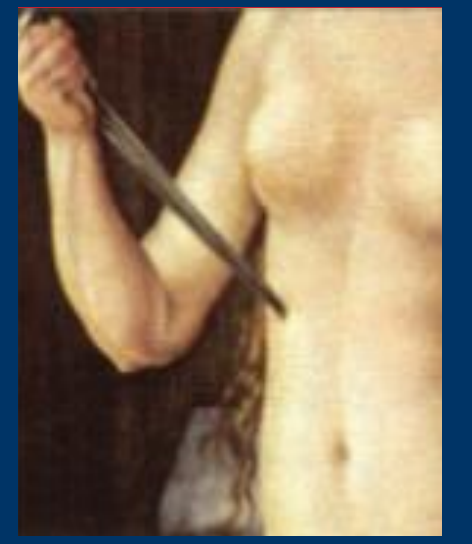


Reward prediction and suicidal behaviour: a neuropsychological study



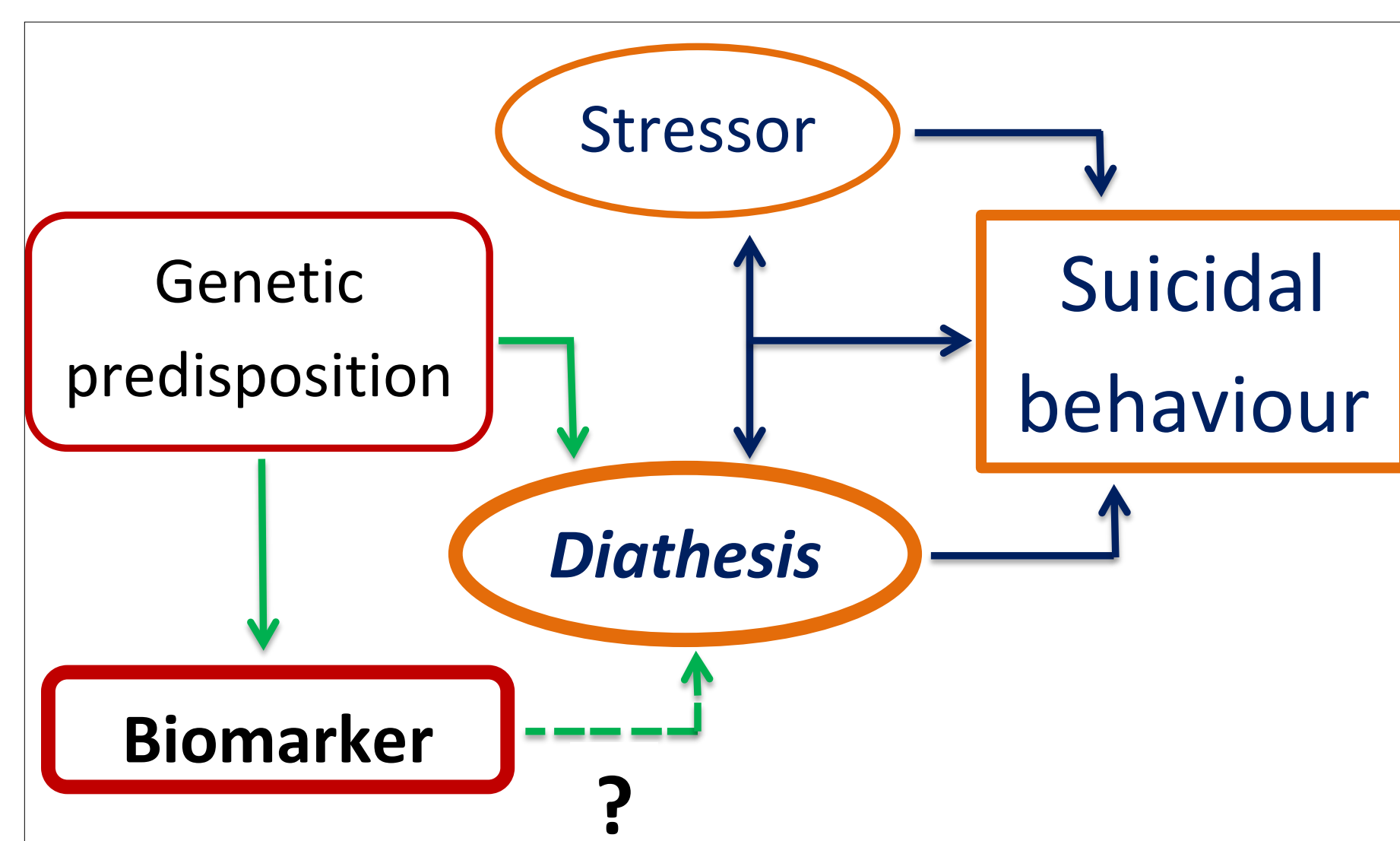
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Introduction

A stress-diathesis model has been proposed in order to classify risk factors based on their distal versus proximal relationship with suicidal behaviour (1). While proximal risk factors such as depression are relatively easy to recognize, the way in which a diathesis may become manifest is less clear.



Neuro-imaging studies have identified a role of brain regions, specifically the orbitofrontal cortex and the dorsolateral prefrontal cortex, in the vulnerability to suicidal behaviour (2). Together with findings from neuropsychological studies (3), these results increasingly suggest a role for neurobiological dysfunctions as a biomarker for suicidal behaviour. More specifically, deficits in decision-making have been identified as possible manifestations of the vulnerability to suicidal behaviour (2, 3).

The current study assessed the association between reward prediction and suicide attempts, providing direction for further research in search of a biomarker for suicidal behaviour.

Methods

PARTICIPANTS

- 15 euthymic outpatients (SA), aged 22-59, with a history of Major Depressive Disorder (MDD) and minimum one suicide attempt.
- 53 euthymic controls (EC), aged 20-70, with no history of suicide attempt.

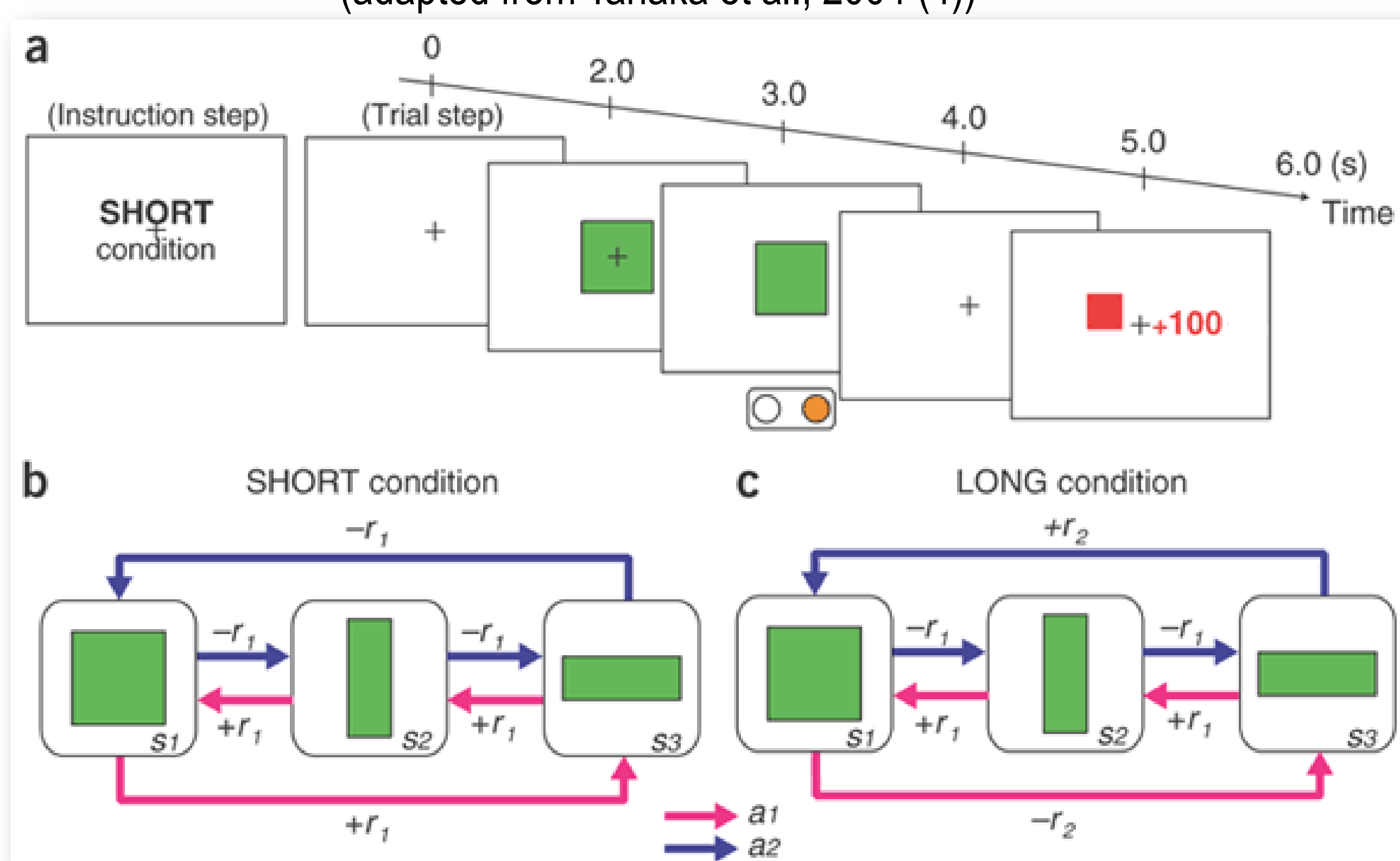
CLINICAL ASSESSMENT

Clinical assessments included: *Scale for Suicidal Ideation (SSI)*; *Suicide Intent Scale*; *Beck Hopelessness Scale*; *Barratt impulsiveness scale*; *State-Trait Anxiety Inventory*; *Utrechtse Copinglijst*; *Beck Depression Inventory*; *SCID*.

NEUROPSYCHOLOGICAL ASSESSMENT

Decision-Making task:

(adapted from Tanaka et al., 2004 (4))

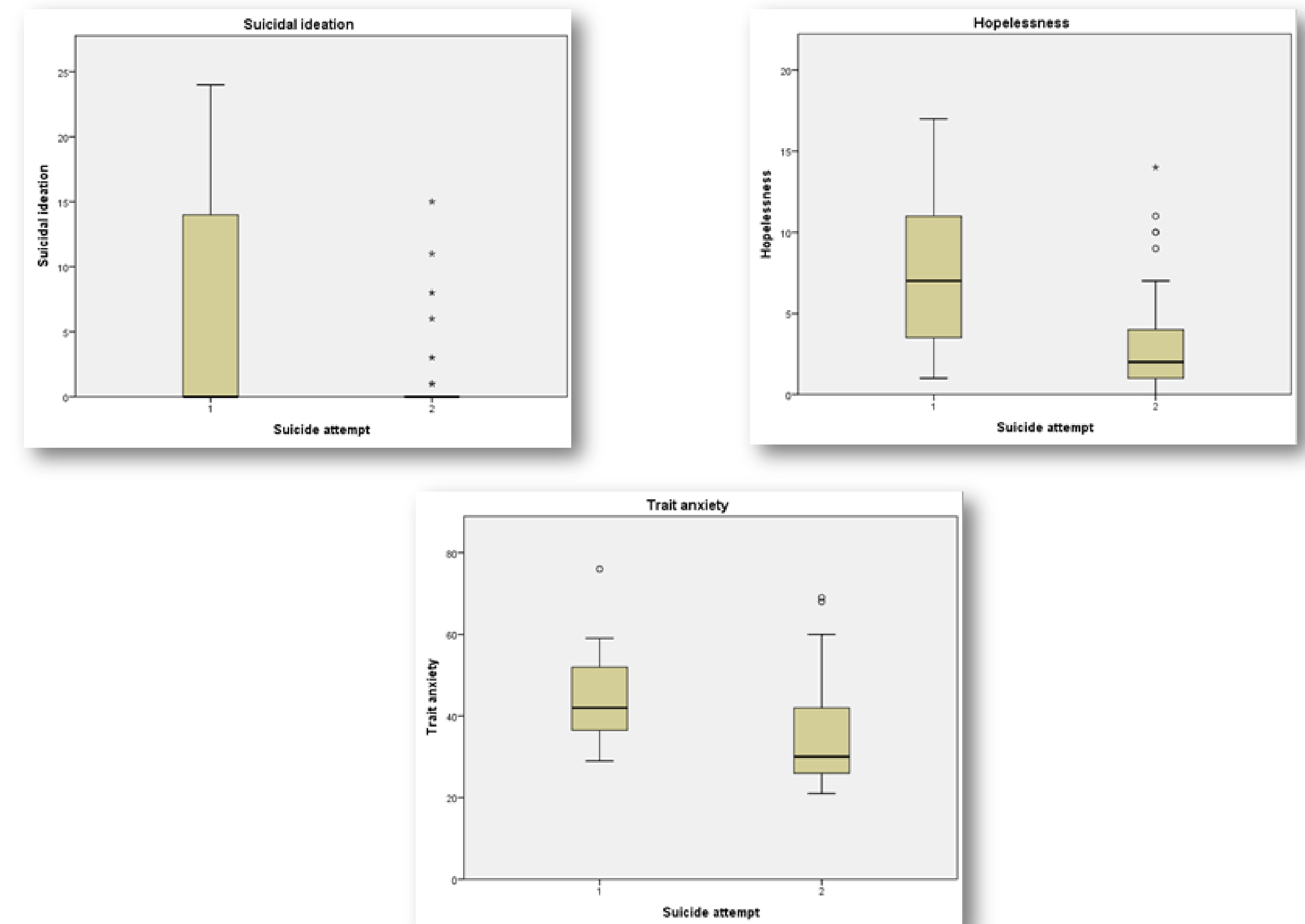


STATISTICAL ANALYSES

As the data were not normally distributed, Mann-Whitney tests were used for both clinical and neuropsychological variables.

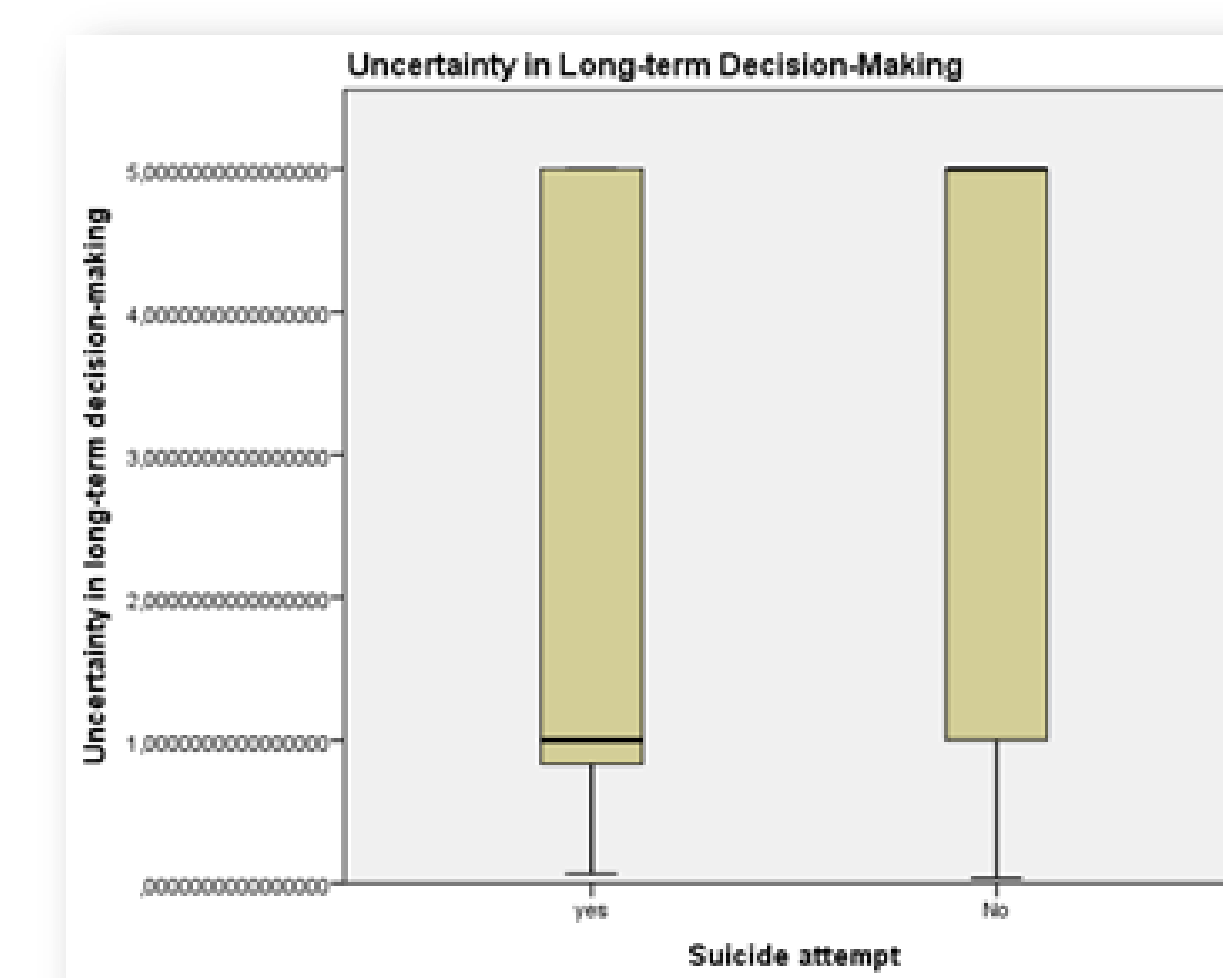
Results

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS



Groups were comparable, except for current level of suicidal ideation ($Z = -2.67, p < 0.05$), hopelessness ($Z = -3.07, p < 0.01$), and trait anxiety ($Z = -2.90, p < 0.01$).

NEUROPSYCHOLOGICAL CHARACTERISTICS



SA performed worse on the reward prediction task, showing more uncertainty in long term decision-making ($Z = -2.07, p < 0.05$), but no reward prediction deficit, ($Z = -.26, p = 0.79$).

Conclusion

The results provide mixed support for a role of reward prediction (dys-)functioning as a biomarker for suicidal behaviour. However, this study adds to our current knowledge by demonstrating the involvement of uncertainty in long term decision-making associated with a history of attempted suicide.

Further research using functional brain imaging techniques is needed to provide insight on the role of reward prediction and certainty of decision making in suicide attempters.

References

- (1) Hawton, K., van Heeringen, K. (2009). Suicide. *Lancet*, 373, 1372-1381.
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