains to a different observer (see inset label in each panel). The ordinate represents proportion of "simultaneous" (S) responses for SJ data and proportion of "vestibular first" (VF) responses for TOJ data. Other graphical conventions as in analogous figures in the main paper.

Table S1. Layout as in analogous tables in the main paper. Subscripts "t" and "r" for λ denote test and reference stimuli; Subscripts "RF", "S", and "TF" for ε denote "reference first", "simultaneous", and "test first" judgments. Code for conditions: 1: 0 ms cue; 2: 40 ms cue; 3: 75 ms cue; 4: 125 ms cue; 5: 200 ms cue; 6: 500 ms cue; 7: 1000 ms cue.

Obs.	Cond.	$1/\lambda_t$	$1/\lambda_r$	τ	δ_{SJ}	$\varepsilon_{RF\text{-}SJ}$	$\varepsilon_{S\text{-}SJ}$	$\varepsilon_{TF\text{-}SJ}$	δ_{TOJ}	$\varepsilon_{RF\text{-}TOJ}$	ξ	$\varepsilon_{TF\text{-}TOJ}$	G^2	p -value
1	1	38.152	16.879	-14.299	39.646	0.674	0.000	0.000	37.725	0.965	0.724	0.103	13.754	0.131
2	1	41.369	1.070	-10.701	75.114	0.173	0.000	0.000	73.631	0.000	0.591	0.000	16.606	0.084
3	1	4.392	17.127	42.324	63.676	0.797	0.151	0.000	57.785	0.000	0.486	0.000	10.041	0.437
4	1	20.102	18.633	21.531	102.689	0.000	0.000	0.000	73.363	0.000	0.685	0.000	7.838	0.798
5	1	1.892	32.266	63.566	84.350	0.000	0.000	0.000	15.042	0.372	0.144	0.189	14.990	0.132
6	1	1.000	34.785	101.437	122.119	1.000	0.043	0.072	116.537	0.000	0.422	0.000	7.524	0.583
7	1	47.751	1.013	-19.431	67.326	0.000	0.000	0.000	55.576	0.809	0.541	0.056	5.090	0.826
8	1	1.073	36.396	93.726	137.467	0.000	0.000	0.000	92.104	0.000	0.429	0.107	9.368	0.588
9	1	25.642	12.707	-18.650	42.325	0.490	0.000	0.000	53.019	0.586	0.660	0.000	13.109	0.218
1	2	27.363	49.563	62.425	50.159	0.000	0.000	0.000	148.491	0.000	0.934	0.000	10.648	0.559
2	2	2.732	23.034	18.509	22.681	0.461	0.000	0.000	19.934	0.410	0.798	0.000	8.446	0.585
3	2	12.074	2.149	36.856	61.269	0.000	0.565	0.000	12.374	0.552	0.430	0.063	1.756	0.995
4	2	10.845	18.418	41.820	91.079	0.000	0.051	0.000	35.921	0.431	0.735	0.033	11.378	0.251
5	2	37.678	12.562	0.480	20.421	0.554	0.000	0.000	63.417	0.000	0.647	0.064	12.558	0.249
6	2	23.271	35.940	22.686	32.485	0.535	0.000	0.000	85.186	0.000	0.758	0.000	13.770	0.246
7	2	25.393	16.794	-2.222	24.436	0.343	0.000	0.000	4.363	0.752	0.000	0.032	7.476	0.588
8	2	36.895	7.991	22.515	83.996	0.000	0.000	0.000	58.678	0.000	0.436	0.019	14.380	0.213
9	2	112.361	27.463	-20.699	28.327	0.000	0.000	0.000	2.544	0.531	0.000	0.000	12.053	0.360
1	3	67.818	45.581	-4.435	22.590	0.000	0.000	0.000	106.055	0.000	1.000	0.000	18.387	0.104
2	3	121.697	15.588	-1.881	21.540	0.000	0.000	0.000	22.930	0.000	0.462	0.000	8.183	0.771
3	3	22.201	2.054	49.294	3.273	0.000	0.000	0.000	52.194	0.000	0.656	0.027	5.961	0.876
4	3	1.607	31.086	46.815	45.238	0.299	0.278	0.000	9.261	0.769	0.000	0.000	11.974	0.215
5	3	56.001	31.473	2.466	5.288	0.266	0.000	0.000	71.450	0.000	0.753	0.000	11.239	0.423
6	3	1.000	50.499	118.313	27.355	0.000	0.000	0.078	95.582	0.000	0.627	0.000	8.692	0.650
7	3	21.605	12.023	-3.275	4.484	0.132	0.000	0.000	106.714	0.000	0.877	0.000	11.417	0.409
8	3	70.328	23.651	26.147	60.003	0.000	0.000	0.000	71.638	0.000	0.590	0.000	9.046	0.699
9	3	267.332	37.441	28.371	7.894	0.000	0.000	0.000	57.184	0.000	0.610	0.000	15.831	0.199
1	4	53.325	9.554	40.976	8.352	0.000	0.000	0.067	29.137	0.000	1.000	0.052	14.820	0.139
2	4	3.744	40.773	18.876	4.431	0.000	0.000	0.000	85.839	0.000	0.988	0.000	5.420	0.943
3	4	79.162	3.214	11.610	12.862	0.000	0.000	0.000	8.389	0.000	1.000	0.045	6.804	0.815
4	4	24.942	12.614	-1.507	17.349	0.245	0.000	0.000	74.537	0.000	0.929	0.000	2.331	0.997
5	4	64.061	1.351	-46.297	6.250	0.121	0.000	0.000	61.690	0.000	0.790	0.152	8.710	0.560
6	4	9.114	69.427	91.339	16.208	0.000	0.000	0.065	31.158	0.000	1.000	0.000	13.464	0.264
7	4	1.269	26.388	-24.481	0.511	0.000	0.000	0.000	146.251	0.000	0.949	0.000	9.395	0.669
8	4	57.213	1.000	-7.089	23.750	0.000	0.000	0.000	69.831	0.000	0.657	0.074	2.606	0.978
9	4	1.117	59.824	76.411	1.880	0.000	0.000	0.000	112.575	0.000	1.000	0.000	12.352	0.338
1	5	78.074	64.471	43.356	29.679	0.000	0.000	0.000	43.468	0.000	1.000	0.000	6.588	0.884
2	5	50.602	24.007	4.986	6.419	0.000	0.000	0.031	14.929	0.000	1.000	0.000	16.857	0.112
3	5	15.108	31.558	45.669	26.718	0.000	0.000	0.121	5.950	0.160	0.000	0.000	14.412	0.155
4	5	18.340	1.560	4.374	57.324	0.000	0.539	0.000	22.837	0.488	0.719	0.013	10.436	0.316
5	5	19.361	48.534	43.867	32.531	0.000	0.000	0.000	53.755	0.000	0.377	0.000	20.770	0.054
6	5	6.430	26.267	97.536	9.105	0.000	0.000	0.151	26.503	1.000	0.110	0.086	15.392	0.081
7	5	34.680	21.387	-0.333	5.272	0.000	0.000	0.000	82.860	0.000	0.922	0.000	18.993	0.089
8	5	1.502	52.314	56.821	24.424	0.000	0.000	0.000	20.191	0.333	0.943	0.000	9.074	0.615
9	5	28.371	28.975	51.053	3.963	0.000	0.000	0.000	55.699	0.000	0.975	0.000	12.749	0.388
1	6	1.000	15.057	37.190	15.131	0.524	0.000	0.350	19.257	0.712	0.804	0.038	7.407	0.494
2	6	66.660	1.000	-33.479	54.991	0.000	0.000	0.000	37.860	0.000	1.000	0.000	6.824	0.869
3	6	36.466	33.243	-0.212	71.154	0.000	0.000	0.000	29.543	0.000	0.491	0.000	8.672	0.731
4	6	15.162	52.624	40.037	69.428	0.000	0.000	0.000	61.510	0.000	0.913	0.126	9.545	0.572
5	6	24.439	1.000	-30.327	48.688	0.263	0.000	0.000	21.838	0.063	0.543	0.124	13.853	0.128
6	6	59.255	39.545	24.635	91.864	0.292	0.000	0.000	18.920	0.723	0.000	0.000	12.900	0.167
7	6	7.880	49.551	33.174	42.020	0.000	0.000	0.000	93.274	0.000	0.978	0.000	14.272	0.284
8	6	28.018	23.678	-9.591	32.255	0.470	0.000	0.313	58.534	0.334	0.714	0.000	6.946	0.643
9	6	5.604	22.403	-5.857	19.754	0.311	0.000	0.000	129.367	0.000	0.945	0.000	15.597	0.157
1	7	8.430	6.320	-32.156	7.425	0.542	0.000	0.187	130.440	0.000	0.955	0.000	6.233	0.795
2	7	22.894	38.267	19.657	58.433	0.000	0.000	0.000	44.642	0.000	1.000	0.000	15.070	0.238
3	7	17.058	10.978	11.900	60.141	0.000	0.000	0.120	39.156	0.000	0.525	0.000	8.657	0.654
4	7	19.832	12.916	-1.671	77.971	0.000	0.106	0.000	78.773	0.000	0.797	0.087	14.155	0.166
5	7	31.146	29.088	12.283	61.189	0.000	0.000	0.000	62.693	0.000	0.285	0.000	17.508	0.132
6	7	13.945	47.174	-26.038	19.195	0.950	0.000	0.000	84.663	0.393	1.000	1.000	11.878	0.220
7	7	8.456	38.201	29.358	35.254	0.000	0.000	0.000	77.774	0.000	0.949	0.050	12.881	0.301
8	7	65.594	75.967	-0.691	97.408	0.000	0.000	0.000	49.814	0.000	0.941	0.000	2.061	0.999
9	7	45.269	12.860	-14.341	40.691	0.253	0.000	0.000	5.092	0.699	1.000	0.000	9.279	0.506

Table S2. Layout as in analogous tables in the main paper. Subscripts "t" and "r" for λ denote test and reference stimuli; Subscripts "RF", "S", and "TF" for ε denote "reference first", "simultaneous", and "test first" judgments. Code for conditions: 1: 0 ms cue; 2: 100 ms cue; 3: 300 ms cue; 4: 500 ms cue; 5: 1000 ms cue; 6: 1500 ms cue.

Obs.	Cond.	$1/\lambda_t$	$1/\lambda_r$	τ	δ_{SJ}	$\varepsilon_{RF\text{-}SJ}$	$\varepsilon_{S\text{-}SJ}$	$\varepsilon_{TF\text{-}SJ}$	δ_{TOJ}	$\varepsilon_{RF\text{-}TOJ}$	ξ	$\varepsilon_{TF\text{-}TOJ}$	G^2	p -value
1	1	40.764	1.000	-36.385	45.799	0.000	0.000	0.000	65.749	0.000	0.370	0.000	7.833	0.798
2	1	14.112	15.444	-5.907	66.114	0.000	0.000	0.000	60.851	0.190	0.767	0.000	6.697	0.823
3	1	22.599	23.196	8.297	12.737	0.000	0.000	0.000	40.105	0.000	0.225	0.000	19.034	0.088
4	1	26.435	22.345	-2.688	42.032	0.000	0.000	0.000	30.331	0.000	0.034	0.122	10.582	0.479
5	1	13.510	22.912	3.005	50.296	0.000	0.141	0.000	69.129	0.000	0.345	0.000	17.069	0.106
6	1	15.972	34.135	0.741	57.216	0.395	0.000	0.000	59.154	0.000	0.366	0.000	8.573	0.661
7	1	19.768	18.208	-1.962	73.072	0.000	0.000	0.000	67.150	0.000	0.420	0.000	12.809	0.383
8	1	32.263	11.644	-26.132	87.801	0.000	0.000	0.000	80.486	0.000	0.570	0.000	27.344	0.007
9	1	10.956	8.082	-21.829	81.139	0.353	0.000	0.000	52.948	0.087	0.407	0.181	3.500	0.941
1	2	32.003	25.525	-15.193	10.716	0.000	0.000	0.000	28.896	0.000	0.619	0.000	13.538	0.331
2	2	45.215	1.000	-39.394	46.621	0.000	0.000	0.000	38.021	0.000	0.875	0.032	18.783	0.065
3	2	3.678	10.493	-5.751	0.000	0.011	0.000	0.013	54.269	0.027	0.732	0.000	10.648	0.301
4	2	42.479	4.258	-37.807	9.505	0.000	0.000	0.000	41.583	0.000	0.461	0.000	13.987	0.302
5	2	89.698	14.680	-25.128	13.440	0.000	0.000	0.000	66.769	0.000	0.237	0.000	23.212	0.026
6	2	19.393	2.970	-12.181	67.382	0.000	0.490	0.000	24.569	0.000	0.513	0.257	9.256	0.508
7	2	1.000	28.522	25.603	50.529	0.000	0.194	0.000	44.990	0.076	0.529	0.149	15.647	0.075
8	2	36.274	7.335	-15.805	50.248	0.000	0.172	0.000	40.885	0.059	0.265	0.118	3.358	0.948
9	2	25.321	16.289	-5.236	59.800	0.000	0.251	0.000	71.873	0.000	0.215	0.000	13.883	0.240
1	3	31.119	17.255	-6.780	20.141	0.000	0.000	0.049	21.504	0.000	0.604	0.000	6.446	0.842
2	3	13.344	21.365	4.613	45.712	0.054	0.000	0.000	52.549	0.000	0.838	0.000	12.830	0.305
3	3	14.998	42.340	24.013	29.693	0.000	0.000	0.000	16.530	0.000	1.000	0.000	20.423	0.060
4	3	21.456	1.000	-17.374	53.716	0.000	0.540	0.000	39.251	0.000	0.474	0.243	7.545	0.673
5	3	12.089	42.995	23.054	30.209	0.000	0.000	0.000	52.775	0.000	0.618	0.000	9.187	0.687
6	3	14.304	19.676	20.364	51.846	0.000	0.468	0.060	29.007	0.000	0.398	0.000	4.763	0.906
7	3	25.593	8.970	-13.381	49.547	0.000	0.000	0.037	7.426	0.189	1.000	0.147	16.871	0.051
8	3	22.242	3.592	-6.264	51.411	0.000	0.000	0.079	28.490	0.000	0.554	0.090	9.461	0.489
9	3	18.249	6.051	-12.331	55.940	0.000	0.071	0.204	35.151	0.059	0.520	0.052	3.950	0.862
1	4	18.216	26.712	10.478	38.651	0.000	0.311	0.000	38.734	0.000	0.608	0.071	11.750	0.302
2	4	33.242	3.577	-22.277	59.269	0.000	0.146	0.000	52.097	0.000	0.930	0.000	9.893	0.540
3	4	18.502	23.149	-19.086	7.893	0.153	0.000	0.000	30.083	0.000	1.000	0.000	11.987	0.365
4	4	4.597	23.453	27.080	48.195	0.000	0.356	0.000	46.077	0.000	0.448	0.000	7.591	0.749
5	4	14.783	16.910	11.028	35.654	0.000	0.203	0.000	43.408	0.060	0.535	0.060	3.643	0.933
6	4	21.155	9.491	-5.601	49.585	0.000	0.212	0.056	48.980	0.000	0.426	0.000	10.416	0.405
7	4	12.719	24.147	6.265	40.943	0.089	0.000	0.000	12.818	0.122	1.000	0.084	7.132	0.623
8	4	22.179	11.950	-4.496	51.146	0.000	0.000	0.000	46.103	0.000	0.695	0.000	12.229	0.428
9	4	13.624	22.780	14.733	63.151	0.000	0.000	0.000	18.980	0.072	0.933	0.049	19.538	0.034
1	5	3.678	17.472	7.196	44.215	0.027	0.222	0.000	47.556	0.056	0.630	0.000	8.872	0.449
2	5	21.919	1.000	-18.031	56.563	0.000	0.000	0.093	53.533	0.000	0.817	0.000	16.558	0.122
3	5	12.996	1.000	-15.271	38.632	0.042	0.544	0.000	31.769	0.000	0.589	0.000	3.566	0.965
4	5	32.129	24.244	6.044	30.604	0.000	0.000	0.000	1.431	0.000	0.000	0.087	10.111	0.521
5	5	12.244	15.022	7.735	42.514	0.000	0.141	0.000	41.934	0.000	0.509	0.065	7.147	0.712
6	5	1.123	28.429	33.670	52.711	0.000	0.330	0.000	29.554	0.076	0.475	0.000	11.289	0.336
7	5	23.877	21.212	-4.186	50.132	0.000	0.000	0.000	52.947	0.000	0.725	0.053	13.411	0.267
8	5	17.999	4.045	-14.196	55.571	0.000	0.069	0.000	37.508	0.000	0.833	0.069	7.876	0.641
9	5	1.149	19.983	16.685	65.569	0.000	0.025	0.000	37.438	0.000	0.862	0.098	4.693	0.911
1	6	24.223	24.672	-10.051	34.374	0.000	0.000	0.000	31.461	0.000	1.000	0.047	11.361	0.414
2	6	15.440	17.005	0.987	51.887	0.000	0.000	0.000	46.758	0.121	0.878	0.059	15.521	0.114
3	6	22.432	14.635	-10.930	49.891	0.000	0.556	0.000	29.376	0.000	0.408	0.000	12.213	0.348
4	6	27.675	3.903	-13.812	59.809	0.000	0.369	0.000	44.522	0.000	0.408	0.000	9.911	0.538
5	6	16.992	25.497	11.796	33.016	0.000	0.000	0.000	38.055	0.097	0.512	0.000	7.237	0.780
6	6	24.466	31.972	6.521	40.317	0.000	0.000	0.000	6.547	0.000	1.000	0.000	14.362	0.278
7	6	12.660	25.789	14.408	61.042	0.000	0.000	0.000	52.701	0.080	0.514	0.000	6.993	0.800
8	6	15.337	12.158	4.535	50.918	0.073	0.000	0.196	19.144	0.000	1.000	0.143	21.240	0.012
9	6	24.841	22.379	0.306	70.130	0.000	0.000	0.000	23.671	0.000	0.927	0.063	3.323	0.986

Table S3. Layout as in analogous tables in the main paper. Subscripts "t" and "r" for λ denote test and reference stimuli; Subscripts "RF", "S", and "TF" for ε denote "reference first", "simultaneous", and "test first" judgments. Code for conditions: 1: 0 ms cue; 2: 100 ms cue; 3: 300 ms cue; 4: 600 ms cue; 5: 1000 ms cue; 6: 1500 ms cue.

Obs.	Cond.	$1/\lambda_t$	$1/\lambda_r$	τ	δ_{SJ}	$\varepsilon_{RF\text{-}SJ}$	$\varepsilon_{S\text{-}SJ}$	$\varepsilon_{TF\text{-}SJ}$	δ_{TOJ}	$\varepsilon_{RF\text{-}TOJ}$	ξ	$\varepsilon_{TF\text{-}TOJ}$	G^2	p -value
1	1	28.911	19.454	-13.169	62.758	0.000	0.000	0.000	67.420	0.000	0.900	0.209	6.071	0.869
2	1	10.014	39.327	12.856	79.890	0.459	0.000	0.000	84.600	0.000	0.509	0.000	7.232	0.780
3	1	43.570	17.139	-13.893	69.698	0.000	0.000	0.000	62.625	0.000	0.534	0.106	5.642	0.896
4	1	16.217	3.849	-3.948	52.113	0.000	0.000	0.134	36.838	0.000	0.455	0.174	8.317	0.598
5	1	21.497	24.265	-2.324	74.450	0.000	0.000	0.000	77.446	0.000	0.752	0.000	6.746	0.874
6	1	25.463	14.164	-18.971	57.414	0.530	0.000	0.133	53.929	0.099	0.509	0.000	5.686	0.771
7	1	25.655	38.860	1.522	63.680	0.000	0.000	0.000	56.875	0.000	0.547	0.340	27.565	0.004
8	1	17.762	9.354	-1.046	71.750	0.000	0.000	0.378	51.487	0.000	0.680	0.000	9.242	0.600
9	1	25.222	18.486	-9.194	72.175	0.000	0.000	0.000	85.076	0.000	0.470	0.000	9.237	0.683
10	1	23.598	5.218	-25.178	42.749	0.068	0.226	0.000	28.460	0.000	0.525	0.000	5.337	0.868
1	2	14.569	33.937	10.750	53.153	0.000	0.504	0.000	51.549	0.234	0.523	0.000	17.844	0.058
2	2	15.859	42.287	18.316	73.735	0.000	0.000	0.000	15.357	0.258	0.455	0.150	2.554	0.990
3	2	25.039	11.713	-6.244	64.910	0.000	0.476	0.130	53.473	0.000	0.573	0.000	10.119	0.430
4	2	42.952	15.111	-17.240	23.276	0.000	0.000	0.000	59.049	0.000	0.404	0.000	11.446	0.491
5	2	15.269	29.083	12.437	47.509	0.000	0.000	0.000	50.061	0.154	0.542	0.000	24.117	0.012
6	2	43.365	58.985	49.206	38.162	0.000	0.000	0.187	37.187	0.000	0.010	0.000	11.629	0.392
7	2	6.811	66.034	46.389	21.287	0.000	0.000	0.000	51.801	0.000	0.622	0.000	16.583	0.166
8	2	10.046	33.623	21.281	52.885	0.000	0.000	0.000	25.750	0.000	0.645	0.000	17.124	0.145
9	2	25.197	21.936	-4.061	46.476	0.000	0.000	0.000	21.950	0.293	0.465	0.175	13.592	0.192
10	2	40.876	23.288	-16.784	6.456	0.036	0.000	0.000	4.228	0.000	0.000	0.000	15.819	0.148
1	3	12.213	15.122	9.217	15.367	0.000	0.000	0.000	32.364	0.213	0.802	0.106	16.181	0.095
2	3	1.000	21.246	26.324	47.330	0.079	0.000	0.276	31.495	0.105	0.473	0.102	14.687	0.066
3	3	1.781	39.779	43.721	40.359	0.000	0.000	0.000	25.934	0.102	0.915	0.000	9.209	0.603
4	3	24.400	13.535	-10.664	35.580	0.000	0.000	0.000	27.927	0.000	0.707	0.059	13.641	0.254
5	3	8.704	18.765	13.912	41.423	0.000	0.000	0.136	60.047	0.000	0.819	0.000	14.459	0.209
6	3	37.006	15.796	-39.206	28.903	0.271	0.000	0.000	29.530	0.000	1.000	0.085	12.574	0.249
7	3	13.277	29.433	13.772	35.046	0.000	0.000	0.000	48.498	0.112	0.588	0.000	18.056	0.080
8	3	18.247	14.341	0.233	51.635	0.000	0.000	0.000	34.114	0.000	0.733	0.000	15.459	0.217
9	3	10.953	11.032	7.336	41.073	0.000	0.000	0.000	49.257	0.206	0.522	0.123	4.662	0.913
10	3	23.784	27.555	3.499	37.226	0.000	0.000	0.000	14.394	0.000	1.000	0.000	13.748	0.317
1	4	3.050	12.968	18.994	41.913	0.000	0.225	0.000	44.363	0.103	0.838	0.034	7.504	0.585
2	4	30.162	18.452	-11.721	67.454	0.000	0.000	0.000	45.258	0.282	0.598	0.077	8.430	0.587
3	4	3.561	43.533	33.324	43.163	0.049	0.000	0.000	23.257	0.135	0.652	0.044	7.396	0.596
4	4	12.213	23.403	15.804	43.133	0.000	0.000	0.000	38.307	0.103	0.413	0.061	7.501	0.678
5	4	23.319	13.386	-9.838	50.192	0.000	0.000	0.000	33.182	0.000	0.834	0.034	20.450	0.040
6	4	22.318	39.556	18.095	66.192	0.000	0.301	0.000	37.681	0.000	0.852	0.000	6.954	0.803
7	4	19.295	15.147	2.585	42.007	0.000	0.213	0.000	16.335	0.151	1.000	0.228	3.968	0.914
8	4	1.099	20.251	17.891	40.116	0.049	0.000	0.000	37.278	0.000	0.687	0.000	6.031	0.871
9	4	22.114	12.653	-1.560	46.042	0.000	0.000	0.000	25.189	0.236	0.401	0.129	2.984	0.982
10	4	32.024	13.360	-19.275	27.581	0.000	0.000	0.000	11.662	0.000	0.906	0.036	17.310	0.099
1	5	23.265	7.438	-12.805	46.896	0.000	0.000	0.000	61.673	0.000	0.933	0.000	7.273	0.839
2	5	9.941	12.531	4.138	54.518	0.186	0.000	0.102	45.978	0.068	0.644	0.134	10.588	0.226
3	5	10.510	39.179	25.919	58.255	0.000	0.000	0.000	48.666	0.000	0.697	0.000	18.608	0.098
4	5	12.547	4.335	-1.589	49.325	0.000	0.216	0.027	28.462	0.057	0.505	0.091	11.939	0.154
5	5	12.979	13.352	3.088	45.761	0.000	0.000	0.135	46.853	0.047	0.851	0.031	10.170	0.337
6	5	61.616	1.139	-42.663	60.007	0.000	0.194	0.000	2.700	0.000	1.000	0.019	11.316	0.334
7	5	27.857	2.522	-24.666	50.225	0.000	0.207	0.000	53.775	0.000	0.609	0.000	8.657	0.654
8	5	5.438	14.050	7.540	51.726	0.047	0.096	0.000	42.142	0.000	0.639	0.000	8.419	0.588
9	5	15.802	19.658	3.975	49.273	0.000	0.000	0.000	30.165	0.194	0.648	0.144	8.246	0.605
10	5	16.297	14.933	-1.401	47.913	0.000	0.253	0.000	26.772	0.000	0.397	0.000	6.654	0.826
1	6	19.132	15.231	3.045	44.988	0.000	0.000	0.000	55.199	0.098	0.908	0.021	9.608	0.476
2	6	24.439	14.900	-15.565	50.183	0.286	0.000	0.000	48.792	0.000	0.707	0.068	11.074	0.352
3	6	6.486	20.001	9.600	51.434	0.000	0.000	0.000	48.055	0.157	0.576	0.000	7.709	0.739
4	6	17.477	16.891	4.644	40.065	0.000	0.000	0.000	43.412	0.000	0.701	0.048	23.079	0.017
5	6	17.855	16.495	2.713	55.030	0.000	0.000	0.000	33.014	0.000	0.833	0.000	18.459	0.102
6	6	26.018	21.202	-11.603	36.336	0.337	0.000	0.264	47.733	0.000	0.787	0.000	10.551	0.394
7	6	31.266	12.182	-8.968	45.643	0.000	0.000	0.000	38.658	0.000	0.580	0.054	12.885	0.301
8	6	20.050	7.382	-15.228	45.678	0.000	0.000	0.000	36.241	0.000	0.851	0.000	10.138	0.604
9	6	1.077	23.371	32.258	47.558	0.116	0.000	0.000	72.395	0.000	0.589	0.000	9.451	0.580
10	6	4.893	10.289	3.385	44.950	0.054	0.236	0.000	23.063	0.000	0.619	0.035	7.602	0.575

Table S4. Layout as in analogous tables in the main paper. Subscripts "t" and "r" for λ denote test and reference stimuli; Subscripts "RF", "S", and "TF" for ε denote "reference first", "simultaneous", and "test first" judgments. Code for conditions: 1: 1 cue; 2: 2 cues; 3: 4 cues; 4: 6 cues; 5: 8 cues; 6: 10 cues.

Obs.	Cond.	$1/\lambda_t$	$1/\lambda_r$	τ	δ_{SJ}	$\varepsilon_{RF\text{-}SJ}$	$\varepsilon_{S\text{-}SJ}$	$\varepsilon_{TF\text{-}SJ}$	δ_{TOJ}	$\varepsilon_{RF\text{-}TOJ}$	ξ	$\varepsilon_{TF\text{-}TOJ}$	G^2	p-value
1	1	37.536	30.687	-2.036	16.420	0.000	0.000	0.000	94.568	0.000	0.917	0.000	15.826	0.199
2	1	1.027	30.374	45.281	7.510	0.000	0.000	0.000	13.365	0.000	1.000	0.000	8.944	0.708
3	1	20.393	27.894	22.604	3.880	0.049	0.000	0.000	18.021	0.000	1.000	0.000	12.178	0.350
4	1	12.754	37.697	38.636	40.577	0.000	0.000	0.000	72.091	0.000	0.768	0.000	17.976	0.116
5	1	72.638	32.479	-3.511	19.752	0.000	0.000	0.000	48.437	0.000	0.940	0.000	18.244	0.109
6	1	80.161	43.167	25.412	36.305	0.000	0.000	0.000	27.318	0.000	1.000	0.106	18.495	0.071
7	1	60.429	1.000	-2.821	16.630	0.000	0.000	0.000	22.129	0.000	0.723	0.000	3.383	0.992
8	1	21.210	19.498	-17.290	83.728	0.000	0.872	0.000	96.085	0.000	1.000	0.329	12.307	0.265
9	1	28.011	47.830	46.829	25.528	0.000	0.000	0.000	198.678	0.000	0.906	0.000	10.331	0.587
10	1	28.767	35.917	37.017	11.332	0.000	0.000	0.000	10.487	0.220	0.000	0.000	10.422	0.493
11	1	22.784	18.820	5.183	47.294	0.000	0.561	0.000	15.393	0.000	1.000	0.000	10.514	0.485
12	1	98.974	1.092	0.002	62.496	0.000	1.000	0.000	24.999	0.000	0.505	0.000	3.066	0.990
1	2	18.022	44.183	29.524	24.905	0.000	0.000	0.000	82.820	0.000	0.924	0.000	13.716	0.319
2	2	16.617	30.564	14.876	22.993	0.000	0.000	0.000	4.461	0.000	1.000	0.000	14.413	0.275
3	2	15.137	20.992	16.061	7.474	0.000	0.000	0.000	37.487	0.000	1.000	0.000	6.009	0.916
4	2	28.914	15.135	7.557	45.008	0.000	0.000	0.000	68.851	0.000	0.807	0.000	10.211	0.597
5	2	75.275	1.000	-32.811	41.363	0.000	0.000	0.000	58.604	0.000	0.750	0.000	12.753	0.387
6	2	4.575	35.695	13.880	13.993	0.384	0.000	0.000	97.970	0.000	0.904	0.000	12.533	0.325
7	2	23.855	11.007	3.031	33.833	0.000	0.000	0.000	53.328	0.000	0.809	0.000	7.962	0.788
8	2	7.140	15.282	35.509	53.954	0.000	0.586	0.000	29.499	0.362	1.000	0.042	11.316	0.255
9	2	38.902	37.771	30.260	38.105	0.000	0.000	0.000	60.347	0.000	1.000	0.000	19.129	0.086
10	2	14.643	24.111	21.582	19.944	0.000	0.000	0.000	22.021	0.255	0.999	0.121	4.720	0.909
11	2	6.108	21.919	24.320	46.947	0.000	0.411	0.000	14.553	0.228	0.541	0.000	5.186	0.878
12	2	45.827	29.325	30.171	5.513	0.000	0.000	0.000	23.563	0.000	0.570	0.000	10.853	0.542
1	3	38.985	27.378	2.951	45.113	0.000	0.000	0.000	71.294	0.000	0.843	0.000	5.246	0.949
2	3	17.273	23.588	12.270	32.342	0.000	0.000	0.000	7.839	0.000	0.000	0.000	9.227	0.683
3	3	14.729	15.253	19.289	16.677	0.000	0.000	0.000	14.449	0.000	0.662	0.000	5.311	0.947
4	3	1.033	23.575	33.058	49.321	0.165	0.000	0.000	19.664	0.291	0.912	0.114	11.221	0.261
5	3	53.939	4.060	-17.250	57.465	0.000	0.000	0.000	31.411	0.000	0.894	0.175	13.381	0.269
6	3	97.496	6.905	-44.658	55.305	0.000	0.000	0.000	82.188	0.000	0.698	0.000	4.687	0.968
7	3	22.607	17.263	6.394	48.093	0.000	0.000	0.000	44.578	0.000	0.797	0.000	11.823	0.460
8	3	27.823	40.852	20.710	47.184	0.000	0.000	0.000	48.503	0.000	1.000	0.000	17.244	0.141
9	3	57.580	21.148	-1.967	54.538	0.000	0.000	0.000	78.027	0.000	0.724	0.000	17.351	0.137
10	3	49.204	1.243	-36.501	46.587	0.000	0.000	0.000	58.297	0.000	0.746	0.125	16.277	0.131
11	3	1.083	15.517	27.725	25.831	0.000	0.000	0.075	26.976	0.000	0.676	0.000	5.066	0.829
12	3	21.154	23.391	36.539	13.443	0.000	0.000	0.000	43.804	0.000	0.721	0.000	6.182	0.907
1	4	30.613	31.827	10.467	53.165	0.000	0.000	0.000	20.339	0.470	0.819	0.100	12.529	0.251
2	4	23.898	1.000	-18.835	42.107	0.000	0.000	0.059	12.122	0.020	0.000	0.000	8.644	0.471
3	4	16.355	23.590	21.124	26.537	0.000	0.000	0.000	9.076	0.000	1.000	0.000	11.269	0.506
4	4	21.673	17.459	10.994	57.808	0.000	0.000	0.000	39.013	0.000	0.578	0.051	14.327	0.215
5	4	24.675	2.278	-4.799	65.559	0.000	0.000	0.138	50.449	0.145	0.841	0.000	2.286	0.994
6	4	24.432	52.185	27.640	42.632	0.000	0.000	0.000	75.772	0.000	0.799	0.000	10.893	0.538
7	4	21.987	18.361	15.243	48.937	0.000	0.000	0.000	32.983	0.000	0.730	0.000	9.994	0.617
8	4	54.537	13.269	-23.575	64.093	0.000	0.000	0.000	22.138	0.000	1.000	0.046	10.620	0.476
9	4	45.557	20.881	-0.435	47.156	0.000	0.000	0.000	50.127	0.000	0.692	0.199	13.253	0.277
10	4	3.009	35.702	29.371	46.229	0.000	0.000	0.000	87.207	0.000	0.736	0.000	13.164	0.357
11	4	16.530	16.641	7.710	43.669	0.000	0.000	0.000	33.741	0.000	0.699	0.000	10.958	0.533
12	4	23.080	27.263	23.668	29.522	0.000	0.000	0.000	24.583	0.186	0.991	0.069	6.719	0.752
1	5	17.326	31.487	15.527	62.916	0.000	0.000	0.000	68.288	0.000	0.689	0.000	10.762	0.549
2	5	21.280	15.662	5.579	49.883	0.000	0.000	0.000	13.365	0.000	0.000	0.000	12.786	0.385
3	5	8.780	12.725	21.198	29.651	0.000	0.000	0.000	10.950	0.050	0.179	0.000	8.581	0.661
4	5	33.107	1.000	-12.905	60.144	0.000	0.000	0.000	75.344	0.000	0.539	0.000	11.014	0.528
5	5	24.818	13.078	-2.259	74.365	0.000	0.000	0.000	55.663	0.000	0.851	0.052	6.047	0.870
6	5	45.655	9.363	-24.941	61.878	0.000	0.000	0.000	15.843	0.509	0.000	0.096	4.744	0.908
7	5	47.529	1.000	-27.083	52.112	0.000	0.000	0.000	17.117	0.000	0.712	0.000	12.432	0.412
8	5	19.712	33.717	18.246	71.983	0.000	0.000	0.000	22.858	0.000	0.802	0.000	6.091	0.911
9	5	30.117	28.388	22.315	49.845	0.000	0.000	0.000	22.832	0.000	0.773	0.105	6.189	0.861
10	5	1.332	22.201	28.376	48.179	0.000	0.000	0.000	58.638	0.000	0.706	0.064	15.039	0.181
11	5	14.783	13.481	5.829	43.005	0.000	0.000	0.000	27.076	0.000	0.669	0.000	5.987	0.917
12	5	29.508	35.711	18.771	36.903	0.000	0.000	0.000	52.149	0.000	0.597	0.000	10.569	0.566
1	6	22.615	11.935	-7.081	66.494	0.000	0.000	0.000	8.229	0.305	1.000	0.071	15.717	0.108
2	6	10.832	1.000	-10.753	58.976	0.197	0.000	0.000	15.756	0.000	0.338	0.000	2.418	0.996
3	6	1.000	20.038	32.651	28.887	0.000	0.000	0.000	20.637	0.000	0.649	0.000	13.304	0.347
4	6	23.388	14.988	10.127	60.493	0.000	0.000	0.000	38.612	0.000	0.619	0.000	10.195	0.599
5	6	20.372	9.984	-0.925	74.290	0.000	0.000	0.000	44.990	0.221	0.743	0.063	12.284	0.267
6	6	24.781	1.000	-6.878	56.886	0.000	0.099	0.000	76.737	0.000	0.605	0.000	12.625	0.180
7	6	34.050	14.379	0.842	49.670	0.000	0.000	0.000	25.593	0.000	0.629	0.000	2.665	0.998
8	6	14.811	22.130	-0.240	49.894	0.416	0.000	0.000	29.131	0.133	1.000	0.000	15.668	0.110
9	6	34.926	23.296	-3.954	55.173	0.000	0.000	0.000	44.968	0.000	0.599	0.000	9.024	0.701
10	6	1.000	31.918	31.925	49.454	0.000	0.000	0.000	21.166	0.196	0.736	0.000	17.707	0.060
11	6	13.971	10.616	3.140	47.348	0.000	0.000	0.000	27.531	0.000	0.521	0.000	5.110	0.954
12	6	25.423	26.418	8.736	39.145	0.000	0.000	0.000	34.520	0.000	0.697	0.000	10.104	0.607

Table S5. Layout as in analogous tables in the main paper. Subscripts "t" and "r" for λ denote test and reference stimuli; Subscripts "RF", "S", and "TF" for ε denote "reference first", "simultaneous", and "test first" judgments. Code for conditions: 1: audio-visual; 2: visuo-tactile; 3: audio-tactile; 4: tactile-tactile.

Obs.	Cond.	$1/\lambda_t$	$1/\lambda_r$	τ	δ_{SJ}	$\varepsilon_{RF\text{-}SJ}$	$\varepsilon_{S\text{-}SJ}$	$\varepsilon_{TF\text{-}SJ}$	δ_{TOJ}	$\varepsilon_{RF\text{-}TOJ}$	ξ	$\varepsilon_{TF\text{-}TOJ}$	G^2	p -value
1	1	14.658	20.340	0.705	64.967	0.000	0.000	0.000	47.332	0.013	0.397	0.000	31.971	0.954
2	1	14.646	23.340	29.213	73.254	0.000	0.078	0.000	45.153	0.035	0.414	0.023	49.287	0.306
3	1	12.631	10.607	0.866	48.745	0.000	0.141	0.000	15.953	0.010	0.645	0.000	32.137	0.940
4	1	36.415	22.358	-34.858	123.903	0.000	0.075	0.000	61.474	0.029	0.393	0.073	44.188	0.506
5	1	28.221	17.238	20.874	58.492	0.000	0.000	0.000	43.186	0.000	0.263	0.000	39.624	0.800
6	1	18.568	8.731	2.558	74.828	0.000	0.049	0.000	43.267	0.000	0.224	0.000	28.752	0.983
7	1	46.552	21.070	-46.986	103.219	0.000	0.000	0.175	79.595	0.000	0.368	0.000	56.767	0.156
1	2	18.801	15.348	3.920	37.248	0.000	0.000	0.000	36.010	0.000	0.296	0.036	33.965	0.923
2	2	26.190	21.691	6.749	51.932	0.000	0.282	0.000	52.434	0.000	0.326	0.000	29.529	0.978
3	2	14.175	19.825	26.875	51.857	0.000	0.277	0.000	17.083	0.000	0.120	0.000	32.048	0.953
4	2	11.935	40.345	36.939	81.164	0.036	0.000	0.000	62.707	0.000	0.246	0.000	41.624	0.694
5	2	24.700	27.954	17.097	43.424	0.000	0.000	0.000	18.176	0.019	0.001	0.000	41.620	0.694
6	2	14.654	9.771	14.856	46.670	0.019	0.000	0.000	31.365	0.000	0.374	0.000	51.989	0.286
7	2	25.568	28.089	10.947	82.036	0.176	0.000	0.000	28.379	0.000	0.620	0.000	30.516	0.970
1	3	8.233	12.344	-13.489	24.001	0.000	0.000	0.000	25.055	0.070	0.766	0.000	43.011	0.639
2	3	8.263	13.188	-8.357	28.075	0.000	0.000	0.000	50.790	0.082	0.582	0.000	44.511	0.576
3	3	4.480	13.079	-4.723	22.223	0.000	0.000	0.000	19.690	0.000	0.462	0.055	36.218	0.873
4	3	31.675	24.276	-14.892	72.338	0.000	0.000	0.000	32.726	0.000	0.498	0.000	34.607	0.927
5	3	6.895	10.788	-5.505	29.878	0.000	0.000	0.000	14.952	0.000	0.215	0.000	25.731	0.997
6	3	15.273	12.961	-3.940	44.777	0.000	0.000	0.000	26.987	0.000	0.016	0.000	26.875	0.994
7	3	24.098	4.414	-73.074	79.355	0.000	0.000	0.054	47.751	0.000	0.617	0.022	32.086	0.940
1	4	4.647	9.138	-0.488	17.086	0.000	0.000	0.000	29.230	0.000	0.593	0.000	40.861	0.758
2	4	6.356	6.264	-1.020	21.802	0.000	0.000	0.000	19.869	0.000	0.605	0.000	15.918	1.000
3	4	0.500	4.647	2.124	19.380	0.000	0.000	0.000	18.880	0.000	0.540	0.008	16.145	1.000
4	4	7.765	6.020	-1.700	24.465	0.015	0.000	0.000	27.160	0.013	0.779	0.013	40.403	0.667
5	4	0.500	1.728	0.349	19.321	0.000	0.000	0.000	39.844	0.053	0.809	0.000	29.817	0.976
6	4	1.081	8.196	7.817	25.179	0.000	0.000	0.000	20.539	0.056	0.559	0.000	25.935	0.995
7	4	10.702	5.362	-2.879	7.738	0.000	0.000	0.007	19.576	0.000	0.876	0.000	14.962	1.000

Table S6. Layout as in analogous tables in the main paper. Subscripts "t" and "r" forλ denote test and reference stimuli; Subscripts "RF", "S", and "TF" for ε denote "reference first", "simultaneous", and "test first" judgments

Obs.	$1/\lambda_t$	$1/\lambda_r$	τ	δ_{SJ}	$\varepsilon_{RF\text{-}SJ}$	$\varepsilon_{S\text{-}SJ}$	$\varepsilon_{TF\text{-}SJ}$	δ_{TOJ}	$\varepsilon_{RF\text{-}TOJ}$	ξ	$\varepsilon_{TF\text{-}TOJ}$	G^2	p -value
1	76.105	48.076	-189.928	202.074	0.041	0.000	0.284	91.847	0.000	0.281	0.062	30.112	0.068
2	0.500	99.762	-75.095	95.622	0.127	0.000	0.000	74.858	0.000	0.456	0.000	32.283	0.055
3	41.608	64.879	-248.237	225.301	0.000	0.140	0.135	102.838	0.000	0.426	0.000	27.683	0.186
4	53.099	100.727	-193.564	161.143	0.000	0.000	0.000	169.668	0.088	0.144	0.119	30.975	0.097
5	92.148	61.614	-250.874	144.859	0.000	0.000	0.126	58.973	0.065	0.405	0.000	31.807	0.081
6	55.081	42.149	-189.984	147.597	0.000	0.123	0.000	40.276	0.000	0.000	0.000	14.143	0.923
7	64.403	79.001	-367.532	147.459	0.030	0.000	0.434	108.545	0.000	0.770	0.000	18.375	0.684
8	1.192	116.855	-16.351	218.952	0.679	0.125	0.166	252.985	0.000	0.562	0.000	25.777	0.215
9	59.223	66.704	-222.532	177.467	0.309	0.000	0.095	83.840	0.094	0.437	0.120	30.770	0.058
10	0.500	135.852	-106.196	194.468	0.127	0.000	0.155	143.971	0.000	0.192	0.000	32.121	0.075
11	77.991	68.862	-219.334	188.951	0.000	0.079	0.051	36.367	0.000	0.000	0.000	23.130	0.394
12	68.816	37.299	-315.791	211.812	0.000	0.135	0.126	65.144	0.000	0.525	0.000	17.582	0.731
13	160.636	1.271	-283.965	152.416	0.000	0.532	0.000	124.668	0.078	0.210	0.000	19.596	0.608
14	65.370	25.273	-280.431	161.131	0.000	0.137	0.000	82.101	0.000	0.264	0.000	19.267	0.568