Supplementary materials

	LOW PROBABILITY	MEDIUM PROBABILITY	HIGH PROBABILITY
HIT RATE	M = 0.52, SD = 0.21	M = 0.62, SD = 0.18	M = 0.73, SD = 0.17
FALSE ALARM	M = 0.12, SD = 0.09	M = 0.17, SD = 0.12	M = 0.29, SD = 0.18

Supplementary Table 1. Descriptive statistics for Hit Rate (HR) and False Alarms (FA) across cue probabilities

To assess how cue probability influenced detection performance, we computed, for each participant, *hit rate* (HR) defined as the proportion of correct responses on target-present trials, and *false alarm rate* (FA), the proportion of "yes" responses on target-absent trials. Both measures were submitted to within-subjects repeated-measures ANOVAs with Cue probability (three levels: low, medium, high) as a factor. The analysis revealed a robust main effect of cue probability on HR, $F_{2,158} = 74.52$, $p < .001$, indicating that participants' detection report increased as cue probability increased. Post-hoc comparisons confirmed that HR was significantly higher for medium cues (M = 0.62, SD = 0.18) than for low cues (M = 0.52, SD = 0.21), and further increased for high cues (M = 0.73, SD = 0.17, all p < 0.01). A similar pattern emerged for false alarms, with a significant main effect of cue ($F_{2,158} = 65.63$, $p < 0.01$). FA rates increased from low (M = 0.12, SD = 0.09) to medium (M = 0.17, SD = 0.12) and high cue probabilities (M = 0.29, SD = 0.18, all p < 0.01), indicating that participants adopted a progressively more liberal response criterion as the likelihood of target presence increased.

HEMISPHERE * LINE * CUE * CRITERION SHIFT ~ BW ALPHA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMI	9.877×10^{-4}	1	9.877×10^{-4}	0.017	0.896	2.207×10^{-4}
HEMI ✻ CRITERION SHIFT	0.184	1	0.184	3.217	0.077	0.040
Residuals	4.474	78	0.057			
LINE	0.291[a]	3[a]	0.097[a]	1.830[a]	0.142[a]	0.023
LINE ✻ CRITERION SHIFT	0.149[a]	3[a]	0.050[a]	0.938[a]	0.423[a]	0.012
Residuals	12.392	234	0.053			
CUE	0.047	2	0.024	3.330	0.038	0.041
CUE ✻ CRITERION SHIFT	0.016	2	0.008	1.109	0.333	0.014
Residuals	1.102	156	0.007			
HEMI ✻ LINE	0.277[a]	3[a]	0.092[a]	6.195[a]	< .001[a]	0.074
HEMI ✻ LINE ✻ CRITERION SHIFT	0.031[a]	3[a]	0.010[a]	0.685[a]	0.562[a]	0.009
Residuals	3.489	234	0.015			
HEMI ✻ CUE	0.014	2	0.007	2.653	0.074	0.033
HEMI ✻ CUE ✻ CRITERION SHIFT	0.025	2	0.013	4.946	0.008	0.060
Residuals	0.401	156	0.003			
LINE ✻ CUE	0.002[a]	6[a]	3.057×10^{-4}[a]	0.249[a]	0.960[a]	0.003
LINE ✻ CUE ✻ CRITERION SHIFT	0.004[a]	6[a]	7.053×10^{-4}[a]	0.575[a]	0.750[a]	0.007
Residuals	0.574	468	0.001			
HEMI ✻ LINE ✻ CUE	0.002[a]	6[a]	2.522×10^{-4}[a]	0.323[a]	0.925[a]	0.004
HEMI ✻ LINE ✻ CUE ✻ CRITERION SHIFT	4.374×10^{-4}[a]	6[a]	7.290×10^{-5}[a]	0.093[a]	0.997[a]	0.001
Residuals	0.366	468	7.813×10^{-4}			

Supplementary Table 2.

HEMISPHERE * LINE * CUE * CRITERION SHIFT ~ FW ALPHA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.227	1	0.227	2.831	0.096	0.035
HEMISPHERE ✻ CRITERION SHIFT	0.003	1	0.003	0.032	0.859	4.081×10^{-4}
Residuals	6.267	78	0.080			
LINE	0.927[a]	3[a]	0.309[a]	5.121[a]	0.002[a]	0.062
LINE ✻ CRITERION SHIFT	0.034[a]	3[a]	0.011[a]	0.190[a]	0.903[a]	0.002
Residuals	14.112	234	0.060			
CUE	0.030	2	0.015	1.999	0.139	0.025
CUE ✻ CRITERION SHIFT	0.040	2	0.020	2.666	0.073	0.033
Residuals	1.168	156	0.007			
HEMISPHERE ✻ LINE	0.382[a]	3[a]	0.127[a]	11.442[a]	< .001[a]	0.128
HEMISPHERE ✻ LINE ✻ CRITERION SHIFT	0.057[a]	3[a]	0.019[a]	1.698[a]	0.168[a]	0.021
Residuals	2.606	234	0.011			
HEMISPHERE ✻ CUE	0.006	2	0.003	1.091	0.339	0.014
HEMISPHERE ✻ CUE ✻ CRITERION SHIFT	0.004	2	0.002	0.784	0.458	0.010
Residuals	0.436	156	0.003			
LINE ✻ CUE	0.007[a]	6[a]	0.001[a]	0.973[a]	0.443[a]	0.012
LINE ✻ CUE ✻ CRITERION SHIFT	0.003[a]	6[a]	4.638×10^{-4}[a]	0.364[a]	0.901[a]	0.005
Residuals	0.596	468	0.001			
HEMISPHERE ✻ LINE ✻ CUE	0.010[a]	6[a]	0.002[a]	2.332[a]	0.031[a]	0.029
HEMISPHERE ✻ LINE ✻ CUE ✻ CRITERION SHIFT	0.005[a]	6[a]	8.268×10^{-4}[a]	1.208[a]	0.301[a]	0.015
Residuals	0.320	468	6.843×10^{-4}			

Supplementary Table 3.

HEMISPHERE * LINE * CUE * GROUP ~ BW ALPHA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.185	1	0.185	3.440	0.067	0.042
HEMISPHERE ✻ GROUP	0.471	1	0.471	8.779	0.004	0.101
Residuals	4.187	78	0.054			
LINE	0.924[a]	3[a]	0.308[a]	5.761[a]	< .001[a]	0.069
LINE ✻ GROUP	0.026[a]	3[a]	0.009[a]	0.163[a]	0.921[a]	0.002
Residuals	12.515	234	0.053			
CUE	0.034	2	0.017	2.410	0.093	0.030
CUE ✻ GROUP	0.003	2	0.002	0.210	0.811	0.003
Residuals	1.115	156	0.007			
HEMISPHERE ✻ LINE	0.451[a]	3[a]	0.150[a]	10.145[a]	< .001[a]	0.115
HEMISPHERE ✻ LINE ✻ GROUP	0.050[a]	3[a]	0.017[a]	1.134[a]	0.336[a]	0.014
Residuals	3.469	234	0.015			
HEMISPHERE ✻ CUE	0.002	2	0.001	0.416	0.660	0.005
HEMISPHERE ✻ CUE ✻ GROUP	0.018	2	0.009	3.537	0.031	0.043
Residuals	0.408	156	0.003			
LINE ✻ CUE	0.012[a]	6[a]	0.002[a]	1.679[a]	0.124[a]	0.021
LINE ✻ CUE ✻ GROUP	0.022[a]	6[a]	0.004[a]	3.079[a]	0.006[a]	0.038
Residuals	0.556	468	0.001			
HEMISPHERE ✻ LINE ✻ CUE	0.004[a]	6[a]	7.140×10^{-4}[a]	0.924[a]	0.477[a]	0.012
HEMISPHERE ✻ LINE ✻ CUE ✻ GROUP	0.004[a]	6[a]	7.453×10^{-4}[a]	0.965[a]	0.449[a]	0.012
Residuals	0.362	468	7.727×10^{-4}			

Supplementary Table 4.

HEMISPHERE * LINE * CUE * GROUP ~ FW ALPHA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.591	1	0.591	7.434	0.008	0.087
HEMISPHERE ✻ GROUP	0.071	1	0.071	0.890	0.348	0.011
Residuals	6.199	78	0.079			
LINE	2.521[a]	3[a]	0.840[a]	13.943[a]	< .001[a]	0.152
LINE ✻ GROUP	0.044[a]	3[a]	0.015[a]	0.242[a]	0.867[a]	0.003
Residuals	14.103	234	0.060			
CUE	0.001	2	6.933×10^{-4}	0.090	0.914	0.001
CUE ✻ GROUP	0.007	2	0.004	0.455	0.635	0.006
Residuals	1.201	156	0.008			
HEMISPHERE ✻ LINE	0.866[a]	3[a]	0.289[a]	25.520[a]	< .001[a]	0.247
HEMISPHERE ✻ LINE ✻ GROUP	0.016[a]	3[a]	0.005[a]	0.479[a]	0.697[a]	0.006
Residuals	2.647	234	0.011			
HEMISPHERE ✻ CUE	0.002	2	9.665×10^{-4}	0.354	0.703	0.005
HEMISPHERE ✻ CUE ✻ GROUP	0.014	2	0.007	2.634	0.075	0.033
Residuals	0.426	156	0.003			
LINE ✻ CUE	0.019[a]	6[a]	0.003[a]	2.541[a]	0.020[a]	0.032
LINE ✻ CUE ✻ GROUP	0.027[a]	6[a]	0.004[a]	3.615[a]	0.002[a]	0.044
Residuals	0.572	468	0.001			
HEMISPHERE ✻ LINE ✻ CUE	0.006[a]	6[a]	9.429×10^{-4}[a]	1.370[a]	0.225[a]	0.017
HEMISPHERE ✻ LINE ✻ CUE ✻ GROUP	0.003[a]	6[a]	5.340×10^{-4}[a]	0.776[a]	0.589[a]	0.010
Residuals	0.322	468	6.880×10^{-4}			

Supplementary Table 5.

HEMISPHERE * LINE * CUE * CRITERION SHIFT ~ BW THETA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.384	1	0.384	9.452	0.003	0.108
HEMISPHERE ✻ CRITERION SHIFT	0.089	1	0.089	2.192	0.143	0.027
Residuals	3.173	78	0.041			
LINE	0.402[a]	3[a]	0.134[a]	5.260[a]	0.002[a]	0.063
LINE ✻ CRITERION SHIFT	0.197[a]	3[a]	0.066[a]	2.576[a]	0.055[a]	0.032
Residuals	5.968	234	0.026			
CUE	0.008[a]	2[a]	0.004[a]	0.763[a]	0.468[a]	0.010
CUE ✻ CRITERION SHIFT	0.002[a]	2[a]	9.347×10^{-4}[a]	0.177[a]	0.838[a]	0.002
Residuals	0.822	156	0.005			
HEMISPHERE ✻ LINE	0.290[a]	3[a]	0.097[a]	9.029[a]	< .001[a]	0.104
HEMISPHERE ✻ LINE ✻ CRITERION SHIFT	0.024[a]	3[a]	0.008[a]	0.760[a]	0.518[a]	0.010
Residuals	2.506	234	0.011			
HEMISPHERE ✻ CUE	9.666×10^{-4}	2	4.833×10^{-4}	0.177	0.838	0.002
HEMISPHERE ✻ CUE ✻ CRITERION SHIFT	0.004	2	0.002	0.786	0.458	0.010
Residuals	0.426	156	0.003			
LINE ✻ CUE	0.002[a]	6[a]	3.674×10^{-4}[a]	0.302[a]	0.936[a]	0.004
LINE ✻ CUE ✻ CRITERION SHIFT	0.004[a]	6[a]	7.274×10^{-4}[a]	0.598[a]	0.732[a]	0.008
Residuals	0.570	468	0.001			
HEMISPHERE ✻ LINE ✻ CUE	0.002[a]	6[a]	3.625×10^{-4}[a]	0.489[a]	0.817[a]	0.006
HEMISPHERE ✻ LINE ✻ CUE ✻ CRITERION SHIFT	0.002[a]	6[a]	3.554×10^{-4}[a]	0.479[a]	0.824[a]	0.006
Residuals	0.347	468	7.413×10^{-4}			

Supplementary Table 6.

HEMISPHERE * LINE * CUE * CRITERION SHIFT ~ FW THETA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.293	1	0.293	4.581	0.035	0.055
HEMISPHERE ✻ CRITERION SHIFT	0.043	1	0.043	0.675	0.414	0.009
Residuals	4.995	78	0.064			
LINE	0.994[a]	3[a]	0.331[a]	10.525[a]	< .001[a]	0.119
LINE ✻ CRITERION SHIFT	0.026[a]	3[a]	0.009[a]	0.272[a]	0.845[a]	0.003
Residuals	7.368	234	0.031			
CUE	0.004	2	0.002	0.353	0.703	0.005
CUE ✻ CRITERION SHIFT	0.003	2	0.001	0.283	0.754	0.004
Residuals	0.777	156	0.005			
HEMISPHERE ✻ LINE	0.380[a]	3[a]	0.127[a]	12.706[a]	< .001[a]	0.140
HEMISPHERE ✻ LINE ✻ CRITERION SHIFT	0.047[a]	3[a]	0.016[a]	1.577[a]	0.196[a]	0.020
Residuals	2.335	234	0.010			
HEMISPHERE ✻ CUE	0.003	2	0.002	0.586	0.558	0.007
HEMISPHERE ✻ CUE ✻ CRITERION SHIFT	0.002	2	8.877×10^{-4}	0.330	0.719	0.004
Residuals	0.420	156	0.003			
LINE ✻ CUE	0.003[a]	6[a]	5.627×10^{-4}[a]	0.458[a]	0.839[a]	0.006
LINE ✻ CUE ✻ CRITERION SHIFT	0.008[a]	6[a]	0.001[a]	1.099[a]	0.362[a]	0.014
Residuals	0.574	468	0.001			
HEMISPHERE ✻ LINE ✻ CUE	0.005[a]	6[a]	7.541×10^{-4}[a]	0.976[a]	0.441[a]	0.012
HEMISPHERE ✻ LINE ✻ CUE ✻ CRITERION SHIFT	0.005[a]	6[a]	8.844×10^{-4}[a]	1.145[a]	0.335[a]	0.014
Residuals	0.362	468	7.725×10^{-4}			

Supplementary Table 7.

HEMISPHERE * LINE * CUE * GROUP ~ BW THETA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.354	1	0.354	8.506	0.005	0.098
HEMISPHERE ✻ GROUP	0.017	1	0.017	0.401	0.528	0.005
Residuals	3.245	78	0.042			
LINE	0.232[a]	3[a]	0.077[a]	2.994[a]	0.032[a]	0.037
LINE ✻ GROUP	0.113[a]	3[a]	0.038[a]	1.452[a]	0.228[a]	0.018
Residuals	6.053	234	0.026			
CUE	0.014[a]	2[a]	0.007[a]	1.296[a]	0.276[a]	0.016
CUE ✻ GROUP	0.009[a]	2[a]	0.004[a]	0.840[a]	0.434[a]	0.011
Residuals	0.815	156	0.005			
HEMISPHERE ✻ LINE	0.506[a]	3[a]	0.169[a]	15.756[a]	< .001[a]	0.168
HEMISPHERE ✻ LINE ✻ GROUP	0.025[a]	3[a]	0.008[a]	0.766[a]	0.514[a]	0.010
Residuals	2.506	234	0.011			
HEMISPHERE ✻ CUE	0.014	2	0.007	2.513	0.084	0.031
HEMISPHERE ✻ CUE ✻ GROUP	0.006	2	0.003	1.048	0.353	0.013
Residuals	0.425	156	0.003			
LINE ✻ CUE	0.004[a]	6[a]	6.170×10^{-4}[a]	0.508[a]	0.803[a]	0.006
LINE ✻ CUE ✻ GROUP	0.005[a]	6[a]	8.922×10^{-4}[a]	0.734[a]	0.622[a]	0.009
Residuals	0.569	468	0.001			
HEMISPHERE ✻ LINE ✻ CUE	0.004[a]	6[a]	6.786×10^{-4}[a]	0.918[a]	0.481[a]	0.012
HEMISPHERE ✻ LINE ✻ CUE ✻ GROUP	0.003[a]	6[a]	5.436×10^{-4}[a]	0.736[a]	0.621[a]	0.009
Residuals	0.346	468	7.389×10^{-4}			

Supplementary Table 8.

HEMISPHERE * LINE * CUE * GROUP ~ FW THETA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	1.081	1	1.081	16.930	< .001	0.178
HEMISPHERE ✻ GROUP	0.056	1	0.056	0.880	0.351	0.011
Residuals	4.982	78	0.064			
LINE	2.553[a]	3[a]	0.851[a]	27.465[a]	< .001[a]	0.260
LINE ✻ GROUP	0.142[a]	3[a]	0.047[a]	1.530[a]	0.207[a]	0.019
Residuals	7.251	234	0.031			
CUE	0.003	2	0.002	0.318	0.728	0.004
CUE ✻ GROUP	0.006	2	0.003	0.593	0.554	0.008
Residuals	0.774	156	0.005			
HEMISPHERE ✻ LINE	0.836[a]	3[a]	0.279[a]	27.429[a]	< .001[a]	0.260
HEMISPHERE ✻ LINE ✻ GROUP	0.004[a]	3[a]	0.001[a]	0.132[a]	0.941[a]	0.002
Residuals	2.378	234	0.010			
HEMISPHERE ✻ CUE	0.004	2	0.002	0.854	0.428	0.011
HEMISPHERE ✻ CUE ✻ GROUP	0.014	2	0.007	2.679	0.072	0.033
Residuals	0.407	156	0.003			
LINE ✻ CUE	0.003[a]	6[a]	4.678×10^{-4}[a]	0.380[a]	0.892[a]	0.005
LINE ✻ CUE ✻ GROUP	0.006[a]	6[a]	0.001[a]	0.828[a]	0.548[a]	0.011
Residuals	0.576	468	0.001			
HEMISPHERE ✻ LINE ✻ CUE	0.006[a]	6[a]	0.001[a]	1.321[a]	0.246[a]	0.017
HEMISPHERE ✻ LINE ✻ CUE ✻ GROUP	0.005[a]	6[a]	7.517×10^{-4}[a]	0.971[a]	0.444[a]	0.012
Residuals	0.362	468	7.742×10^{-4}			

Supplementary Table 9.

HEMISPHERE * LINE * CUE * CRITERION SHIFT ~ BW BETA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.022	1	0.022	0.900	0.346	0.011
HEMISPHERE ✻ CRITERION SHIFT	0.039	1	0.039	1.606	0.209	0.020
Residuals	1.900	78	0.024			
LINE	1.350[a]	3[a]	0.450[a]	14.397[a]	< .001[a]	0.156
LINE ✻ CRITERION SHIFT	0.203[a]	3[a]	0.068[a]	2.164[a]	0.093[a]	0.027
Residuals	7.316	234	0.031			
CUE	0.010	2	0.005	1.803	0.168	0.023
CUE ✻ CRITERION SHIFT	0.003	2	0.002	0.605	0.547	0.008
Residuals	0.441	156	0.003			
HEMISPHERE ✻ LINE	0.172[a]	3[a]	0.057[a]	3.507[a]	0.016[a]	0.043
HEMISPHERE ✻ LINE ✻ CRITERION SHIFT	0.010[a]	3[a]	0.003[a]	0.203[a]	0.894[a]	0.003
Residuals	3.816	234	0.016			
HEMISPHERE ✻ CUE	0.002	2	0.001	0.779	0.461	0.010
HEMISPHERE ✻ CUE ✻ CRITERION SHIFT	0.007	2	0.004	2.494	0.086	0.031
Residuals	0.232	156	0.001			
LINE ✻ CUE	0.012[a]	6[a]	0.002[a]	2.781[a]	0.011[a]	0.034
LINE ✻ CUE ✻ CRITERION SHIFT	0.008[a]	6[a]	0.001[a]	2.015[a]	0.062[a]	0.025
Residuals	0.323	468	6.901×10^{-4}			
HEMISPHERE ✻ LINE ✻ CUE	0.002[a]	6[a]	3.392×10^{-4}[a]	0.655[a]	0.686[a]	0.008
HEMISPHERE ✻ LINE ✻ CUE ✻ CRITERION SHIFT	0.001[a]	6[a]	2.373×10^{-4}[a]	0.458[a]	0.839[a]	0.006
Residuals	0.242	468	5.177×10^{-4}			

Supplementary Table 10.

HEMISPHERE * LINE * CUE * CRITERION SHIFT ~ FW BETA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.201	1	0.201	5.649	0.020	0.068
HEMISPHERE ✻ CRITERION SHIFT	0.022	1	0.022	0.613	0.436	0.008
Residuals	2.780	78	0.036			
LINE	1.174[a]	3[a]	0.391[a]	15.592[a]	< .001[a]	0.167
LINE ✻ CRITERION SHIFT	0.040[a]	3[a]	0.013[a]	0.525[a]	0.665[a]	0.007
Residuals	5.871	234	0.025			
CUE	0.008	2	0.004	1.384	0.254	0.017
CUE ✻ CRITERION SHIFT	9.872×10^{-4}	2	4.936×10^{-4}	0.162	0.850	0.002
Residuals	0.474	156	0.003			
HEMISPHERE ✻ LINE	0.227[a]	3[a]	0.076[a]	5.606[a]	< .001[a]	0.067
HEMISPHERE ✻ LINE ✻ CRITERION SHIFT	0.005[a]	3[a]	0.002[a]	0.130[a]	0.942[a]	0.002
Residuals	3.154	234	0.013			
HEMISPHERE ✻ CUE	2.780×10^{-4}	2	1.390×10^{-4}	0.085	0.918	0.001
HEMISPHERE ✻ CUE ✻ CRITERION SHIFT	0.001	2	5.258×10^{-4}	0.322	0.725	0.004
Residuals	0.255	156	0.002			
LINE ✻ CUE	0.012[a]	6[a]	0.002[a]	2.744[a]	0.012[a]	0.034
LINE ✻ CUE ✻ CRITERION SHIFT	0.008[a]	6[a]	0.001[a]	1.889[a]	0.081[a]	0.024
Residuals	0.343	468	7.332×10^{-4}			
HEMISPHERE ✻ LINE ✻ CUE	0.003[a]	6[a]	4.493×10^{-4a}	0.735[a]	0.622[a]	0.009
HEMISPHERE ✻ LINE ✻ CUE ✻ CRITERION SHIFT	9.757×10^{-4a}	6[a]	1.626×10^{-4a}	0.266[a]	0.953[a]	0.003
Residuals	0.286	468	6.112×10^{-4}			

Supplementary Table 11.

HEMISPHERE * LINE * CUE * GROUP ~ BW BETA WAVES

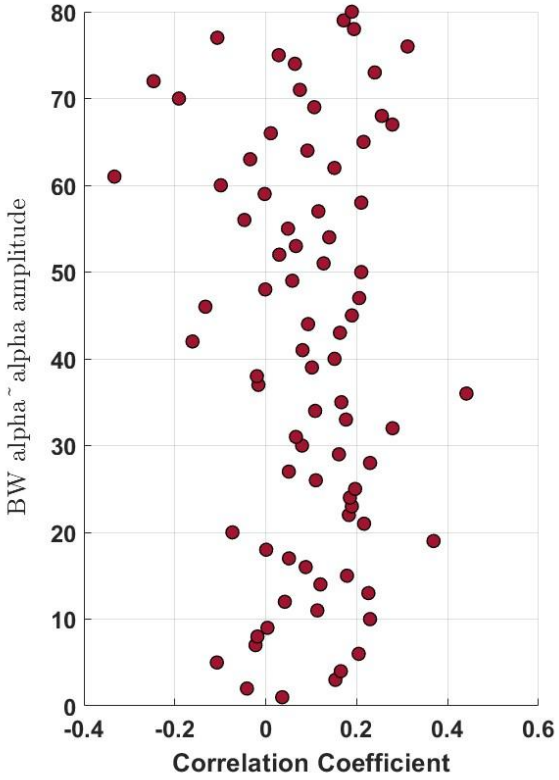
Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMI	2.706×10^{-6}	1	2.706×10^{-6}	1.206×10^{-4}	0.991	1.546×10^{-6}
HEMI ✻ GROUP	0.189	1	0.189	8.398	0.005	0.097
Residuals	1.751	78	0.022			
LINE	4.851[a]	3[a]	1.617[a]	50.771[a]	< .001[a]	0.394
LINE ✻ GROUP	0.067[a]	3[a]	0.022[a]	0.697[a]	0.554[a]	0.009
Residuals	7.452	234	0.032			
CUE	0.039	2	0.019	6.765	0.002	0.080
CUE ✻ GROUP	1.547×10^{-4}	2	7.737×10^{-5}	0.027	0.973	3.481×10^{-4}
Residuals	0.444	156	0.003			
HEMI ✻ LINE	0.324[a]	3[a]	0.108[a]	6.859[a]	< .001[a]	0.081
HEMI ✻ LINE ✻ GROUP	0.138[a]	3[a]	0.046[a]	2.926[a]	0.035[a]	0.036
Residuals	3.688	234	0.016			
HEMI ✻ CUE	6.956×10^{-4}	2	3.478×10^{-4}	0.227	0.797	0.003
HEMI ✻ CUE ✻ GROUP	4.956×10^{-6}	2	2.478×10^{-6}	0.002	0.998	2.073×10^{-5}
Residuals	0.239	156	0.002			
LINE ✻ CUE	0.006[a]	6[a]	9.466×10^{-4a}	1.347[a]	0.235[a]	0.017
LINE ✻ CUE ✻ GROUP	0.002[a]	6[a]	4.118×10^{-4a}	0.586[a]	0.742[a]	0.007
Residuals	0.329	468	7.027×10^{-4}			
HEMI ✻ LINE ✻ CUE	0.001[a]	6[a]	2.417×10^{-4a}	0.468[a]	0.832[a]	0.006
HEMI ✻ LINE ✻ CUE ✻ GROUP	0.002[a]	6[a]	3.444×10^{-4a}	0.667[a]	0.676[a]	0.008
Residuals	0.242	468	5.163×10^{-4}			

Supplementary Table 12.

HEMISPHERE * LINE * CUE * GROUP ~ FW BETA WAVES

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
HEMISPHERE	0.696	1	0.696	19.381	< .001	0.199
HEMISPHERE ✻ GROUP	6.907×10^{-4}	1	6.907×10^{-4}	0.019	0.890	2.466×10^{-4}
Residuals	2.801	78	0.036			
LINE	1.969[a]	3[a]	0.656[a]	26.062[a]	< .001[a]	0.250
LINE ✻ GROUP	0.016[a]	3[a]	0.005[a]	0.218[a]	0.884[a]	0.003
Residuals	5.894	234	0.025			
CUE	0.013	2	0.006	2.079	0.129	0.026
CUE ✻ GROUP	1.209×10^{-4}	2	6.047×10^{-5}	0.020	0.980	2.546×10^{-4}
Residuals	0.475	156	0.003			
HEMISPHERE ✻ LINE	0.451[a]	3[a]	0.150[a]	11.484[a]	< .001[a]	0.128
HEMISPHERE ✻ LINE ✻ GROUP	0.094[a]	3[a]	0.031[a]	2.381[a]	0.070[a]	0.030
Residuals	3.066	234	0.013			
HEMISPHERE ✻ CUE	0.001	2	6.252×10^{-4}	0.382	0.683	0.005
HEMISPHERE ✻ CUE ✻ GROUP	6.428×10^{-4}	2	3.214×10^{-4}	0.196	0.822	0.003
Residuals	0.255	156	0.002			
LINE ✻ CUE	0.006[a]	6[a]	0.001[a]	1.363[a]	0.228[a]	0.017
LINE ✻ CUE ✻ GROUP	0.002[a]	6[a]	3.621×10^{-4}[a]	0.485[a]	0.819[a]	0.006
Residuals	0.349	468	7.463×10^{-4}			
HEMISPHERE ✻ LINE ✻ CUE	0.002[a]	6[a]	4.147×10^{-4}[a]	0.680[a]	0.666[a]	0.009
HEMISPHERE ✻ LINE ✻ CUE ✻ GROUP	0.001[a]	6[a]	2.448×10^{-4}[a]	0.401[a]	0.878[a]	0.005
Residuals	0.286	468	6.102×10^{-4}			

Supplementary Table 13.



Supplementary Figure S1. Trial-by-trial fluctuations in backward waves predict alpha band amplitude.

We examined the relationship between alpha band amplitude and the traveling waves' power. In line with recent findings, we observed a positive and significant association between these measures (mean r = 0.09, $t_{79} = 6.27$, $p < 0.01$). This supports the main text results, showing that backward alpha band waves predict the degree of alpha band oscillation modulation driven by prior knowledge. These findings highlight a potential functional role for backward waves in shaping posterior alpha band activity levels.

Laplacian Control Analysis

We confirmed that this relationship was not driven by spatial leakage or volume conduction by applying a surface Laplacian filter to the EEG signal before computing alpha band traveling waves (see S1). As in the original analysis, we conducted two ANCOVAs using CUE (low, neutral, high probability), LINE (1–4; distance from the midline), and HEMISPHERE (contralateral, ipsilateral) as factors, with CRITERION SHIFT entered as a covariate. In the first ANCOVA, backward (BW) waves served as the dependent variable, whereas in the second, forward (FW) waves were used as the dependent variable. The ANCOVA on alpha band backward waves revealed a significant three-way interaction between CRITERION SHIFT, HEMISPHERE, and CUE ($F_{2,156}$ = 3.23, p = 0.04). To clarify this effect, we examined the relationship between CUE and CRITERION SHIFT separately for each hemisphere. A significant CUE × CRITERION SHIFT interaction emerged in the contralateral hemisphere ($F_{2,156}$ = 3.33, p = 0.04), whereas no such effect was observed in the ipsilateral hemisphere ($F_{2,156}$ = 1.03, p = 0.36). Post-hoc analyses confirmed that prestimulus contralateral BW waves predicted the extent of criterion modulation in the low-probability condition (Pearson r = 0.31, p < 0.01; Spearman ρ = 0.42, p < 0.01; Kendall = 0.28, p < 0.01; Pearson BF_{10} = 7.09, Kendall BF_{10} = 13.52), in the high-probability condition (Pearson r = 0.24, p = 0.03; Spearman ρ = 0.34, p < 0.01; Kendall = 0.23, p < 0.01; BF_{10} = 1.38 and 15.39), and also in the neutral condition (Pearson r = 0.25, p = 0.03; Spearman ρ = 0.36, p < 0.01; Kendall = 0.24, p < 0.01; BF_{10} = 1.53 and 9.21). In contrast, the second ANCOVA on prestimulus FW waves did not reveal any significant effect of the covariate CRITERION SHIFT, nor any interaction involving this covariate (all F < 2.73, all p > 0.07). Finally, we replicated the reported association between alpha band backward waves and the modulation of parieto-occipital alpha amplitude after Laplacian filtering (Pearson r = 0.32, p < 0.01; Spearman ρ = 0.31, p < 0.01; Kendall = 0.204, p < 0.01; Pearson BF_{10} = 7.47, Kendall BF_{10} = 4.92). Consistent with the original mediation analysis, we again observed a positive indirect effect, indicating that the influence of backward waves on decision criterion was mediated by the concurrent modulation of alpha power (Indirect effect = 0.30, 95% CI = [0.08, 0.71]). Taken together, these results demonstrate that the link between backward alpha band traveling waves, alpha amplitude modulation, and criterion shifts is robust to spatial filtering, reinforcing the functional role of backward waves in mediating the impact of prior expectations on perceptual decision-making.