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Research Article

Frustration elevates arousal in individuals high on the psychopathy scale: The role of approach, not avoidance motivation

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ABSTRACT

Psychopaths tend to react with aggression when mistreated. The literature offers two contradicting explanations of this subject. The aim of this study is to determine whether approach or (the lack of) avoidance motivation underlie emotional reactions of individuals with elevated psychopathic tendencies in frustrative situations. The sample of sixty participants (43.3% male) participated in the experiment in which the Ultimatum Game was used to induce the feeling of injustice. The participants received four fair offers in the first phase of the game and six unfair offers in the second phase of the experiment. Their electrodermal activity (EDA) was recorded during both parts of the experiment. Along with the EDA recording, the participants fulfilled Short Dark Triad (SD3) questionnaire and Questionnaire of Approach and Avoidance Motivation (QAAM). Generally, the unfair offers significantly elevated EDA in comparison to the levels of EDA during the fair part of the experiment. The mediational analysis conducted by hierarchical regression analysis revealed that psychopathy is associated with a higher EDA in frustrative conditions, which is entirely explained by QAAM wanting, i.e. approach-related scale. Neither of avoidance-related scales predicted the EDA. This result indicates that individuals with elevated psychopathic tendencies experience stronger emotional reactions when facing the potential loss of rewards, which is driven by their stronger approach motivation, and not by the lack of avoidance motivation. Hence, the study contributes to the understanding of the underlying reason for emotional reactions of individuals with elevated psychopathic tendencies in unfair conditions within the

approach-avoidance framework. Implications for the methodological setting of future studies on this subject are discussed.

Keywords: psychopathy, wanting, approach-avoidance, Ultimatum Game, electrodermal activity

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Introduction

Imagine completing a big project and obtaining significant financial gain for your company. Before the project, you had promised a certain financial reward to your employee. However, you cannot reward him or her as promised prior to the project due to some unexpected reasons. In addition, the employee from this example, who will not be treated fairly, might be described as a person with elevated psychopathic tendencies. What kind of reaction could we expect from the employee in the given situation?

Such and similar situations are likely to occur in the organisational context (e.g. Akhtar et al., 2013) since the subclinical levels of psychopathic tendencies are normally distributed in the population. Therefore, this study aims to explore relations between emotional reactions and psychopathy within the approach-avoidance context. The following text describes basic characteristics of psychopathy, explains how frustration is defined within the approach-avoidance framework, and defines the psychophysiological response to frustration.

Psychopathy, alongside Machiavellianism and narcissism, is one of the three personality traits known under the term - Dark triad. It encompasses characteristics such as callousness, impulsivity, recklessness and tendency to manipulate others to obtain some immediate rewards. Machiavellianism is characterised by a cynical worldview, lack of morality, and manipulativeness, where individuals high on this trait are prone to planning, coalition formation, and reputation building. The key feature of narcissism is grandiosity associated with underlying insecurity. All three dark traits share in common the tendency to manipulate others, callousness and antagonism (Dinić et al., 2021; Jones & Paulhus, 2014).

In the approach-avoidance terminology, unfair treatment is interpreted as reward-omission or frustrative nonreward condition (Corr, 2002). Such conditions typically provoke anger as a response, which was found in animal (e.g., Gallup, 1965) and human studies (e.g., Berkowitz, 1989). Knowing that frustration

leads to aggression and that psychopathy is related to aggression (Blais et al., 2014; Cornell et al., 1996; Dinić & Wertag, 2018; Dinić et al., 2019; Reidy et al., 2011; Woodworth & Porter, 2002), it is expected that the employee from the above-mentioned example will display some sort of uncooperative and/or aggressive response. Needless to say, all individuals might react with disagreement in such a situation, but this study tries to examine whether the magnitude of reaction will be higher for individuals with higher psychopathic tendencies.

Two economic games are typically used in experimental studies to evoke the feeling of injustice in laboratory settings resembling the above-mentioned fictional example; the Dictator's Game (DG) and Ultimatum Game (UG) (e.g., Fetchenhauer & Huang, 2004; Suleiman, 1996). There are several variations of these two games (for a detailed review, see Diekmann, 2004), but they all share the same paradigm and emotion-motivational effects on an individual. In the most typical case, there are two players in the game. One player is placed in a position of power and can decide how to split a financial reward with another player. In the DG, the first player suggests, whereas the second accepts the offers with no influence on the outcome. In the UG, the first player proposes how to share the reward, but in contrast to the DG, the recipient can either accept or decline the offer. If the recipient rejects the offer, neither of the players will receive the reward. Conversely, if the recipient agrees with the given proposition, the reward is shared as proposed. These two games can be adjusted in many ways to represent different real-world scenarios. In this study, participants played the role of the second player in the UG, i.e. they were in the role of the offer recipient.

The results of studies exploring the behavioural outcome of individuals with higher psychopathic tendencies in the position of the recipient in the UG are inconclusive. Some studies found that individuals with elevated psychopathic tendencies are more willing to accept unfair offers (Mayer et al., 2019; Osumi & Ohira, 2010), others found the opposite effect (Koenigs et al., 2010), and the rest did not find any effect (Radke et al., 2013; Vieira et al., 2014). In addition to inconsistent findings, these empirical studies lack a theoretical framework, which seems necessary to organize the existing findings on this

subject. Therefore, the aim of this study is to examine the psychophysiological response of individuals high on the psychopathy scale during the UG within the approach-avoidance theoretical framework. More specifically, this study aims to determine whether approach or avoidance motivation underlies the frustration of individuals with the subclinical level of psychopathy when treated unfairly.

One way to measure frustration as an aversive emotional reaction is with electrodermal activity (EDA). The EDA is an emotionally neutral reaction of the autonomic nervous system that actives in the presence of different stimuli such as reward (e.g., Gomez & McLaren, 1997), punishment or threat (e.g., Krupić et al., 2020) and the omission of reward (e.g., Tranel, 1983). Thus, the interpretation of the EDA highly depends on the context that caused the reaction (for a detailed description of the EDA, see Dawson, et al., 1990). As elaborated above, the higher EDA obtained during the UG in the role of recipient of unfair offer can be interpreted as a higher level of frustration.

Due to a scarcity of studies, the literature review on psychophysiological reactions of individuals with elevated psychopathic tendencies in frustrative conditions is complex and contains many unanswered questions (Patrick, 2014). One reason could be the lack of a clear theoretical framework to study this topic. Within the most prominent approach-avoidance theory, the reinforcement sensitivity theory (RST), psychopathic tendencies are associated with higher levels of approach and lower levels of avoidance motivation (Corr, 2010). Numerous studies provide evidence that individuals with elevated psychopathic tendencies are less responsive to cues of punishment, i.e. have underactive avoidance motivation (e.g., Fowles, 1980; Newman et al., 2005; Ross et al., 2007). For instance, psychopathy relates to lower EDA in the conditions of conflict (Waid & Orne, 1982), aversive stimuli such as white noise (Fung et al., 2005), injected adrenalin (Hare, 1972), etc. According to Gray's original version of RST, frustration is an aversive emotional state that is associated with the workings of the behavioural inhibition system (BIS; Gray, 1977; for a detailed review, see Corr & Krupić, 2017) – that is, avoidance motivation. In short, according to Gray's original RST, the BIS is triggered by both omission of reward and the presence of

punishment. The revised version of RST (Gray & McNaughton, 2000) relates frustration to the workings of the second type of avoidance motivation: the fight-flight-freeze system (FFFS). Thus, according to both versions of RST, it follows that individuals with elevated psychopathic tendencies would have lower levels of EDA in a situation when they are treated unfairly since they have reduced activation of avoidance motivation.

Harmon-Jones and colleagues (Carver & Harmon-Jones, 2009) contradicted Gray's explanation of frustration and advocated that anger (and thereby frustration as well) is under the control of approach, not avoidance mechanism (Harmon-Jones, 2003). They found that students with overactive behavioural approach system (BAS), the representative of the approach motivation, reacted more strongly to insults (Harmon-Jones & Peterson, 2008), while insults resulted in greater activation of the left hemisphere (Harmon-Jones & Sigelman, 2001) which is related to approach motivation (Davidson, 1992). Similarly, Corr (2002) relates anger to higher reward expectancies, where higher expectations lead to a greater discrepancy between actual and expected rewards. Thus, according to these perspectives, individuals with elevated levels of psychopathy, which are high on the BAS scale (Corr, 2010; Wallace et al., 2009), should exhibit a stronger EDA in the nonreward frustrative conditions.

To sum up, there are two contradicting hypotheses regarding the autonomous emotional reactions of individuals with elevated psychopathic tendencies in unjust conditions. According to original and revised versions of Gray's theory, it is expected that individuals with elevated psychopathic tendencies should have lower EDA in unjust conditions because frustration is mediated by underactive avoidance motivation. On the contrary, according to Corr and Harmon-Jones, a higher EDA is expected in conditions when treated unfairly (i.e., in the frustrative nonreward situation) since frustration is under the control of the overactive approach motivation in individuals with elevated psychopathic tendencies.

In this study, the relationship between psychopathy and EDA in the injustice settings in the UG was examined. In addition, the two above-elaborated hypotheses will be analysed more extensively by the hierarchical regression

analysis with approach and avoidance scales entered as mediators of the relationship between psychopathy and EDA. The mediational effect of avoidance- or approach-type of scale will support either Gray's or Corr/Harmon-Jones's hypothesis, respectively. Finally, the hypotheses will also be analysed alongside Machiavellianism and narcissism to determine the distinctive effects of psychopathy from the rest of the dark traits.

Method

Participants

Participants were community members recruited by advertising the study on social networks. A total of 70 participants (42 female and 28 male) gave consent to participate in the study. The whole study was conducted in a laboratory at Faculty of Humanities and Social Sciences, University of Osijek. Due to poor quality or loss of signal, ten records of participants' EDA were excluded from the analysis. Hence, the final sample consisted of 26 male and 34 female participants in the age range from 19 to 27 (M = 21.70, SD = 1.74). Excluded participants differed on neither of the self-report scales from the participants retained in the final sample, which was examined by Mann-Whitney nonparametric test for independent samples. A statistical power analysis using G*Power 3.1 (Erdfelder et al., 2007) was performed for sample size estimation and reported according to recommendation of (Sun et al., 2010). With an alpha error = .05 and power = .80, with the final sample size, it was possible to achieve statistical significance for beta regression weights above b = .25, which according to Cohen (1988) corresponds to a weak to moderate effect. The research was approved by the Institutional Review Board of Faculty of Humanities and Social Sciences, University of Osijek.

Instruments

Short Dark Triad (SD3)

Short Dark Triad (SD3; Jones & Paulhus, 2014) was used to assess psychopathy. In addition to psychopathy (e.g., "People who mess with me always regret it."), this questionnaire contains two further scales; Machiavellianism (e.g., "You should wait for the right time to get back at people.") and narcissism (e.g., "Many group activities tend to be dull without me"). Each of these three scales contains nine items. The questionnaire is translated and validated in the Croatian language, and reliability coefficients of the translated version were comparable to the original version, ranging from .69 for narcissism, .73 for psychopathy and .74 for Machiavellianism scale (Wertag et al., 2011).

Questionnaire of Approach and Avoidance Motivation (QAAM)

Questionnaire of Approach and Avoidance Motivation (QAAM; Krupić et al., 2021) is a 27-item questionnaire containing four approach-related (Wanting, Seeking, Getting and Liking) and two avoidance-related scales (Anxiety and Fear). Wanting (e.g., "I would like to be an important person.") presents the level of aspiration, which explains the strength of desire to possess relevant resources. Seeking (e.g., "I have a wide range of interests.") assesses curiosity and ability to make plans for achieving the desired goals. Getting (e.g., "I don't give up easily if I want to achieve something.") captures the level of persistence in following the plan until the final attainment of the goal. The last approach-related scale, Liking (e.g., "It is quite easy to make me happy.") measures individual differences in the activation on the cues of reward or attained goals. Finally, Anxiety (e.g., "My voice trembles when I need to say something in public.") and Fear (e.g., "I have experienced the feeling of choking due to panic attacks.") represent two avoidance-related scales. All scales contain four items except the seven-item Anxiety scale. The participants were instructed to rate themselves on a six-point Likert scale (*1 - Completely disagree to 6 - Completely agree*). All scales from the questionnaire achieve Cronbach alpha's reliability coefficients above .80 (Table 1). The questionnaire contains good psychometric characteristics, which are tested against well-known approach-avoidance related personality measures

such as BIS/BAS Scales (Krupić et al., 2021) and was used previously in similar psychophysiological studies (Krupić et al., 2020).

Electrodermal activity (EDA)

Electrodermal activity (EDA) was recorded by Moodmetric Ring (MM; Jussila et al., 2018, Torniainen et al., 2015). This instrument contains ring-shaped sensors with a sandwich-like arrangement of two electrode bands around an insulating layer. It was attached to the ring finger on the non-dominant hand. The EDA signal was recorded from the outer rims of the ring at a sampling rate of 4 Hz, pre-processed by dividing the raw signal with the slow-changing skin conductance level and transformed into the Mood Metric (MM) scale ranging from 1 to 100. There were two measurement points during UG. The first recording started at the beginning of the fair conditions, where the participants received four fair offers. After receiving the fourth fair offer, the EDA recording was stopped. The following measurement lasted during the rest of the six unfair offers. The final EDA in fair and unfair conditions represent the average values of the phasic component of the EDA during the two conditions. Larger values indicate higher arousal that can be either positive (e.g., excitement) or negative (e.g., stress). The MM ring has a small data storage capacity, and the data was transferred by Bluetooth to the computer for permanent storage.

The version of the Ultimatum Game (UG)

The version of the Ultimatum Game (UG) adapted in this study was not used in typical dyad interactions. Instead, participants were playing the game only in the role of the offer recipient, who could either accept or reject the offer. There were ten offers presented to each participant in the same (fixed) order. The first four were fair offers suggesting to split the reward equally (50:50). The subsequent six offers were unfair offers presented in the fixed order (40:60, 30:70, 10:90, 20:80, 40:60, 30:70), offering a smaller share to the recipient. The order of offers was determined randomly and was kept the same for all participants to avoid the potential distinctive effect of the first offer. Namely, a highly unfair offer (e.g., 10:90) at the beginning of the unfair condition might

affect the decision on the subsequent offers. To avoid that source of variation, it is determined to keep the schedule of offers constant, where the first offer was the least unfair (40:60). The recording of EDA in the first part of the game represented EDA in fair, and the recording during the second phase represents the measure of EDA during unfair conditions.

Procedure

Before the UG, participants completed both questionnaires. In the experimental part of the study, they were instructed to imagine themselves in a situation where they were working very hard on a project with their partner who was in the position to decide how to split the reward. They were told that a partner was sitting in the room next to them. Each of the ten offers was handed in an envelope, while experimenters were pretending that they arrived from the real partner next door. The participants had only eight seconds to decide whether to accept or reject the offer. The first four envelopes contained fair offers. The EDA was recorded during that time, starting from the acceptance of the first and ending after the decision of the last, fourth offer. In the second part of the study, six unfair offers were also brought one by one, and the arithmetic mean of EDA recorded during that time was used as the criterion variable in the study – EDA in injustice conditions. Since the unfair treatment was at the centre of the study, there were more unfair offers in comparison to fair offers to make sure that the experimental manipulation would produce a significant effect, i.e., to evoke frustration. In addition, the EDA was not recorded for each offer separately, as the envelopes were arriving one by one, which will make the measurement impractical. In addition, it would be debatable to determine when to start and stop recording the EDA, as the frustration is emotional state that is not present only in the presence of the stimuli (in this case unfair offers). It may have a lasting effect. Alongside the EDA, participants had to write whether they accepted or rejected offers on the envelopes. After the experiment, participants were thanked and fully debriefed. Psychology students conducted the experiment under supervision in exchange for course credits.

Results

The analyses were conducted with IBM SPSS v26 and Hayes Process v3.5. (Hayes, 2017). All scales achieved Cronbach alpha coefficients above .70 except Machiavellianism and narcissism (Table 1). The average MM score (representing the EDA) was $M = 44.80$, but the variation was substantial ($SD = 15.66$). The EDA in unfair conditions was statistically significantly higher than the EDA in fair conditions (Wilcoxon Signed Ranks Test $Z = 4.70$, $p < .01$). On average, participants rejected 3.50 out of six ($SD = 1.71$) unfair offers. Only a few participants rejected fair offers, which resulted in extreme positively asymmetric distribution ($M = 0.02$, $SD = 0.13$). Therefore, the correlation coefficients regarding the number of rejected fair offers in Table 1 should not be interpreted. As Table 1 indicates, the MM Score is positively related to Psychopathy and Wanting scale (one of approach motivation measures), which supports Corr/Harmon-Jones's hypothesis. The number of rejected offers was related to neither psychopathy nor Wanting scales. In addition, Anxiety and Fear scales did not correlate with EDA, which rejects Gray's hypothesis. Finally, age and gender, used as the control variables, were not correlated to EDA in either of these conditions, but males achieved higher results in Machiavellianism and psychopathy, which is in line with previous studies (e.g., Miller et al., 2011).

Further analysis explored the mediational effect of the Wanting in explaining the relationship between psychopathy and EDA using Hayes Process v3.5. Table 2 indicated that the Wanting has completely explained the effect of the psychopathy scale on EDA (completely standardised indirect effect psychopathy – Wanting – EDA obtained by 2000 bootstrap samples; $b = .11$; $se = .05$; 95% bootstrap confidence interval .04 ↔ .21), which also supported Corr's and Harmon-Jones's hypothesis. The observed effect size for the psychopathy on EDA is low ($R^2 = .10$), while psychopathy and Wanting combined explain 19%, representing a low to moderate effect. The mediational effects of the rest of the QAAM scales were also analysed, but none achieved statistical significance. The only unpredicted effect beyond the hypothesis is the positive relationship between the Liking scale and the number of rejected unfair offers. **Table 1**

Descriptive statistics and zero-order correlation

	Demographics		Electrodermal activity		Number of rejected offers		Short Dark Triad			Questionnaire of Approach and Avoidance Motivation				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	-														
2. Gender[a]	-.20	-													
3. Fair offers	.05	-.13	-												
4. Unfair offers	.00	-.05	.87**	-											
5. Fair offers	-.05	-.15	-.15	-.16	-										
6. Unfair offers[b]	-.16	.32*	-.19	-.15	.04	-									
7. Narcissism	-.13	.00	.03	.11	-.01	-.04	.65								
8. Machiavellianism	.03	-.30*	.17	.23	.28*	-.23	.06	.68							
9. Psychopathy	-.02	-.29*	.29*	.32*	.30*	-.19	.37**	.59**	.73						
10. Wanting	.01	-.07	.30*	.40**	.07	-.10	.47**	.33*	.35**	.81					
11. Seeking	-.12	.11	.00	.04	.15	.09	.32*	-.00	.08	.42**	.85				
12. Getting	-.05	.21	.06	.07	-.11	.15	.19	-.06	-.03	.17	.21	.90			
13. Liking	-.19	.48**	-.21	-.16	-.01	.42**	.09	-.38**	-.23	-.06	.44**	.20	.84		
14. Anxiety	-.18	.16	.13	.03	-.10	.25	-.45**	.06	-.15	-.28*	-.18	-.27*	.05	.86	
15. Fear	-.08	.00	-.07	-.03	-.00	.17	-.01	.35**	.17	-.17	-.09	-.06	-.03	.50**	.84
M	21.72	-	41.16	44.80	0.02	3.50	25.55	27.33	19.06	17.63	18.95	18.43	19.38	23.23	7.25
SD	1.74	-	14.40	15.66	0.13	1.71	5.32	5.08	6.10	4.34	4.36	4.25	4.45	8.59	4.29

Notes: * $p < .05$; ** $p < .01$. Cronbach alpha coefficients are placed in diagonal; a – positive correlations indicate higher results for females; b – data for the number of rejected fair offers are transparently presented, but should not be interpreted because of the extreme asymmetrical distribution

Table 2

Mediational effect of wanting between psychopathy and EDA in injustice situation

Predictors	Outcome variables		
	Wanting	EDA in injustice condition	EDA in injustice condition
Psychopathy	.35**	.32*	.21
Wanting	-	-	.32*
	R^2 = .13	R^2 = .10	R^2 = .19
	$F(1, 58) = 8.23^{**}$	$F(1, 58) = 6.55^{**}$	$F(2, 57) = 6.82^{**}$

Note: * $p < .05$; ** $p < .01$.

Discussion

This study examined the underlying motivation of emotional reactions of individuals with elevated levels of psychopathy in frustrative nonreward conditions. The results indicate that individuals with elevated psychopathic tendencies have higher EDA when treated unfairly. However, the main contribution of this study is that the increase of EDA is mediated by higher social aspirations (measured by Wanting) for individuals with elevated psychopathic tendencies, which supports Corr's (2002) and Harmon-Jones's (2003) hypothesis that aggression (as a result of frustration) is mediated by approach, not avoidance motivation. Narcissism and Machiavellianism were not related to the EDA.

This study is one of the few psychophysiological studies that explored the role of psychopathy in economic games adjusted to evoke the sense of unfairness (frustration). As could be expected, the finding of this study is more congruent with studies employing a similar methodology. One such study is Vieira et al.'s (2014) fMRI study indicating that individuals with elevated psychopathic tendencies tend to experience more frustration during the unfair phase in the UG. This frustration appears to be related to the reward system in the brain-behavioural circuits, such as the ventral striatum that activates during the reward anticipation (Abler et al., 2005; Murray et al., 2018). On the contrary, Osumi and Ohira (2010) found that individuals with elevated

psychopathic tendencies have lower EDA and a higher level of acceptance of unfair offers in the UG, which contradicts the finding from this study. Later, Osumi et al. (2012) conducted an fMRI study where they found that individuals with elevated psychopathic tendencies have a dysfunctional amygdala, which reduces aggressive reactions toward the proposer of unjust offers. All of these studies were conducted on small samples and with a slightly different methodology, which might contribute to the inconsistency of the findings. For instance, Osumi and Ohira's (2010) used real money in the study and divided participants into two extreme groups according to the results of Primary and Secondary Psychopathy Scales (PSPS: Levenson et al., 1995). Hence, almost all key methodological aspects of that study (psychopathy measures, type of incentives, brain imaging instead EDA) were different from the present one. Hence, it is possible that these differences in methodology between Osumi et al's and this study led to different conclusions.

In addition, this study relates elevated psychopathic tendencies with Wanting – a component of approach motivation, which is consistent with earlier findings (e.g. Birkás et al., 2015; Brazil & Forth, 2020; Glenn et al., 2017) and neurobiological findings of the brain functioning of individuals with elevated psychopathic tendencies. Namely, higher aspirations (measured by Wanting in this study) are related to a higher level of reward anticipations that are associated with the hypersensitivity of the ventral striatum (e.g., Murray et al., 2018) and ventromedial prefrontal cortex (Blair, 2010) for individuals with elevated psychopathic tendencies. Hence, according to several studies conducted with different methodology, individuals with elevated psychopathic tendencies tend to be especially sensitive to cues of threats to their desired social status (i.e., loss of potential reward), making them more reactive aggressive and prone to frustration, which is commonly observed in the literature (e.g., Blair, 2010; Dinić & Wertag, 2018).

As mentioned in the introduction, the EDA has neither positive nor negative emotional valence, per se. Thus, the interpretation of the EDA highly depends on the context, and the RST might serve as a useful theoretical framework for the interpretation. Namely, without the context and

theoretical framework, the relationship between EDA and psychopathy might be hard to comprehend. According to RST, psychopaths have low avoidance (BIS and FFS) and high approach motivation (BAS) (Corr, 2010). Thus, individuals with elevated levels of psychopathy are less reactive to the cues of threats when confronted by stimuli that provoke avoidance motivation. For instance, psychopaths do not react to angry faces (von Borries et al., 2012) or aversive stimuli such as unpleasant noise (Fung et al., 2005). As this study shows, only the approach-related stimulus might lead to the increase of EDA in individuals with elevated psychopathic tendencies. Therefore, future experimental studies on this subject should classify stimuli within the approach-avoidance framework in order to increase the precision in predicting the change in EDA of individuals with elevated psychopathic tendencies.

The relationship between Liking and the number of rejected unfair offers was the unpredicted result in this study. Liking strongly correlates to the BAS Reward Responsiveness from the BIS/BAS Scales (Krupić, et al., 2021), which was earlier used in studies with the UG. The post-hoc literature review found only two studies exploring the role of the mentioned scale in the UG. They both revealed the same finding; Reward Responsiveness relates to the maximising rewards strategy in the economic games (Harjunen et al., 2018; Scheres & Sanfey, 2006) and avoidance of unfairness (Harjunen et al., 2018). In addition, a positive correlation between the EDA during the fair condition and psychopathy is found. There is a possibility that negotiating itself increases arousal in individuals with elevated psychopathy. Since these two topics were not previously extensively examined and were out of scope in this study, future studies should attempt to replicate these findings and explore the possible underlying mechanism of these two effects.

Limitation

A potential threat to the generalizability and replicability of the finding is that fairness in the UG varies across cultures (Oosterbeek et al.,

2004), gender (Solnick, 2001) or employment status (Carpenter et al., 2005). Furthermore, despite (or maybe because of) the fact that psychopathy is well studied in personality and clinical psychology, researchers do not agree on the definition of this construct. Consequently, there are several competing psychometric operationalisations of that construct (e.g., Colins & Andershed, 2016; Hare et al., 1990; Levenson et al., 1995; Sellbom et al., 2018). The SD3 treats psychopathy as a unidimensional trait, and it would be useful to replicate the findings of this study with another self-report measure that operationalizes psychopathy as a multidimensional construct. Also, it would be useful to replicate the findings where the personality questionnaires would be applied after the experimental manipulation. In addition, the baseline level of the EDA was not recorded, so it was not possible to determine to what extent the injustice evoked by the UG increased the EDA. However, the statistically significant difference between the EDA during the time spent in the fair and unfair conditions in this study might indicate the efficiency of the UG to evoke the emotional reaction. Nevertheless, it is necessary to replicate the findings of this study with random order and balanced length of the time spent during the fair and unfair treatments to eliminate the effects of possible confounding variables to the results of EDA recordings. Finally, despite the incongruence between implicit and explicit measures of motivation (e.g., Thrash et al., 2012), future studies on this subject could use the self-report verification of provoked emotion, which were absent in this study. The EDA here is interpreted as frustration according to the approach-avoidance theoretical framework, but nevertheless, an additional self-report of the emotional state of the participants might provide additional support for the interpretation of the EDA during unfair conditions.

To conclude, individuals with an elevated subclinical level of psychopathic tendencies react more strongly when faced with injustice. This emotional reaction appears to be motivated by their strong desire for status, which provides evidence of the usefulness of the approach-avoidance theoretical framework in understanding frustration, frustrative nonreward and unfairness in individuals with elevated psychopathic tendencies. In

addition, the findings might have practical implications in an organisational context, where unfair situations might occur. According to this study, individuals with higher psychopathic tendencies and driven by their ambition would react more strongly to injustice.

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Declarations of interest

I have no conflicts of interest to disclose.

Data availability statement

Raw data were generated at the University of Osijek, Faculty of Humanities and Social Science. Derived data supporting the findings of this study are available from the corresponding author Dino Krupić on request.

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