We used a two-alternative forced choice paradigm to measure thresholds for change in apparent health and facial attractiveness due to change in skin colour. For colour changes associated with diet, thresholds were ΔE <1.5; equivalent to a change of 3.3 portions of fruit and vegetables per day. For skin colour changes with oxygenated blood perfusion, thresholds were ΔE <1.4; possibly equivalent to the difference between 0 and 1 hour of vigorous exercise a week. We conclude that even small changes to diet and lifestyle can induce perceivable benefits to skin colour, facial health and attractiveness.

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52.24, *11:30 am*

Facial Expression Production and Training

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Research in facial expression production has shown that typical adults are adept at performing facial expressions spontaneously, but not voluntarily. The current study investigates the effects of training on facial expression production in typical individuals using the Computer Emotion Recognition Toolbox (CERT) (Bartlett, 2006). CERT is a video processing program that detects frontal-faces in a live video stream, and codes each frame with respect to 40 dimensions, including the 6 basic emotions and 30 facial action units (AU's) from the Facial Action Coding System (FACS) (Ekman & Friesen, 1978). FaceMaze is an interactive Pac-man-like game in which players navigate though a maze overcoming obstacles by producing facial expressions based on feedback from CERT. Experiment 1 consisted of two blocks, targeting Happy and Angry expression production exclusively. Participants were given a pre-training assessment in which emotion words were presented and participants were required to perform the matching facial expression. Electromyography (EMG) measures were recorded from the Zygomaticus Major (ZM), the Currogator supercili (CS) and the Obicularis Occuli (OO) corresponding to the Happy, Angry and Surprise (control) expressions. Participants then played the FaceMaze game, followed by a post-training assessment that was identical to the pre-training assessment. Results revealed an improvement in expression production as indicated by post-FaceMaze increases in ZM and CS in the Happy and Angry block, respectively. In Experiment 2, naive participants were presented with videos of pre- and post-FaceMaze facial expressions and were asked to rate the video on the quality of the expression. Results showed that participants rated post-FaceMaze productions of the trained target expression reliably higher than pre-FaceMaze productions. In summary, the EMG findings from Experiment 1 and the expressions ratings from Experiment 2 support the use of CERT as a research and training tool in expression production and recognition.

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52.25, *11:45 am*

When angry faces are just (a) cross

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Throughout man's time on Earth, one of the most consistent threats to his chances of survival has been other humans. It would seem, therefore, evolutionarily expedient to provide humans with every opportunity to detect the threat posed by individuals around them. Previous thinking along these lines has prompted some researchers to argue that certain facial expressions might be subject to enhanced processing to maximize the speed and accuracy with which humans locate individuals bearing threatening expressions. Evidence supporting this proposal comes largely from visual search tasks which have demonstrated that threatening expressions are more rapidly detected than non-threatening ones. An open criticism of this effect is that it may be due to low-level visual artifacts, rather than biological preparedness. One successful approach for controlling low-level, image-based differences has been to use schematic faces (simplified line drawings). We report experiments aimed at discovering whether the enhanced processing of threatening schematic faces, might also be due to low-level features within the stimuli. The first study replicated the standard threat search advantage, but also measured an effect using similar stimuli comprised of obliquely oriented lines. The effect was also present with these stimuli rotated, a manipulation which served to remove any residual resemblance the abstract images had to a face. The results suggest that low-level features underlie the search advantage for angry, schematic faces, thereby undermining a key source of evidence of a search advantage for specific facial expressions. As an interesting aside: whatever the features happen to be, that are responsible for this effect, they are not captured in simple saliency models such as that of Itti & Koch (Vision Research, 2001).

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52.26, *12:00 pm*

A General Recognition Theory Study of Race Adaptation

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Studies of race aftereffects show that adaptation biases responses away from an adapting stimulus. However, it remains unclear if shifts in response frequencies result from changes in perceptual representations or in decisional mechanisms supporting race classification. General recognition theory (GRT) provides a single modeling framework within which we investigated adaptation-induced changes on perceptual and decisional mechanisms. Phase 1 measured participants' white-black discrimination thresholds on facial feature and skin tone dimensions. Results were used to construct a two-dimensional stimulus set for a GRT experiment tailored to each participant's race thresholds. Phase 2 constituted a set of typical race adaptation tasks, in which participants made 2AFC (white, black) responses to faces varying on a single stimulus dimension (features, skin tone) under each of four adapting conditions (white/black features, light/dark skin tone). We replicated previous findings that adaptation shifts perceived features away from the adapting stimulus (adapting to white features made faces appear more black and vice versa), and we provide new skin tone adaptation results showing a similar effect on this dimension. Phase 3 included five tasks requiring complete identification (CI) feature and skin tone responses to four faces in feature-skin tone space (derived in Phase 1). The no-adaptation CI task provides participants' baseline models of perceptual race space, revealing positive correlations between features and skin tone within and across stimuli. As face features were perceived as more black (white), skin tone was perceived as darker (lighter). CI completed under the four adaptation conditions enabled modeling of adaptation-induced changes in participants' race space. Fitted models reveal shifts in perceptual representations away from adapting stimuli, variability in the within-stimulus correlations, and shifts in the decision bounds toward the adapting stimulus. Additionally, equal numbers of self-identified Caucasian and African-American subjects allow us to explore potential race group differences in adaptation aftereffects.

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52.27, *12:15 pm*

The other "other-species" effect: Understanding important differences in primate face discrimination.

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As human adults, we find it difficult to discriminate between individual monkey faces. A sizable body of research attributes this "other-species effect" to insufficient experience. That is, our expertise with faces is limited to the species that we have been exposed to and have interacted with. In recent years, however, evidence has emerged to suggest that monkeys do not share this same expertise. Here, we advance our understanding of face discrimination in humans by comparing two nonhuman primate species using multiple markers of human face expertise. Chimpanzees (Pan troglodytes, N = 6) are our closest-living relative, and thus represent the most direct comparison for understanding human cognitive specializations. Rhesus monkeys (Macaca mulatta, N = 6) are more distantly related but more frequently used as neurological models of human face perception. All 12 subjects were born at the Yerkes National Primate Research Center (Atlanta, GA). Using a 2AFC MTS procedure we measured how face discrimination performance (% correct) in these two species was influenced by changes in orientation, viewpoint, geometric stretching, feature scrambling and contrast-reversal. We also tested whether the composite face effect was