



Psychopathy and Non-Linear Processing of Facial Expressions of Emotion

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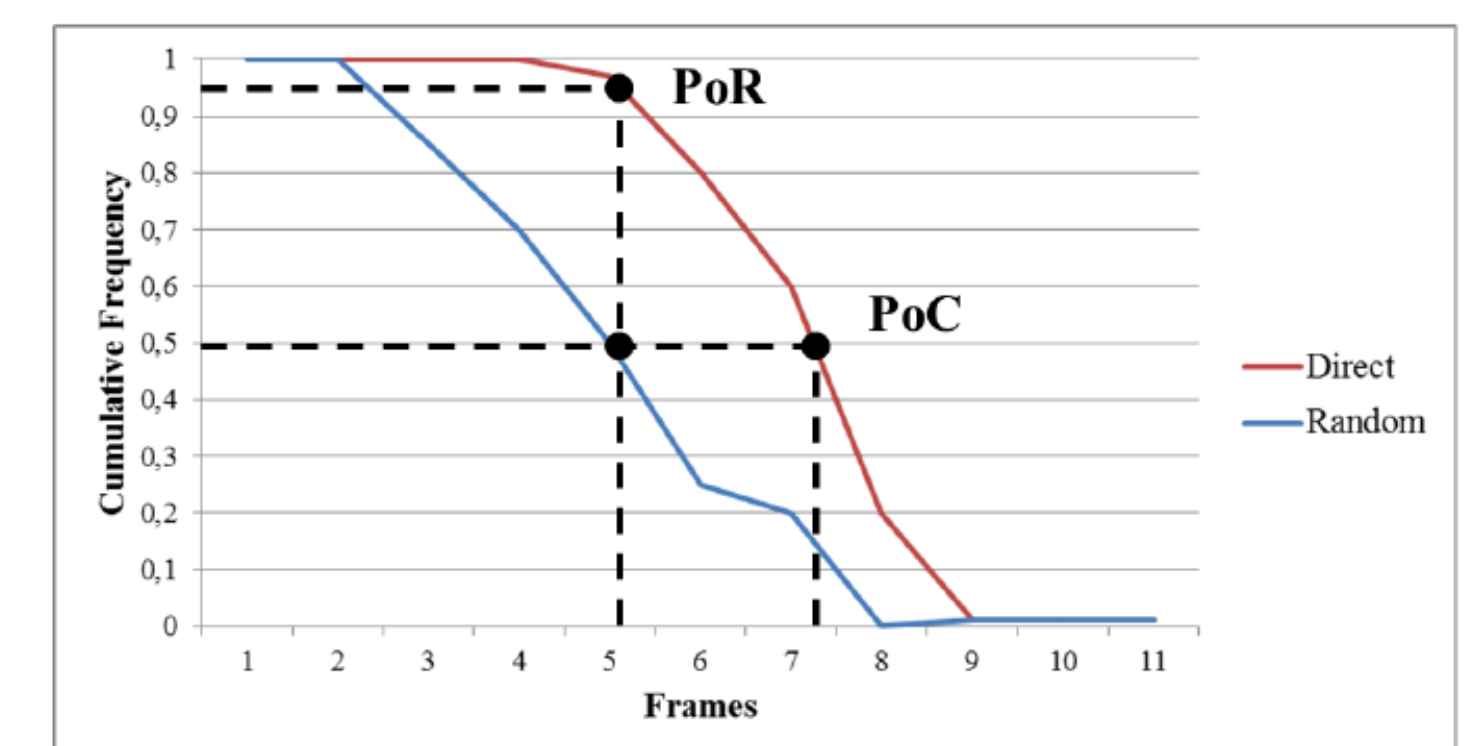
Introduction

Psychopathy is described as a personality disorder associated with affective, interpersonal and behavioral deficits such as lack of empathy or remorse, manipulation and antisocial behaviour. The study of facial expression of emotion (FEE) processing in psychopathy is a common theme, as an indicator and /or justification of the affective and relational deficits. When dealing with emotional continua, where FEE changes from one emotion to another, we can observe perceptual hysteresis effect. This may be defined as a phenomenon where the initial percept of an object is created and persists in time, although its parameter values favour another alternative percept, which will be reached later (1). Therefore, there might be a perseverance of the first emotional category. In psychopathy, studies using morphed facial stimuli found a deficit in fear and sadness detection (2) after a neutral face, representing the need for more frames to be able to identify these emotional categories.

However, there are no studies which consider psychopathy as a dimensional construct, and that use morphs evolving from one emotional category to another. This work seeks to explore how hysteresis effect in FEE processing varies with a lower or higher prevalence of psychopathic personality traits.

H1: Higher TriPM total scores will lead to a more salient hysteresis effect, i.e. larger number of frames needed to change its CP throughout psychopathy spectrum

H2: Higher TriPM total scores will lead to a more salient hysteresis effect when the second emotional category is fear, i.e. more difficulty in fear detection



Methods

Sample: 29 healthy adults (16 females) with age between 19 and 32 years old (mean=22.97, DP=2.93)

Materials:

- Psychopathy level were measured by Triarchic Psychopathy Measure (TriPM; Patrick, 2010).
- Stimulation: continua composed by 11 morphed frames, representing the evolution from one emotional category to another. The emotional categories were: Anger, Fear, Sadness, and Happiness.

Procedure:

Participants could be part of one of the following conditions: Anger – Fear – Sadness (AFS); Fear – Sadness – Happiness (FSH); Anger – Happiness – Sadness (AHS); Anger – Fear – Happiness (AFH), previously defined and counterbalanced.

The continua was presented in Direct Order (e.g. A-F), Reverse Order (F-A), or the 11 frames could be shown stochastically.

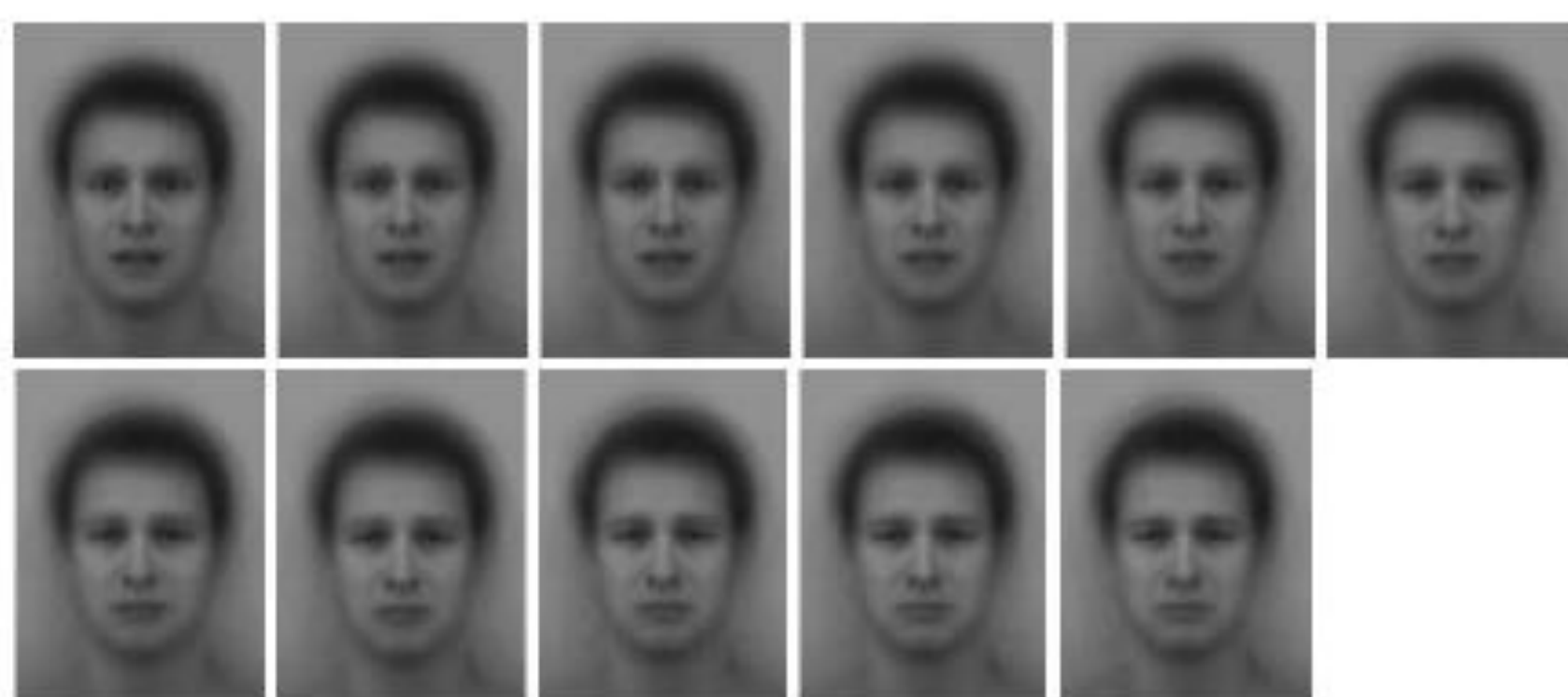


Fig.1 Example of a Fear-Sadness continua.

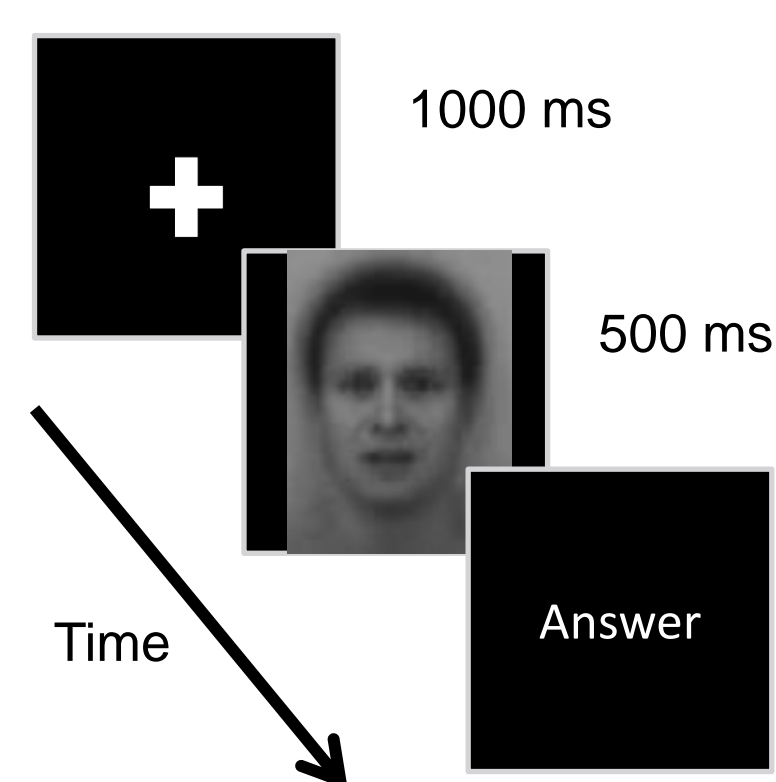


Fig.2 Illustration of the stimulation protocol.

At each frame, they had to identify which of the three emotions they considered that was being presented.

Results

In terms of Psychopathy, we considered TriPM's total score and subdomain scores of Boldness, Meanness and Disinhibition.

Participants responses were analysed in terms of:

- PoC: number of frames between the frame where participants changed the emotional category in the R order and in the Direct Order
- PoR: cumulated frequency of the answers

Main Results:

- Positive correlation between TriPM total score and AF PoC – latest detection of Fear coming from Anger
- Positive correlation between Boldness and AS PoC – latest detection of Sadness coming from Anger
- Negative correlation between Boldness and AH PoC – quicker detection of Happiness coming from Anger

Fig.3 Correlation between TriPM subscales and total score and each continuum PoC.

	FH (n = 18)	FS (n = 21)	HS (n = 11)	AF (n = 14)	AH (n = 8)	AS (n = 10)	HF (n = 19)	SF (n = 21)	SH (n = 11)	HA (n = 8)	SA (n = 10)	FA (n = 18)
Boldness	.349	.051	.408	.085	-.420	.802**	.068	-.169	.257	.019	-.312	.326
Meanness	.019	-.106	-.194	.434	.341	.127	-.207	-.057	.050	-.180	.362	.084
Disinhibition	-.079	-.100	.180	.282	.499	-.038	-.058	-.115	.230	.043	.059	-.415
Total	.163	-.049	.219	.544*	.341	.403	-.016	-.157	.210	-.180	.095	-.081

Note. *p < .05; **p < .01 (FDR Corrected)

Fig.4 Correlation between TriPM subscales and total score and each continuum PoR..

	FH (n = 19)	HF (n = 19)	FS (n = 21)	SF (n = 21)	HS (n = 11)	SH (n = 11)	AF (n = 18)	FA (n = 18)	AH (n = 8)	HA (n = 8)	AS (n = 10)	SA (n = 10)
Boldness	.357	.336	.039	-.114	.209	.428	-.172	-.175	-.796**	-.193	.782**	.250
Meanness	-.147	-.030	-.191	-.021	-.426	-.085	.414	.397	-.137	-.012	.167	.211
Disinhibition	-.059	-.059	.057	.059	-.094	.509	.202	.322	-.027	.012	.043	-.237
Total	.146	.093	-.001	-.027	-.099	.449	.314	.379	-.137	-.048	.423	.079

Note. *p < .05; **p < .01 (FDR Corrected)

Conclusion

The major finding of this work is the association of a higher prevalence of psychopathy traits with a late detection of Fear after seeing Anger. Boldness is also associated with a late detection of Sadness after seeing Anger. These findings are consistent with literature that described deficits in Sadness and Fear, even using morphed stimuli (Blair et al., 2001, 2004). The fact that these deficits are found only after Anger presentation might be indicative of a perseverence phenomenon, never described in literature.

Limitations:

- reduced sample size - low number of participants in each condition and a reduced range of psychopathy scores.

Future directions:

- Relate emotional processing with the domains of TriPM
- EEG correlations

References:

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- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *The Journal of Abnormal Child Psychology*, 29, 491-498.

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