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The Life History of Psychopathy: A Distinctive Role of Boldness*

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Previous research of psychopathic traits in the context of life history were limited by using single-score psychopathy measures and analyzing only some aspects of human life history. In the present study, we explored the associations between triarchic psychopathy traits (Meanness, Boldness, and Disinhibition) and a large number of life history indicators (childhood environment, age of menarche and first sexual intercourse, short and long-term mating, intra-sexual competition, and reproductive motivation) using a data from a community sample (N=486). We used network analysis to estimate the associations between the variables and their centrality indices in the network. The results were mostly in line with the hypothesis that psychopathy represents a set of behavioral traits that depicts a faster pace of life. However, some differences between psychopathic traits in the life history traits also emerged, showing different associations between psychopathy traits and life history indicators, especially regarding Boldness trait. Furthermore, Boldness showed a markedly higher centrality in the network compared to other psychopathy traits. Taken together, the results suggest that Boldness has the highest adaptive potential of all psychopathy traits. The findings are implicative for understanding psychopathy's pace of life and adaptive potential of psychopathic characteristics.

Keywords: psychopathy, life history, pace of life syndrome, boldness, mating, reproductive motivation

Highlights:

- The life history theory predicts that psychopathy is associated with faster life history
- However, the existing data frequently overlook the differences between narrow psychopathy traits

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- We analyzed the associations between TriPM psychopathy traits and various life history indicators
- The findings are largely in line with the fast pace of life hypothesis regarding psychopathy
- Boldness trait showed specific importance in life history network and elevated potential for evolution

Emergence and Descriptions of Human Life Histories

There is increasing interest in examining human behavioral dispositions in an evolutionary context. The task of understanding the role of behavior in biological adaptation is perplexing because evolutionary fitness is a complex trait that comprises several components (e.g., reproductive success, survival, mating, investment in offspring) and the links between fitness and behavior are dependent on ecological conditions. Firstly, fitness components constrain each other and therefore the investment in a certain component restricts the investment in some other component—this leads to the emergence of evolutionary tradeoffs (Bolund, 2020). Ecological theory of evolutionary tradeoffs is labeled as life history theory (Lawson, 2011). It has been suggested that in harsh, depriving and hostile environments, natural selection would favor earlier onset of reproductive activity, higher mating effort, earlier age of first reproduction, higher number of offspring with diminished parental investment: this is labeled as fast life history (Del Giudice et al., 2016). The opposite pattern of fitness-related outcomes is expected in beneficial and supportive ecologies. It is believed that childhood environment is particularly important in forming life histories because early environmental harshness may facilitate faster life history trajectory via developmental plasticity (Hämäläinen et al., 2021), as posited by psychosocial acceleration theory (Belsky, 2012). While some researchers believe that life history trajectories can be understood through a single fast-slow continuum, others believe that the continuum probably represents an oversimplification of the relations between life history indicators and that human life histories cannot be subsumed to a single fast-slow dimension (Međedović, 2020; Sear, 2020). The extended framework based on fast-slow life history continuum includes physiological and behavioral traits: all these three sets of traits are thought to be interconnected on a fast-slow dimension into the Pace Of Life Syndrome or POLS (Réale et al., 2010). Having in mind that fast POLS encompasses personality traits like boldness, aggressiveness, impulsiveness, and activity, it is not surprising that some researchers proposed that psychopathy as a set of traits may be a part of fast POLS (Jonason et al., 2009; Međedović, 2018).

Psychopathy as a Fast Behavioral Phenotype

There are several models of psychopathy in literature that have certain differences in the operationalization of psychopathy, but the majority agree that psychopathy is comprised of callous emotions and affective coldness, manipulative and exploitative interpersonal behavior, and behavioral

dysregulation expressed as impulsiveness and disinhibition (Hare, 2003; Levenson et al., 1995; Lilienfeld & Andrews, 1996). For instance, the triarchic model of psychopathy (TriPM: Patrick et al., 2009) depicts psychopathy as a syndrome of three behavioral dispositions: Meanness (a proclivity to harm others based on a lack of emotional empathy), Boldness (fearlessness, domination, and high self esteem), and Disinhibition (a lack of premeditation and diminished behavioral control). Psychopathy became infamous because the majority of research has shown that it has detrimental and destructive social consequences in various life domains (Patrick, 2018).

Due to a fact that psychopathy is closely related to the behavioral traits expected to depict fast POLS (Réale et al., 2010), the researchers assumed that psychopathy as well may be linked with fast life history trajectory (Jonason et al., 2009; Međedović, 2018). And indeed, research of the association between psychopathy and life history indictors has mostly shown that this set of traits depicts a faster pace of life. For instance, psychopathy is related to elevated reproductive success; however, there are differences between the narrow traits' associations with fertility—manipulative interpersonal behavior and emotional coldness tend to have positive relations with the number of children, while impulsive and reckless behavior have negative relations (Međedović & Petrović, 2019; Međedović et al., 2017). Differential relations between psychopathy traits and pubertal timing have been found as well: pubertal timing is negatively correlated with Disinhibition but positively correlated with Boldness (Sadeh et al., 2019). Psychopathy is positively related to short-term mating (Holtzman & Strube, 2013; Jonason et al., 2009) and negatively to long-term mating and the onset of sexual activity (Međedović, 2018; 2019). Furthermore, psychopathic characteristics facilitate intra-sexual competition—mating behavior aimed towards retaining existing mates and competing with mating rivals (Goncalves & Campbell, 2014; Lyons et al., 2019). Psychopathic characteristics are negatively related to parental investment (Međedović, 2019; Međedović & Petrović, 2019), which again should characterize faster pace of life. Finally, data show that a harsher environment (e.g., deprivation and maltreatment) facilitates the emergence of psychopathic traits during development (Craparo et al., 2013). Hence, the existing findings suggest that psychopathy traits accelerate the onset of sexual behavior, facilitate intrasexual competition and reproductive success, and buffer parental investment—this reproductive trajectory suggests a fast pace of life. However, the existing findings also suggest that narrower psychopathy traits may have different roles in life history trajectories, which can be expected because of differences in their content.

Goals of the Present Research

Examining the role of behavioral traits in the pace of life and their links with life history indicators is crucial for understanding their adaptive functions and selection regimes that potentially operate on behavior. The research of psychopathy in this framework has two important limitations: firstly,

psychopathy is often operationalized via a single score which can mask different associations between psychopathy traits and other measures. Secondly, life history was also usually measured by specific aspects of mating or reproduction, which prevents the possibility of gaining insight into a more comprehensive set of associations between psychopathy and life history. The current study has an aim to advance this research topic by investigating the associations between triarchic psychopathy characteristics and the broader set of life history indicators composed of childhood environmental characteristics, pubertal timing, onset of sexual behavior, mating, and reproductive motivation. As far as we are aware, there are no data about the relations between reproductive motivation and psychopathy. On the other hand, it has been emphasized that reproductive motivation represents an important determinant of fertility in modern humans (McAllister et al., 2016); hence, reproductive motivation plausibly plays an important role in life histories and fitness optimization in contemporary humans.

Furthermore, we applied network analysis (Costantini et al., 2015; Epskamp et al., 2018) in exploring the relations between psychopathy and life history. It has been recently proposed that the network approach can be especially fruitful in the analysis of life history pathways (Međedović, 2021a). Conceptually, in this framework life histories are viewed as populational spatio-temporal networks; i.e., dynamic systems of fitness-related indicators and their associations in specific ecological contexts. Statistical benefits of the network analysis are expressed in the exploration of the specific associations between the variables in a multivariate fashion, in contrast to factor analysis or canonical correlation analysis where there is a loss of information due to combining the observed variables in latent factors. Assuming that psychopathy depicts a fast pace of life, our basic hypothesis is that psychopathy traits would be negatively associated with a beneficial childhood environment, pubertal timing, and the onset of sexual behavior, and positively related to mating effort and reproductive motivation. Since previous research on the links between narrow psychopathy traits (especially the TriPM model that we investigated in the present research) are scarce, we could not set a priori assumptions of the associations between narrow psychopathy characteristics and life history indicators – this is an exploratory part of the current research.

Method

Sample

The data were collected via an online study using the Google Forms platform. Students who participated in the Evolutionary Social Science course at Singidunum University, Belgrade, disseminated the survey through social networks and emails as part of their course activity (students analyzed a part of the data in order to write a research paper). Participation in the research was voluntary both for students who disseminated the survey and the research participants. The goals of the study were presented on the first page of the survey and informed consent was obtained. Power analysis suggested that the minimum sample size to detect correlations of r=.15 with p<.05 (we anticipated low magnitude associations between

psychopathy physiological/behavioral life history indicators) for the study that would have power of 0.90 is 463 participants. We applied the snowball sampling technique which resulted in a sample of 483 individuals (after the removal of 7 individuals who answered a small portion of the questions – the small portion refers to one third of the survey – apparently, these were the participants that started the survey but they quickly gave up); 65.5% were females, with a mean age of 26.3 years (SD=5.67) with a large age range (from 18 to 72 years). The sample consisted only of participants without children. The mean education of participants was higher than average (37.7% of participants had finished college, 46.3% of participants were studying at college level at the time of data collection, while the rest of participants had finished secondary education). The research was approved by the ethics committee of Faculty of Media and Communications in Belgrade.

Measures

We measured psychopathy using the sample of items from the Triarchic Personality Measure (Međedović & Damjanović, 2018; for the original inventory see Patrick, 2010). These short TriPM scales showed high reliability estimates, high correlations with original TriPM scales and the same pattern of correlations with general personality traits (thus confirming their validity) as original scales (Međedović & Damjanović, 2018; however, note that some aspects of original TriPM are deliberately excluded from the short version because they may reflect other personality traits like sadism od criminal behavior). Furthermore, they are already used in evolutionary ecological research, showing validity in this context as well (e.g., Međedović, 2019). *Boldness*, *Meanness*, and *Disinhibition* were operationalized via 5 items in this research; 5-point Likert type scale was used for responding (where 1 stands for "Completely disagree and 5 for "Completely agree").

Beneficial childhood environment was measured via three items: *Childhood SES* ("Please rate on a scale of 1 to 10 the financial situation in your family while you were growing up"), *Childhood Family Relations* ("Please rate on a scale of 1 to 10 the relationships in your family while you were growing up") and *Childhood Stability* ("How stable was your environment during your childhood? Stable means that there were no changes and sudden circumstances, while unstable means that things often changed and suddenly happened"). The response scale was 1 - "very poor" and 10 - "very good" for Childhood SES and Childhood Family Relations; the numbers on the scale denoted 1 - "very unstable" and 10 - "very stable" for Childhood Stability.

Pubertal timing was assessed as the *Age of Menarche* (hence, measured only in females), while the *Age of First Sex* was used as an indicator of onset of sexual behavior.

Number of Sexual Partners was used as a measure of a short-term mating success while the duration of *Longest Partner Relationship* (in months) indicated long-term mating success.

Intrasexual competition was assessed using the Intrasexual Competition survey (Fisher & Cox, 2011). It measures four types of behavior in intrasexual competition: *Self-Promotion, Competitor Derogation, Competitor Manipulation, and Mate Manipulation*. Participants were asked to put themselves in the following situation: "If I sense that a rival is competing with me for my (potential) mate's attention, I would..."; the inventory items were shown afterwards. The scales that operationalize these behaviors were operationalized via 7 items each and have a 7-degree Likert-type scale for responding (1 denoted "definitely would not do" and 7 "definitely would do").

In order to measure reproductive motivation, we administered the Reasons for Parenthood scale (Langdridge et al., 2005). Both *Reasons for Parenthood* (a set of beliefs and motives favoring reproduction) and *Reasons Against Parenthood* (cognitions and motivations representing obstacles for becoming a parent) were analyzed; the former has 20 while the

latter has 15 items. Items that measure Reasons for Parenthood were presented with the preceding instruction: "I want to have a child because... (item example: I would give a child a good home)"; the responses are collected via 5-point scale where 1 stands for "does not influence me to want a child" while 5 stands for "very strongly influences me to want a child." Similarly, the opening sentence for Reasons Against Parenthood was: "I do not want to have a child because ... (item example: Having a child would cause financial difficulties)"; the responses ranged from 1 ("does not influence me not to want a child") to 5 ("very strongly influences me not to want a child") once again. Additionally, we measured the *Desired Number of Children* by asking the participants how much children they would like to have.

The Plan of Data Analysis

Firstly, we showed bivariate correlations (including both zero-order and partial correlations where participants' sex, age, and education are controlled for) between psychopathy traits and mating, reproductive motivation, and childhood environment indicators (descriptive statistics and reliabilities of multi-item scales are presented as well). Spearman's correlation coefficient was used because several analyzed variables are count measures which by definition are not normally distributed. Afterwards we showed the results of network analysis. In this framework, life history indicators are represented as network nodes while the associations between them are depicted as edges. The covariation between analyzed variables and demographic characteristics (sex, age, and education) was removed before building the model. Partialization was achieved via regression method: sex, age, and education were set as the predictor variables and all analyzed variables were set as the criteria. Standardized and normalized residuals (i.e., the variation of criteria measures that is not associated with the predictors) were saved for every criterion variable; these new variables were analyzed in the network model. The edges in the network were estimated using partial correlations. EBICglasso penalization (graphical lasso based on Extended Bayesian Information Criterium) was applied in order to reduce the probability of a Type 1 error: this is an upgraded algorithm for the lasso procedure (least absolute shrinkage and selection operator) aimed to select the best combination of variables in a multivariate space by estimating non-zero associations between them. Hence, it should be noted that these are conservative estimates of the associations between the variables. Besides revealing linkages and pathways between the nodes, network analysis produces centrality indices for every node: they show the relative importance of nodes for the network dynamics (which nodes are peripheral and relatively irrelevant and which nodes drive the functioning of the network to a higher degree). We calculated four centrality indices for the estimated network: *strength* (number of connections of the target node adjusted for the average weight of the target node, usually calculated as a product of these two parameters), *closeness* (estimation of the position of the target node in the network based on direct and indirect connections with other nodes), *betweenness* (the position of the target node in the shortest paths between other nodes in the network, i.e., the importance of a certain node to serve as a bridge between other nodes) and *expected influence* (which is a node's centrality measure that takes in account presence of edges with negative weights in the network).

Results

Bivariate Associations Between Psychopathy and Life History Indicators

First, we show the correlations between psychopathy traits and life history variables. Boldness shows positive, while Disinhibition has negative relations with a beneficial environment in childhood; Boldness has negative association with the Age of Menarche as well. All psychopathy traits are

negatively associated with the Age of First Sex and positively with the Number of Sexual Partners (although only via partial correlations in the case of the latter). Meanness and Disinhibition show negative relations with the duration of partner relationship at the zero-order level. The relations between psychopathy and intrasexual competition are positive, but they are especially characteristic for Disinhibition (which is associated with all four indicators), then Meanness (associated with Competitor Derogation, Competitor Manipulation, and Mate Manipulation) and the least for Boldness (which has significant associations with Mate Manipulation and Self-Promotion). Finally, different relations between psychopathy and reproductive motivation were detected: Meanness is negatively related to Reasons for Parenthood, while the association between other psychopathy traits and favorable parenthood motives are positive; Disinhibition is positively associated with Reasons Against Parenthood as well. Finally, individuals with higher Boldness and Disinhibition want to have more children, although these associations are obtained only on a zero-order level. It should be noted that the detected associations are mostly low in magnitude. The results of correlation analysis are shown in Table 1.

Table 1
Correlations between psychopathy traits, life history indicators, childhood environment, and first menarche

	M(SD)	*α*	Meanness	Boldness	Disinhibition
Meanness	1.82(0.70)	.76	/		
Boldness	3.25(0.77)	.72	.10*(.04)	/	
Disinhibition	2.11(0.83)	.74	.24**(.17**)	.03(-.02)	/
Childhood SES	6.58(1.86)		.05(.07)	.16**(.16**)	-.05(-.05)
Childhood Family Relations	6.90(2.40)		-.02(-.04)	.14**(.14**)	-.17**(-.17**)
Childhood Stability	7.12(2.58)		-.02(-.04)	-.02(-.02)	-.15**(-.16**)
Age of Menarche	12.87(1.48)		-.05(-.03)	-.14*(-.12*)	-.06(-.10*)
Age of First Sex	18.11(2.25)		-.11*(.00)	-.21**(-.17**)	-.16**(-.10**)
Number of Sexual Partners	7.79(12.71)		.09(.11**)	.01(.16**)	.08(.19**)
Longest Partner Relationship	54.51(38.10)		-.11*(-.03)	-.07(.06)	-.11*(.04)
Self Promotion	4.17(1.29)	.80	-.03(-.02)	.21**(.19**)	.22**(.22**)
Competitor Derogation	2.40(1.36)	.91	.19**(.19**)	.01(.01)	.30**(.31**)
Competitor Manipulation	2.09(1.23)	.84	.27**(.25**)	.05(.02)	.29**(.29**)
Mate Manipulation	3.88(1.46)	.78	.11*(.09*)	.14**(.11**)	.27**(.26**)
Reasons for Parenthood	3.47(0.79)	.91	-.19**(-.19**)	.17*(.11*)	.11*(.10*)
Reasons Against Parenthood	2.34(0.83)	.90	.07(.02)	-.03(-.08)	.18**(.13**)
Desired Number of Children	2.58(1.06)		.00(-.01)	.10*(.08)	.10*(.09)

Note. * – p <.05; ** – p <.01; correlations partialized for age, sex, and education are shown in the parentheses.

Network Model of Psychopathy and Life History Indicators

Next, we estimated the network where psychopathy and life history outcomes were set as the network nodes (network is estimated in JASP: Walker et al., 2022). The Age of Menarche was removed from the analysis in order to estimate the network on the full sample. The model is shown in Figure 1; edges' weights are presented in Table 2. The Boldness trait has significant positive edges with Childhood Family Relations and childhood SES, Reasons for Parenthood, Self-Promotion, while the negative edge connects it to the Age of First Sex. Meanness is positively associated to Competitor Derogation, Competitor Manipulation, and the Disinhibition psychopathy trait, while it has negative connection with Reasons for Parenthood. Finally, Disinhibition is also positively connected to Desired Number of Children, Number of Sexual Partners, all four aspects of intrasexual competition, and Reasons Against Parenthood; it is negatively linked to Childhood Family Relations and Childhood environmental Stability.

Figure 1
Network model of life history indicators and psychopathy traits

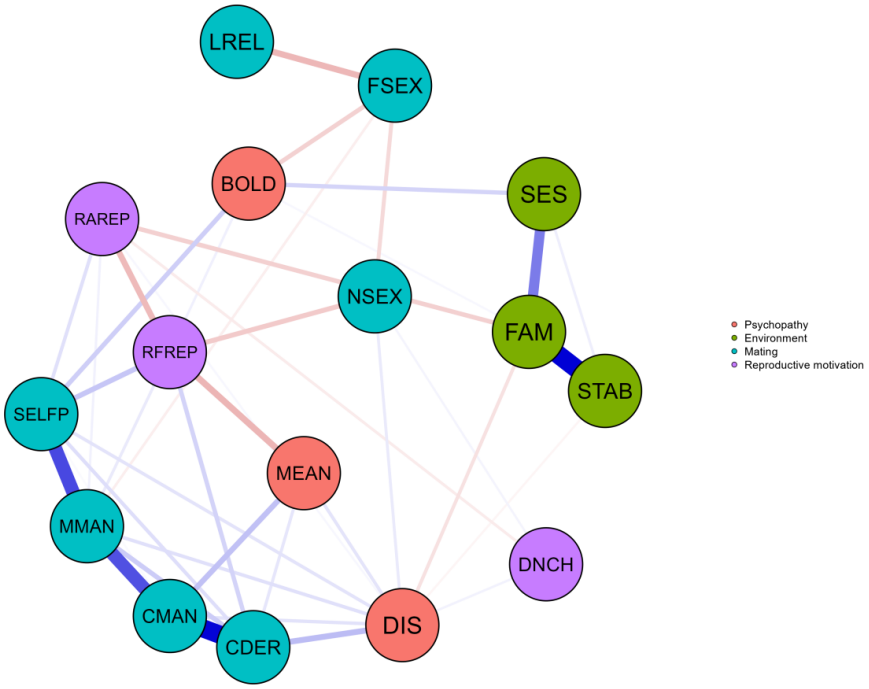
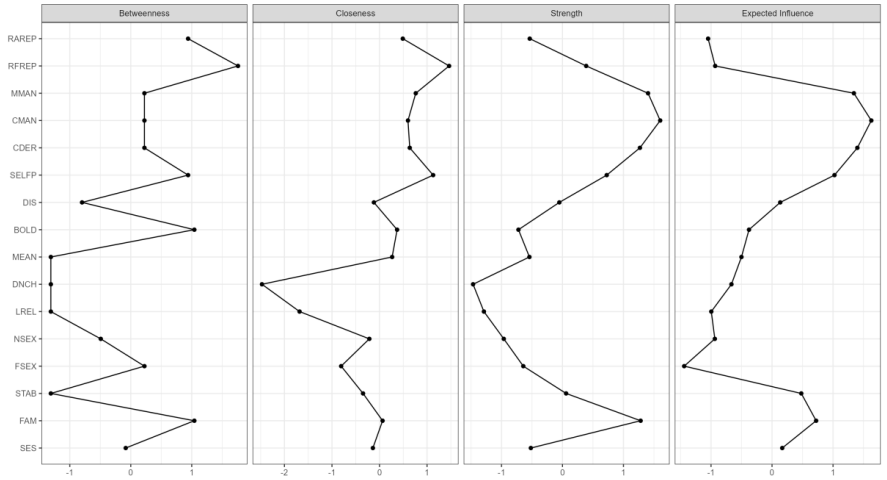


Table 2
Edge's weights matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. SES															
2. FAM	**.24**														
3. STAB	**.03**	**.46**													
4. FSEX	0	0	0												
5. NSEX	0	0	0	**-.07**											
6. LREL	0	0	0	**-.13**	0										
7. DNCH	0	0	0	0	**.02**	0									
8. MEAN	0	0	0	0	0	0	0								
9. BOLD	**.08**	**.01**	0	**-.08**	0	0	0	0							
10. DIS	0	**-.06**	**-.02**	0	**.04**	0	**.02**	**.05**	0						
11. SELFP	0	0	0	0	0	0	0	0	**.09**	**.05**					
12. CDER	0	0	0	0	0	0	0	**.05**	0	**.12**	**.06**				
13. CMAN	0	0	0	0	0	0	0	**.11**	0	**.05**	**.01**	**.45**			
14. MMAN	0	0	0	**-.03**	0	0	0	0	0	**.06**	**.33**	**.09**	**.32**		
15. RFREP	0	0	0	0	**-.10**	0	0	**-.13**	**.03**	0	**.10**	**.08**	0	**.04**	
16. RAREP	0	**-.09**	0	0	0	0	**-.04**	0	0	**.01**	**.06**	0	0	**.03**	**-.12**

Note. Edges that are estimated to be non-zero are bolded. MEAN – Meanness; BOLD – Boldness; DIS – Disinhibition; SES – Childhood SES; FAM – Childhood Family Relations; STAB – Childhood Stability; FSEX – Age of First Sex; NSEX – Number of Sexual Partners; LREL – Longest Partner Relationship; SELFP – Self Promotion; CDER – Competitor Derogation; CMAN – Competitor Manipulation; MMAN – Mate Manipulation; RFREP – Reasons for Parenthood; RAREP – Reasons Against Parenthood; DNCH – Desired Number of Children.

Figure 2
Centrality indices of the network nodes



Centrality indices can be seen in Figure 2. We can see that Disinhibition has average strength and expected influence while two remaining psychopathy

traits fall below average on these two centrality indices. However, the situation is different with the remaining centrality indices: Boldness has high closeness and especially high betweenness. This suggests that when we take into account not only direct, but also indirect edges, Boldness represents one of the most important nodes in the network.

Discussion

The main goal of the present research was to investigate the associations between TriPM psychopathy traits and life history indicators operationalized via childhood environment, pubertal timing, onset of sexual behavior, mating behavior, and reproductive motivation. As suggested by previous research and theory, psychopathy may contribute to a fast pace of life: earlier pubertal timing and start of sexual activity, higher investment in short-term mating, and competition for mates. However, some differences between psychopathy traits emerged as well, especially regarding reproductive motivation and childhood environment; they warn us that psychopathy should not be measured as a single score because this way different relations between narrow psychopathy traits and other variables can be masked. Differences were especially highlighted in the network model; however, we should remember that it provides conservative estimates and therefore, bivariate associations and network nodes should be interpreted simultaneously. The present findings contribute to the understanding both to psychopathy's pace of life and adaptive potentials of psychopathic characteristics.

Psychopathy and Life History: Disinhibition and Meanness

Meanness and Disinhibition have a somewhat more similar life history compared to Boldness. They are positively correlated between themselves and share similar behavior related to intrasexual competition. While previous studies found that psychopathy (represented as a single score) is positively related to competition for mates (Carter et al., 2015; Goncalves & Campbell, 2014; Lyons et al., 2019), the key tactics for individuals high in Meanness and Disinhibition is Competitor Derogation and Competitor Manipulation. Competitor Derogation represents attempts to humiliate potential rival and it can be volatile—therefore, its links with the Meanness trait are not surprising. Meanness was negatively related to attitudes that favor reproduction and childbearing; furthermore, positive bivariate association between Meanness and short-term mating was detected as well. Although not replicated in the network analysis, the latter correlation was obtained in previous research as well (Međedović, 2019). It can be assumed that emotional coldness and lack of empathy facilitates the search for uncommitted sexual relationships while at the same time decreasing a motivation for parenthood; if they do have children, these individuals tend to invest less in them (Međedović & Petrović, 2019). Therefore, the results obtained in this research echo the previous findings of Meanness's involvement in mating-parenting tradeoff (Međedović, 2019).

Disinhibition is the only psychopathy trait that is negatively related to beneficial childhood environment. This is in line with the previous data showing that impulsive, erratic and antisocial traits are positively related to environmental harshness, but not other psychopathy characteristics (Poythress et al., 2006). However, it is highly questionable whether Disinhibition represents an adaptive response to a harsh environment. Correlation analysis suggested that Disinhibition positively correlates both with positive and negative reasons for parenthood, but only the latter association was confirmed in the network model. Even if Disinhibition is positively associated to the desired number of children (as suggested by our data), previous research has shown that a similar psychopathy trait (Lifestyle characteristics from PCL-R) negatively predicts number of children (Međedović et al., 2017); hence, the lack of behavioral control may generate a discrepancy between motives and actual behavior. Congruently with this, previous research showed that individual higher in Conscientiousness trait, the personality characteristic that is opposite to Disinhibition are more capable of translating their reproductive motivation into observed fertility (Allen & Robson, 2018). Taken together, all discussed findings together with positive link with number of sexual partners suggest that Disinhibition is psychopathic trait with the life history profile that is most consistent to fast Pace Of Life.

The Curious Case of Boldness

Boldness is positively associated to a beneficial childhood environment, especially to functional family relations. Having in mind the hypothesized negative links between psychopathy and beneficial environment, this result is intriguing, but it is in line with the data of more cautious and restricted personality traits in dangerous ecologies (Schaller & Murray, 2008); being bold, sociable, and stimulus-seeking in hostile environments may not be adaptive. Boldness is linked to intrasexual competition primarily through Self-Promotion: this is a competitive behavior where an individual shows one's best qualities in order to attract a mate and some scholars regard it as the most effective of competition tactics (Schmitt & Buss, 1996). Boldness is the only trait that negatively correlated with Age of Menarche; this was expected, but it is not in line with a previous study that obtained the association between Boldness and later pubertal timing (Sadeh et al., 2019). The discrepancy can be attributed to the measures of pubertal timing because the previous study used subjective estimations of puberty, not the exact age of menarche. Congruently to the previous result, Boldness was the only psychopathy trait that was negatively connected to the onset of sexual behavior and positively to beliefs in favor of reproduction and parenthood. We view this as an adaptive role of Boldness because reproductive motivation is positively associated with observed fertility, even on a genetic level (Miller et al., 2010). Furthermore, interpersonal psychopathy traits, which share some content with Boldness, positively predicted reproductive fitness in previous research as well (Međedović et al., 2017). It is also noteworthy to mention the high closeness and betweeness of Boldness in the network model:

these centrality measures indicate that Boldness is one of the central nodes in the life history network, especially when indirect pathways are considered. For example, earlier onset of sexual behavior is positively connected with intrasexual competition (i.e., Self promotion) only via the Boldness trait; similarly, a functional childhood family environment is indirectly positively associated with positive motives toward reproduction through Boldness. Hence, the current findings suggest that Boldness is somewhat distinct from the other psychopathy traits, with the highest adaptive benefits. Additionally, we may conclude that Boldness has heterogenous life history profile with both slow (beneficial environment) and fast POLS characteristics (earlier pubertal timing and onset of sexual behavior followed by higher reproductive motivation). However, we must bear in mind that these data can be viewed from another conceptual viewpoint: one that criticizes the Boldness trait as an operationalization of psychopathic personality due to its somewhat questionable validity (Crego & Widiger, 2014; Lynam & Miller, 2012; Sleep et al., 2019).

The Notion on the Network Life History Model

The network model did not produce a dense network of life history indicators, but more sparse space of the associations between the life history outcomes, similarly to the estimations obtained in previous research (Međedović, 2021a). This suggests that a single fast-slow dimension is not an adequate description of the covariation between the life history measures (Međedović, 2020; Sear, 2020). This is probably a consequence of the fact that evolutionary tradeoffs are relatively weak and therefore, the correlations between the fitness components are low or even nonexistent, in industrial and postindustrial human populations (probably due to low fertility rates); hence, the life histories of contemporary humans are more flexible. It is important to mention that the Reasons for Parenthood are estimated as the most central node in the network using betweenness and closeness as centrality measures: previous research with similar life history indicators also identified reproductive motivation variables as the ones with the highest importance in the life history network (Međedović, 2021b). This can be explained by the fact that reproductive motivation is a variable closest to reproductive success in the present data and therefore to fitness as well. The network model provides us with an insight of the covariation of the pathways between the life history indicators in a context of dynamic systems where the change in one part of the system facilitates the changes in other parts. For life history research this may be especially beneficial in the analysis of the ways ecological changes instigate the variation and covariation in reproductive-related traits on a population level. For example, the model shows that family relations in childhood are the most important aspects of early environment for developing life histories as indicated by centrality metrics. By examining direct and indirect links in the network, we may gain hypotheses about the causal relations between life history indicators, which can be further empirically tested in longitudinal research.

Limitations and Future Directions

This study has several limitations. The sample was consisted of young adults that did not have children in the time of data collection: this prevented us to analyze observed reproductive events like number of children and the age of first reproduction. We tried to compensate this limitation by analyzing reproductive motivation because reproductive motivation is closely linked to the observed reproductive behavior, but observed reproductive outcomes are certainly more beneficial in examining life histories. The sample of participants was biased towards individuals with higher education levels, which diminishes its representativeness. Psychopathy was estimated via short measures—full scales are certainly more comprehensive and thus could reveal more significant effects. This limitation may be related to the fact that the effect sizes of obtained relations are rather low in magnitude; some associations are expected to have small effect sizes (e.g., the ones between psychopathy and count measures like the duration of longest relationship, number of partners, and the desired number of children) but overall pattern of low associations may partly be product of administering short scales of psychopathy. Another measurement-related limitation is expressed in the operationalization of early environment measures: retrospective assessment of childhood ecology is prone to memory biases – objective indicators of early environmental conditions would provide more reliable estimations of these conditions. Furthermore, the current romantic relationship status was not measured; this may be important because it may influence participants' motivations about having children or their responses regarding intrasexual competition. This study did not apply attention checks; we believe that the lack of this control procedure did not undermine the quality of measurement because the survey was not long, but this should be recognized as the study limitation as well. Future studies may apply different models of psychopathy and different methods of measurement in order to explore the robustness of psychopathy – life history links. Although life history trajectories imply causal links between some variables (because some life history events appear in earlier developmental phases than others), the present research was cross-sectional and thus causal links cannot be established. All these limitations can be overcome in future research. We believe that human life history research could benefit from applying network analysis because it can help in developing the hypotheses about the life history pathways as the set of population-level interconnected events that influence fitness optimization. It can certainly be useful in identifying the role of behavioral traits like psychopathy characteristics in the pace of life and, therefore, shedding new light on their current evolution.

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Životna istorija psihopatije: posebna uloga smelosti

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Dosadašnja istraživanja psihopatskih karakteristika u kontekstu teorije životne istorije bila su ograničena korišćenjem mera psihopatije sa jedinstvenim skorom i analizom samo nekih aspekata životne istorije. U ovoj studiji istražili smo povezanost između osobina Trijarhijskog modela psihopatije (zlobe, smelosti i dezinhibicije) i velikog broja indikatora životne istorije (sredinskih uslova u detinjstvu, uzrasta prve menstruacije i prvog seksualnog odnosa, kratkotrajnog i dugotrajnog sparivanja, intraseksualne kompeticije i reproduktivne motivacije) koristeći podatke iz uzorka zajednice (N = 486). Koristili smo mrežnu analizu da procenimo povezanost između varijabli i indekse njihove centralnosti u mreži. Rezultati su uglavnom bili u skladu sa hipotezama da psihopatija predstavlja skup ponašajnih karakteristika koje opisuju brži životni tempo. Međutim, pojavile su se i neke razlike između psihopatskih karakteristika u životnoj istoriji, pokazujući različite povezanosti između osobina psihopatije i indikatora životne istorije, posebno u pogledu osobine smelosti. Štaviše, smelost je pokazala značajno veću centralnost u mreži u poređenju sa drugim psihopatskim karakteristikama; takođe, rezultati sugerišu da smelost ima najveći adaptivni potencijal od svih psihopatskih karakteristika. Nalazi pružaju nove mogućnosti za razumevanje životnog tempa psihopatije i adaptivnog potencijala psihopatskih karakteristika.

Ključne reči: psihopatija, životna istorija, sindrom životnog tempa, smelost, sparivanje, reproduktivna motivacija

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