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### **Lying with the brain and the body**

Lying is the deliberate act of transmitting false knowledge and thus inducing in others false beliefs about specific circumstances. Although generally considered immoral, lying is a universal behavior that requires a complex set of mental skill. Due to its inherent spontaneity and sociality, deceptive behavior may be hardly reproducible in experimental settings. Most neuroscience studies on lying sanction or instruct deceptive behaviors thus highlighting the cognitive but not the significance of lie-related conflicts. We developed a novel paradigm in the form of an interactive card game where participants can choose whether to lie to another person in situations of loss vs. gain, and of no-reputation-risk vs. reputation-risk linked to the disclosure of their deceptive behavior to others. Thus, our ecological paradigm allowed participants to spontaneously decide when to lie and face the challenge of deceiving others. In the case of loss, participants lied to reverse the outcome in their favor. We performed behavioral, EEG and thermal imaging studies all converging to indicate that: i) deception is promoted by unfavorable events (e.g. loss), and maintaining one's own reputation encourages honesty; ii) lying is associated with decreased motor readiness, an ERP component that is linked to motor preparation of self-determined actions and modulated when we face moral dilemmas; iii) specific lie-related changes of facial temperature (involving the nose and the periorbital regions) can be found when reputation of the liar is at risk. All the above effects are influenced by specific personality traits indicating that deception is influenced by both situational and dispositional variables.