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## Reading the Lie in the Eyes: Machiavellian Gaze Deception and Perception

Interpreting eye gaze is a critical faculty for social interactions – one important component being that of establishing joint attention to an intended location, object, or event. The ability to silently communicate intentions to each other in this way would have been invaluable in the many collaborative activities – for example hunting – that were critical to humans' survival in their ancestral environments. However, because gaze is a typically great signal of intentions, it can also be used competitively in social situations, as in discovering others' intentions through their eye gaze, or conversely misdirecting others' attention with deceptive eye gaze. These tactical social advantages could allow for an arms race in the abilities to produce – and conversely detect – deceptive eye gaze. Using a signal detection design within a spatial cuing task, we evaluated how well participants could 1) produce deceptive directed gazes amongst honest directed gazes, and 2) discriminate between deceptive and honest directed gazes in others. In groups of four, participants were matched with each of the other participants in turn. In each match, participants alternated between two roles. "Viewers" sat in front of two side-by-side monitors and "responders" sat behind the monitors, with an unobstructed view of each other between the monitors. Viewers were instructed (equally and randomly across trials) either to gaze "honestly" at an appearing probe or to gaze "dishonestly" at the monitor opposite the probe. Responders attempted to report which monitor the probe appeared on. In honest trials, both participants were rewarded for correct responses, or penalized for incorrect responses. In dishonest trials, viewers were rewarded for incorrect responses (successful deceptions), and responders penalized. Responders were rewarded for correct responses (detected deceptions), and viewers penalized. As with many types of deception, overall sensitivity for detecting gaze deception was low and responses were very conservative – deceptive gazes were mistaken as honest far more than the reverse. The ability to discern deceptive gazes did not appear to improve with exposure to an individual nor from one individual to the next. This may reflect simply a failure to improve in the short-term, or may more interestingly reflect an effective stalemate in which people are improving comparably in both roles. There were large individual differences — a small number of participants quickly reached near-perfect performance in discriminating between honest and dishonest gazes whereas others were persistently incapable of doing so.