

Learning to discriminate invisible emotional facial expressions

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Previous works suggest that the amygdala responds to affective information even when presented outside of conscious awareness (Morris, Öhman & Dolan, 1999; Whalen et al., 1998). However, the degree to which such activity can be utilised for behaviour remains unknown. Here, we investigated learning effects in an emotion discrimination task for invisible face images of two different emotions. We suppressed face images using continuous flash suppression at 10 Hz. On the first day, before the experiment, a calibration test was conducted to determine the optimal contrast level of the face stimulus, to reduce suppression breaks. Participants then performed a 2-AFC task discriminating the perceptually invisible face images (positive/negative) for 1.5-2 hours a day for 3 days, with audible feedback on each trial. Discrimination accuracy improved with training, while breaks in suppression remained constant. Catch trials ensured we could rely on participant's criteria for reporting any breaks in suppression. In addition, using the exact same concurrent procedure, spatially inverted face images failed to produce any learning outside of awareness, suggesting that the learning is specific to upright emotional content of the face images. Training enhanced the sensitivity to facial expression presented outside awareness. These data suggest that with training we can learn to utilise affective information, even when we are unaware of the source of such information.

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