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Unemotional psychopathy? What part of the emotional self-reported experience is missing in individuals scoring high, medium and low in psychopathy

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ABSTRACT

Most of the studies on emotion in psychopathy has, to date, concentrated on criminal trials and focused on specific emotions without examining how the emotions are experienced. This study aims to verify whether and how individuals showing different scores on a psychopathic scale present mixed emotion, which are considered particularly challenging due to accompanying uncertainty and ambivalence. Sixty individuals participated in a computer experiment in which they were shown one of four excerpts from the film evoking: (1) negative emotion, (2) positive emotion, (3) mixed emotions, and (4) neutral affect. Subsequently, they reported the level of three forms of meta-emotions toward that experience: (1) curiosity, (2) distress, and (3) being moved. The level of the trait of psychopathy was measured using the Self-Report Psychopathy Scale-III. Results revealed that individuals scoring high on psychopathy show a lower ability to experience the meta-emotion of being moved in response to mixed emotions compared to individuals scoring low on psychopathy, which does not occur in the case of negative emotions. The results provide preliminary empirical support for the idea that individuals scoring high in the psychopathy scale may experience more challenging emotions in an acutely less profound and personal way than others. This may be a new line of explanation for the emotional superficiality and callousness characteristic of psychopaths, particularly in the social domain. This is also significant the difficulty of integrating the affects and the resulting personality disorders, especially psychopathy as the most socially harmful personality. However, this study has some limitations, especially due to its small sample size, so interpretation of these results should be considered with caution.

Key words: psychopathy, meta-emotions, mixed emotions, emotional experiences, personality.

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Novelty and Relevance

What is already known about the topic?

- Recent studies have increasingly focused on the emotional aspects of psychopathy, and it is known that psychopathy is associated with certain deficits in the emotions experience.
- Mixed emotion allows for a deeper understanding of ambiguous situations but also have troublesome nature and not all people are incapable of experiencing them.
- Inability to integrate positive and negative aspects of the emotional experience of reality is the basis for pathology in personality.

What this paper adds?

- Individuals scoring high in the psychopathy scale may experience more challenging emotions like mixed emotions in less profound and less personal way than others.
- Meta-emotions could be an important factor in emotion functioning for individuals scoring high in the psychopathy scale.

The most popular and widely used model in psychopathy research is Hare's model (Hare, 2003). Based on Cleckley's concept, the original two-factor model, which included interpersonal affect and impulsive antisocial factors, has now been expanded to include four main factors: affective, interpersonal, antisocial, and lifestyle (Cleckley, 1988). The affective factor refers to the absence of guilt and crisis of conscience, emotional superficiality, lack of empathy, and non-acceptance of self-responsibility. The interpersonal factor concerns superficial personal charm, articulate self-expression,

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unjustified high self-esteem, pathological lying, and tendencies to cheat and manipulate. The antisocial factor includes poor behavioral control, early-onset conduct problems, serious criminal behavior, failure to comply with probation, and delinquency. The lifestyle factor includes a need for stimulation, a parasitic lifestyle, a lack of long-term goals, impulsivity, and a lack of responsibility. Recent studies have increasingly focused on the emotional aspects of psychopathy, identifying dysfunctional emotional responses as the main factors contributing to callous and manipulative treatment of others, as well as moral relativism (Brooks, Fritzon, & Watt, 2020; Decety, Chen, Harensky, & Kiehl, 2013; Garofalo, Neumann, Zeigler-Hill, & Meloy, 2019; Shane, & Groat, 2018; Spantidaki-Kyriazi, Bogaerts, Tamir, Denissen, Garofalo, & 2021). On the other hand, it is necessary to mention about critical considerations and another approaches about the theoretical and empirical basis of the psychopathy construct. For example, functional interpretation of psychopathic behavior focus on unusual and exceptional personal histories, filled with conditions that favor developing some specific behaviors.

This approach point out the underestimation of environmental factors, which are less highlighted in comparison with the biological basis of the psychopathy phenomenon nowadays. (Jalava, Griffiths, & Maraun, 2015; Visdómine-Lozano, Gil-Luciano, & Roales-Nieto, 2019). The differences in the individuals analyzed by Cleckley and Hare are also worth to mention. Hare based his construct of psychopathy on the accounts of previous researchers representing the clinical paradigm, primarily Cleckley's original criteria. Cleckley conducted research as part of his clinical practice, while Hare examined inmates. Despite this difference in the individuals studied, the items describing psychopathy proposed by both authors are very similar.

The aim of the present study is to examine the relationship between individuals scoring high in a psychopathy scale and the ability to experience more complex emotional states that allow for a deeper understanding of ambiguous situations, i.e., mixed emotions. These results could be a hint about such relationship in undoubtedly cases of psychopaths, i.e., those individuals committing extremely criminal acts against other people, although this requires further studies to confirm or reject the results found herein.

According to Lazarus, most human situations embody positive and negative aspects, which are also relevant to emotional responses to situations that evoke both affects (Lazarus, 2003). Frijda extended this thesis by claiming that emotion itself can be a simultaneous conflict between avoidance and approach toward the realization of two opposing goals (Frijda, 2008). Affective co-activation produces mixed emotions, which are two or more emotions or emotional experiences of opposite valence that occur together in the same situation (Brooks & Associates, 2015; Oceja, & Carrera, 2009).

The recognition and experience of mixed emotions emerges in children between the ages of 4 and 5. Initially, it is recognized in others before direct personal experience (Larsen, Firemen, 2007). The development of these abilities is continuous in typical growth throughout adolescence and adulthood, peaking between the ages of 40 and 60 (Labouvie-Vief, 2003). Oceja and Carrera reported that only about half of the adult population experiences mixed emotions, demonstrating the complexity of the phenomenon and raising the question of why this ability eludes the rest (Oceja, & Carrera, 2009). The coexistence of conflicting emotions helps us understand and appreciate the positive and negative aspects of a situation. Studies have shown that the experience of mixed emotions confers benefits at many levels, such as being associated with a lower propensity to use psychoactive substances as an emotion regulation strategy and more frequent pro-social engagement (Oceja, & Carrera, 2009), less intense reminiscence of situations that evoke

strong emotions (Aaker, Drolet, & Griffin, 2008), a more creative approach to matters that evoke emotional involvement (Fong, 2006), easier coping with the loss of a loved one, which means greater mental resilience (Coifman, Bonanno, & Rafaeli, 2007).

Despite the many advantages arising from the ability to experience mixed emotions, the process is not without its difficulties, which may arise from doubts about the appropriate reception of a situation and the resulting course of action. Williams and Aaker showed that mixed-emotions stimuli are perceived as less attractive than those that evoke clearly positive or negative emotions (Williams, & Aaker, 2002). Taking into account the troublesome nature of mixed emotions, an essential factor influencing the potential for deriving benefit from them may be the way an individual responds to them, specifically the meta-emotions associated with them. As Russell and Barrett explained, “prototypical emotional episodes necessarily include all of the following: core affect; overt behavior of the right sort (flight with fear, fight with anger, etc.) in relation to the object; attention toward, appraisal of, and attributions to that object; the experience of oneself as having a specific emotion; and, of course, all the neural, chemical, and other bodily events underlying these psychological happenings” (Russell, & Barrett, 1999, p. 86). The value of first-order emotions is influenced by meta-emotion. The generally accepted definition of meta-emotion is that it is an emotion that evaluates other emotions (Mitmansgruber, Beck, Höfer, & Schüßler, 2009; Shaver, Veilleux, & Ham, 2013). For example, when someone is sad about their jealousy, sadness is meta-emotion. Similarly, when someone is happy about joy, the first-order emotion is the joy from something that happened, and the second-order emotion is happiness about feeling joy. The intensity and valence of the first-order emotion are modified by meta-emotion, which contributes additional knowledge that can influence the meaning of an emotional experience and, thus, modify the perspective, decisions, and behavior (Mendonça, 2013).

We assumed that psychopathy is not about the lack of emotions, but rather about specific difficulties in experiencing more complex emotions. Some research indicates that emotion regulation in psychopathy may be motivated by specific goals related to psychopathy (Garofalo, Eisenbarth, & Shane, 2020). In particular, in psychopathy emotions may be felt as good or bad due to peculiar needs and values. Studies have shown that these values and goals could be seeking power (but not necessarily personal achievement), financial success, and acquiring material possessions. Individuals high scores in psychopathy demonstrated a preference for group-based dominance (social dominance orientation) and were more concerned about their relative position in society than their absolute level of income, education, or vacation time (Glenn, Efferson, Iyer, Graham, 2017). The construction of emotions depends on cognitive and affective processes that shape how individuals experience, interpret, and respond to emotional stimuli. This process involves not only experiencing emotion but also the way in which emotions are cognitively appraised and integrated into prototypical emotional episode. Previous research has focused on the specificity of meta-emotions concerning specific emotions in psychopathy (usually fear and anger).

Our study goes beyond this by examining the perception of one's own emotions depending on their complexity. We argue that experiencing mixed emotions requires resistance to uncertainty and ambivalence. Therefore, psychopathic individuals may not want to experience mixed emotions in situations that have both positive and negative aspects and prefer to experience unequivocal emotions. One possible explanation is that individuals scoring high on psychopathy may tend to avoid experiencing mixed emotions in situations that contain both positive and negative elements, instead showing

a preference for unequivocal emotional states. As Kernberg suggests, difficulty in holding positive and negative affects together within the same emotional experience is one of the main factors contributing to development of personality pathology (Kernberg, 2016). Consequently, given that psychopathy may impede the experience of mixed emotions, we concentrate on three types of meta-emotions that are highly pertinent to emotional control. The first is the meta-emotion of being moved, which enables an individual to perceive experienced emotions as valid, profound, vivid, powerful, and personal (Menninghaus, Wagner, Hanich, Wassiliwizky, Kuehnast, & Jacobsen 2015). The second type of meta-emotion is curiosity, which makes a person more open to their own emotions, and the third type is distress, which causes aversion toward one's own emotions. The research question was: do individuals scoring high on psychopathy differ from individuals scoring low on psychopathy in experiencing different forms of emotion (i.e., positive emotion, negative emotion, and mixed emotion) in terms of the meta-emotions of being moved, distress, and curiosity?

METHOD

Participants

The study was conducted online and involved a sample of the Polish general population, selected through the snowball method. Participants were provided with a link to the study page. A total of 60 individuals (85% women, $n= 51$), aged between 18 and 56 years ($M= 29.13$, $SD= 10.45$), participated in the study.

Instruments and Measures

Self-Report Psychopathy Scale (SRP-III; Paulhus, Neumann, & Hare, 2009; Polish translation, Killam, 2010). The SRP-III is a self-report questionnaire designed to measure psychopathic personality traits based on a four-factor model of psychopathy (Hare, 2003). The questionnaire consisted of 43 items on one general scale and four subscales: interpersonal manipulation, erratic lifestyle, criminal tendencies 1, and criminal tendencies 2. The internal structure of the tool in this translation is similar, though not identical to that of the original (Paulhus, Hemphill, & Hare, 2016). Therefore, we elected to utilize a general psychopathy index, where a higher score indicates a higher level of psychopathy. The reliability of the overall scale was $\alpha= 0.895$, which is comparable to that of the original version.

Film Reception Survey. The correlated variables were evaluated using the author's film reception survey, which includes adjectives referencing the following meta-emotions: (1) being moved, (2) distress, and (3) curiosity. The participants were asked to indicate on a scale of 1 (does not fit) to 5 (fits very well) how well the adjectives corresponded to their perception of the emotions evoked by the film clip they had just watched. The film reception survey comprises 43 items, divided into three categories: feeling of curiosity (20 items), feeling of distress (13 items), and feeling of being moved (11 items). The Appendix contains a list of sample items for each of the scales. The distinctiveness of the meta-emotions scales was confirmed by factor analysis following rotation. The sum of the ratings of the items on a given scale yields the score for that scale. Higher scores indicate greater curiosity, greater distress, and greater being moved. The reliability indicators obtained in this study were as follows: $\alpha= 0.923$ for the curiosity scale, $\alpha= 0.916$ for distress, and $\alpha= 0.915$ for being moved.

Procedure and Intervention

The procedure was developed using Inquisit 4.0 (Millisecond Software, LLC). Initially, participants completed a questionnaire to assess their level of psychopathy.

Subsequently, each participant was randomly presented with one of four film clips, selected to elicit a specific type of affective stimulus. The efficacy of the manipulation was evaluated. Participants then completed a questionnaire to assess their perceptions of the emotions elicited by the observed scene. Participants were informed that the study was anonymous, voluntary, and could be terminated at any time. This information was included in both the introductory email and the study instructions that appeared after the survey link was clicked. Upon completion of the requisite reading, the participant may initiate the experiment by clicking the button, thereby indicating their willingness to participate in the study and providing their informed consent.

Affective arousal was induced using scenes from the film *Life is Beautiful* (Benigni, 1997), which is typically employed in mixed emotion studies due to its bittersweet character (Larsen, McGraw, 2011). The survey was conducted in accordance with four conditions of affective arousal: negative emotion, positive emotion, mixed emotions (positive following negative), and neutral affect. Neutral affect is defined as the presence of a disinterested emotional state, particularly feelings of neutrality, indifference, and a lack of strong emotions (Gasper & Danube, 2016). The scenes were selected by a panel of judges, each of whom was a psychologist with expertise in the concept of mixed emotions. A detailed description of each film scene, accompanied by an introductory description and the number of respondents indicating their feelings related to each scene, can be found in the Appendix.

The study was conducted in accordance with the ethical principles set forth in the 1975 Declaration of Helsinki, as revised in 2008. It was approved by the Ethical Review Board at SWPS University of Social Sciences and Humanities, Poland, Faculty of Psychology in Warsaw (opinion no. 65/2022).

Data Analysis

Data were analyzed using IBM SPSS Statistics. As an initial step in the exploration of the data, descriptive statistics of relevant variables were generated: psychopathy, distress, curiosity, and being moved. These variables were evaluated on a quantitative scale, thus allowing a range of statistics to describe their characteristics. All variables were checked for normality of distribution.

The first analysis was Spearman's correlation, which examined the strength and direction of correlations between study variables.

The second analysis was moderation analysis. We analyzed the relationships between study conditions and emotional attitudes, specifically in terms of the meta-emotions of being moved, distress, and curiosity. These analyses were conducted within a statistical model in which psychopathy served as a moderator. The study was conducted in four study conditions: negative emotion, positive emotion, mixed emotions, and neutral affect. Psychopathy severity was assessed using the overall score of the SRP-III. Meta-emotions were analyzed using three scales: the emotion of being moved, distress, and curiosity. In the analysis, the Hayes Process macro (2018) was applied in model 1. Each type of meta-emotion and the overall psychopathy scale score were analyzed separately within their respective models. The study conditions were examined using planned contrasts. These contrast comparisons were designed to account for valence-differentiated affect. Contrast 1: (1) negative emotion vs. (3) mixed emotions, Contrast 2: (1) negative emotion vs. (2) positive emotion, Contrast 3: (4) neutral affect vs. (2) negative emotion. The comparison between positive emotion and mixed emotions was omitted because of

the sequential nature of mixed emotions (negative followed by positive), in which the positive component at the end may eliminate the contrast effect.

RESULTS

Table 1 presents descriptive statistics. The average level of psychopathy was almost 21 points ($SD= 3.81$), which, according to the tool's author, indicates a of moderate severity of psychopathic traits (Hare 1991; Groth, 2010). For the psychopathy (SRP III overall scale) and meta-emotion of being moved, the distribution of the scales according to the results of the Kolmogorov-Smirnov test ($p > .05$) was normal.

Table 1. Descriptive statistics.

	$M (SD)$	Minimun/Maximum	Skewness	Kurtosis
Psychopathy	20.47 (3.81)	14.25/31.25	0.708	0.446
Being moved	22.75 (8.72)	11/41	0.415	-0.737
Curiosity	57.81(13.52)	20/82	-0.870	0.786
Distress	22.35 (8.23)	12/45	0.406	-0.454

Notes: Being moved= Total score of *Film Reception Survey Being moved Scale*; Curiosity= Total score of *Film Reception Survey Curiosity Scale*; DISTRESS= Total score of *Film Reception Survey Distress Scale*; SD= Standard Deviation; Psychopathy= Total score of *Self-report Psychopathy Scale-III*.

Table 2 presents correlations between study variables. Being moved were positively correlated with distress, and curiosity. Statistically significant correlations were obtained also between curiosity and distress.

Table 2. Results of Pearson's correlations analysis

	Psychopathy	Being moved	Curiosity	Distress
Psychopathy	--	-0.027	0.021	0.180
Being moved	-0.027	--	0.491**	0.817**
Curiosity	0.021	0.491**	--	0.384**
Distress	0.180	0.817**	0.384**	--

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$.

Subsequently, we examined the moderating role of psychopathy on the relationships between study conditions and the meta-emotions of being moved, distress, and curiosity. Statistically significant values of planned contrasts 2 and 3 were obtained, i.e. differences between the study condition with negative emotion and the condition with a positive emotion, and between the study condition with negative emotion and the condition with neutral emotion. The study conditions showed a differentiation in meta-emotions, as evidenced by higher average values of curiosity ($M= 62.50$), distress ($M= 30.42$), and being moved ($M= 29.25$) in the study condition with negative emotion compared to both the condition with neutral affect and the condition with positive emotion (Figure 1).

The results of moderation analysis using Hayes Process macro in model 1 revealed a negative and significant moderating impact of psychopathy on the relationships between study conditions and the meta-emotions of being moved. Notably, significant interactive effects were identified only between contrast I (negative emotion vs. mixed emotions) and the general level of psychopathy in a model in which the emotion of being moved served as a dependent variable. The second model which added the interaction term (study condition x psychopathy) explained an additional $\Delta R^2= .047$, $F(5, 114)= 1.62$, $p= .17$, bringing the total variance explained 32%, $\Delta R^2= .32$, $F(5, 114)= 4.85$, $p < .001$. Despite the non-significant adjusted R^2 , the significant interaction coefficient still suggests that the

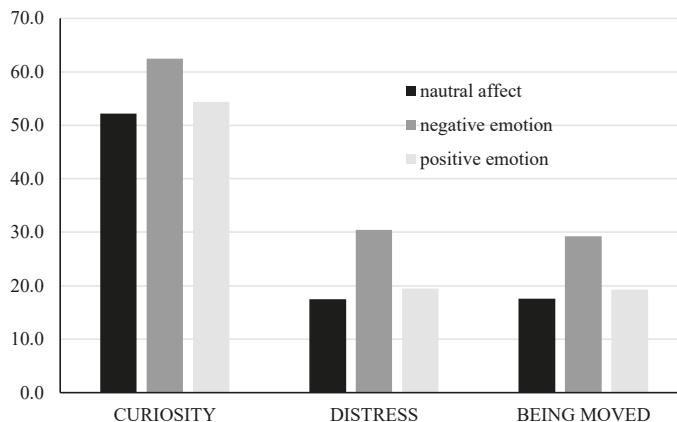


Figure 1. Average values of the variables in the condition with neutral affect, condition with negative emotion, and condition with positive emotion.

moderator variable is influencing the relationship between the independent and dependent variables. It means that the main effects of the independent and moderator variables themselves are not strong, but their interaction is substantial. Moderation analysis summary is presented in Table 3. which includes standardized regression coefficients, standard error, values of statistical significance tests of the analyzed regression coefficients and values of statistical significance.

Table 3. Results of moderation analysis. Psychopathy (overall score) as a moderator of the relationship between study conditions and meta-emotions.

Explanatory variables	Dependent variable											
	Curiosity			Distress			Being moved					
	B	SE	t	p	B	SE	t	p	B	SE	t	p
Contrast I×Psychopathy	-0.18	0.70	-0.94	.352	0.70	0.40	-1.12	.264	-0.41	0.390	-2.39	.018
Contrast I×Psychopathy	-0.35	1.77	-1.42	.158	1.77	1.06	0.17	.865	-0.12	1.030	-0.53	.595
Contrast III×Psychopathy	-0.23	1.03	-1.10	.276	1.03	0.62	-0.31	.758	-0.24	0.599	-1.31	.193

Notes: B=unstandardized regression coefficients; SE= Standard Error; t= regression coefficients.

The results of simple slope analysis were conducted to better understand the nature of the moderating effect. Figure 2 presents the mean standardized severity in conditions with negative emotion and mixed emotions on the general scale of psychopathy. It depicts values one standard deviation below the test sample mean, the mean value, and one standard deviation above the mean.

Finally, Table 4 shows the results concerning the effectiveness of manipulation, the number of participants indicating feelings related to each film scene; That is, the data appearing in Table 4 show how many participants in each subgroup described the scene as negative emotion, positive emotion, mixed emotion or neutral. The research question was: do psychopaths differ from non-psychopaths in experiencing different forms of emotion (i.e., positive emotion, negative emotion, and mixed emotion) in terms of the meta-emotions of being moved, distress, and curiosity?

The data showed in Table 4 indicate that across the groups, the observed indicators showed that in the condition of negative emotion most respondents ($n= 11$) described it as a negative emotion. And in the condition of positive emotion, most of the participants ($n= 11$) responded that they felt a positive emotion while watching a

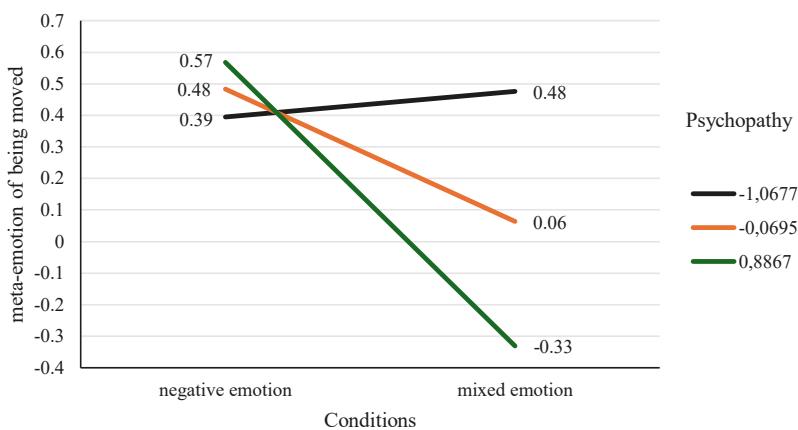


Figure 2. Mean standardized severity values in conditions with negative emotion and mixed emotion for three psychopathy levels (overall score).

Table 4. Measuring the effectiveness of intervention (number of participants indicating feelings related to each film scene).

		Negative emotion	Positive emotion	mixed emotion	Neutral affect
Affective arousal introduced	"I didn't feel any emotions"	0	6	1	8
	"I felt ONE unequivocally negative emotion, such as sadness"	11	0	2	2
	"I felt ONE unequivocally positive emotion, such as joy"	0	11	2	2
	"I felt TWO EMOTIONS, first negative and then positive, such as sadness followed by joy"	2	2	8	3

given movie scene. However, in this condition some respondents ($n= 6$) also described the scene as one that evokes neutral emotion. In the mixed emotions condition most participants ($n= 8$) described the movie scene as one that evoked mixed emotions. And finally, in the condition of neutral emotion, respondents also rated it as eliciting a neutral emotion ($n= 8$).

DISCUSSION

The primary objective of the study was to assess whether high scores on psychopathy plays a role in differentiating various forms of meta-emotions, such as being moved, curiosity, and distress. Therefore, this study compared these three types of attitudes between groups in which the four types of emotions were aroused: negative emotion, positive emotion, mixed emotions, and neutral affect. The results show that intensity of being moved towards mixed emotions depends on the level of psychopathy, and that happens exclusively in the case of mixed emotions thus the severity of the psychopathy acts as a moderator for being moved towards mixed emotions, and not any other emotion elicited, suggesting that psychopathy is associated with a specific insusceptibility to affective co-arousal.

At a low level of psychopathy (i.e., one standard deviation below the mean), the meta-emotion of being moved in a condition with negative emotion closely resembled the meta-emotion of being moved in a condition with mixed emotions. The meta-emotion of being moved in the condition with mixed emotions was found to be lower than

in the condition with negative emotion, with the level of psychopathy at the average level in the sample or higher. This may indicate that for individuals scoring high on psychopathy, negative emotions are experienced as more vivid and personal than mixed emotions. It is possible, that this is due to deficits in reinforcement learning, which is attributed to psychopathic individuals. Dargis, Wolf, and Koenigs (2017) proved that higher psychopathy scores were associated with reversal learning errors and draw a conclusion, that individuals high in psychopathy have particular difficulty in flexibly altering behavior in the face of changing contingencies (Dargis *et alii*, 2017). The collective analysis in this study leads to the conclusion that mixed emotion experiences pose more difficulty for individuals scoring high on psychopathy scale than negative emotion. Mixed emotions appear to be trivial and incomprehensible, or even unattainable for psychopathic individuals compared to unequivocal emotions. Negative emotions are perceived as simpler and more accessible by psychopaths. They require plain and unambiguous. The meta-emotion of being moved is considered to be a beneficial and sublime emotional state, characteristic of individuals with high emotional maturity (Landmann, Cova, & Hess, 2019).

The potential limitation of the capacity to experience affectively in a manner that is inconsistent with high or even moderate psychopathy is consistent with Kernberg's notions of borderline organization, which is the foundation for personality and is characterized by an inability to integrate inconsistent aspects of reality (Kernberg, 2016). In psychopathy, the shallow way of experiencing mixed emotions may be indicative of this type of deficit in the integration of negative and positive affect. Consequently, psychopathy may involve emotional withdrawal in bitter -sweet situations that demand the integration of positive and negative affect. From the perspective of the theory of constructed emotion, the flattening of sensitivity to mixed emotion can be understood as an intentional way to lower mental involvement in affective processing, which turns out to be too difficult and ineffective (Barrett, 2017). Our findings are also consistent with the conclusions of other studies that emphasize the specific responses of individuals scoring high on psychopathy to ambiguity, inconsistency, and conflicting stimuli, either at the neurobiological (Dickison, Neo, McNaughton, & Sellbom, 2024) or cognitive (Łuczak, & Tarnaś, 2021) level.

The question "do psychopaths differ from non-psychopaths in experiencing different forms of emotion (i.e., positive emotion, negative emotion, and mixed emotion) in terms of the meta-emotions of being moved, distress, and curiosity? It seems to be supported by the results obtained in this study. It was notable to observe that during the mixed emotions episode, a negative emotion arrives and subsequently a positive one. This may result in moderation of the negative emotion via the positive emotion or in focusing attention exclusively on the positive aspect to exclude the negative. Both effects may be a "salvation". This phenomenon, known as the "undoing" effect, was investigated by Fredrickson *et al.* In their study, the researchers triggered cardiovascular responses by exposing participants to a horror film (Fredrickson, Mancuso, Branigan, & Tugade, 2000). Participants were then shown second films intended to evoke happiness, fun, a neutral state, or sadness, depending on the study condition. The results confirmed the "undoing" effect, participants who watched one of the two films evoking positive emotions experienced a rapid return of the cardiovascular system to the optimal state. This evidence indicates that positive emotions can mitigate the physiological symptoms associated with negative emotions. It is plausible that in individuals with higher psychopathic traits keep anchored to their negative emotions like anger and their needs

to make others suffer, and hence their possible “undoing” effect.

It is important to consider the findings of our study within the context of several limitations. First, Hare's model, which has undoubtedly contributed greatly to the understanding of the psychopathic construct and stimulated interest in investigating the subject, also has limitations. For example, it has been criticized for its reliance on the intrinsic antisocial aspect to diagnose psychopathy. Some in the field, including with Hare (Hare, Neumann, 2005; Neumann, Hare, 2014) himself, maintain that antisocial behavior is an important aspect of psychopathy, whereas others (Boduszek, & Dębowska, 2016; Cook, & Mitchie, 2001) assert that the behavioral dimension is more a consequence rather than integral. In fact, this view is increasingly dominant in the literature, where psychopathic personality is seen as cognitively and emotionally rooted, and antisocial behavior is considered a consequence not necessarily central to psychopathic traits. However, it is important to remember about conceptual evolution of psychopathy. In its origin, “sociopathy” and “psychopathy” were used to denote different types of antisocial patterns.

According to Visdómine psychopathy is a special case of antisocial behavior, and they can neither be treated as completely different, nor as completely identical (Visdómine, 2014). The development of neuroimaging and genetics, recent years have brought incredible progress in understanding the functioning of the human brain, and most psychopathy researchers are strongly focused on finding its biological bases, but is this concentration not at the expense of environmental factors? Jalava, Griffiths, & Maraun (2015) in their book present a comprehensive critique of the psychopathy concept and recommend great caution in drawing far-reaching conclusions about some brain structural and functional abnormalities as the cause of psychopathy. “Just as brain abnormalities can produce behavioral symptoms, behavior and experiences can lead to changes in brain function. Many studies demonstrate that our brains are shaped by our lifestyle just as much as our neurobiology causes lifestyle choices.” (Jalava, Griffiths, & Maraun 2015, p. 148-149). The discussion about definition of psychopathy and also structural or tangential relation between antisocial behavior and psychopathy is still opened, and this should be always considered.

A key limitation of our study is small sample size, which considerably limits the attempt to generalize the results. Due to the above, this study should be treated as preliminary research that requires replications with more representative samples. Likewise, the failure to collect data on additional characteristics of the sample of participants (i.e., academic level, socioeconomic status, criminal history, etc.) should be included in subsequent studies. It would expand knowledge of the topic in the context of the research objective. Perhaps it would turn out to be differences in the results between the different groups of respondents, e.g., between those with and without a criminal history.

Another limitation of this study is its reliance on self-report measures of psychopathy, which inherently reflect the theoretical assumptions underlying their construction. While these scales provide valuable empirical data, they do not necessarily capture the full complexity of psychopathy as a psychological construct. Psychometric instruments used in this research are composed of items that largely reflect our conceptualizations of psychopathy rather than providing an independent measure of the disorder itself. Future research should incorporate a more nuanced theoretical framework, considering alternative methodologies such as behavioral assessments or neurobiological markers to complement self-report data and ensure a more comprehensive understanding of psychopathic traits.

Notably, the Polish version of the SRP-III is only a translation. The authors

prioritized the cultural appropriateness of the instrument according to the factor solution obtained in the Polish population, although the original SRP-III factor structure dominates in the international literature.

Regarding the SRP-III questionnaire, sample selection and diagnostic thresholds should be taken into account. The psychopathy indicator varies according to the aims of the assessment and the context of use. The creators of the questionnaire suggest a minimum of 30 points in North American conditions to confirm a diagnosis of psychopathy in research. However, the recommendation for Europe is only 25 points (Groth, 2010). Hare suggested that individuals scoring between 21 and 25 should be considered to have moderate psychopathy, exhibiting many signs without meeting all the criteria. The participants in the present study fell into this category, with scores centered around 21 on the SRP-III, which is not a high score. Notably, these individuals were from the general population and not criminals, which may be related to the theory of successful psychopathy, in which an increasingly antisocial element exerts minimal influence on their effectiveness compared to more highly skilled interpersonal manipulation and a more overt lack of emotion (Hall, Benning, 2006; Genau-Hagebölling, & Blickle, 2024).

One should also consider the possible impact of knowledge of the entire film on the reception of the scene presented. Whether or not respondents were familiar with the entire film may have weakened the differentiation in the perception of the study conditions and thus made it difficult to capture their specific meaning for the participants, but this is likely to be independent of the level of psychopathy. For similar future studies, this variable should be controlled, e.g. by asking whether the respondent has seen the movie before.

In addition, consideration should be given to addressing the gender imbalance or to focusing more concordantly on males, who are generally considered to be more prone to psychopathy, or at least more overt. In this study, 80% of the participants were women, which precludes extrapolation of the general findings to the general population. This tendency is present in internet studies more often, perhaps due to sex differences in internet use preference. Men use the internet mainly for purposes related to entertainment and leisure, whereas women use it primarily for interpersonal communication and educational assistance (Weiser, 2000).

Present study shows that meta-emotions are an important factor in determining overall emotional competence. It may be valuable to examine emotional functioning in psychopathy using a more holistic construct, such as meta-emotional intelligence. This construct is a combination of emotional abilities and meta-emotional dimensions, including beliefs about emotions, self-concept of one's emotional abilities, and self-evaluation of performance (Russell, & Barrett, 1999).

The results of this study provide information that may have important practical implications. If psychopathy involves difficulties in experiencing the emotion as moving in ambiguous situations, interventions aimed at developing this competence may prove beneficial. Especially since there are known studies on what exactly causes the emotion of being moved (Eerola, Vuoskoski, Kautiainen, Peltola, Putkinen, & Schäfer, 2021; Høffding, & Roald, 2022; Sawada, & Nomura, 2024; Koike, Murayama, Nishida; Herting, & Schubert 2022). In the future, interventions using this type of stimulus could be developed for people with psychopathic traits. While the effectiveness of therapy for psychopathic adults is low or counterproductive (Vitale, & Newman, 2008), it is more promising for children with characteristics and behaviors that put them at risk for developing psychopathy in the future (Conduct Problems Prevention Research

Group, 2011). For example, the effectiveness of emotion recognition training has been confirmed in 10-year-old children with behavioral problems and callousness (Dadds, Cauchi, Wimalaweera, Hawes, & Brennan, 2012). Although priority is given to social stimuli (Hänninen, Koski Jännies, & 2023), which may be too difficult to use initially, other stimuli can be used that are also effective in eliciting emotion, such as those related to values, music, art, or nature. It is therefore possible to select materials for developing the meta-emotion of being moved that are socially neutral and adapted in terms of content, form and context to the preferences of the target group, possibly with a view to gradually including interpersonal stimuli as an element of more advanced prevention programs.

This study shows the importance of how individuals scoring high on psychopathy perceive their own emotions (meta-emotions). Depending on whether an emotion is negative or mixed, individuals high in psychopathy perceive these experiences differently. They feel mixed emotions as less emotionally moving compared to individuals with lower psychopathic traits. This may be due to some type of fear or an aversion toward their own emotions. They are certainly not indifferent to emotions; rather, they seem to inflict them with affective overload - a subject that demands further research. Our results provide preliminary empirical support for the notion that individuals scoring high on psychopathy can experience emotions in a more characteristic way than previously considered. Individuals with severe, or even moderate, levels of psychopathy exhibit a limited ability to experience the meta-emotion of being moved in response to emotionally complicated states (i.e., affectively incoherent and mixed). Designing interventions aimed at developing the ability to feel being moved could help limit the development of psychopathic tendencies, especially in children and adolescents from risk groups.

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APPENDIX

Sample items for individual scales in film reception survey.

BEING MOVED	DISTRESS	CURIOSITY
intense	annoying	engaging
strong	irritating	interesting
severe	tiring	important
penetrating	hard	essential
excessive	troublesome	puzzling

Description of individual movie scenes with introductory description.

Experimental conditions	Scene description	Introductory explanation for participants
Positive emotion	<p>The parents are preparing for the grandmother's visit. They organize the living room, arrange flowers, and bring dishes. The woman asks her son to take a bath. The boy and dad tease their mom, and they seem to be enjoying spending time together.</p>	<p>The man, along with his wife and son, stays at home, having a good time while waiting for the visit of the boy's grandmother.</p>
Negative emotion	<p>The wife goes to the station straight away. When she sees a transport full of people, she decides to board the train. The duty officer stops the train, and the woman gets on.</p>	<p>The Nazis forcibly take the man and his son from home, transporting them and others to the train station. When the wife learns about it, she immediately goes to the station.</p>
Mixed emotions (positive following negative)	<p>The boy comes out of hiding and wanders sadly in the courtyard. Suddenly, an American tank emerges from around the corner. The boy sees it and shouts, "It's true!" The American driving the tank takes the boy with him and gives him a helmet, and they continue together. The child laughs.</p>	<p>In a concentration camp, the father tries to protect his son from suffering by pretending that everything that happens in the camp is fun, and the main prize is a tank. The day of liberation is coming, and there is chaos in the camp. The man hides the boy in an outside cabinet in the courtyard, but he does not return for a long time.</p>
Neutral affect	<p>The man brings the dish to the client, and they begin to talk about the riddles. In between times, an important but unannounced guest appears.</p>	<p>The man works in his uncle's elegant restaurant as a waiter. One of the regular customers of the restaurant is a doctor who likes riddles.</p>