

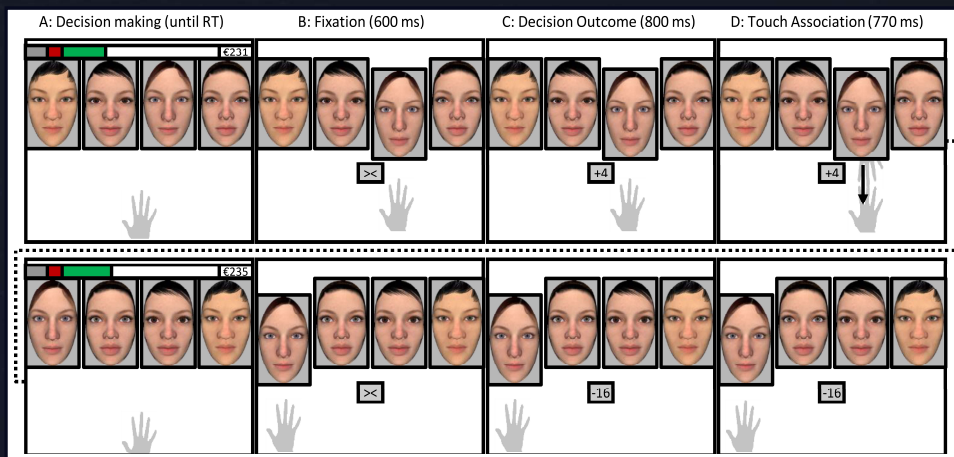
# Facial ERP responses to touch, trust and betrayal: From Midas Touch to Judas' Kiss

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Social touch is critical for emotional development and has long-lasting consequences for non-verbal interaction<sup>1,2</sup>. However, the dynamics of how we associate touch with emotion remain unclear. We designed a novel task to cause people to associate decisions with affective outcomes. In the normal Iowa Gambling Task<sup>3</sup>, participants serially choose a card from four decks. Two of these first appear to provide economically positive outcomes, but the game is rigged: choosing these will cause one to lose money in the long run. The Social Gambling Task is like the Iowa Gambling Task but with *people* instead of cards. What happens when we learn to associate certain people with certain outcomes?

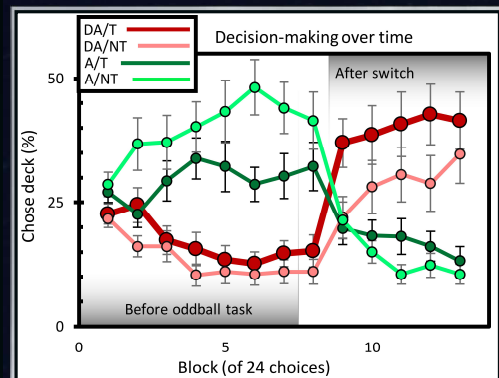
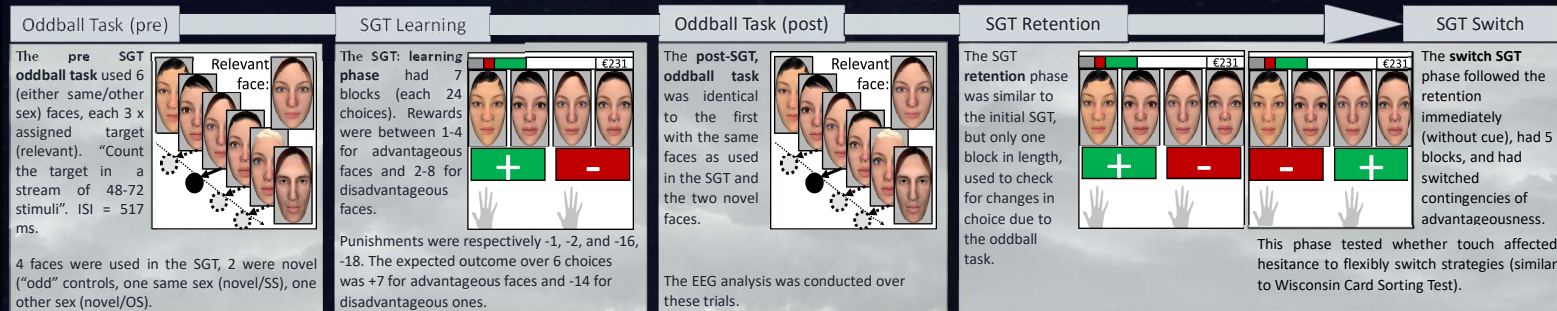
INTRODUCTION



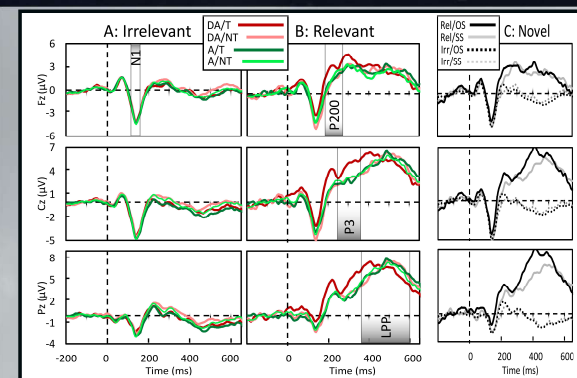
In the Social Gambling Task (SGT), you choose a person and he or she gives you a reward or punishment. Some persons also complement a reward with a (symbolic, visual/tactile cue of a) touch. Thus, there are 4 sorts of persons: trustworthy people (who give lower punishments) who touch, trustworthy people who do not touch, untrustworthy people (who give higher punishments) who touch, and untrustworthy people who do not. Q1: Does touch affect learning to trust?

We predicted that the SGT will cause people to represent the four different faces by the consequences associated by acting towards them<sup>4</sup>. If so, then perceiving the four faces in other contexts still retrieves their associated action-effects. Q2: Do action effects alter face perception, as measured in ERPs in an oddball task?

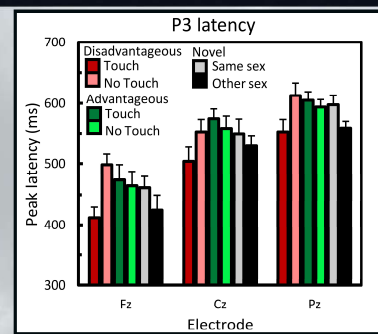
## METHODS / RESULTS



**Behavioural results.** Participants showed learning of advantageousness (A) vs disadvantageousness (D) over time. Touch (T) did not significantly facilitate learning of trust vs no touch (NT). However, following the switch, participants significantly favoured (formerly) disadvantageous/touch (DA/T) faces.



**ERP results.** There were no effects of type of face (as learned in the SGT) on irrelevant ERPs. However, for relevant (counted) faces, disadvantageous/touch faces amplified the early parts of the P3. The pattern looked similar to that of seeing a relevant novel face that is categorically different: novel/OS faces amplified P3s.



**A P3 peak latency analysis** (max Fz, [150, 550], Cz [200, 675], Pz [250, 800]) showed both disadvantageous/touch and novel/other sex to have earlier P3s. It seems that the disadvantageous/touch was prioritised in terms of response processing – much like seeing a novel/odd stimulus.

## DISCUSSION / CONCLUSION

Contrary to predictions, touch did not facilitate learning to trust. However, after the switch in contingencies, participants switched preference in favour of faces that were associated with touch. Forgiveness, so to speak, was granted sooner to those who touched.

The ERPs hint towards the underlying dynamics. Although the faces in the second oddball task were the same as those in the first, the action-effects acquired in the SGT affected ERPs. Trustworthiness had little effect but untrustworthy faces that were associated with touch had earlier P3s, much like seeing a novel, special face. Thus, people whose touch provoked a sense of betrayal were tagged, standing out as special cases in episodic memory. It seems that the task-change resulted in defaulting towards the tagged individual, here resulting in a forgiving pattern.

In conclusion, we show again that touch does not automatically improve preference or affect<sup>5</sup> but rather affects our memory of events<sup>6</sup>. A touch of betrayal may turn a Midas Touch into Judas' Kiss (or vice versa).

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