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CAN WE KEEP THE SPARK ALIVE?

NEUROBIOLOGICAL MODEL OF PERSONALITY, LOVE STYLES, AND PASSIONATE LOVE IN LONG-TERM ROMANTIC RELATIONSHIPS

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Abstract: Current study investigated associations between neurohormonal dimensions of personality, love styles and passionate love and explored their ability to predict passionate love and love styles in long-term romantic relationships. The aim of the research was to contribute to the field of couple counseling and therapy by providing novel evidence that improves the understanding of clients' loving attitudes and the underlying dynamics of relationships. The study population comprised of 147 participants (median age 38 years) currently in long-term romantic relationship living in Slovakia. Research sample consisted of 49 men and 98 women (66.7 per cent). Median for relationship length was 102 months (8.5 years). Research followed exploratory, correlational, quantitative, non-experimental design. Positive associations were found between Negotiator personality (estrogen-oxytocin) and Mania love style, Builder (serotonin) and Pragma, and between Explorer (dopamine) and Ludus. Negotiator and Builder were moderate predictors of above-mentioned love styles. Eros, Agape and Mania related positively to Passionate love. Links between personality and Passionate Love were strongest for Negotiator and Builder. Personality assessment via Fisher Temperament Inventory may enhance greater awareness for therapists, counsellors, and clients themselves to better understand the configuration of major psychological constructs associated with its dimensions. Also, identifying personal love style may bring additional insight for therapist about clients' preferences, motivation, emotionality, and relationship dynamic.

Keywords: personality, temperament, love, love styles, passionate love.

¿PODEMOS MANTENER VIVA LA CHISPA?

MODELO NEUROBIOLÓGICO DE PERSONALIDAD, ESTILOS DE AMOR Y EL AMOR APASIONADO EN LAS RELACIONES ROMÁNTICAS DURADERAS

Resumen: El presente estudio investigó las asociaciones entre las dimensiones neurohormonales de la personalidad, los estilos de amor y el amor apasionado, y exploró su capacidad para predecir el amor apasionado y los estilos de amor en las relaciones románticas a largo plazo. El objetivo de la investigación fue contribuir al campo del asesoramiento y la terapia de pareja aportando evidencia novedosa que mejore la comprensión de las actitudes amorosas de los clientes y la dinámica subyacente de las relaciones. La población del estudio estuvo formada por 147 participantes (media de edad: 38 años) que mantenían una relación sentimental duradera y vivían en Eslovaquia. La muestra de la investigación estuvo compuesta por 49 hombres y 98 mujeres (66,7 %). La mediana de la duración de la relación fue de 102 meses (8,5 años). La investigación siguió un diseño exploratorio, correlacional, cuantitativo y no experimental. Se encontraron asociaciones positivas entre la personalidad Negociador (estrógeno-oxitocina) y el estilo de amor Manía, Constructor (serotonina) y Pragma, y entre Explorador (dopamina) y Ludus. Negociador y Constructor fueron predictores moderados de los estilos amorosos mencionados. Eros, Ágape y Manía se relacionaron positivamente con el amor apasionado. Los vínculos entre personalidad y amor apasionado fueron más fuertes en Negociador y Constructor. La evaluación de la personalidad mediante el Inventario de Temperamentos de Fisher puede aumentar la concienciación de terapeutas, asesores y los propios clientes para comprender mejor la configuración de los principales constructos psicológicos asociados con sus dimensiones. Además, la identificación del estilo personal de amor puede aportar información adicional al terapeuta sobre las preferencias, la motivación, la emocionalidad y la dinámica relacional del cliente.

Palabras claves: personalidad, temperamento, amor, estilos de amor, amor apasionado.

DEPENDÊNCIA DE REDES SOCIAIS E VITIMIZAÇÃO ENTRE ADOLESCENTES

Resumo: O presente estudo investigou as associações entre as dimensões neuro-hormonais da personalidade, os estilos de amor e o amor apaixonado, e explorou a sua capacidade de prever o amor apaixonado e os estilos de amor em relações românticas de longo prazo. O objetivo da pesquisa foi contribuir para o campo da terapia de casal, fornecendo novas evidências que aprimorem a compreensão das atitudes amorosas dos clientes e da dinâmica subjacente aos relacionamentos. A população do estudo era constituída por 147 participantes (idade média: 38 anos) que viviam numa relação de longa duração e residiam na Eslováquia. A amostra da investigação era constituída por 49 homens e 98 mulheres (66,7%). A duração média da relação era de 102 meses (8,5 anos). A investigação seguiu um modelo exploratório, correlacional, quantitativo e não experimental. Foram encontradas associações positivas entre Negotiator (estrogénio-oxitocina) e o estilo amoroso Mania, Builder (serotonina) e Pragma, e entre Explorer (dopamina) e Ludus. O Negociador e o Construtor foram preditores moderados dos estilos amorosos acima referidos. Eros, Ágape e Mania foram positivamente relacionados com o amor apaixonado. As ligações entre a personalidade e o amor apaixonado foram mais fortes no Negotiator e no Construtor. A avaliação da personalidade utilizando o Inventario de Temperamento de Fisher pode aumentar a consciencialização dos terapeutas, conselheiros e dos próprios clientes para compreenderem melhor a configuração dos principais constructos psicológicos associados às suas dimensões. Para além disso, a identificação do estilo de amor pessoal pode fornecer informações adicionais ao terapeuta sobre as preferências, motivação, emocionalidade e dinâmica relacional do cliente.

Palavras-chave: personalidade, temperamento, amor, estilos de amor, amor apaixonado.

INTRODUCTION

Loss of passion in long-term relationships seems to be a recognized phenomenon. As the production and distribution of dopamine and related neurochemicals eventually declines, so does the passion (Lieberman & Long, 2018; Fisher, 2009). Ongoing love relationships, driven by a different set of hormones, create feelings of attachment and closeness. Attachment (predominant component in long-term relationships) mediates emotional intimacy, friendships, parent-infant bonding and social relationships and is influenced by hormones oxytocin and vasopressin (Fisher, 2009). This companionate love does not necessarily involve intensity, sexual desire, or attraction (Berscheid and Hatfield, 1969; Grote and Frieze, 1994 as cited in Acevedo, Aron, Fisher & Brown, 2011). The novelty that triggers dopamine doesn't last forever and the loss of passion happens eventually (Lieberman & Long, 2018). General length of intense passionate love is between approximately 18 months and three years (Fisher, 2009). These neurobiological mechanisms are universal, even though, there are individuals who seem to experience passionate love long-term, therefore we were interested in exploring whether personality and its temperamental traits may be associated with specific feelings of love and passion in long-term romantic relationships.

Personality

Recent advances in medicine, molecular genetics, biochemistry, behavioral endocrinology, and brain imaging have enabled us to uncover fascinating biological sources of human behavior and personality. Fisher et al. (2012, 2013) constructed a personality measure derived directly from physiology and brain architecture. This model is based on neurotransmitter and neurohormonal correlates of human behavior associated with either dopamine, serotonin, testosterone, or estrogen/oxytocin system. These are reflected in four personality types: Explorer, Builder, Director and Negotiator. The first system represents a '*'Curious/Energetic'*' temperament (Explorer), linked with the dopamine-norepinephrine system. Explorer personality is associated with sensation and novelty seeking, curiosity, higher levels of energy and motivation, optimism, adaptability, generosity, impulsivity and susceptibility to boredom. On the other

hand, Explorers may be unpredictable, unreliable, disorderly, and prone to addictive behavior (Fisher, 2009). The second system, the '*'Cautious/Social Norm Compliant'*' reflects a personality of a *Builder* and is linked with the activation of the serotonin system. The traits related to this circuit include caution (harm avoidance), observing social norms, following rules and respecting authorities, religiosity, prosocial behavior, sociability and conformity (Fisher, 2009); concrete thinking and sustained attention (Zuckerman, 2005), self-control (Manuck et al., 1998) and low novelty seeking (Serretti et al., 2006). Builders are orderly, conscientious, conventional, loyal, they enjoy planning forward, follow rules, methods, habits and traditions, are self-controlled, precise and detail oriented. These people have factual and concrete disposition, are family and community oriented. Builders are the most likely from all types to seek a lifelong partner (Fisher, 2009). The '*'Analytical/Tough-Minded'*' (*Director*) scale is physiologically linked to prenatal endogenous testosterone priming. They exhibit higher social dominance, assertiveness, and antisocial behavior (Booth et al., 2006). Testosterone has been linked to enhanced sex drive, self-confidence, cognition, competitiveness, risk-taking and aggressive behavior (Dabbs & Dabbs, 2000), less emotion recognition and eye contact along with lack of empathy (Baron-Cohen et al., 2005). According to Fisher (2009), Directors are rather emotionally contained, autonomous (can tolerate extreme isolation), analytical, ambitious, assertive, bold, competitive, forthright, dominant, tough-minded, self-confident, logical, pragmatic, resourceful, focused and competitive. The estrogen-oxytocin system is reflected in the '*'Prosocial/Empathetic'*' scale of a *Negotiator*. Physiologically, it is linked with prenatal endogenous estrogen priming and oxytocin levels. Estrogen activity is associated with contextual thinking, verbal fluency and other language skills (Baron-Cohen et al., 2005), empathy, nurturing and other pro-social skills (Kendrick, 2000). Oxytocin has been positively correlated with social approach, trust, attachment, affiliation, and bonding (Kovatsi & Nikolaou, 2019). Estrogen has been associated with greater connectivity between brain hemispheres and lower 2D/4D digit ratio (Fisher et al., 2010). Negotiators are empathetic, imaginative, introspective, intuitive, cooperative, agreeable, emotionally expressive and

mentally flexible. They are good in tolerating ambiguity, web and contextual thinking, building intimate attachments and reading non-verbal cues. Negotiators value social harmony, friendships and relationships are very important to them (Fisher, 2009).

Love Styles

Theory of love styles (Lee, 1977) provides a framework for understanding the complexities of romantic relationships, unfolding ways how individuals navigate and experience love within their romantic relationships. Seminal research on love types was carried out by John Alan Lee, Canadian sociologist, and published in his book *The Colours of Love* in 1973. Lee constructed typology of different love concepts (styles) of intimate adult affiliations derived from fictional and non-fictional literature of love, ranging from Plato to Stendhal and modern authors. Methodology was based on qualitative data. Initially constructed types were tested and revised, generating a structured typology of six distinguishable love styles. The pilot research study used data from of 120 qualitative interviews analyzing over 100 000 items of data. Lee's typology does not ignore or deny overlap between individual categories but focuses on the clustering of the most distinctive characteristics. After extensive qualitative exploration and analysis, Lee (1977) identified three primary love styles (Eros, Ludus, Storge) and three secondary styles (Pragma, Agape, Mania), which are combination of primary styles. A person may engage at different love styles during intimate relationships, as well as specific love style may evolve over a period of time in the current relationship (e.g. from mania to storge). Eros embodies an intense and passionate love, characterized by an avid emotional connection, physical attraction, and a tendency to idealize the partner. Ludus practices a playful and non-committal approach to love, prioritizing short-term flings or parallel relationships, viewing intimacy as a source of pleasure rather than a marker of emotional depth. Storge represents a love that develops gradually, nurtured by the foundation of friendship and shared experiences. While lacking the initial intensity of Eros, Storge fosters enduring bonds built on mutual understanding, trust, and a deep commitment. Mania is volatile and potentially destructive blend of Eros and Ludus; it manifests as an obsessive and possessive

love characterized by emotional turbulence. Individuals high in Mania exhibit need for constant reassurance of their partner's love potentially leading them to co-dependence or obsessive jealousy. Agape embodies selfless or altruistic love. Agapean individuals prioritize their partner's needs and well-being above their own, demonstrating a willingness to make significant personal sacrifices for the sake of the relationship. However, this inclination towards selflessness can leave them vulnerable to exploitation. Pragma unites manipulation and control of Ludus with the companionship of Storge. Partner selection is guided by a set of desired qualities, often emphasizing factors like social status, financial security, or compatibility. While Pragma can lead to stable and successful relationships based on pragmatism, it may lack the depth of emotional connection found in other styles.

Lee's (1973) descriptions of the six different loving styles suggests certain overlap with a personality concept. Richardson et al. (1988) found a positive association between sensation-seeking and Ludic love, while simultaneously demonstrating negative correlations with Pragmatic and Agapic love styles. Further, Woll (1989) reported negative associations between excitement-seeking and both Pragmatic and Storge love, and a positive correlation between impulsivity (a facet of neuroticism) and Mania. Middleton (1993) extended these findings by identifying a relationship between neuroticism and Ludic love, while also demonstrating an inverse correlation with Storge love among male participants. Woll (1989) further differentiated love styles by linking Pragmatic love to a heightened need for cognitive control and Erotic love to impulsivity. White et al. (2003) expanded on this research by examining the associations between Lee's love styles and the Big Five personality traits, while also considering relationship satisfaction and intimacy. Their findings indicated that neuroticism was positively correlated with Mania but negatively associated with relationship satisfaction and intimacy. Extraversion exhibited positive correlations with all three domains: satisfaction, intimacy, and Eros. Openness, specifically among males, was negatively correlated with Ludic and Pragmatic love styles. Conversely, Agreeableness and Conscientiousness demonstrated consistent positive correlations with relationship satisfaction, intimacy, and the love styles of Eros, Storge, and Agape.

Passionate Love

Hatfield and Walster (1978, p. 9) define passionate love as "a state of intense longing for union with another. Reciprocated love (union with the other) is associated with fulfillment and ecstasy. Unrequited love (separation) with emptiness, anxiety or despair. A state of intense physiological arousal." According to Hatfield and Sprecher (1986), passionate love has *cognitive, emotional, and behavioral components*. Cognitive aspects demonstrate as intrusive thinking, idealization of the partner or the relationship, desire to know the loved one, preoccupation with the partner. Emotional components consist of attraction (especially physical or sexual attraction), positive and negative feelings when things go well or awry, longing for reciprocity of love, desire for complete and permanent union and physiological (sexual) arousal. Actions aimed at maintaining physical closeness, determining loved one's feelings, studying the significant other and service to the other represent behavioral components.

Present Study

The aim of this study was to investigate whether individual differences in personality are associated with Lee's Love styles and Passionate love. We also aimed to identify predictors of love style and passionate love.

METHOD

Research Design

The research followed exploratory, correlational, quantitative, non-experimental design.

Population

Research sample was based on a snowball sampling. In total, 147 people from Slovakia participated in the study (median age was 38 years; min. 22, max. 71). The sample consisted of 49 men and 98 women. Median for relationship length was 102 months (min. 36 and max. 652 months). 65.3 per cent of participants were married, 34.7 per cent were in a partnership.

Procedure

The research sample was established through an internet survey using snowball method. Questionnaires were integrated into a single survey using Google Forms tool. Announcements about the possibility of participation in the study were made

via multiple channels: in person, using social media (LinkedIn, Facebook), e-mails, through sharing and recommending to others and by word of mouth. The research survey was fully completed by 147 participants (18 years or older and currently in a long-term heterosexual relationship - min. of 36 months). No time limit was set to completing the survey and no personal data were requested except for basic demographics. The Fisher Temperament Inventory, Love Attitudes Scale and Passionate Love Scale were translated from English to Slovak language. The initial translation was made by two independent translators (using one bilingual translator). Discrepancies between translations were discussed, resolved and the items were revised. Translated questionnaires were pilot tested on a small sample. After comprehension testing, we further revised problematic items and finalized the Slovak version for all three instruments.

Data Analysis

Data were analyzed in IBM SPSS Statistics 20. Internal consistency of the instruments was measured with Cronbach's coefficient α . Descriptive statistics for demographic data and instruments included means, medians, standard deviations, skewness, kurtosis, interquartile range. To measure the strength of relationships between variables a non-parametric Spearman's Rho was used and predictors were tested using a stepwise regression analysis.

Instruments

Participants completed the Slovak version of *the Fisher Temperament Inventory* (FTI, Fisher et al. 2015), a 56-item self-report personality questionnaire. The FTI consists of four independent scales: 1. Explorer (dopamine); 2. Builder (serotonin); 3. Director (testosterone); and 4. Negotiator (estrogen/oxytocin). There are 14 statements for each dimension. Participants respond on a 4-item Likert scale (from "strongly disagree" to "strongly agree"). Validity of the model was assessed in two fMRI studies, which brought empirical support for the association of the FTI scales with activation of proposed brain regions (dopamine and serotonin circuit) (Brown et al., 2013). Hormonally based scales were empirically supported by 2D/4D ratio analysis (Fisher et al., 2010). FTI exhibits good internal consistency (Fisher et al., 2015).

In present study the Cronbach's alpha coefficients were as follows: Explorer, $\alpha = .891$; Builder, $\alpha = .817$; Director, $\alpha = .864$; Negotiator, $\alpha = .873$.

The *Love Attitudes Scale* (LAS, Hendrick & Hendrick, 1986) is a self-report instrument reflecting Lee's theory of love styles. The measure has six scales, representing: Eros, Ludus, Storge, Mania, Pragma and Agape. Numerous studies have supported the validity and reliability of the measure. High test-retest reliabilities, evidence of content validity and good internal consistency were also reported with this instrument (Hendrick et al., 1998; White et al., 2003; Mallandain & Davies, 1994; Woll, 1989; Middleton, 1993). The instrument consists of 42 items. Participants respond to each item using a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree". Cronbach's alpha coefficients showed good reliability of the measure (Hendrick et al., 1998; White, 2003). In this study, the internal consistency ranged from $\alpha = .668$ to $\alpha = .846$ (Eros: $\alpha = .846$, Ludus: $\alpha = .70$, Storge: $\alpha = .703$, Pragma: $\alpha = .722$, Mania: $\alpha = .668$ and Agape $\alpha = .834$).

The *Passionate Love Scale* (PLS) assesses the cognitive, emotional, and behavioral components of passionate love. The most common form of the PLS is a 15-item measure. Participants are presented with statements such as: "I would rather be with _____ than anyone else." or "I would feel deep despair if _____ left me." and are asked to indicate how true the statement is of them on the following Likert scale: 1 = not at all true to 9 = definitely true. The "_____ in each statement refers to the partner. Hatfield & Sprecher (1986)

reported high reliability (Cronbach's $\alpha = .91$ for the 15-item version and $\alpha = .94$ for the 30-item version). In the present study the PLS reached very good reliability ($\alpha = .89$). Construct validity has been supported by several positive associations with conceptually similar scales and measures (Hatfield & Sprecher, 1986).

Research Ethics

The study was approved by the Department of General Psychology, Faculty of Psychology at the Pan-European University (approval number FPS-139942-10331). Informed consent was obtained from all participants involved in the study. Participants agreed that the data may be further used for research and academic purposes. The survey was completely anonymous, and participants were treated according to the ethical standards of the Pan-European University and the Declaration of Helsinki.

RESULTS

The strongest correlations were discovered between Negotiator and Mania ($r_s = .42$, $p < .001$) and Builder and Pragma ($r_s = .348$, $p < .001$). Explorer correlated mildly with Ludus ($r_s = .235$, $p < .01$) and Builder with Storge ($r_s = .227$, $p < .01$) and Agape ($r_s = .219$, $p < .01$). Director and Mania displayed inverse relationship ($r_s = -.236$, $p < .01$). Coefficient of determination r^2 indicates that 17.6 per cent of the variance in Mania is predictable from the independent variable Negotiator, and 12.1 per cent of Pragma is predictable from Builder. The strongest association was found between Passionate love and Negotiator ($r_s = 0.263$, $p < .001$) and Builder ($r_s = 0.238$, $p < .01$).

Table 1. Comparación de correlaciones en función del género.

Variable	1	2	3	4	5	6	7	8	9	10	11
Explorer	—										
Builder	-0.304***	—									
Director	0.283***	0.070	—								
Negotiator	0.121	-0.076	-0.283***	—							
Eros	-0.035	0.112	0.083	0.038	—						
Ludus	0.235**	-0.080	0.163*	0.011	-0.300***	—					
Storge	0.037	0.227**	-0.007	-0.017	-0.243**	0.252**	—				
Pragma	0.086	0.348***	0.055	0.008	-0.095	0.220**	0.352***	—			
Mania	0.125	-0.099	-0.236**	0.420***	-0.051	0.125	0.143	0.164*	—		
Agape	0.002	0.219**	0.108	-0.024	0.405***	-0.254**	-0.011	-0.021	0.064	—	
PL	-0.088	0.238**	-0.148	0.263**	0.511***	-0.316**	-0.085	0.024	0.328***	0.472***	—

* $p < .05$, ** $p < .01$, *** $p < .001$ PL= Passionate love

Results of linear regression (Table 2) show that Builder is a significant predictor of Pragma ($\beta = .445$, $p < .001$) and Negotiator of Mania ($\beta = .428$, $p < .001$). The rest of the FTI scales exhibited lower predictive strength though statistically significant ($p < .05$): Explorer / Ludus ($\beta = .276$), Builder/ Storge, ($\beta = .233$), Explorer/Pragma ($\beta = .221$), Builder/Agape ($\beta = .175$). Passionate Love (PLS) correlated strongly with Eros ($r_s = .511$, $p < .001$) and moderately with Agape ($r_s = .472$, $p < .001$) and Mania ($r_s = .328$, $p < .001$). Ludus had inverse relationship with PLS ($r_s = -.316$, $p < .001$). Coefficient of determination r^2 indicates that 26.1 per

cent of the variance in Passionate Love is predictable from Eros, and 22.3 per cent from Agape. Ludus and Mania explain about 10 per cent of the variance each. Results of stepwise regression analysis show that both Builder and Negotiator temperament types are significant predictors of Passionate love (Builder $\beta = 0.265$, $p = .001$; Negotiator $\beta = 0.216$, $p = .007$). Results of stepwise regression analysis show that both Builder and Negotiator temperament types are significant predictors of Passionate love (Builder $b = 0.265$, $p = .001$; Negotiator $b = 0.216$, $p = .007$). page 9 / Table 2

Table 2. Regression coefficients for Love styles and Passionate love

	β	t	p	CC LL	CC UL
Dependent variable Pragma					
(Constant)		2.12	.035	.46	12.34
Builder	.371	4.80	.000	.19	.476
(Constant)		-.50	.616	-10.58	6.29
Builder	.445	5.55	.000	.26	.549
Explorer	.221	2.76	.007	.042	.254
Dependent variable Mania					
(Constant)		5.98	.000	7.29	14.50
Negotiator	.42	5.70	.000	.17	.35
Dependent variable Passionate love					
(Constant)		6.116	.000	44.760	87.507
Builder	.251	3.124	.002	.290	1.287
(Constant)		3.316	.001	17.809	70.364
Builder	.265	3.361	.001	.342	1.320
Negotiator	.216	2.738	.007	.143	.888

DISCUSSION

The primary aim of the study was to explore associations between a novel personality concept based on neurohormonal correlates, love styles and passionate love. The strongest relationship between personality types and Lee's Love styles was found between Negotiator and Mania. This relationship brings an interesting novel finding. Negotiator personality explains 17.6 percent of the variance for Mania style, which is quite impressive. Mania is characteristic for its emotionally intense nature and has been associated with neuroticism (Lester & Philbrick, 1988; Woll, 1989), at the same time, Fisher et al. (2015) found positive

relationship between Negotiator personality and neuroticism, which might in part explain our finding. Also, intense emotions and emotional expressivity are guided by estrogen hormones (Fisher, 2009; Nelson, 2010), which may constitute an additional link in understanding this connection. Jonason et al. (2020) examined association of personality pathology with love styles in adolescents and found that the Mania love style was associated with all pathological traits examined with the Personality Inventory for the DSM-5BF (antagonism, psychoticism, detachment, negative affectivity and disinhibition) (Krueger et al., 2012) as well as all dimensions of the Symptom Checklist-90

(Drahošová, 2025). Mania has been also associated with being erratic, impulsive, antagonistic, negative in affect, and detached from others (Jonason et al., 2015). These traits may lead to severe relationship dysfunctions. Manic love has been associated with several negative relationship characteristics: insecurity, narcissism, hostility, jealousy, uncertainty, and distrust (Karandashev, 2022).

Builder correlated moderately with Pragma. This serotonin driven personality type explains 12.1 per cent of the variance of Pragma, which we consider noteworthy. Activation of the serotonin system relates to specific traits as caution, observing social norms, following rules and respecting authorities (Fisher, 2009); high self-control (Manuck et al., 2000) and low novelty seeking (Delvecchio et al., 2016). Builders are orderly, conscientious, practical, conventional, loyal, self-controlled, family oriented and are the most likely from all types to seek a lifelong partner (Fisher, 2009). These characteristics may explain positive relationship with pragmatic love style. Pragmatic lover is looking for a beloved with similar interests and social background, this style involves conscious and practical considerations about a suitable beloved (education, religion, health, age, finances). Pragmatic lovers are also low in excitement-seeking (Lester & Philbrick, 1988; Woll, 1989) and low in openness to experience (Middleton, 1993, In White, 2003), which corresponds with Fisher's (2009) findings for Builder personality type. Another supporting argument for this relationship is that in Woll's study (1989) pragmatic participants showed a high need for impulse control and logical order and scored low in experience-seeking and high on cognitive structure and order.

Inverse relationship was found between Director and Mania and direct with Ludus. Directors are physiologically linked to prenatal endogenous testosterone priming. People expressive of testosterone exhibit higher social dominance, assertiveness, and antisocial behavior (Schaal et al., 1996; Booth et al., 2006). Testosterone has also been linked to enhanced sex drive, self-confidence, criminal behavior, competitiveness and risk-taking (Dabbs & Dabbs, 2000; Ehrenkranz et al. 1974). Significant associations have been found with sensation seeking,

extraversion, dominance, assertiveness and sexual arousability (Zuckerman, 1979, 1995). Fisher (2009) describes Directors as rather emotionally contained and low in neuroticism and agreeableness (Fisher et al., 2015) these traits might in part explain negative association with Mania. Positive association with Ludus might be elucidated by Director's enhanced sex drive, sensation seeking, self-confidence, competitiveness and risk-taking (Dabbs & Dabbs, 2000; Ehrenkranz et al., 1995). Richardson et al. (1988) found that high sensation seekers were more likely to engage in Ludic love style Ludus correlated positively with impulsivity (Mallandain & Davies, 1994). Ludus has also been associated with several pathological traits examined with the Personality Inventory for the DSM-5BF (antagonism, psychoticism, detachment, and disinhibition) (Jonason et al., 2020). At the same time, high sensation seeking, and impulsivity are core traits of the Explorer personality (Fisher, 2009). Therefore, we hypothesized that there may be a positive link between Ludus and Explorer. Although this relationship showed modest association, we believe the link between this thrill-seeking love style and Explorer personality is plausible. Although Explorers indulge in novelty and excitement seeking, these traits do not necessarily lead to a game playing and manipulative love style. Stepwise linear regression revealed that Builder is a moderate predictor of Pragma and Negotiator is a moderate predictor of Mania. The rest of the personality scales did not show statistically significant predictive strength.

The next objective was to examine relationships between Love styles and intensity of Passionate love. We discovered strong relationship between Passionate love and Eros. 26.1 per cent of the variance of Passionate Love is predictable from this love style. We consider this finding in line with Lee's (1977) description of Eros, as it represents intense physical, emotional and sexual attraction and erotic intimacy. The second strongest relationship was identified between Agape and Passionate love (explaining 22.3 per cent of the variance). This finding may be surprising as Lee's description of agapean love style highlights altruism and self-sacrifice, which might appear as an opposite of passionate erotic love. But when we look at Agape as being a combination of Eros and Storge,

the logic behind the discovered association becomes more plausible. Davis & Latty-Mann's findings (1987) disclosed positive association between Agape and Passion in women. This dimension included: fascination, exclusiveness, and sexual intimacy. For men, Agape was positively related to Viability and Intimacy but not to Passion. These sex difference may bring more light into this unexpected finding as our research sample consisted of 66.7 per cent of women. Relationship between Mania and Passionate love was moderate, accounting for 10.8 per cent of the variance of Passionate love. Lee's description of the Manic love style clearly brings to mind passion and intensity as Mania is a combination of passionate and erotic Eros and playful Ludus. According to Lee (1977), Mania is an obsessive, jealous and emotionally intense love style. We found moderate inverse relationship between Ludus and Passionate love, which is in line with previous research findings. Ludic lovers play games, maneuver for advantage, act permissive (even promiscuous) and engage in multiple relationships either serially or simultaneously (Lee, 1977). Davis & Latty-Mann (1987) found that Ludus correlated negatively to all three components of Passion (fascination, exclusiveness, and sexual intimacy) for both men and women. This is an interesting finding, which is in line with our findings. Although Ludic lovers may engage in sexually open lifestyle it seems that they are not able to feel genuine Passionate love towards their partners, at least not the one defined by Hatfield and Walster (1978).

Storge and Pragma did not show any associations with Passionate love. These findings are consistent with the descriptions of these Love styles as storgic relationships avoid extreme emotions, lack intensity and sexual attraction (Lee, 1977). Storge has been associated with Psychoticism (Jonason et al., 2020) and with all dimensions of the Symptom Checklist-90 (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, paranoid ideation, and psychotism) except for phobic anxiety (Drahošová, 2025). Pragma involves conscious and practical considerations about a suitable beloved and may indicate lack of genuine feelings. Moreover, Pragma is a combination of Storge and Ludus and none of these styles was positively related to Passionate love in our research.

Limitations

This study had a non-experimental research design; therefore, the results do not allow for causal interpretation. Another limitation concerns self-report scales, which are sensitive to various forms of response biases. The research sample was not representative, which limits generalization of our findings. We also need to mention sex disproportions in the sample, which consisted of 66.7 per cent of women. This disproportion might have influenced our results to some degree thus limiting the full potential to generalize our findings.

Conclusion

Results of the current study may contribute to overall understanding of the complex relationships between novel personality model based on neurohormonal correlates of human behavior, Love styles and Passionate love. These research results verified several previous research findings and provided additional empirical support for the established psychological constructs. Although more research is needed, presented results may have practical application in pre-marital, marital or couples counselling, suggesting that Love styles may be a good predictor of long-term Passionate love. Also, identifying personal love style may bring additional insight for therapist about clients' preferences, motivation, emotionality, and relationship dynamic.

Conflict of Interest

The author declares no conflicts of interest.

Author Roles

The author designed the study, performed literature research, and was fully responsible for data collection, data analysis and writing of the manuscript.

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