Autonomic regulation during social interaction in schizophrenia

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Introduction

Schizophrenia is a pervasive and complex neuropsychiatric disorder characterized by deficits in Self-experience and awareness which entail anomalies in self-other relationship [1]. Awareness of one's body constitutes a basic experience of Self: intimately linked to the sense of being 'me'. Interoception Sensitivity (IS; the sensitivity to stimuli originating inside the body) interacts with different aspects of human cognition and behaviour. It has been demonstrated that, during interpersonal interactions, the higher IS the higher social disposition. This latter component is measured by Respiratory Sinus Arrhythmia (RSA; a periodic component of heart rate variability and associated with Vagus Nerve activity) [3] is considered a physiological marker of both individual social disposition and social engagement [4].

Aim

To investigate the nature of IS and autonomic regulation of schizophrenia patients (SCZ) during social interactions compared to healthy controls (HC).

Materials & Methods

Heartbeat perception score, was calculated using the Mental Tracking Method, as measure of IS [3]. RSA values were calculated for Baseline and for each experimental condition of Social and Non Social tasks [5].
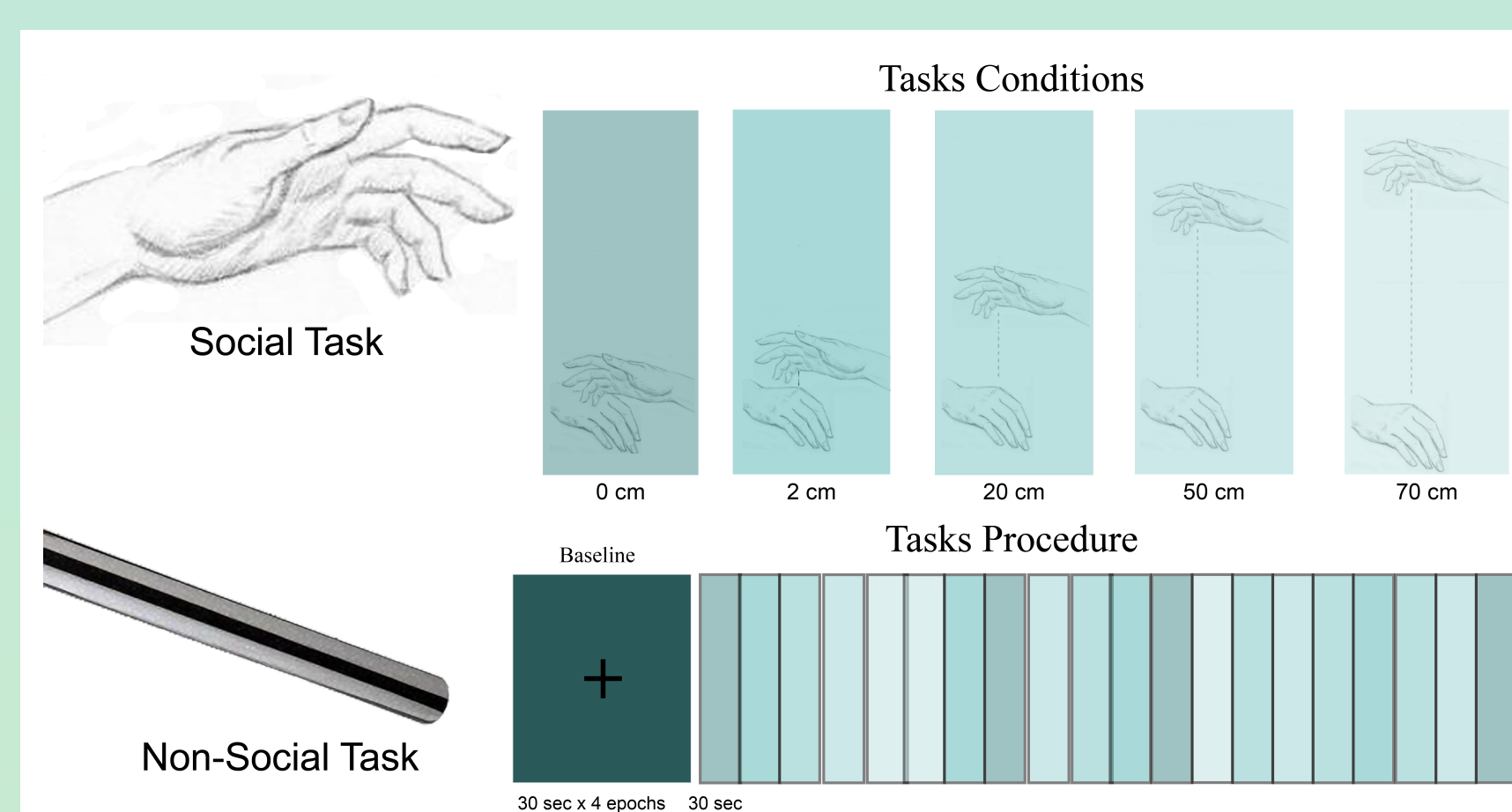

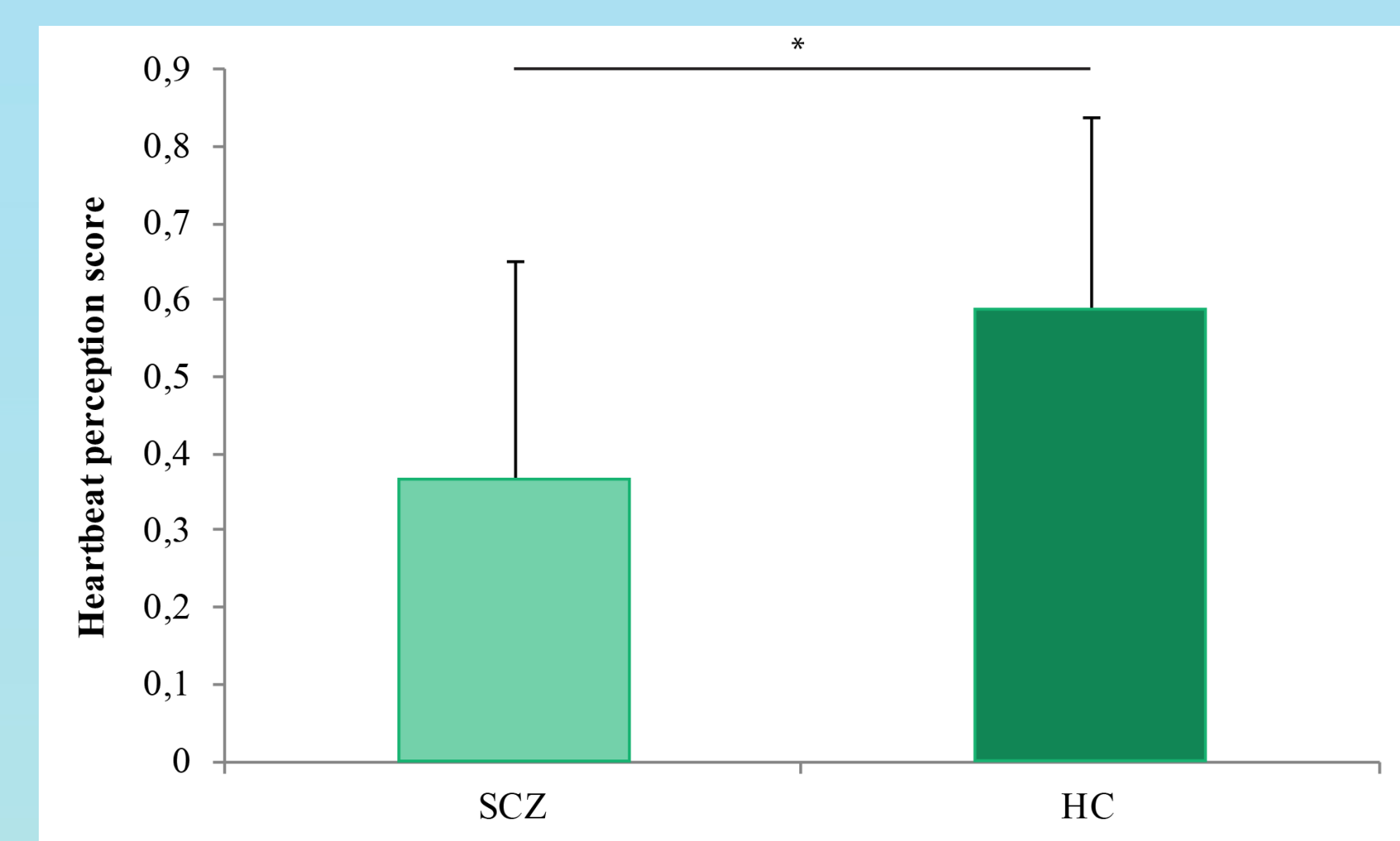Fig.1 - Experimental procedure of Social and Non Social Tasks.

Results

Fig.2 – Between-groups difference in IS (Two-tailed independent sample t-test: t_{36} = -2.47, p<0.05). Error bars represent SD. * = p<0.05.

A regression analysis conducted including as predictors the seven items of P scale (R^2=0.27; $F_{(1,23)}$=8; p<0.05) showed that item P5 (Self-grandiosity) resulted the only significant predictor (β=0.52, p<0.05).
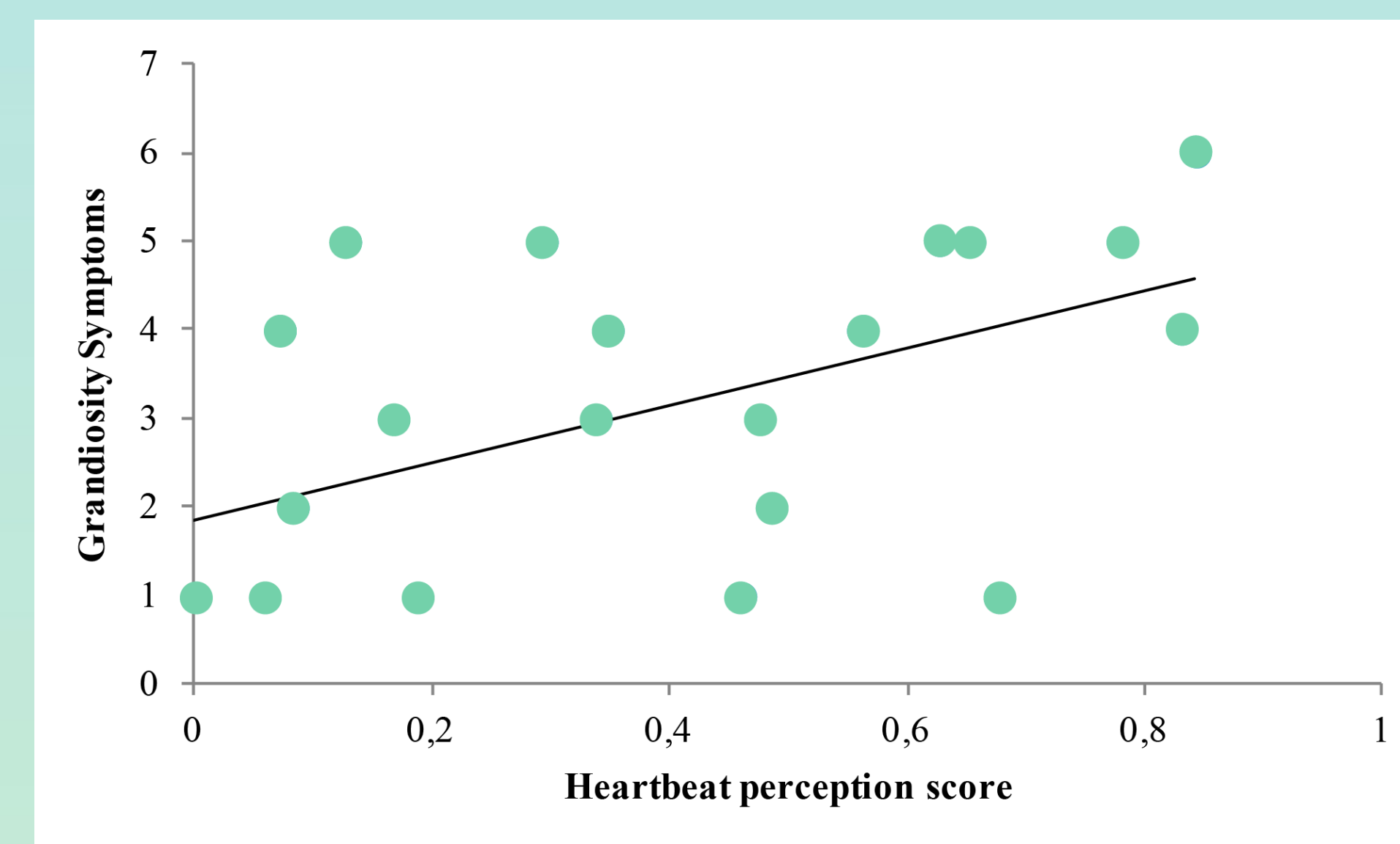

Fig.3 – Linear regression plot of relation between Self-grandiosity score and IS score of SCZ.

A Pearson correlation between IS and Baseline RSA was calculated separately for each group. In HC the higher IS the higher social disposition (r_{16}=0.43; p<0.05). On the contrary, among SCZ there was an absence of relation between IS and social disposition (r_{23}=-0.24; p>0.05).

The two obtained correlation coefficients resulted significantly different (Z=2.00, p<0.05).

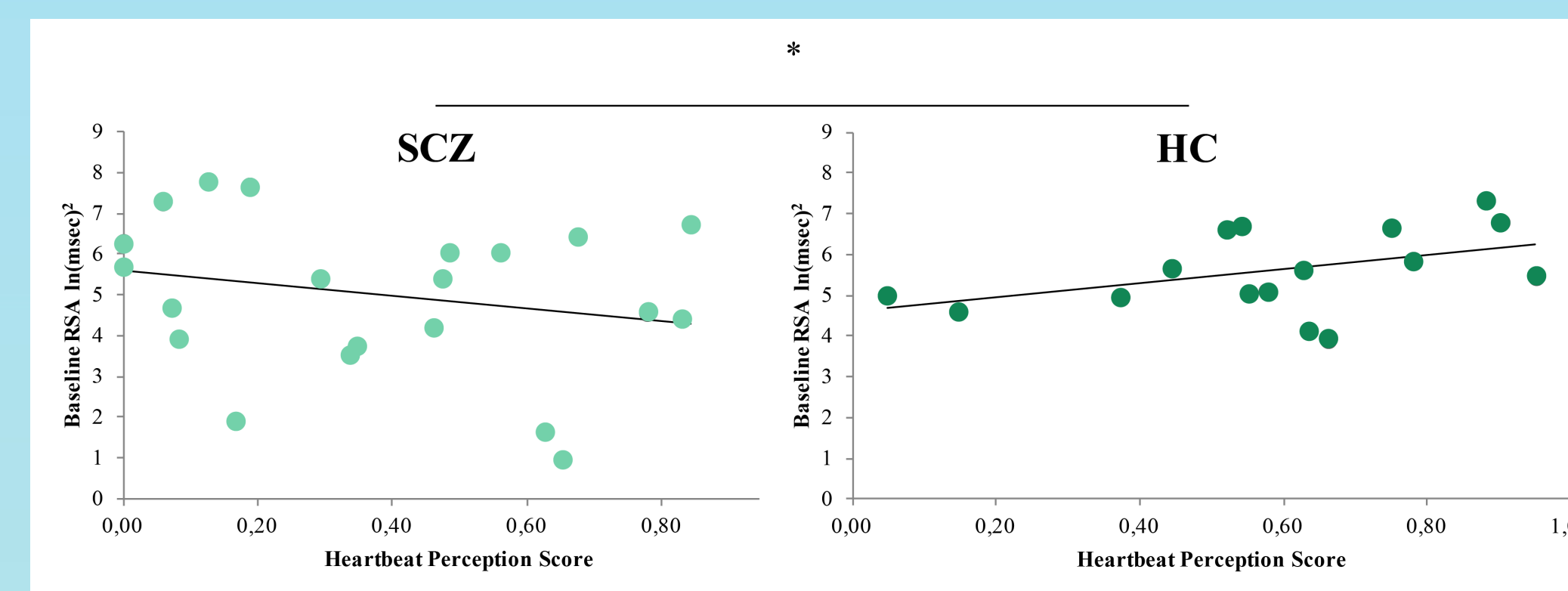Fig.4 – Correlations between IS and Baseline RSA for SCZ and HC. * = p<0.05.

ANOVA conducted on RSA responses recorded during Social and Non Social tasks revealed an interesting trend observed in the interaction Group by Context. HC showed higher RSA resposes to Social context than to Non Social context. An opposite trend was observed among SCZ.
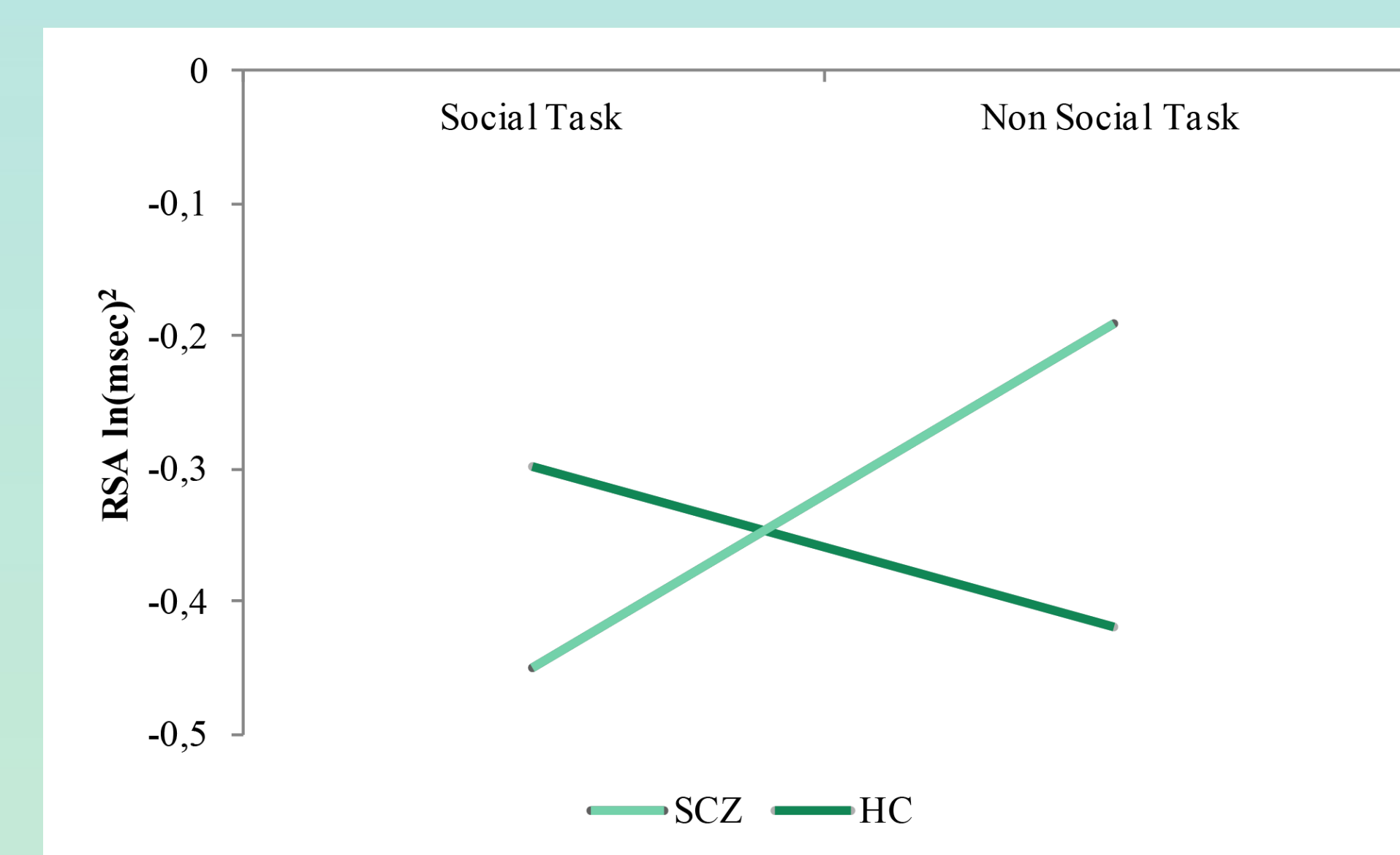

Fig.5 – RSA responses of SCZ and HC to Social and Non Social tasks.

Conclusions

Deficits in the sense of Self, associated with schizophrenia, could be extended to patients' individual sensitivity to internal bodily signals. Exaggerated Self-opinion and unrealistic conviction of Self-superiority (Selfgrandiosity symptom) induce in SCZ higher level of IS. The relation between IS and Self-opinion must be better investigated in healthy individuals. Contrary to what happened among HC, schizophrenia patients' IS was not associated to Baseline RSA.This support the relation between Self-disorders and deficit in interpersonal interaction in schizophrenia.

SCZ and HC in Social and Non Social contexts seem to employ opposite autonomic regulation strategies. If this trend will be confirmed, the observed altered autonomical regulation will be part of interpersonal interaction deficit frequently associated to schizophrenia.

References

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Tab.1 - Demographic information about SCZ and HC.

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