**Perspective:** Patients with **orbitofrontal cortex** (contains vmPFC) damage **persevere** with bad decks

**-vmPFC:** Contains an **index** that **couples knowledge** to emotional/physiological **states**

**-**Emotions can be activated by the **experience** (**body loop**) or through neural **representation** (insula and somatosensory cortex) **without physiological** changes (**as-if: allows prediction** and taking action on stimuli before body change)

**Patient, EVR**: damaged vmPFC, **cannot learn from errors**, perfect scores on Wisconsin card sorting (executive + IQ normal), does poorly in Iowa

**Emotion models**: James-Lange, Canon-Bard, Schacter-Singer

**Tversky and Kahneman**: Somatic markers = **loss aversion**. You can “feel” the loss in your body -> avoid.

-**Activation** of neural representations **depends on** **framing**

-**Memory modulation hypothesis**: arousing emotional events -> stress hormones -> **amygdala strengthens consolidation other areas** (hippocampus, cortex….)

**Discussion:** **Paralyzed** patients can **play “correctly”** even though they do not have somatic markers to guide them

-To track the somatic markers (learning), a **correlation between draw number and option chosen could be used**. This would probably show that the later the draw, the higher the likelihood for choosing the safe decks

**Conclusion:** Participants learn to draw from **profitable decks**

-Therefore, they **perform better in session 2** than 1

-Following specific strategy may be **due to somatic markers**

-Individual data: after **huge loss, participant plays safe**

-**Age doesn’t bring caution (inconclusive)**

**Age and profit**: risk tolerance supposedly decreases with age

-Safer players would earn higher end capital

-No significant correlation between age and session 2 capital

-**No evidence for more risk aversion with age**

-Age spread in sample is minimal -> result inconclusive

**End capital** difference from 2000 DKK (random draws result)

-No difference in session 1 -> **choosing** **strategy late** or never

-Significant difference in session 2 -> **effective strategy**

-End capital for session 1 and 2 are correlated -> **discovering strategy in 1 leads to profit in 2**

**Table 1:** comparing profitable and unprofitable decks

Paired samples t-tests between A+B and C+D

-**More draws from profitable decks** in both sessions -> **greater effect in session 2**

-Earnings **increased by ~50%** between sessions

-Participants **stick with strategies** from session 1 in session 2

**Fig. 1:** draws from each deck in each session

-Session 1: Draws more spread out, significantly **more draws from C & D** than A & D

-Session 2: Same, but enhanced, effect -> **more careful play**

-Participants have **learnt which decks are profitable**, can skip learning phase in session 2 -> **individual plots!**

**Method:** Computer based card drawing game

-Start with **2000** DKK and draw cards from **4 different decks**.

-Different probabilities and rewards/punishments

-**Decks A and B net losses, C and D net gains**

-2 sessions of 100 draws each, naïve to number of draws

-**Reflection** on deck values between sessions

**Hypothesis** emotional/somatic markers will inform decisions

-Forming strategies that lead to **higher profit in session 2**

-**Older** individuals to have **lower risk tolerance**, drawing more selectively from safer decks, **earning more money**

**Iowa gambling task**: Decisions in imperfect circumstances

**Somatic marker hypothesis**: Damasio and Bechara

-**Neural representations** of previously experienced **body states** guide behaviour and decisions

-**vmPFC** couples input from **somatosensory** areas, amygdala