Supplement

1. Experiment 1: Emotion classification task

a. Valid eye-tracking trials

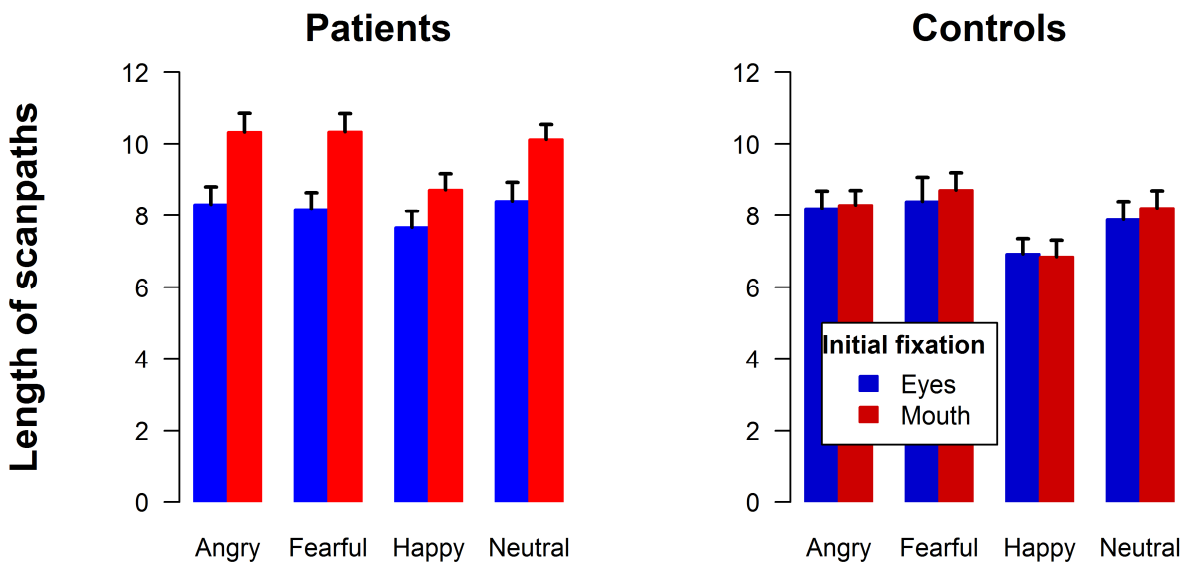
The average percentage of valid trials was 83.15% (SD=13.44%) for patients and 87.10% (SD=9.67%) for controls. More valid trials were observed, when the eyes (*M*=86.22%, *SD*=11.02%) than when the mouth region (*M*=84.03%, *SD*=13.32%) was initially fixated (main effect initial fixation: $F(1,42)= 4.73$, $p<.05$, $f=0.33$). Otherwise, the number of valid trials did not differ as a function of presentation time, emotional expression, initial fixation or group (all $p>0.05$ in a 2×4×2×2-ANOVA on the number of valid trials).

b. Hierarchical regression models

To evaluate how specific our findings are for social phobia, we performed hierarchical linear regression analyses on the eye-tracking data in order to control for the impact of depression, trait anxiety and alexithymia. In a first step, we calculated the mean difference between saccades to the eyes and saccades to the mouth as well as the mean difference in fixation duration on eye and mouth region for each participant in Experiment 1 as well as the mean difference between congruent and incongruent gaze shifts for the second as compared to the first saccade in Experiment 2. These values reflect the significant interactions of group and initial fixation as well as of group and fixated region in Experiment 1 and the interaction of group, congruency and saccade number in Experiment 2. Next, we estimated a regression model using the factor group as predictor and the respective summary statistics as dependent variables. These regression models were then compared to higher order regression models incorporating depression (BDI),

trait anxiety (STAI-T), and alexithymia (TAS) estimates as well as interactions between the group factor and these variables. Model comparison *F*-tests did not reveal any significant results (all *p*-values >.05) indicating that depression, trait anxiety and alexithymia did not account for a significant amount of variance beyond that accounted for by the group factor alone. These analyses foster the assumption that the observed group difference is attributable to social anxiety symptoms and not to other differences between the two groups such as depression, trait anxiety or alexithymia.

c. Scanpath length



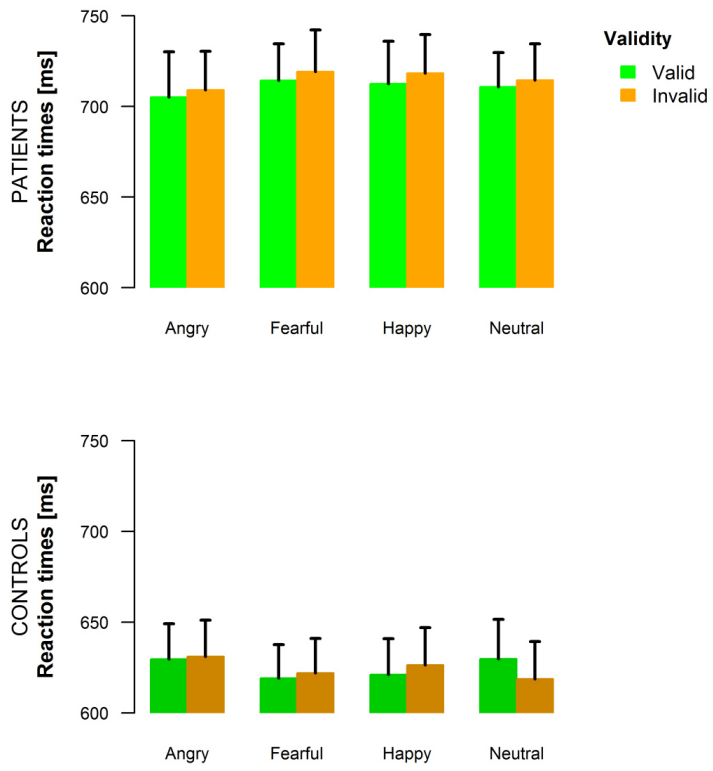
Supplemental Figure S1. Length of the visual scanpath as a measure for potential hyperscanning. The graph is based on the mean length of all saccades when faces were presented for 3000 ms. Error bars indicate SEM.

2. Experiment 2: Gaze-cueing task

a. Valid eye-tracking trials

For the second task, the average percentage of valid trials was high as well with 84.20% (SD=15.69%) for patients and 86.79% (SD=11.19%) for controls. The number of valid trials did not differ as a function of the experimental conditions (all $p>0.2$ in a 2×4×2-ANOVA on the number of valid trials with factors gaze direction, emotional expression and group).

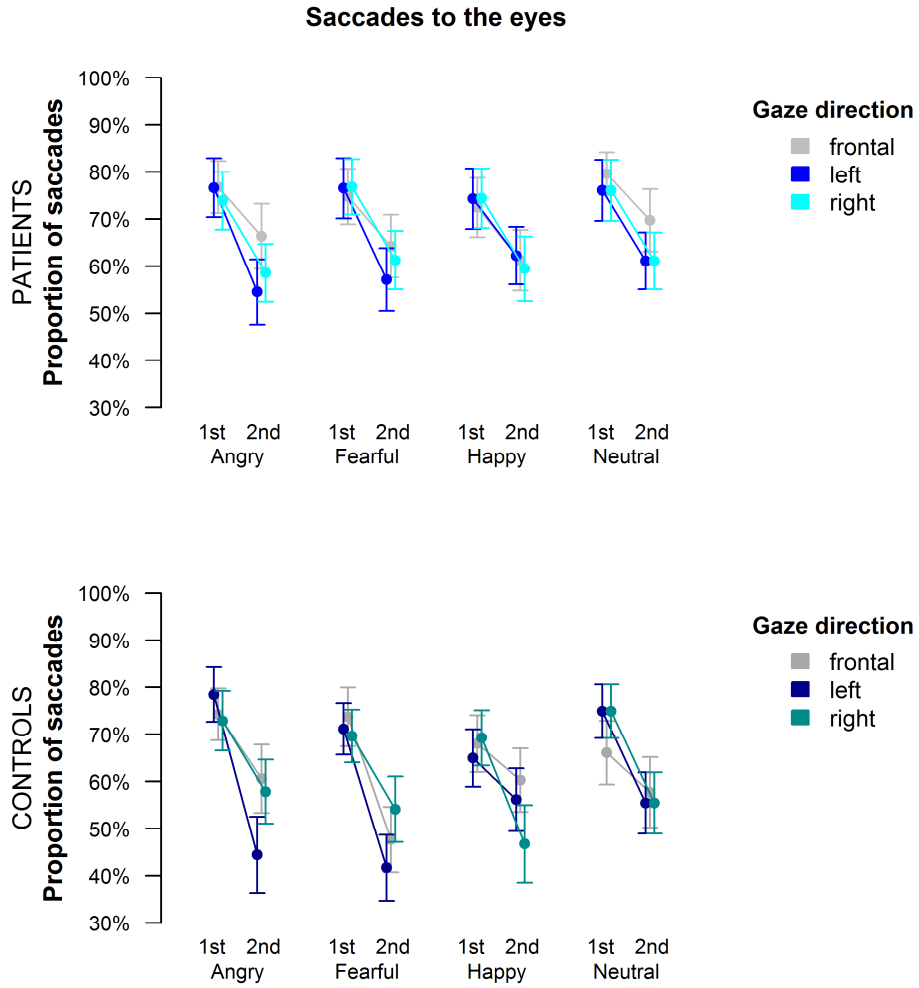
b. Gaze-cueing effects



Supplemental Figure S2. Response latencies in ms are shown for patients and controls. No gaze-cueing effect could be observed: Valid gaze cues (green bars) did not result in faster reaction times than invalid gaze cues (orange bars). Error bars indicate SEM.

c. Saccades towards the eyes in the emotional gaze-cueing task

In addition to analyzing gaze-following effects, we also determined whether the first and the second saccade within the same scoring window of 150 to 700ms was directed at the eye region using rectangular regions of interests (ROIs) individually adjusted for each facial stimulus. The number of saccades towards the eyes for the first and the second saccade was divided by the number of all first and second saccades, respectively. Statistical analysis of this eye-tracking measure was based on a 3×4×2×2-ANOVA with the within-subject factors gaze direction (frontal, left, right), emotional expression (angry, fearful, happy, neutral), saccade (first, second) and the between-subjects factor group. Overall, more first than second saccades were directed towards the eye region (main effect saccade: $F(1,42)=20.39$, $p<.001$, $f=0.70$, see Figure S3). We found no significant group effect or group interaction indicating that patients did not avoid the eyes more frequently when facing a direct-gazing face. Apart from the main effect saccade a significant interaction of gaze direction and saccade ($F(3,41)=3.62$, $p<.05$, $f=0.34$) and a significant main effect of gaze direction ($F(2,41)=4.18$, $p<.05$, $f=0.28$) were observed. These effects relied on direct-gazing faces triggering slightly more saccades towards the eyes than faces gazing to the left or to the right particularly for second saccades (Figure S3). None of the other effects reached statistical significance.



Supplemental Figure S3. Proportion of saccades towards the eyes relative to all trials are shown separately for the patients and controls for each experimental condition. First saccades were more frequently directed towards the eyes than second saccades. No interaction of group and gaze direction could be observed indicating that patients did not particularly avoid the eye region when confronted with direct-gazing faces. Error bars indicate SEM.