Supplementary Materials

for

Social attention as a general mechanism?

Demonstrating the influence of stimulus content factors on social attentional biasing

Effie J. Pereira[1,2], Elina Birmingham[3], & Jelena Ristic[2]

[1] *Department of Psychology, University of Waterloo*; [2] *Department of Psychology, McGill University*; [3] *Faculty of Education, Simon Fraser University*

Correspondence to:

Effie J. Pereira
Department of Psychology, University of Waterloo
PAS Building, 200 University Avenue West
Waterloo, ON, N2L 3G1
Canada
Phone: 1-519-888-4567 ext. 42813
Email: effie.pereira@uwaterloo.ca

Methods

To illustrate the broad range of attractiveness ratings for the face and house images, Figure S1 plots individual face and house scores for the current set of studies from the twenty-eight naïve participants recruited.

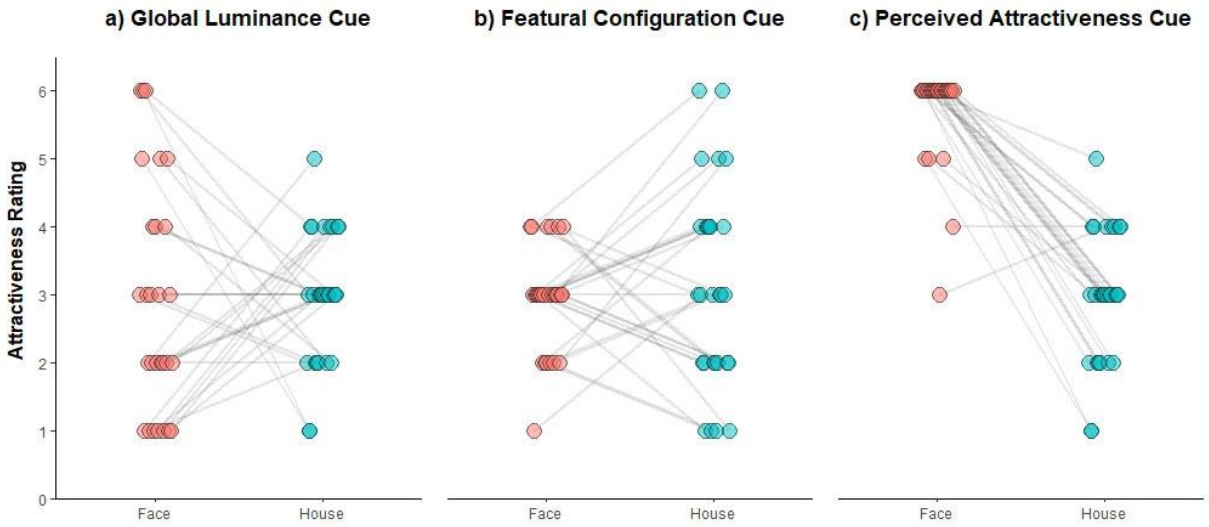

Fig. S1. Individual attractiveness ratings for the face and house images used for the (a) global luminance cue (Experiments 1 & 2), (b) featural configuration cue (Experiments 3 & 4), and (c) perceived attractiveness cue (Experiments 5 & 6). Grey lines represent linked participant responses.

Experiment 1

Results

Manual RT

Mean correct RTs are illustrated in Figure S2 for Upright (S2a) and Inverted (S2b) cues for all target locations. The omnibus ANOVA revealed a significant main effect of *Cue-target interval* [Mauchly's test of sphericity, $\chi^2(5)=23.11$, $p<.01$; $F(1.96,56.70)=39.61$, $p<.01$, $\eta_p^2=.58$], with overall slower RTs for shorter relative to longer cue-target intervals [250ms vs. all,

*t*s>14.20, *p*s<.01, d_zs>1.31; all other *p*s>.40, d_zs<.28]. This finding demonstrates the typical foreperiod effect found within attentional dot-probe tasks (Bertelson, 1967; Hayward & Ristic, 2013), reflecting an increased response preparation with a lengthening of the time between the cue and the target, and demonstrates that participants performed the task with an expected degree of preparation and alertness to the target.

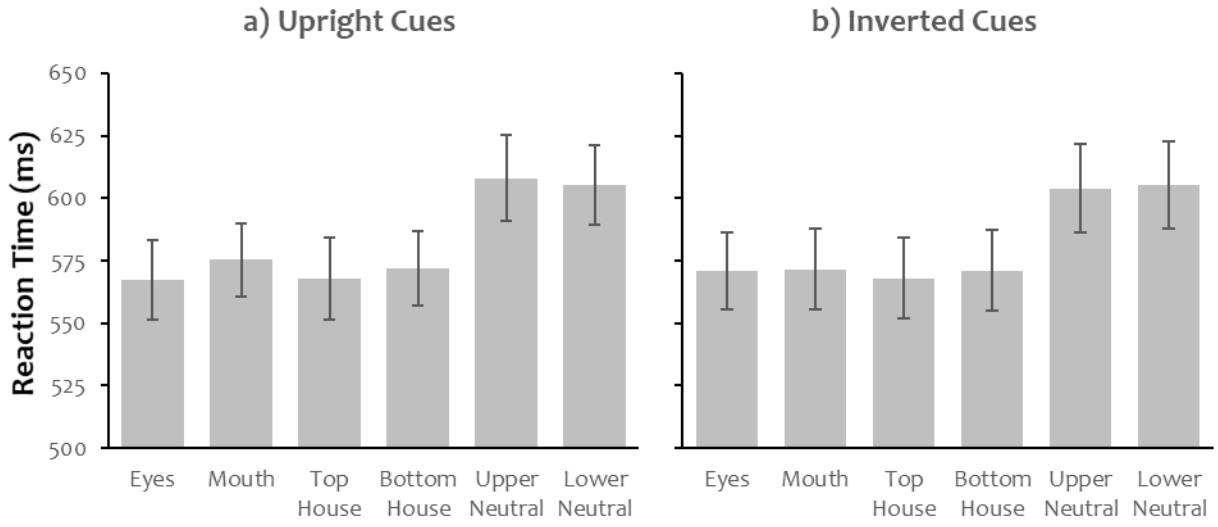

Fig. S2. Experiment 1 manual RT results. Mean correct RTs as a function of all Target positions for (a) Upright and (b) Inverted cues. Error bars represent 95% CIs.

We also found a main effect of *Target location* [Mauchly's test of sphericity, $\chi^2(14)=55.42$, $p<.01$; $F(2.95,85.53)=61.26$, $p<.01$, $\eta_p^2=.68$], indicating differential performance for face and house cues versus neutral cues. That is, targets appearing at the previous location of the Upper and Lower Neutral cues had overall slower RTs than those that appeared at the previous location of the Eyes, Mouth, Top House, and Bottom House cues [*t*s>8.41, *p*s<.01, d_zs>1.53]. Importantly however, no differences were found for targets occurring at the previous location of the Eyes or Mouth versus the Top or Bottom House cues [*t*s<2.59, *p*s>.10, d_zs<.47]. No other reliable effects were found [*F*s<1.89, *p*s>.10, η_p^2<.06].

Experiment 2

Results

Manual RT

Mean correct RTs are illustrated in Figure S3 for Upright (S3a) and Inverted (S3b) cues for all target locations. The omnibus ANOVA indicated a main effect of *Cue orientation* [$F(1,29)=4.73$, $p=.04$, $\eta_p^2=.14$], which reflected overall slower RTs when cues were upright versus inverted, and a main effect of *Cue-target interval* [Mauchly's test of sphericity, $\chi^2(5)=17.51$, $p=.01$; $F(2.08,60.33)=32.74$, $p<.01$, $\eta_p^2=.53$], which was driven by slower RTs at shorter relative to longer cue-target intervals [250ms vs. all, ts>5.11, ps<.01, d_zs>.93; all other ps>.14, d_zs<.38]. We also found a significant main effect of *Target location* [Mauchly's test of sphericity, $\chi^2(14)=38.95$, $p<.01$; $F(3.50,101.57)=59.72$, $p<.01$, $\eta_p^2=.67$], reflecting overall slower RTs for targets occurring at the previous location of the Upper and Lower Neutral cues versus all other target locations [ts>7.82, ps<.01, d_zs>1.43]. Importantly, no significant differences for targets occurring at the previous location of the Eyes or Mouth relative to those occurring at the location of the Top or Bottom House were found [ts<1.35, ps>.99, d_zs<.25].

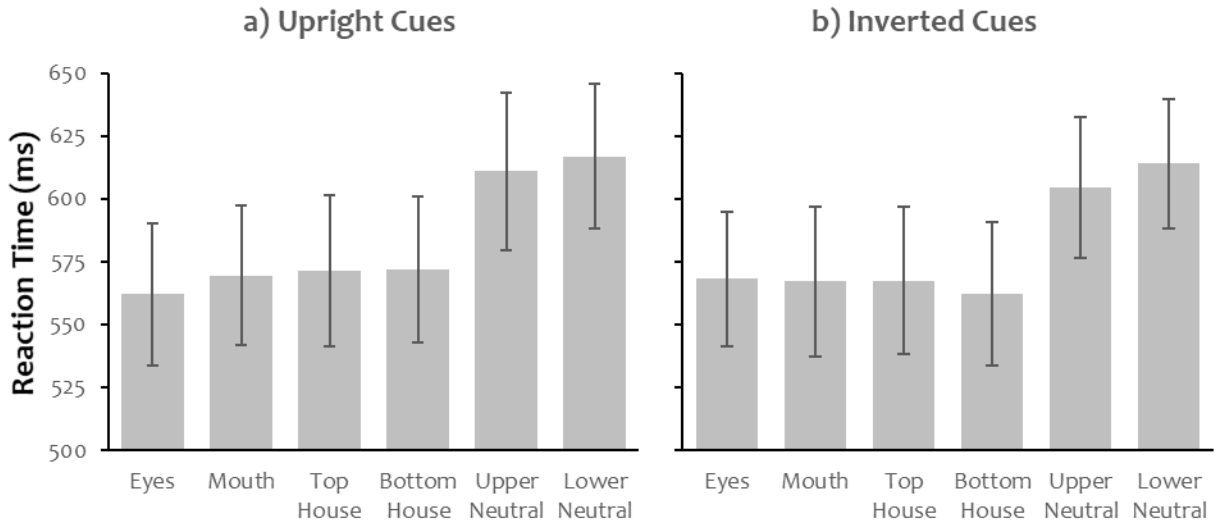

Fig. S3. Experiment 2 manual RT results. Mean correct RTs as a function of all Target positions for (a) Upright and (b) Inverted cues. Error bars represent 95% CIs.

There was a four-way interaction between *Cue orientation*, *Face position*, *Target location*, and *Cue-target interval* [$F(15,435)=1.97$, $p=.02$, $\eta_p^2=.06$; all other Fs<1.99, ps>.08, η_p^2<.06]. When separating by Cue orientation, for Upright cues, there was an expected main effect of *Cue-target interval* [$F(3,87)=19.96$, $p<.01$, $\eta_p^2=.41$], which was driven by slower RTs at shorter versus longer intervals [250ms vs. all, ts>3.46, ps<.01, d_zs>.63; all other ps>.13, d_zs<.39], and a significant main effect of *Target location* [Mauchly's test of sphericity, $\chi^2(14)=30.63$, $p<.01$; $F(3.73,108.12)=39.14$, $p<.01$, $\eta_p^2=.57$], reflecting overall slower RTs for targets occurring at the previous location of the Upper and Lower Neutral cues versus all other cues [ts>6.42, ps<.01, d_zs>1.17]. No differences were found for targets at the previous location of the Eyes or Mouth relative to the Top or Bottom House [all other ps>.19, d_zs<.43]. No other effects were reliable for Upright cues [Fs<1.69, ps>.14, η_p^2<.06]. A similar pattern of data was found for Inverted cues. There was a main effect for *Cue-target interval* [Mauchly's test of sphericity, $\chi^2(5)=15.26$, $p<.01$; $F(2.20,63.91)=20.67$, $p<.01$, $\eta_p^2=.42$], reflecting slower RTs at

shorter versus longer cue-target intervals [250ms vs. all, *t*s>4.10, *p*s<.01, d_zs>.75; all other *p*s>.70, d_zs<.22], and a significant main effect for *Target location* [$F(5,145)=45.07$, $p<.01$, $\eta_p^2=.61$], reflecting overall slower RTs for targets occurring at the previous location of the Upper and Lower Neutral cues versus all other cues [*t*s>6.21, *p*s<.01, d_zs>1.13]. As before, no differential results for targets at the previous location of the Eyes, Mouth, Top House, or Bottom House cues were found [all other *p*s>.68, d_zs<.30]. No other effects were reliable for Inverted cues [*F*s<1.52, *p*s>.14, η_p^2<.05].

Eye movement Data

Table S1 details the total number of trials containing breakaway saccades during the cue period, along with the number of trials containing breakaway saccades directed towards an *ROI* (eyes, mouth, top house, bottom house, upper neutral, lower neutral) for each participant.

Table. S1. Experiment 2 oculomotor data. Total number of trials containing saccades during the cue period, and number of trials when saccades were directed towards regions of interest.

ID Number	Total Number of Trials with Breakaway Saccades	Separated by Region of Interest					
		Eyes	Mouth	Top House	Bottom House	Upper Neutral	Lower Neutral
1	30	5	1	7	5	4	6
2	15	8	3	2	1	1	0
3	18	3	2	3	3	3	4
4	10	4	1	2	1	1	1
5	10	7	0	0	1	1	0
6	16	5	2	3	1	3	2
7	17	7	2	5	2	1	0
8	17	3	1	3	1	7	1
9	8	2	1	2	0	1	1
10	64	7	13	15	6	17	3
11	28	7	4	3	2	11	1
12	8	1	1	0	2	0	3
13	18	1	3	8	0	1	5
14	5	0	1	0	0	3	0
15	30	1	8	12	4	0	5
16	7	0	1	3	1	0	2
17	3	0	0	1	1	1	0
18	37	3	1	2	1	11	11
19	4	0	2	1	1	0	0
20	38	8	1	12	5	12	0
21	24	5	2	4	3	6	2
22	101	39	22	5	14	3	18
23	96	23	1	12	10	31	18
24	276	159	55	23	23	7	6
25	19	7	4	2	5	0	0
26	55	4	7	8	5	11	14
27	12	1	1	0	0	9	0
28	41	11	6	11	5	4	2
29	12	3	1	0	1	3	4
30	17	0	0	0	0	14	1

Experiment 3

Results

Manual RT

Mean correct RTs are illustrated in Figure S4 for Upright (S4a) and Inverted (S4b) cues for all target locations. Similar to Experiment 1, we found a significant main effect of *Cue-target interval* [$F(3,87)=30.05$, $p<.01$, $\eta_p^2=.51$], with slower RTs for shorter relative to longer cue-target intervals [250ms vs. all, ts>5.97, ps<.01, d_zs>1.09; all other ps>.73, d_zs<.22]. We also found a main effect of *Target location* [Mauchly's test of sphericity, $\chi^2(14)=34.24$, $p<.01$; $F(3.44,99.67)=50.03$, $p<.01$, $\eta_p^2=.63$], which once again demonstrated that targets at the previous location of the Upper and Lower Neutral cues had overall slower RTs than those that appeared at the previous location of the Eyes, Mouth, Top House, and Bottom House cues [ts>7.99, ps<.01, d_zs>1.46]. There were no differences for targets occurring at the previous location of the Eyes or Mouth relative to those occurring at the location of the Top or Bottom House [ts<.90, ps>.99, d_zs<.16].

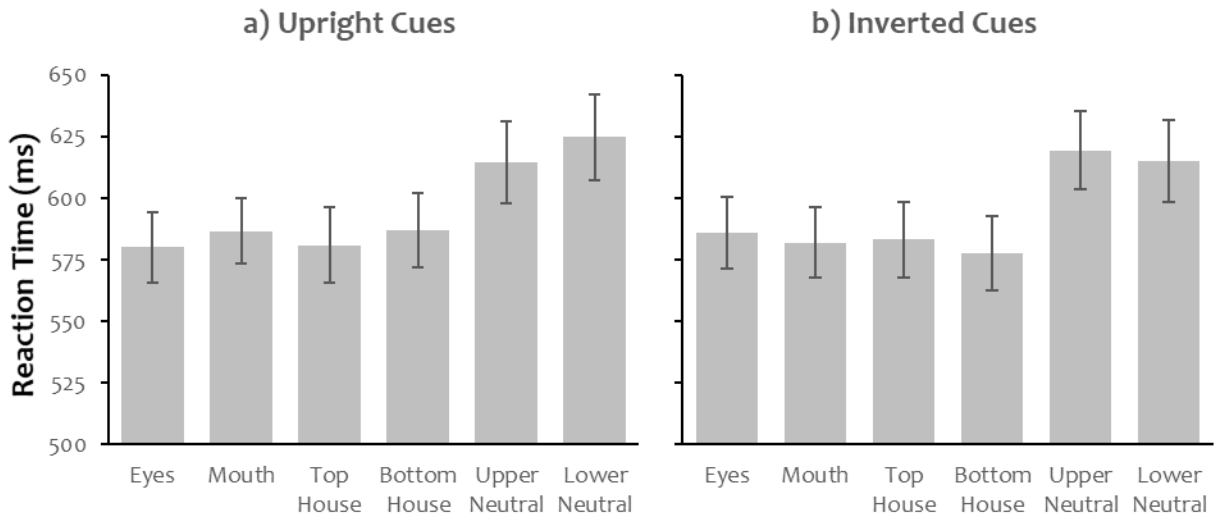

Fig. S4. Experiment 3 manual RT results. Mean correct RTs as a function of all Target positions for (a) Upright and (b) Inverted cues. Error bars represent 95% CIs.

The main effect of Target location was qualified by two interactions. First, there was a two-way interaction between *Target location* and *Cue orientation* [$F(5,145)=4.91$, $p<.01$, $\eta_p^2=.15$]. When separating by Cue orientation, for Upright cues, targets at the previous location of the Upper and Lower Neutral cues had overall slower RTs than those appearing at all other cues [ts>5.54, ps<.01, d_zs>1.01], with no differences for targets at the previous location of the Eyes or Mouth relative to those occurring at the location of the Top or Bottom House [ts<2.29, ps>.21, d_zs<.42]. The same effects were found for Inverted cues. Targets at the previous location of the Upper and Lower Neutral cues had overall slower RTs than those appearing at all other cues [ts>5.63, ps<.01, d_zs>1.03], with no differences for targets at the previous location of the Eyes, Mouth, Top House, or Bottom House cues [ts<1.81, ps>.56, d_zs<.33].

Second, there was an interaction between *Target location* and *Cue-target interval* [$F(15,435)=1.92$, $p=.02$, $\eta_p^2=.06$]. When separating by Cue-target interval, there were slower RTs for targets occurring at the previous location of the Upper and Lower Neutral cues versus all

other cues for all cue-target intervals, however this effect was greater for shorter relative to longer cue-target intervals [Upper and Lower Neutral versus all other cues; 250ms, *t*s>5.14, *p*s<.01, d_zs>.94; 360ms, *t*s>5.14, *p*s<.01, d_zs>.94; 560ms, *t*s>5.22, *p*s<.01, d_zs>.95; 1000ms, *t*s>3.28, *p*s<.02, d_zs>.60]. Further, RTs were slower for targets that occurred at the previous location of the Mouth versus the Eyes and Bottom House locations for a cue-target interval of 250ms only [*t*s>3.50, *p*s<.01, d_zs>.64]; however, since this finding reflected an overall difference in RT and was not specific to when cues were upright or when faces were presented in the left visual field, it is likely that this effect may be due to additional differences in stimulus properties of the cues rather than a true effect of our featural configuration manipulation (Frank et al., 2009; Kanwisher & Yovel, 2006; Simion & Giorgio, 2015; Yovel et al., 2003). No other main effects or interactions were reliable [*F*s<2.23, *p*s>.09, η_p^2<.07].

Experiment 4

Results

Manual RT

Mean correct RTs are illustrated in Figure S5 for Upright (S5a) and Inverted (S5b) cues for all target locations. The omnibus ANOVA found a significant main effect of *Cue-target interval* [Mauchly's test of sphericity, $\chi^2(5)=20.15$, $p<.01$; $F(1.98,57.42)=41.99$, $p<.01$, $\eta_p^2=.59$], reflecting slower RTs for shorter relative to longer cue-target intervals [250ms vs. all, *t*s>4.69, *p*s<.01, d_zs>.86; 1000ms vs. all, *t*s>2.54, *p*s<.03, d_zs>.46, all other $p=.05$, $d_z=.37$], and a significant main effect of *Target location* [$F(5,145)=58.80$, $p<.01$, $\eta_p^2=.67$], which once again demonstrated overall slower RTs for targets occurring at the previous location of the Upper and Lower Neutral cues versus all other cues [*t*s>8.93, *p*s<.01, d_zs>1.63], with no differences found

for targets occurring at the previous location of the Eyes or Mouth relative to those occurring at the location of the Top or Bottom House [*ts*<1.41, *ps*>.99, d_zs<.26].

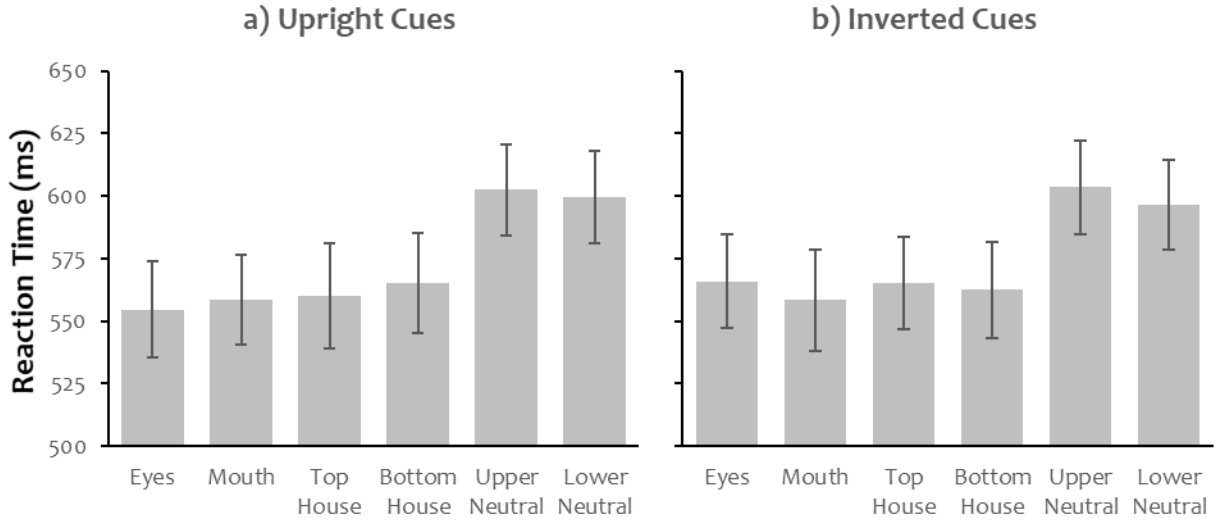

Fig. S5. Experiment 4 manual RT results. Mean correct RTs as a function of all Target positions for (a) Upright and (b) Inverted cues. Error bars represent 95% CIs.

There was a significant interaction between *Cue orientation*, *Face position*, and *Cue-target interval* [$F(3,87)=3.06$, $p=.03$, $\eta_p^2=.10$; all other Fs<1.72, ps>.20, η_p^2<.06]. When separating by Cue orientation, we found larger effects for cue-target interval when cues were Upright as compared to Inverted. That is, a main effect of *Cue-target interval* was found for both Upright [Mauchly's test of sphericity, $\chi^2(5)=17.63$, $p<.01$; $F(2.14,62.02)=30.17$, $p<.01$, $\eta_p^2=.51$] and Inverted cues [$F(3,87)=27.75$, $p<.01$, $\eta_p^2=.49$], reflecting greater effects for shorter relative to longer cue-target intervals [Upright, 250ms vs. all, ts>4.13, ps<.01, d_zs>.75; all other ps>.06, d_zs<.45; Inverted, 250ms vs. all, ts>3.52, ps<.01, d_zs>.64; 360ms vs. 1000ms, $t(29)=3.60$, $p<.01$, $d_z=.66$; all other ps>.10, d_zs<.37]. No other main effects or interactions were reliable for either Upright [Fs<2.50, ps>.08, η_p^2<.08] or Inverted cues [Fs<1.64, ps>.19, η_p^2<.05].

Eye movement Data

Table S2 details the total number of trials containing breakaway saccades during the cue period, along with the number of trials containing breakaway saccades directed towards an *ROI* (eyes, mouth, top house, bottom house, upper neutral, lower neutral) for each participant.

Table. S2. Experiment 4 oculomotor data. Total number of trials containing saccades during the cue period, and number of trials when saccades were directed towards regions of interest.

ID Number	Total Number of Trials with Breakaway Saccades	Separated by Region of Interest					
		Eyes	Mouth	Top House	Bottom House	Upper Neutral	Lower Neutral
1	27	9	5	2	1	8	1
2	6	1	1	2	0	1	1
3	74	17	11	14	18	6	3
4	4	0	3	0	0	1	0
5	24	11	4	1	3	0	2
6	11	2	1	1	0	3	4
7	70	12	6	6	4	39	1
8	2	0	0	0	1	0	0
9	23	8	5	0	1	1	4
10	2	0	0	0	0	1	1
11	1	0	0	0	0	0	1
12	49	13	4	3	8	14	3
13	213	70	51	29	45	5	5
14	28	1	2	3	1	0	19
15	10	2	1	1	1	5	0
16	10	3	1	1	0	4	1
17	38	8	8	5	8	4	2
18	386	168	164	17	18	4	2
19	9	1	2	0	2	2	1
20	9	2	1	1	3	2	0
21	3	0	0	0	0	1	2
22	28	12	5	0	3	5	3
23	53	20	12	6	7	2	6
24	31	8	6	2	2	8	1
25	26	4	1	1	2	7	8
26	42	2	1	0	0	39	0
27	18	4	3	4	1	6	0
28	22	5	5	1	3	5	3
29	5	2	0	1	0	2	0
30	311	203	72	12	19	3	1

Experiment 5

Results

Manual RT

Mean correct RTs are illustrated in Figure S6 for Upright (S6a) and Inverted (S6b) cues for all target locations. The omnibus ANOVA revealed significant main effects for *Cue orientation* [$F(1,29)=5.49$, $p=.03$, $\eta_p^2=.16$], reflecting overall faster RTs when cues were Upright versus Inverted; for *Cue-target interval* [$F(3,87)=37.83$, $p<.01$, $\eta_p^2=.57$], reflecting slower RTs for shorter relative to longer cue-target intervals [250ms vs. all, ts>7.66, ps<.01, d_zs>1.40; all other ps>.27, d_zs<.32]; and for *Target location* [Mauchly's test of sphericity, $\chi^2(14)=45.08$, $p<.01$; $F(2.93,85.09)=31.68$, $p<.01$, $\eta_p^2=.52$], reflecting overall slower RTs for targets occurring at the previous location of the Upper and Lower Neutral cues versus all other cues [ts>5.85, ps<.01, d_zs>1.07]. As before, no significant differences were found for targets occurring at the previous location of the Eyes or Mouth relative to those occurring at the location of the Top or Bottom House [ts<2.27, ps>.21, d_zs<.42].

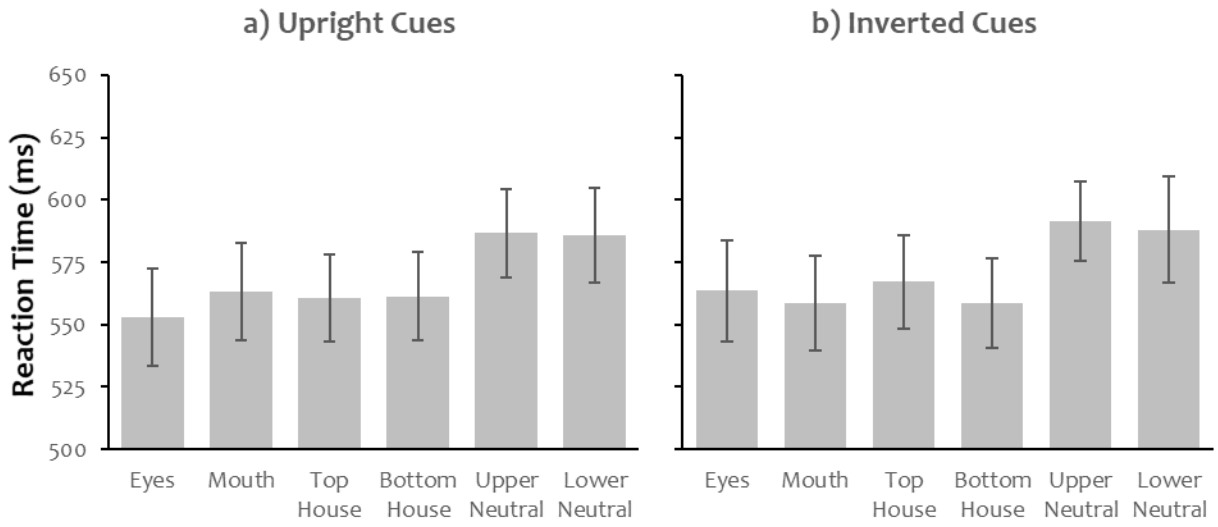

Fig. S6. Experiment 5 manual RT results. Mean correct RTs as a function of all Target positions for (a) Upright and (b) Inverted cues. Error bars represent 95% CIs.

A two-way interaction occurred between *Target location* and *Cue orientation* [$F(5,145)=3.29$, $p=.01$, $\eta_p^2=.10$; all other Fs<2.61, ps>.06, η_p^2<.08]. When separating by Cue orientation, for Upright cues, targets at the previous location of the Upper and Lower Neutral cues had overall slower RTs than those appearing at all other cues [ts>4.58, ps<.01, d_zs>.84]. RTs were reliably faster for targets that occurred at the previous location of the Eyes versus the Mouth and Bottom House cues [ts>2.92, ps<.04, d_zs>.53; all other ps<.09, d_zs>.45]. This effect however was not qualified by a further interaction with Face position [*Target location*, *Cue orientation*, and *Face position*, $F(5,145)=.32$, $p=.90$, $\eta_p^2=.01$] and was thus not specific to when faces were presented in the left visual field. For Inverted cues, targets at the previous location of the Upper and Lower Neutral cues had overall slower RTs than those appearing at all other cues [ts>4.70, ps<.01, d_zs>.86], with no differences for targets at the previous location of the Eyes or Mouth relative to those occurring at the location of the Top or Bottom House [ts<2.82, ps>.06, d_zs<.51].

Experiment 6

Results

Manual RT

Mean correct RTs are illustrated in Figure S7 for Upright (S7a) and Inverted (S7b) cues for all target locations. There were significant main effects for *Cue-target interval* [$F(3,87)=43.56$, $p<.01$, $\eta_p^2=.60$], reflecting overall slower RTs for shorter versus longer cue-target intervals [250ms vs. all, ts>6.91, ps<.01, d_zs>1.26; all other ps>.25, d_zs<.33], and for *Target location* [Mauchly's test of sphericity, $\chi^2(14)=34.58$, $p<.01$; $F(3.53,102.42)=68.86$, $p<.01$, $\eta_p^2=.70$], reflecting overall slower RTs for targets occurring at the previous location of the Upper and Lower Neutral cues versus all other cues [ts>9.28, ps<.01, d_zs>1.69]. As before, no reliable facilitation was found for targets occurring at the location of the Eyes or Mouth relative to those occurring at the location of the Top or Bottom House [ts<2.89, ps>.05, d_zs<.53]. No other effects were reliable [Fs<1.40, ps>.24, η_p^2<.05].

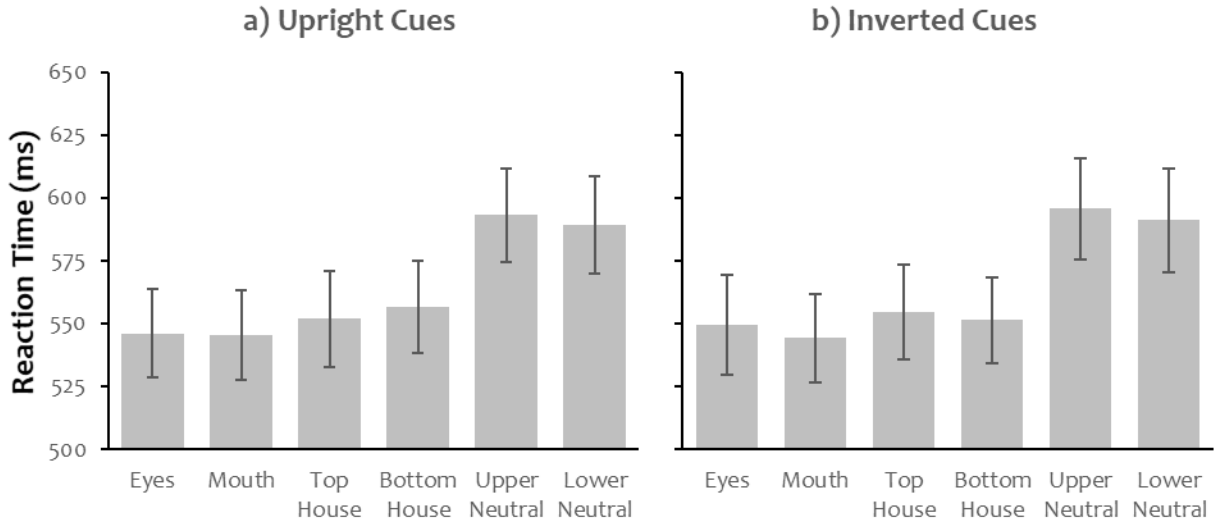

Fig. S7. Experiment 6 manual RT results. Mean correct RTs as a function of all Target positions for (a) Upright and (b) Inverted cues. Error bars represent 95% CIs.

Eye movement Data

Table S3 details the total number of trials containing breakaway saccades during the cue period, along with the number of trials containing breakaway saccades directed towards an *ROI* (eyes, mouth, top house, bottom house, upper neutral, lower neutral) for each participant.

Table. S3. Experiment 6 oculomotor data. Total number of trials containing saccades during the cue period, and number of trials when saccades were directed towards regions of interest.

ID Number	Total Number of Trials with Breakaway Saccades	Separated by Region of Interest					
		Eyes	Mouth	Top House	Bottom House	Upper Neutral	Lower Neutral
1	64	49	6	1	2	3	3
2	13	2	3	1	3	1	0
3	9	1	1	1	0	2	3
4	102	32	14	6	11	26	0
5	9	4	0	2	0	1	2
6	36	6	1	1	2	22	2
7	1	0	0	0	0	1	0
8	25	6	4	1	1	7	2
9	434	368	60	2	4	0	0
10	42	7	4	14	8	7	1
11	7	3	0	1	0	3	0
12	9	2	1	2	1	1	1
13	19	2	1	4	4	6	1
14	17	4	1	2	1	3	5
15	75	8	10	13	10	7	16
16	5	0	0	1	0	4	0
17	3	0	0	0	1	0	2
18	56	21	6	11	6	7	2
19	9	2	1	2	0	3	1
20	2	1	0	0	0	1	0
21	113	34	16	18	6	30	0
22	13	3	1	2	2	2	3
23	167	33	26	32	18	41	8
24	88	54	28	4	0	0	0
25	17	2	1	2	0	10	0
26	92	57	9	13	6	2	0
27	141	37	24	22	23	20	10
28	2	1	0	0	0	1	0
29	21	10	4	4	0	1	0
30	42	9	4	10	2	13	2